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Quad Tilt Wing VTOL UAV

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Abstract: **A Tilt Wing Vertical Take-off and Landing (VTOL) UAV, which highlights Tilt wings alongside each other and propellers fitted at the mid-span of every wing, is one of the better reassuring UAV configurations having both vertical take-off and landing capability and high cruise performance. A small prototype TW UAV has been constructed to prove the concept and full transition between vertical and horizontal flight has been successfully demonstrated under remote manual control. The essential aerodynamic characteristics of the TW i.e. Tilt wing derived from ANSYS data are summarized, and a tandem wing concept which achieves both hovering and cruising stability has been applied to design the prototype UAV. A flight control system (FCS) enabling continuous sway through all flight phases enabled a pilot to carry out vertical take-off, accelerating transition, cruise, decelerating transition and hover landing, all these phases with sufficient flying qualities.**

Keywords: **Tilt wing, UAV, VTOL (vertical takeoff and landing).**

1. Introduction

Uses of the Unmanned Aerial Vehicle (UAV) are getting mainstream dependent on quick mechanical advance & development in operational familiarity. Potential common and business UAV applications incorporate logical exploration, for example, meteorology and geology, ecological perception, for example, air examining, vegetation review, and untamed life following, law implementation, debacle support, and modern help, for example, crop tidying, fish finding and electrical cable upkeep. Without a doubt, a few UAVs have just been functional to fringe watch, backwoods fire planning, etc. It is normal that the use of UAVs will continue extending and the market will develop drastically inside the decade. Existing fixed-wing & helicopter UAVs can be functional to satisfy the needs of these missions, yet these have inborn operational burdens. Fixed-wing UAVs by and large have great journey execution however require run ways or unique dispatch and recuperation hardware, for example, sling launchers, parachutes or nets. Helicopter UAVs can take off and land with no runways however have helpless voyage and payload conveying execution contrasted with fixed-wing UAVs.

A progression of air stream tests must be done first to examine the QTW arrangement's fundamental streamlined qualities, with estimations completed of intensity on high approach (wing alpha from 0 degree to +90 degree) attributes, push of the couple propeller format in standalone mode, and wing-propeller downwash utilizing (molecule picture velocimetry). These test will affirm the streamlined achievability of the setup, and can propose a need to improve the pair wing plan for better soundness and control, in any period of flight. In the current task, rather than completing air stream test to get the streamlined plausibility, an ANSYS program is rushed to get however much subtleties as could be expected, since accessible air stream in school isn't adequate to get the streamlined subsidiaries. At that point an improved couple wing design be created and utilized in the structure of the confirmation of-idea vehicles, and an essential flight control framework intended to permit the vehicle to be physically forbidden all through its wide flight envelope.

2. Background

The TW (Tilt Wing) has a pair wing design with 4 propellers, 1 mounted on every one of the front and back wings. The vehicle take off in VTOL mode with the main edges of its wings coordinated vertically upwards. The vehicle climbs and afterward quickens while turning its wing step by step towards the flat. This flight stage is named "quickening progress" and the vehicle's arrangement during change is supposed to be in a "transformation mode". The QTW travels in "quite mode" with the principle wings fixed on a level plane at a down stop. In "decelerating change" stage, the wings tilt back to vertical, & the vehicle at last grounds in VTOL mode. In the drift, the vehicles is forbidden in pitch and roll by means of disparity push. Yaw is restricted by means of Flaperon surfaces on the front and back principle wings which are submerged in the propeller slip stream. In standalone mode, the vehicle is controlled in pitch by means of lifts or flaperons, in roll by means of flaperons & in yaw by means of a rudder or discrepancy push. 1 bit of leeway of the QTW setup is that the QTW propeller & wing blend doesn't would like principle or tail rotor instruments, which are heavier and more mind boggling than propellers. Additionally, a cross shaft system to make up for lopsided push in a 1-motor defective drifting circumstance could be killed by a programmed motor control work that decreases the push of the working motor corner to corner inverse the bombed one. A tilt wing vehicle for the most part has higher circle stacking and littler measurement

Design of High Performance Axial Compressor for Single Spool Engine to Substitute Twin Spool Engine

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Abstract: *Design of an axial compressor in order to replace the double spool engine to single spool with higher efficiency and increased thrust is our aim. Initially the thorough study and analysis of axial compressor and the turbine was done by individuals. The conventional calculation of the axial compressor including finding out the exact and suitable number of stages, calculation of turbine specifications, blade angles and various other required and fundamental parameters are found precisely. The utmost challenge faced during this project was to analysis each and every fighter jet aircrafts and considering parameters and specifications from each of these engines required for our project. In this research, several single-spool, double-spool, three-spool engines were studied to understand that how can we redesign and develop our axial-compressor which would yield us the expected result. Thrust, number of stages, various efficiencies, temperature at each stage of compressor and turbine, blade parameters, specific fuel consumption and many more frameworks have been solved meticulously.*

Index terms: axial compressor, gas turbines, blade parameters, etc.

1 Introduction

Aviation industry supports around 65.5 million jobs worldwide and enables around 2.7 trillion U.S dollars in global GDP. India's military aviation entered its first phase of modernization in the mid-sixties and entered its second phase in the late seventies and early eighties.

Objective of our project is increase the performance of the single spool engine in order to substitute double spool engines. The ultimate aim is to replace the double spool engine with single spool engines keeping the efficiency and total thrust outcome higher or at least equal to

ZN-NANOPARTICLES COMPOSITES BY ELECTRODEPOSITION METHOD

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Abstract: Zinc coating by using Electrodeposition on a mild steel or aluminum substrate in a acid bath solution in hull cell by supplying continuous 5 volts current was investigated using cyclic voltamatric and chronopotentiometry techniques . The rate of current efficiency, deposition rate, and corrosion resistance capacity, thickness of the deposition, current density, deposition potential, strength and hardness of the deposited metal is investigated. Electrodeposition is a process of giving property of zinc metal to the test case metal like (aluminum, mild steel etc). Zinc metal has the property of corrosion resistance, creep resistance, resistance towards the environmental conditions like moisture, rain, and sun light, using this process test case metal get the property of zinc and it shows resistance toward the environmental conditions. The chemical composition and surface morphology of zinc costing are characterized using Energy Dispersive X-Ray (EDX) spectrometer and Scanning Electron Microscopy (SEM). The EDX analysis shows that the presence of zinc in the deposition on the surface of the test case metal.SEM observation gives that the morphology of the film surface was modified from dense and uni-axial to disperse and dendritic with increasing the current density.

Keywords: Electrodeposition

1 Introduction

The Electro deposition method of corrosion resistance of metals, alloys, and semiconductors has formed wide use in the fabrication of Microsystems and microelecromechanical systems (MEMS). A large number of metals found in Microsystems can be electroplated from aqueous electrolytes (Ni, Cu, Au, Pt, Fe, Pb, to name a few), except where a few metals cannot, notably Al, Ti, and pure W. Nickel and its high strength alloys provide some of the more useful materials available to Microsystems fabrications by Electrodeposition, owing to their greater uses in forming mechanical and magnetic elements such as precision gears, latches, motors, and flexure spring arms. Electroplating is a versatile technique spanning a wide range of coatings and thin films less than a micron to thick electroformed mechanical elements with millimeters tall. Varieties of materials are deposited near ambient conditions without the need for any of the expensive vaccum equipment. In this method deposition rates can be too faster than vapor deposition methods and film thickness can be as high as a millimeter or two. The necessary elements of the process are the cathode, or the work piece to be plated, an anode or counter electrode, and electrolyte that occupy the metal ion in a reducible form. While current is supplied to the work piece, which form MEMS is often a flat substrate metalized by vapor deposition. Through this thin metal coating forms a conductive seed layer to which electrical touch is created. This seed layer wrap micro patterned films of insulator, as in the copper Damascene process for integrated circuit interconnection. An insulating patterned layer for through-resist plating can cover the seed layer. Further approach is more often utilized for making freestanding parts, illustrate by the LIGA (German acronym associated with the process of lithographically

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Nickel Nano Particle Composite by Electrodeposition Method

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Abstract: **A turbine blades are the individual component which makes up the turbine section of a gas turbine or stream engine. The turbine blades are responsible for extracting energy from the high temperature, high pressure gas produced by the combustor the turbine is often the limiting component of gas turbine to survive in this difficult environment.**

Nickel coatings are commonly applied to steel, Nickel and other metal to provide protection against corrosion and abrasion, however most nickel is consumed in decorative finishes, our main aim is to change the characteristics of turbine blades which can withstand high temperature and availability of the material. At present they are using Ni and Rh composite material, we are replacing nickel with mild steel which is easily available in nature and we are giving Ni coating on it.

Keywords: **Electrodeposition.**

1. Introduction

The Electro deposition method of corrosion resistance of metals, alloys, and semiconductors has formed wide use in the fabrication of Microsystems and micro electromechanically systems (MEMS). A large number of metals found in Microsystems can be electroplated from aqueous electrolytes (Ni, Cu, Au, Pt, Fe, Pb, to name a few), except where a few metals cannot, notably Al, Ti, and pure W. Nickel and its high strength alloys provide some of the more useful materials available to Microsystems fabrications by Electrodeposition, owing to their greater uses in forming mechanical and magnetic elements such as precision gears, latches, motors, and flexure spring arms. Electroplating is a versatile technique spanning a wide range of coatings and thin films less than a micron to thick electroformed mechanical elements with millimeters tall. Varieties of materials are deposited near ambient conditions without the need for any of the expensive vacuum equipment. In this method deposition rates can be too faster than vapor deposition methods and film thickness can be as high as a millimeter or two. The necessary elements of the process are the cathode, or the work piece to be plated, an anode or counter electrode, and electrolyte that occupy the metal ion in a reducible form. While current is supplied to the work piece, which form MEMS is often a flat substrate metalized by vapor deposition. Through this thin metal coating forms a conductive seed layer to which electrical touch is created. This seed layer wrap micro patterned films of insulator, as in the copper Damascene process parts, illustrate by the LIGA (German acronym associated with the process of litho graphically defining moulds for electroforming) and X-ray lithographic methods. The use of LIGA process overcomes many disadvantages of conventional fabrications methods and pattern transfer technique like chemical etching, sputter etching, reactive ion etching.

A. Electrodeposition

In the process of electrolysis, the cell circuit consists of an anode (positive electrode), the cathode (negative electrode), an electrolytic bath, a current source and an ampere/ voltmeter. Reduction and Oxidation take place at the cathode and anode respectively because of the metal ions and electrons that can cross electrode-electrolyte interface. Where cathode is conducting substrate on which Electrodeposition required to be done; the anode can be either soluble or stagnant. The overall reaction occurring during electrolysis can be represented as Eq. 1 at the cathode, Eq. 2 at the soluble anode and Eq. 3 at insoluble anode:

$$M^{Z+} + ne^- \Diamond M \quad (1)$$

$$M \Diamond M^{Z+} + ne^- \quad (2)$$

$$H_2O \Diamond 2H^+ + \tfrac{1}{2}O_2 + 2e^- \quad (3)$$

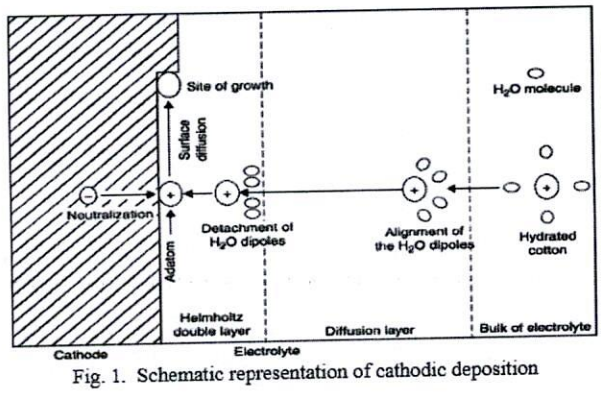

Fig. 1. Schematic representation of cathodic deposition

In the simple salt solutions, metal ions are present in mass solution as hydrated ions; the metal ions when hydrated ions as denoted as $M(H_2O)_x^{z+}$, where x is the number of water molecules in the primary hydration case. The reactions taking

AUTOMATED FOD DETCTION SYSTEM ON RUNWAY USING OBJECT DETECTION DEEP LEARNING MODEL

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Abstract: *FOD detection has become a very important aspect in terms of aircraft safety. There are some FOD detectors or technologies developed in the recent times. In this project we will be implementing real time FOD detection on a runway using YOLO V3 which is a conceptional simple, effective, flexible and a efficient framework which is used for object instant segmentation. Segmentation is a process of separating meaningful individual object from a image. YOLO V3 has shown the most efficient progress which could detect an object in image or a processed video with generating a very high quality segmentation mask for every instance with detecting the FOD on the runway by using YOLO V3 and there will be alarming system when FOD is detected which is done using the micro controller.*

Index terms: vortex type bladeless power generator, piezoelectric sensor, vortex induced vibrations

1 Introduction

YOLO V3 is a real time object detection system, which has appreciable speed and accuracy. On a Pascal Titan X it processes images at 30 FPS & a map of 57.9% on coco test-div. [Ref 1] as we know that in order to detect an object we need to classify the object and the position, which is a task in computer vision.

YOLO came into existence with seminal paper 2015 by Joseph Redmon. And was an attention seeker "You only look once: unified, Real-Time object detection". [Ref 2] It is popularized because of its high accuracy and YOLO's algorithm can detect the objects in the image at once.

Vortex Type Bladeless Power Generator

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Abstract: *Bladeless Wind Power Generation uses a radically new approach to capture wind energy. The device captures the energy of vorticity. As the wind strikes the fixed structure, its flow changes and generates a cyclical pattern of vortices. Once these forces are strong enough, the fixed structure starts oscillating, and the energy is captured. The design of our device is completely different from a traditional turbine. In traditional turbine it consists of tower, nacelle and blades, in this device it has a mast, a center base and piezoelectric material for power generation. In our project we have done the analysis on the mast using Ansys software. The lifespan of this device is expected to be more than that of conventional wind turbine. Usually structures are designed in such a way that it avoids vortex induced vibrations in order to minimize mechanical failures, but here, we try to increase the vortex induced vibrations in order to increase the generation of electricity.*

Index terms: vortex type bladeless power generator, piezoelectric sensor, vortex induced vibrations

1 Introduction

Vortex type bladeless power generator uses a radically new approach to capture wind energy. Our device uses vortex shedding effect which has plagued structural engineers and architects for ages. As the wind bypasses a fixed structure that is a cylindrical mast, its flow of air, its flow of sir changes and creates a cyclic pattern of vortices. Once these formed are strong enough, the mast starts oscillating. Now this can enter into resonance with the lateral form of the wind, and even collapse. There is a good example of Tacoma Narrows Bridge, which collapsed three months after its inauguration because of the vortex shedding effect well as the effect of flattering and galloping.

Our device captures the energy produced by aerodynamic instabilities created by maximized oscillation. Usually the design of such device is completely different from traditional turbines. Unlike usual turbine, our device has a fixed mast, a power generator.

1.1Motivation

Production of electricity through wind power generation is growing. There are number of current generating technologies using windmill in the market. But these windmills are costly and easily damaged machinery and large land usage requirement are some of the problem that need to be overcome. The new idea for wind power generation to overcome this problem was the bladeless design, large to extent power from wind. In this scheme, when the wind passes one of the cylindrical turbines, it shears off the downward section of the cylinder because of vortex. This vortex causes the cylinder to vibrate. Kinetic energy of the oscillating cylinder is converted to electricity through piezo sensor. In this report one such bladeless power

Design & Analysis of magnetic compressor for turbineless aircraft engine

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Abstract: *Compressor plays a vital role in aircraft engines. The modern aircraft engine manufacturers are researching on the engines that can be more efficient and can be capable to fly at high speeds. In order to justify the customer requirements the aircraft engine should be less cost and fewer maintenances. The use of magnetic axial flow compressor in the aircraft will enhance the requirements. Typically compressors are rotated by turbines which are coupled with single shaft. In this project the idea of rotating axial compressor using electro-magnetic principle. Here the rotor vanes tips are fitted with permanent magnets and outer casing winded with copper wires. The magnetic compressor consist of number stages of compressor blades based on the pressure ratio requirements. The main intention of the magnetic compressor is to remove the turbine section so that cost and maintenance will reduce. The objective of the project is to provide power from the rear of the compressor for magnetic levitation of the air bearing, outer casing, embedded into the airframe at the compressor and for electrical needs of the aircraft.*

Index terms: axial flow compressor, electromagnetics, permanent magnets.

1 Introduction

In present scenario compressors are rotated by coupling them with turbines. The servicing and maintenance cost of this type of will be high. Aircraft engine manufacturers are in search of efficient and cost effective engines. To meet these requirements we have come up with this project where the compressor can rotate without coupling with turbine using the "ELECTRO-MAGNTIC" principle. Here the compressor rotor vane tips are fitted with permanent magnets and outer casing is winded by copper wires. In this project we are designing compressor having two stages, half of windings will be in synchronous motor configuration and other half of windings will follow synchronous generator configuration where it will generate electricity and can use for basic requirements. To rotate the compressor, starting power will be given by an external source since synchronous motor is not self-starting, after compressor vanes get magnetically locked with flux, the external source will be disconnected. Since the compressor vanes are rotating with the help of

Modification and Development of modern day weaponry using composites

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Abstract: *The importance of modifying and developing the existing weaponry has taken by far in weaponry industry and its uses. The user friendly characteristics like long and easier trajectory, high strength, low weight, high thermal conductivity and similar characteristics have made use of composites in various fields. The use of composites is easier approach in making it user and aerodynamic friendly by implementing of engineering knowledge of aerodynamics, composite material characteristic and material properties. Designing a bullet in its best form is made easier through CATIA and CFD software of design analysis. These importances lead us to modify and develop the bullets according to the modern day's technology using aerodynamic characteristic and composite materials.*

Index terms: bullets, aerodynamic characteristics, composite materials

1 Introduction

Designing a bullet for commercial purpose lifts many issues and problems that need to be solved with utter precision to avoid any lose in this building process. Designing a unstandardized bullet with complete new design with new dimensions provide large scope for designers to play within and develop a new bullet with wide varieties of characteristics but it develops manufacturing costs as it might be too complex to manufacture by design and cost, but most importantly any new bullet designed with new dimensions incorporate to design a new gun so that the bullet can be fired, if there is no gun that fires a bullet that has been designed with all new characteristics, then it would be total loss for the designer for its effort. Hence a designer needs to understand the dimensions of existing bullet and gun and then modify it to gain new and better characteristics. A new design with new characteristics which might loosen any previous characteristics also fits in a better category as it would be a new variety of bullet. Fabrication of bullet of light weight with best aerodynamic characteristics is highly complicated process. Building a productive bullet which excludes characteristics used in bullets fabricated before needs the knowledge of designing software's and testing them to best of their abilities and characteristics. Using of light weight but a high penetrating power is

ATTEMPT TO DESIGN AN ENGINE TO MAKE AN AIRCRAFT FIGHT WITHOUT FUEL

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Abstract: The basic requirement for an aircraft to fly is fuel to power the engine. It is becoming costly day by day as the fuel prices soar globally. Researchers all over the world are carrying out work to find a substitute for the petroleum product. So far a good economically and pollutant free product is yet to be found. The researchers are also trying to reduce the aircraft weight by the introduction of composite materials for the aircraft structure as well as introduction of sophisticated aerodynamic improvements. All efforts are made to reduce the fuel burnt to reduce the atmospheric pollution also.

In Hindu mythology, Ravana came to India in his *Pushpaka Vimana* powered by solar power and controlled by mental power to fly from Srilanka to India and back. Hence there can be a possibility to power the airplane by some means other than petroleum product, this is being explored. By using natural energy stored in materials can an aircraft be powered? A trial is being carried out to tap the magnetic power of the materials so that the energy is free and it does not pollute the world and the life of people.

The natural material used in our project is neodymium magnet and non magnetic material like aluminium alloy and stainless steel. An effort is being made to create a pollutant free clean and healthy world.

Keywords: Neodymium Magnet, Aluminium alloys and Stainless steel.

1. Introduction

Aircraft transport system is one of fast going transport system in the world. There are many advantages in this transport system like time saving in reaching the destination, and safety. According to the intergovernmental panel on climate change, United Nations Environmental Program and World Meteological Organization, air transport contributes 4.95% of the human caused climate change including emission of carbon dioxide and other green house gases. Which the world over is considering as a very fatal situation leading to faster global warming and outbreak of new diseases [1].

Generally basic requirement for an aircraft to fly is fuel, which is very costly. In the present situation, all over the world research is going on to find a cheap fuel to substitute the present petroleum fuel as well as one that produces less pollution. Research is going different fields like light material to manufacture the aircraft, better engine technology to produce more thrust per unit weight of fuel, improved blended body shape to reduce the drag of the aircraft, studies on solar powered aircraft etc. All these research has not given fruitful result so far, but has drastically reduced the fuel consumption and emission. The major drawback of these is the aircraft becomes costlier. In this project an effort is being made to power the aircraft with naturally available material in the earth so that this will not result in carbon emission or radioactive product emission. The materials used are non-magnetic materials like aluminum alloys and stainless steel. The natural materials used in our project are Neodymium magnet,

Aluminium Alloy

Aluminium is the available in plenty around the world as ore Bauxite. It is extracted by electrolysis process. It is a light material with good fatigue resistance and heat and electrical conductivity property and is non-magnetic. Hence the aircraft structures are made of aluminium alloys.

Stainless Steel

Stainless steel was discovered in 1913 by Sheffield metallurgist Harry Brearley. Stainless steel is an alloy of Iron with a minimum of 10.5% Chromium. Chromium produces a thin layer of oxide on the surface of the steel known as the 'passive layer'. Increasing the amount of Chromium gives an increased resistance to corrosion. Stainless steel also contains varying amounts of Carbon, Silicon and Manganese.

STRESS ANALYSIS ON OLEO CYLINDER OF LANDING GEAR DURING LANDING

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ABSTRACT

The study deals with a review of preliminary design of a Military transport aircraft and the main landing gear design. For the preliminary design of the aircraft, specifications is first taken, then a reference aircraft is chosen for comparing the results. The weight calculations, fuel calculations, fuselage calculations, engine sizing, wing calculations are carried out. Then the design of landing gear configuration, landing gear location, landing gear height, C.G location, wheel track, wheel base, overturn angle, oleo-pneumatic strut shock absorber are estimated. There is a MATLAB program with output available for quick determination of the result. These calculations are just the preliminary calculations and they need to be repeated in the detail design stages after the aircraft data are frozen.

Keywords:- Military Transport, Landing Gear, Weight Calculation, Matlab Program.

1. INTRODUCTION

This chapter describes the preliminary design phase of an aircraft .Based on the systems engineering approach, an aircraft will be designed during three phases:

1. Conceptual design phase
2. Preliminary design phase
3. Detail design phase

In the conceptual design phase, the aircraft will be designed in concept without the precise calculations. In another word, almost all parameters are determined based on a decision making process and a selection technique. On the other hand, the preliminary design phase tends to employ the outcomes of a calculation procedure. As the name implies, in the preliminary design phase, the parameters that are determined are not final and will be altered later. In addition, in this phase, parameters are essential and will directly influence the entire detail design phase. Therefore the ultimate care must be taken to insure the accuracy of the results of the preliminary design phase. [1]

Three fundamental aircraft parameters that are determined during the preliminary design phase are:

1. Aircraft maximum take-off weight (WTO)
2. Wing reference area (SW or Sref or S)
3. Engine thrust (TE or T) or engine power (PE or P)

DESIGN AND ANALYSES OF FOLDING WING USING CFD

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Abstract: The foldable wing is a way to fold the outer portion of the wing in flight to affect a variety of multi-disciplinary, multiplatform benefits. Foldable wing or in other word span wise adaptive wing fuses propelled incitation innovation which permits the foldable part of the wing to overlay in flight. Foldable idea could build the subsonic airplane effectiveness by expanding the stability and pressure lift on the wing. It uses mechanical joint, going about as a line of hinge giving the freedom of movement development and in the end permitting the rotation. This idea of capability is essentially like that of on-ground folding technique utilized in transporter borne airplane. Wing folding capacity have been around since decades and have commonly been utilized as a technique to upgrade stopping territory and take less space in plane carrying war ship holder deck. The main achievement that was left improved was the mid-air actuation of the fold segment of the wing. Since NASA was re-investigating foldable wing innovation, it plans to utilize control surfaces through advanced activation in this way allowing the foldable parts of wings to adjust as much as 45 degrees.

Keywords: Foldable wing

1. Introduction

Foldable wing or in other word span wise adaptive wing fuses propelled incitation innovation which permits the foldable part of the wing to overlay in flight. . The shape memory composite (SMA) empowers the overlay system to be suited inside the external form line of the foldable wing segment. These solid state actuators can be driven by all these permits the foldable part of wing (hinge span) and its corresponding control surface to be folded to the ideal setting for the flight conditions. In horizontal directional stability and control increases. The expansion in sidelong control empowers expanding airplane proficiency by lessening the rudder through the joining of the foldable wing. Supersonic advantage incorporates, expanded pressure lift and decreased wave drag, and is an empowering influence for supersonic flying wing design structure. Foldable airplane have tried to reproduce and under the versatile systems of flying creatures in nature ever from the early structures of orthinopters and lightweight flyers. The wright sibling's flyer used links to easily wrap the wing for flight control, the fine distortions of a feathered creature's wing in flight. From these early beginnings airplane configuration quickly caught faster, heavier and increasingly flexibility airplane. Control surface changed from biometric transforming structure with adaptable wings to unbending pivoted folds that could bear the bigger streamlined loads. Still the base size and structure of littler airplane was constrained more by a solitary prerequisite, the need of pilot. Theoretical primary study to estimate the aerodynamic performance of a span-wise elastically deformable transport aircraft wing has been performed. The study has been focused on the potential use of such wings to minimize induced drag during take-off and landing. As a reference, similar analysis made for a conventional wing of same plan-form, equipped with modern devices. Throughout the last few decades different schemes have been investigated to make aircraft geometry variation a viable proposal for improved mission adaptation. Some of them reached experimental feasibility, such as a variable sweep wings or on an easy level, complex high lift devices configurations. The greatest benefits could come from suitable airfoil cambered smooth span-wise variation to adequate the aircraft to each of its flight phases, both by better enhancement of local airfoil performance and quality of wing span-wise lift distribution.

Also some successes have been achieved to design a feasible elastically deformable wing by active intervention, it is needless to mention that make the concept possible for experimental use could be a far more difficult and extensive task.

First of all feasibility studies should be made referring to numerous disciplines, such as aero elasticity, structural fatigues, materials, maintenance and many other aspects. Above all the real aerodynamic benefits that could be reaching must be estimated.

1.1 CATIA V5 DESIGN SOFTWARE

CATIA is abbreviation for PC Aided three dimensional intelligent applications. Presently days it is one of the main 3-D model programming utilized by numerous associations in various enterprises, for example, aviation,

Spray Characterization of Liquid Jet in Subsonic Crossflow

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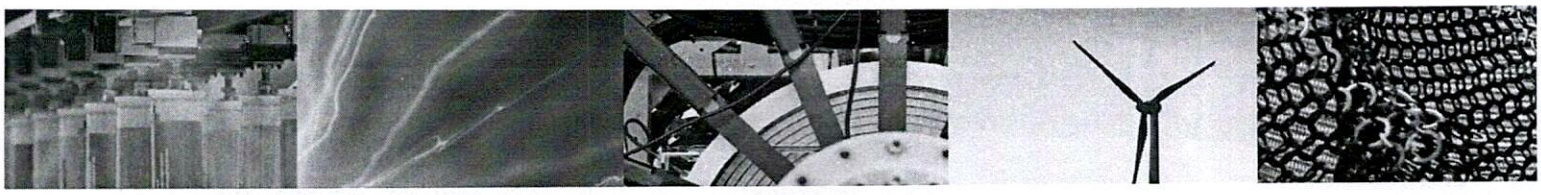
Abstract: *Liquid jets in cross flows grabs attention of combustion in jet engines and other spray devices, and most of the work exists in experimental studies, investigation and observation to determine the structure, droplet size and velocity of the distribution in such flows. The spray of kerosene jet breakup atomization in continuous subsonic crossflow is studied using Particle imaging velocimetry. The liquid jet and gas jet velocities are determined directly by measuring mass flow rate and nozzle and crossflow cross-sectional areas, respectively. Droplet size is found by using "quadratic formula", which gives accurate calculations for the droplet size when compared with experimental and associated results. For liquids sprayed into cross flows, it is mostly the gas phase momentum and kinetic energy that cause the breakup of the liquid column and consequent atomization. Results indicate that the droplet size is reduced when the velocities of jet and gas is increased and the size also reduces when the gas-phase density and injector diameter is increased.*

1. INTRODUCTION

Transversely injected air jets are used in the primary zone of gas turbine combustors as a means of controlling the air–fuel mixture ratio and hence the emissions of nitrogen oxides (NOx). Tuneable air–fuel mixing allows simultaneous control of NOx and carbon monoxide (CO) emissions. To get an optimized airfuel mixture ratio understanding the spray characteristics is helpful.

The jet injected transversely into air cross flow can be classified into two types: 1.A gaseous jet in a gaseous cross flow or a liquid jet in a liquid cross flow (The flow is a single phase type). The fuel air mixture mechanism by jet in cross flow process enhances the flame stabilization, complete conversion of fuel efficiency and finally reducing the emissions. 2.A gaseous jet in a liquid cross flow or a liquid jet in gaseous cross flow (The flow is multi-phase type). Emission of Nitrogen Oxide (NOx) and Carbon Monoxide (CO) is the major issue. To control the emission of NOx and CO, the jet in cross flow mechanism is used in primary zones of gas turbine combustors in order to control the fuel air ratio. The resulting fuel/liquid distribution from sprays can be characterized by a variety of parameters like penetration, spray width, drop size droplet velocity etc.

The process of atomization is sensitive to experimental factors like temperature of the cross-flow, injector geometry and angle, injector location, temperature of the liquid jet, injection scheme and also the dimensionless parameters like Weber number (We), liquid jet to air momentum flux ratio (q). The issue of mixing fuel and air to achieve proper flame stabilization in the short residence time, the atomization of the jet and its mixing with the flow has to be fast enough. The PIV technique for spray droplet velocity measurements offers a simpler means of obtaining spatially resolved velocity data which is quite important in minimizing tunnel run times for making detailed measurements.



Research Article

Thermal performance enhancement studies on a circular finned coil-in-shell heat exchanger using graphene oxide nanofluid

Niranjana Rai[1] · Ramakrishna N. Hegde[2]

Received: 26 March 2020 / Accepted: 24 August 2020 / Published online: 31 August 2020

Abstract
The objective of this study is to investigate the effect on heat transfer augmentation by the combined effect of circular fins directly attached to the helical surface of the coil in two different orientations (45° and 90°) and Graphene Oxide nanofluid as a heat transport agent, in a coil-in-shell heat exchanger. The attached circular fins not only act as turbulators on the shell side but could also add to heat transfer from the hot side to the cold side, by a combined mechanism of conduction and convection. The experiment is conducted at constant heat flux, with the cold nanofluid in the coil side and hot air in the shell side. Test runs are taken by varying hot air velocities from 1 m/s to 5 m/s, keeping fixed volume concentration of nanofluid (0.05–0.15%) and flow rate ($500 \le Re \le 5500$) one at a time. Experimental results indicated significant enhancement in heat transfer performance for the finned configuration. For 90° and 45° fin orientation—0.15% volume concentration of nanofluid, the maximum heat transfer increase is by 78.46%, and 82.22%, Nusselt number increase is by 32.57%, 60.79% respectively, at a hot air velocity of 3 m/s. The coil side pressure drop and friction factor increased to 32.72% and 24.64% for 0.15% GO nanofluid when compared to pure water at the maximum flow rate. The thermal–hydraulic performance improvement is nearly two-fold with 45° fin orientation-GO nanofluid combination.

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Investigations on the effect of disturbed flow using differently configured turbulators and Alumina nanofluid as a coolant in a double tube heat exchanger

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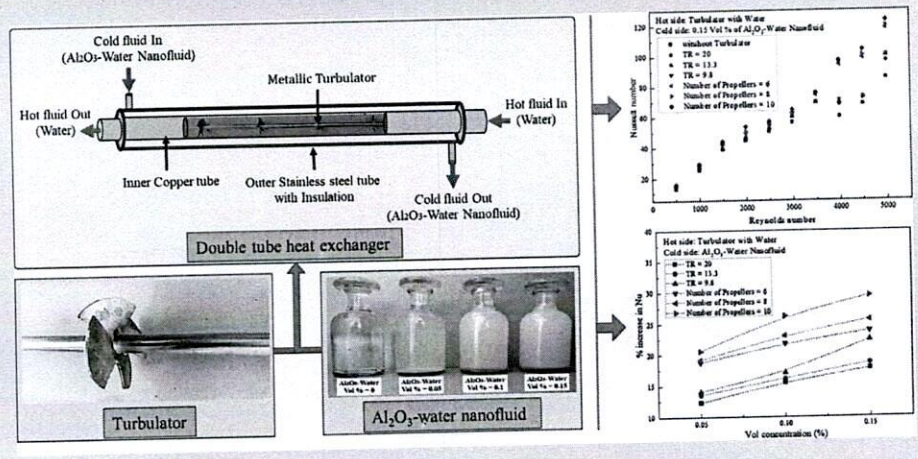
ABSTRACT

This paper investigates the effect of the combined passive technique on heat transfer enhancement, friction factor, and thermal performance of a double-tube heat exchanger fitted with differently configured turbulators and using Alumina nanofluid. The performance parameters are studied for fixed flow rate (Re = 2500) of water at constant heat flux in the inner tube (hot fluid) and varying flow rates (500≤ Re≤5000) of Alumina nanofluid (volume concentrations: 0.05–0.15%) flowing in the outer tube (cold fluid). The configurations tested are a peripherally V-cut twisted tape (Twist Ratio = 20, 13.3, and 9.8) and a propeller turbulator (Number of propellers: 6, 8, and 10). The results show increased Nusselt number by 22.4% and 29.43%, increased Thermal Performance Factor by 1.25 and 1.33, respectively, for decreased twist ratio and increased number of propellers and volume concentration of Alumina nanofluid. The peripherally V-cut twisted tape (TR = 9.8) and propeller turbulator (Number of propellers = 10) with 0.15% volume concentrations of Alumina nanofluid combination give better performance, with a slight penalty in pressure drop. The correlations for the Nusselt number and friction factor are developed from the experimental data, which are fairly in good agreement with the experimental data.



ARTICLE HISTORY
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KEYWORDS
Augmentation; nanofluid; passive heat transfer; thermal performance factor; turbulator

Introduction

Improvement of heat transfer rate in heat exchangers is the foremost concern in various practices ranging from utilization, conversion, and recovery of heat energy in several industrial, commercial & domestic applications. In the existing heat exchangers, concentric tube configuration is the simplest

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Kaavi Kalé: The indigenous architectural ornamentation technique of the Konkan Coast, India

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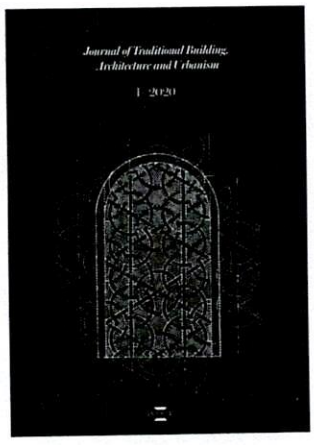

PDF

Keywords

Laterite, Incised plasterwork, Red oxide, Shell lime, Sacred art

How to Cite

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More Citation Formats

Abstract

At the foothills of the formidable Western Ghats of India lies a coastal strip of land, the Konkan Coast, which forms part of the extended coastline along the west coast of the country. The unique culture found in the Konkan coastal landscape has produced a magnificent ornamental style named Kaavi Kalé. Kaavi, or kavé, means in this context "red oxide", while kalé means "art form". It is fundamentally an incised work performed on an architectural surface that has been previously finished with lime plaster and then a red oxide layer over it. This forms elaborate murals and motifs inspired by the unique folklore of Dravidian culture. Although predominantly found in Hindu temples, this secular art form can also be seen in churches, a mosque, Jain temples and folk deity temples, as well as in domestic architecture. This paper presents the history of the art form, its techniques, a brief iconographic study of its compositions and possible methods of conservation, through accounts of extensive primary surveys and on-site experiments and a study of secondary sources.

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SOLAR POWERED AUTOMATIC ORGANIC AND INORGANIC WASTE SEPARATOR

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Abstract - The rapid growth in the population has also led to the surge in the volume of waste being generated on a daily basis. This increase in the generation of waste due to continuous growth in the urbanization and industrialization has become a severe problem for the local and the national government. It is also posing a serious problem for the local authorities to manage the wastes being dumped everywhere as landfill. To ensure the minimal risk to the environment and human health, it is necessary to take meticulous measures when segregating and transporting waste. Segregation of waste in a proper manner brings to the limelight actual economic value of the waste.

1. INTRODUCTION

Spreading type is occurring in large amount of generation o f waste materials will affect to the environment. Municipal community of a particular area has non-comfortable open dumping at landfill is the regular method for the distribution of wastes. It affects the human health and also life cycle of plant and animals also. The worst method used for the recycling of wastes generates having bad chemicals with dirty surface and underground water. Many of the people in the India especially Rag-pickers play a good role in the recycling of the solid wastes in urban areas. Rag-pickers and conservancy staffs who is working in that area have affected by some diseases due to the infection of their skin, respiratory system of their body, due to the bites of some insects.

2. Working

Before starting the system, Microcontroller, conveyor belt motor and sensors are switched on. When the waste enters the conveyor belt it starts off evolved shifting forward. At the starting squander is detected by methods for Inductive Proximity Sensor to see on the off chance that it is a metallic or non metallic. On the off chance that the waste is metallic waste, at that point Motor 1is turned ON and engine 2 is spared off the segregates are driven inside metallic segregates receptacle. Additionally the counter 1 is expanded. In the event that it's anything but a metal waste, engine number 1 is keep off and when it will become contact with the combination of laser and light sensor hat justifies whether the waste is a transparent waste for example plastic paper, glasses, fibers, etc. if we come across opaque wastes as rocks, wood, clothes, etc. by checking if there is any material in the light falling on the light sensor. On the off chance that the waste hindrances the light falling on the light sensor from the laser then it is referred as murky wastes and motor 1 is in off position and motor 2 is in on position and the waste is falls on a wooden waste canister pushed by the sensor. When the input is squander is put on the transport line, the transport line(conveyor belt) begins flowing then whole detectors was turns ON then detection then isolation process starts. Metallic detectors then light sensors are used to get the wastes set up are making helps to arduino UNO. Yield was a latest isolated squanders to various receptacles

3. Constituent Elements

3.1 Regulated Power Supply

The managed power gracefully as an installed circuit. If changes over unregulated AC into a consistent DC. With the assistance of rectifiers, it changes over air conditioning gracefully into DC. Its function is to flexibly a steady voltages to a circuit of gadget must be worked inside certain force gracefully constrains.

3.2 Rectification

It was a electronic device comprising D1,D2,D3,D4 Diodes in which completes of amendment procedure . It is a procedure of exchanging a rotating potential or flow of current to a relating DC. Contribution to rectifiers was air conditioning while this yield is unique type of direction throbbing Direct Current. Typically a scaffold rectifiers can be utilized for amend both the fifty percentage patterns by air conditioner gracefully.

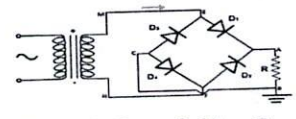

Fig 3.1 Full Wave Bridge Rectifier

3.3 Regulation

This is the last block in a regulated DC power supply. The output voltage or current will change or fluctuate when there is change in the input from ac mains or due to change in load current at the output of the regulated power supply or due to other factors like temperature changes. This problem can be eliminated by using a regulator. A regulator

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IOT BASED PARKING INDICATION NETWORK (PIN)

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Abstract - *Nowadays congestion of traffic level increases with the increasing development of population rapidly, with respect to the amount of population, the utilization of personal vehicles also increased. Managing a parking space is one of the challenges that cities and towns have to face. Due to more use of cars the traffic congestion occurred on the road. Most of the people chooses personal vehicles than public transportation, it is very difficult and time consuming to find parking space in most metropolitan areas, commercial areas, especially during the rush hours. It is often costly in almost every big city in all over the world to find proper and secure parking space. The proposed project is a smart parking system that delivers information to people finding a parking space online, it overcomes unnecessary time consuming for finding the problem of parking space in parking areas. Hence, the website is provided by this project-based system where users can view various parking areas space from the available slots.*

***Key Words*: Parking Indication Network, Smart Parking**

1. INTRODUCTION

The diverse growth in the economy and due to low cost availability of cars, an average middle-class person can afford a vehicle, which is a good thing, but due to this problem such as traffic jams, pollutions, etc. are arisen. The major issue to be taken under consider is the parking availability of those vehicles. Although, there are available parking spaces, a lot of time is spent in finding out the exact parking slot resulting loss of fuel and causes environmental pollution. It will be a great help in finding out the remedy to pin point parking availability slot which will be helpful for the driver and as well as for the environment. Thereafter, resulting in the creation of new innovative solutions to it.

1.1 PROJECT OBJECTIVE

Parking Indication Network involves the usage of efficient cost applications and realistic time data used to locate the of low-cost sensors, real-time data and applications that allow users to monitor available and unavailable parking spots. Further going into the advancement of this service will inculcate online payment system, parking notification and location history of parked location. It is an advantage to both sides to the user as well as the lot owner

2. WORKING

The flow chart consists of 3 main sections

1) Void setup: Initializing the sensors and motor drives.

2) Void loop 1: The Arduino Esp8266 programming statements comes under this section that are in continuous loop manner.

3) Void loop 2: The .Net framework programming statements comes under this section that are in continuous loop manner.

The execution flow chart begins with start (Fig.6.1), then the signals flow to the initialization section. In this section the ports of the following devices are initialized:

- IR Sensors
- Motor Driver
- Esp8266 Wi-Fi module

The signal from these are fed to Arduino. The conditional statements are used to identify the allotment of parking spaces under provided conditions. The reference signal as space available (i.e. binary-111) is written down in the conditional statements. In case if the space is not available for parking (i.e. binary-000) will be written down in statements. These values are later sent through Esp8266 module to cloud interface loop where the loop will be on the parking space availability to the interface side.

The device consists of 3 main components, IR sensors, ESP8266 Wi-Fi module, Arduino. Whenever a vehicle comes and parks the vehicle in the parking lot the respective sensors detect the availability of parking area. This data is then sent to Arduino through interface that stores the data and sends the signal to ESP8266 module.

SANDY: THE HUMAN ROBOT

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Abstract -The humanoid research is an approach to understand and realize the complex real world interactions between a robot, an environment, and a human. In general a human robot has a head, two arms and two legs. Our system can recognize a set of gestures. It is essential for the functional purpose, such as interacting with human tools and environments. This is human robot which closely resembles to human motion and behaviour. Human robots are meant to overcome the obstacle through the internally built sensors. In this work, we propose a vision and knowledge based gesture recognition system for human robot interaction. Our Robot mainly focuses on the gestures, with is movement in all direction, and makes its own direction to overcome the obstacle. Interaction between a robot and a human may take several forms, but these forms are largely influenced by whether the human and robot are in close proximity to each other. Hence the communication with the robot is remote controlled interaction. Simulation and experiments demonstrate that the proposed method can achieve maximum reduction in human efforts towards the work.

I. INTRODUCTION

1.1 Overview

Robotics is a branch of engineering and science that includes electronics engineering, mechanical engineering and computer science and so on. This branch deals with the design, construction, and use to control robots, sensory feedback and information processing. These are some technologies which will replace humans and human activities in coming years. These robots are designed to be used for any purpose but these are using in sensitive environments like bomb detection, deactivation of various bombs etc. Robots can take any form but many of them have given the human appearance. The robots which have taken the form of human appearance may likely to have the walk like humans, speech, cognition and most importantly all the things a human can do. Most of the robots of today are inspired by nature and are known as bio-inspired robots.

Robotics is that branch of engineering that deals with conception, design, operation, and manufacturing of robots

- Robots will never harm human beings.
- Robots will follow instructions given by humans.

1.2 Proposed Idea

- Make the robot move forward and backward.
- Welcoming the guests by hand shaking.
- Upward and downward movement of hand.
- Opening and closing of fingers of both the hands.
- Making the robot to hold the object.
- Robot senses the obstacle and stops its movement by itself.

1.3 Project Objective

- To make both the hand movement up and down.
- To make all the five fingers movement at a time of both the hands.
- When there is an obstacle in front of the robot it stops its movement by itself.

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Comprehensive Approach towards M Shopper's Shopping Behaviour using Shopping Apps – TAM Model Analysis

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ABSTRACT

In current digital era, the mode of retail business is undergoing rapid change. Retailers are shifting their businesses from brick and mortar to e commerce especially m commerce i.e., business transactions via mobile phones because smartphones are turning to be one of the smart commercial channel. At the same time we see the lifestyle of people also has changed. People depend more on smartphones in their daily life, thanks to the internet. People are also choosing to shop over the mobile phones for convenience purpose. In order to grab this opportunity the e retailers are trying to adapt themselves to m commerce via mobile applications. The success of the m commerce companies depend upon the customer's willingness to accept the usage of technology (smart phone and applications). In this paper the attempt has been made to find the perception regarding the acceptance of technology by m shoppers and to assess the factors that influences the acceptance of usage of apps for m-shopping using TAM model. For this study Questionnaire was designed to find the factors influencing m shopping using apps. The questionnaire includes the variable such as Perceived usefulness, behavioural intention, Perceived ease of use, attitude, Perceived Risk, Perceived Enjoyment from TAM model. Likert scale was used to measure the variables. 102 responses from the shoppers who shop using shopping applications are used for this study. The findings of this study supports the hypothesis framed. High negative correlation is observed between perceived risk and perceived ease of use. Attitude and shopping intention has high positive correlation. From the variables under study with score ranging from 5 to 25, perceived ease of use has highest mean and perceived risk has the minimum mean. Finally, the study also finds that low internet connectivity, low quality of product, low clarity about authentication of product, return policies are the problems faced by shoppers while shopping using mobile apps.

KEYWORD: *m- Shopping, Behavioural intention, Perceived ease of use, Perceived usefulness, Perceived Risk, Perceived Enjoyment, attitude*

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IJTSRD38101

INTRODUCTION

The Technology acceptance model (TAM) is an information systems theory that models how users come to accept and use a technology proposed by Davis, 1989. This model is a foundation for examination of customers approval of online shopping (Stoel and Ha 2009; Umair Cheema et al).The major components of TAM model are perceived ease of use, perceived usefulness, attitude and intention. (Xiaoni Zhang & Victor R. Prybutok 2003). In this digital era, technology has a crucial function in lives of many people. Mobile devices, in particular, have become an important product to many individuals and have been expected to further increase in their usage (JatiKasuma, et.al 2020).

Mobile Apps:

With the increased popularity of mobile apps, there has been a consequential magnification in the number of mobile app developers. Mobile App is one of the paramount marketing implements for any product/service. It might build/eradicate the brand equity and brand adhesion, according to its performance. (Venkata N Inukollu, et.al 2014). Mobile app includes native apps which live on the device and are accessed through icons on the device home screen. These are installed through an application store, Web Apps are not real applications. These are stored on a remote server and delivered over the internet through a browser interface (Gagandeep Kaur; Gagandeep Kaur 2016). Smartphone driven Apps has exciting spaces for today's online community, and India's young economy is no exception. India is world's third largest internet user, after US & China (K Lalitha; ArockiaRajasekar 2018). Compared to traditional mobile web sites, mobile apps provides several advantages for marketers because mobile apps offer greater security features as well as allow consumers bypass competitors' information and go directly to the marketer's self-contained environment (Taylor and Levin, 2014); (TsuangKuo et.al,2016). M commerce Companies are offering the favourite way of shopping through apps for the shoppers and getting equipped with better connectivity and

Automatic Solar Panel Cleaning System by Using Robot

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Abstract— In present days the energy consumption scenario is clearly showing the faster depletion of fossil fuel reserves. On the other hand, the energy usage index indicates the state of growth of a country. The use of renewable energy sources like solar PV has increased in recent years. It faces lots of challenges such as high cost, erratic and unpredictable in nature, needs for storage and low efficiency. The solar PV modules are generally employed in dusty environments which is a case like India. The dust gets accumulated on the front surface of the module and blocks the incident light from the sun. It reduces the power generation capacity of the module. The power output reduces as much as by 50%. The solar photovoltaic panel cleaning technology can considerably increase the efficiency of electricity generated and also increase the durability of Solar panels. Power output is reduced if the module is not cleaned for a month. In order to regularly clean the dust, an automatic cleaning system that removes the dust on the solar panel is to be developed. To overcome this, a solar panel cleaning robot is used to clean the PV modules.

Keywords: Solar Panel Cleaning System, Robot

I. INTRODUCTION

A solar panel is photovoltaic; it absorbs sunlight as the source of energy to generate direct current electricity through the photovoltaic effects. The structure member of the photovoltaic module can be either in the top layer or in the back layers. Cells must be protected from mechanical damages and moisture. The cells are connected electrically in serious, one to another to the desired voltage and then parallel to increase the amperage. The wattage of the module is the mathematical products of the voltage and the amperage of the module.

As the accumulation of dust on the solar panel reduces its transmittance which results in the reduction of power output, also resulting from the loss of power generation this particular problem also responsible for the short life of span, the power output from their solar panel reduces over time because of the accumulation of dust. Further this problem results in huge losses for the solar power plant operators which suffer from reduced power output because of the dust.

To increase the efficiency of the PV cell the dust cleaning robot has to be developed which can be used on the large solar generation plants. The robot can clean the entire solar PV cells by using a continuous power source and a water source. By regular cleaning of PV cells will increase the efficiency and life span of the PV cell.

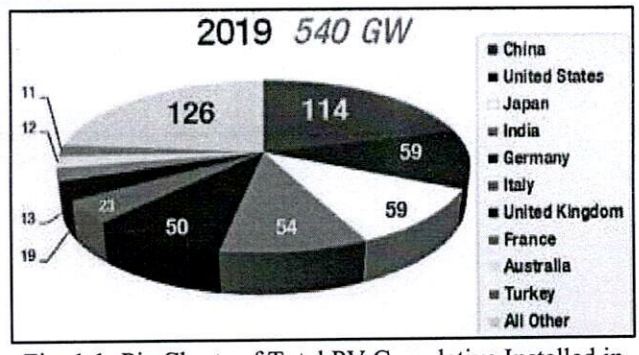

Fig. 1.1: Pie Charts of Total PV Cumulative Installed in world.

II. LITERATURE SURVEY

This chapter gives the information about the literature survey taken from different websites, industrial manuals, and IEEE papers related to design of solar panel cleaning system.

A. Historical Reviews

The most widely used cleaning methods of the solar panel are,

Manual cleaning is methods of cleaning by manually or human operator with the help of wiper or with suitable support structures shows in the fig.2.1. The quality of cleaned surface measured by visual method by the operator himself, till the dust particle gets wiped out completely. The process found to be very long process and challenging process, because solar panel consists of number of panel's inserted at a height of 12 to 20feets for more from the ground. The time required and safety of the person and the panel is threat. To clean the panel manually the flied like cleaners or gels has to be used which act upon the panel and reduces the surface transference and also its cleaning is not proper and quite change of physical damage.

Fig. 2.1: Manual cleaning

Vacuum suction cleaning is a device that uses an air pump to create a partial vacuum to suck up dust and dirt, usually form the floors, window panes etc. In general, the electrical supply is given to the vacuum motor which creates the suction pressure. The input power is converted into airflow at the end and is measured in watts. The vacuum cleaner can clean the panel properly only on the surface

National Conference on IC Engines and Combustion

NCICEC 2019: **Advances in IC Engines and Combustion Technology** pp 207–237

Effect of Static Ignition Timing on the Emission and Performance Characteristics of a Four-Cylinder MPFI Engine Fueled by LPG

Vighnesha Nayak ✉, K. S. Shankar, Anusha, P. M. Ashit, Bhushith & K. L. Vikyath

Conference paper | First Online: 19 August 2020

Part of the Lecture Notes in Mechanical Engineering book series (LNME)

Abstract

The present work aims on the experimental analysis of static ignition timing on MPFI gasoline engine with LPG as an alternative fuel. Four-cylinder MPFI engine setup is used with gasoline, 25% LPG, 50% LPG, 75% LPG, and 100% LPG fuel for different static ignition timing of 5, 8 and 11 deg. bTDC at full load and different speed conditions. The results

Manufacturing and Optimization of EDM Electrodes by DMLS Method

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Abstract— Electro Discharge Machining (EDM) is a nontraditional machining process which is used to machine hard tools and difficult shapes which rarely possible by conventional processes. It is the process of material removal from the workpiece by a series of sparks generated in the dielectric fluid medium. Electro Discharge Machining is a widely used processes in manufacturing. Rapid prototyping is a method of creating a three dimensional object layer by layer with a CAD model. Additive manufacturing is employed in printing the 3D part. In this work, Direct Metal Laser Sintering (DMLS) procedure is followed to print the EDM electrode as a non conventional product and its performance is compared with the conventional electrode. Aluminum AlSi10mg sintered material powder used to fabricate the electrode. The material of the work piece is also the aluminum. Based on Material Removal Rate(MRR) and Tool Wear Rate(TWR) electrode performance is evaluated. By different variations of Current (I), Pulse Off-time (Toff), Pulse On-time (Ton), the experiment is conducted on EDM with both kinds of electrodes. The Taguchi technique of optimization is followed for different levels and arrays. Orthogonal arrays don't consists of repeated values and rows and are very simple. The DOE is based on the Taguchi orthogonal arrays. The number of iterations and trials depend upon the category of orthogonal array selected. The level of quality of the component is described by Taguchi method. Comparison between these different parameters are made.

Keywords: EDM Electrodes, DMLS Method

I. INTRODUCTION

Rapid prototyping (RP) is a technique of manufacturing a prototype by converting a 3D CAD model with various techniques by slicing the 3D object into no. of 2D layers and building them layer by layer. RP techniques are used by industries increasingly to decrease their product development cycle.

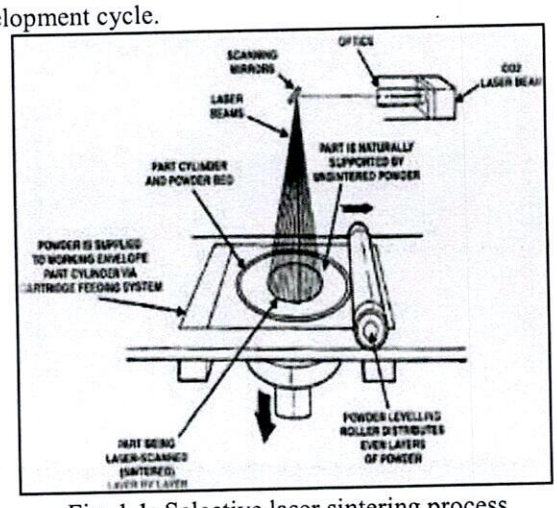

Fig. 1.1: Selective laser sintering process

Selective laser sintering (SLS) is one of the techniques in rapid prototyping system that uses a laser beams to sinter and melt material powders to form the part layers.

- In a build chamber, on the bed or build platform, a build material is deposited in a thin layers.
- The part file is cut into slices in a solid modelling software
- As the laser is powered on the sintered particles solid mass is formed. The powders gets solidified only in the defined areas in the slice design geometry
- The building platform of the part lowers down by the size of one slice.
- The build material is distributed over the successive layer by a roller.
- The above steps are repeated.
- The part is taken out from the build chamber when it is finished.
- The useless material is removed from the build platform. If necessary post processing of the part can be done.

Electro discharge machining(EDM) process is widely used nonconventional material removal process regardless its hardness. Precise machining of ceramics, and hardened steels etc are some of its applications. Geometrically complex shapes that are hard to manufacture by traditional methods are easily manufactured with EDM, therefore making EDM as a vital processes applied in intricate mechanical industry to form complex 3D components. In the EDM, the shape as desired on the workpiece is same as the design of the electrode. Conventional process is used to manufacture EDM electrodes.

II. LITERATURE SURVEY

Fred L. Amorim et al.[1] have carried the work and showed that the production of EDM electrodes with complex geometry consumes more time, difficult and accounts for about 50 percentage of the total process costs.

I. Yadroitsev et al. [2] have carried the work and described in surface morphology in Selective Laser Melting of Metal Powders a kind of additive manufacturing using metal powders to manufacture layer-by-layer parts with a 3D CAD geometric model.

I. Yadroitsev et al. [3] have carried the work and showed, in selective laser melting technology, to improve Selective Laser Melting processes for production of real components, highest properties of the final component has to be gained.

Norliana Md Abas et al. [4] have carried the work stated that, EDM involves thermoelectric energy between electrode and workpiece. A discharge of pulse occurs in a tiny gap in-between the electrode and workpiece and

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STUDY OF MECHANICAL AND WEAR PROPERTIES OF EPOXY AND CARBON POWDER COMPOSITES WITH OR WITHOUT REINFORCEMENT (E-GLASS)

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Abstract— **An experimental investigation has been conducted to evaluate the mechanical properties and wear behavior of epoxy composite with different proportions of carbon powder without e glass as reinforcement as a first part of investigation. As a second part of investigation e glass-fiber reinforced in epoxy matrix filled with different proportions of carbon powder were developed.**

Keywords— Composite, FRP, E-Glass Fibre, hardness, D-shore, wear test

I. INTRODUCTION

Materials with better properties have high demand to replace existing materials or to meet new requirements. The performance of continuous fiber reinforced polymer matrix composites is well known and adopted. The disadvantages of composites related to matrix dominated properties which limit their wide application and creates the need to develop new generation of composite materials. The adding of filler materials [1-6] to a polymer is a common thing. This improves mechanical and thermal properties, and also reduces the processing cost significantly. More than 50% of all polymers produced are in one or another filled [6] (2011) with inorganic fillers to achieve the desirable properties. Epoxy is used in industries in for coatings, electronics and aerospace applications. Epoxy is the dominant matrix material for light weight polymer– matrix structural composites such as carbon fiber composites.

II. METHODOLOGY

Hand layup technique is used for preparing epoxy/e glass/graphite hybrid composite material. Hand lay-up it is the simplest technique used for composite processing. The infrastructural requirement for this method is also minimal as the processing steps are simple.

The wax is pasted on surface of the mold to avoid the sticking problems. Required amount of E-glass fiber and epoxy is taken three times the weight of e-glass. E-glass are made in the form of chopped strand mats and placed at the surface of mold after pasting wax.

Fig: 1 Quenching with epoxy

Then the general purpose resin (epoxy) is mixed thoroughly with a Hardener hy951 of some % of epoxy) and poured on the surface of layer which is placed already in the mold. The polymer is quenched by using brush and then spread all over the surface uniformly. [17] (2017). Since there is chance of formation of air cavities it is important to quench properly. Then the second layer of mat is placed on the polymer surface and again quenched on the mat-polymer layer So that if any air trapped can be removed. The process is repeated, till the required layers are prepared. After completing this much work, wax is pasted on the inner surface of the top mold plate which is then kept on the stacked layers and the pressure is applied. After curing either at room temperature, mold is opened after six to seven hours and the developed composite part is taken out and further processed. The time of curing depends on type of polymer used for composite processing. This method is mainly suitable for thermosetting polymer based composites. The investment is less compared to other methods The problem in the process is very slow.

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Design and Fabrication of 2-Wheel Drive Forklift

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Abstract: **A fork-lift carrier for transporting long heavy loads, having adjust width for accommodating various size loads and for compacting the carrier for storage. The adjustable width allows the carrier to negotiate relatively narrow passages. A high degree of maneuverability is achieved by utilization of independently driven and steered traction wheels. Raising and lowering of loads is accomplished by motorized operated forklift mechanisms disposed on either side of the carrier. Operation of the carrier is controlled by a handheld control unit. A load carrying arrangement for a lift truck includes two spaced apart hollow upright elongated members which are mounted on a mounting element that is displaceable mounted on the frame of the truck, and at least one load-engaging attachment which has at least one load-engaging portion and two mounting portions introducible into the interiors of the corresponding upright members through the open ends thereof to mount the load-engaging attachment on the upright members and thus on the mounting element. Fixing elements, such as pins or bolts extending through aligned bores in the upright members and in the mounting portions, position ally fix the mounting portions within the corresponding upright members. The attachment may be constituted by a pair of fork prongs each of which has a load-engaging portion and a mounting portion which is introducible either into the open upper end or into the lower end of the respective upright member, or a container spreader whose load-engaging portion is adapted to engage a container and whose mounting portions are introducible into the upper open ends of the upright members & turn on 180-degree motion.**

Keywords: **Design and Fabrication, 2-Wheel Drive Forklift.**

1. Introduction

A forklift or a lift truck (also known as counter balanced truck) is a powered industrial vehicle, a truck to be specific, which enables the lifting, shifting and movement of materials from one place to another in an industry. Its primary applications are in warehouses, shops and construction sites, wherein it is used for the transshipment of goods. The earliest forklift truck was invented between 1914 and 1915 and put on the market since 1930s. The widespread usage of forklift started in the period of World War II as a result of the surge in the demand of transporting military materials. After the World War II, maneuverable forklifts found its integral role in warehouses, for lifting the goods to heights. To cater the needs of the warehouse sector, suitable modifications were made in the design framework of the forklift; a remarkable one being the development of Electric forklifts that were powered by batteries which required frequent charging. Forklifts can be electric powered or diesel powered. Electric forklifts are ideal to be used in areas with lesser ventilation because they are quiet and do not exhaust. Electric forklifts have lower operating costs than diesel operated ones. However, their lifting capacity is limited to 3000 kg. Their batteries can take as long as 16 hours to charge and cool off, and have a slower acceleration than the trucks those run on diesel. Diesel powered forklifts were apparently used outdoors due to production of exhaust gases. They cost less than electric forklifts to buy, but they have higher ongoing costs, as they need frequent refueling. It is capable of lifting weights in the range 1000-25000 Kg's, which makes them ideal for heavy-industry situations and under in all types of weather.

2. Literature Review

A. Pennsylvania Railroad at Altoona

Pennsylvania Railroad at Altoona introduced a power accumulator in 1906 to a baggage wagon to a primary power truck. The primary transportable lift into a Patent and Trademark.

B. Dr. R. N. Mall

There are different types of forklift around us that are powered by gasoline, electricity but they are very much tough to handle and fuel that are used are very much costly. To solve these criteria, we introduced a 3-wheel forklift that run on both electric power that are used for loading and unloading using hydraulic jack by forks.

C. Tiny Crane Mounted on a Platform Truck

Truck was introduced in 1913 that are a combination of both vertical and horizontal handling that are molded on a tiny crane on a platform truck. The hydraulic power that are introduced and development of electric vehicle and utilization of standardized patents in late 1930's.

D. Low Back Pain in Port Machinery

In 2002 M. Bovenzi Pintobn Stacchini introduced different varieties of low back pain that was investigated by a standardized questionnaire in a meeting of 219 port machinery operators exposed to whole body vibration & postural load in a meeting of 85 workers that are working in a same company. These consists of forklift truck driver, straddle carrier drivers

Experimental Investigation On Combustion and Emission Characteristics of Single Cylinder Diesel Engine Modified with Fuel Injector Geometry

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Abstract— Fuel injection parameters play an important role in diesel engine performance for obtaining proper combustion. The performance and emission characteristics of diesel engine depend on many parameters. An experimental study was conducted on a DI diesel engine at three hole (0.28mm diameter) and four hole (0.23mm diameter) fuel injector nozzle to study its effect on performance and emission by using conventional diesel fuel on the single cylinder four stroke engine with the engine working at different engine loads at compression ratio 16.5. The results obtained revealed that the performance, combustion, and emission characteristics of the modified engine (4-hole nozzle with an orifice diameter of 0.23 mm) were improved except NOX in comparison with those of the conventional diesel engine (3hole nozzle with an orifice diameter of 0.28 mm). The combustion in a diesel engine is governed mainly by spray formation and mixing. Important parameters governing these are droplet size, distribution concentration and injection velocity. Smaller orifices are believed to give smaller droplet size, with increase injection nozzle hole, which leads to better fuel atomization, faster evaporation and better mixing. The performance and emission characteristics were presented clearly to determine that they were found better with four-hole nozzle for the single cylinder diesel engine.

Index Terms—*Emission Characteristics, Fuel injector geometry, Injector nozzle, CI engine combustion.*

I. INTRODUCTION

Due to their relative simplicity, low capital cost, higher power density and higher efficiency, diesel engines have more popularity. From small single-cylinder generator to super-tankers, diesel engines are often the best choice for use as prime movers or at least considered as alternatives. The engine manufacturers constantly trying to further develop the CI engine technology to improve the efficiency and to control the emissions. The traditional diesel engine suffers from relatively high nitrogen oxide and particulate emissions. Thus, there is an increased focus in diesel engine research on reduction of such emissions. Some research works have been focused on investigating the effects of various engine modification, e.g. compression ratio, injection timing, fuel injector holes, orifice diameter etc. on diesel engines. The injection technology is also a main issue for the realization of recent diesel combustion technologies such as homogeneous charge compression ignition (HCCI) and stoichiometric diesel combustion. In case of combustion the fuel spray needs to be injected with smaller droplet size in order to generate a homogeneous charge within a short duration. Much research have been done on fuel injectors for diesel engine, mainly focused on low pressure swirl injectors and narrow spray included angles for preventing wall wetting. At the same time, the nozzle hole size has been reduced to produce smaller droplets. By reducing the nozzle hole size the spray tip penetration is reduced due to the low spray momentum. M Vijay Kumar, A. Veeresh Babu [1] presented the combustion characteristics of diesel engine modified with EGR and nozzle hole orifice diameter. The engine modification done by reducing orifice diameter of 0.28 mm to 0.2 mm diameter with 3 number of holes. Break thermal efficiency was slightly increased by using 0.2mm nozzle hole orifice diameter. This modified nozzle also improved the fuel vaporization and atomization. Cenk Sayin, Metin Gumus [2] presented an article based on effect of injector hole number on the performance and emission of diesel engine. The diesel engine using biodiesel and its blends and also modified with injector hole number where experimentally investigated by running the engine by different load. The result verified that the break specific fuel consumption (BSFC) and break thermal efficiency (BTE) values at higher percentage biodiesel blends (B50 and B100) produce the best results with the increased injector nozzle hole number. B.H Lee, J.H Song [3] presented the article based on the effect of the number of fuel injector holes on characteristics of combustion and emission in diesel engine. The present study considers multi hole injector with 6, 8 and 10 number of nozzle holes were used to perform the experiment. This numerical study shows that the sauter mean diameter is decreased as the number of holes increased. The local penetration of a liquid spray decreased with increasing number of holes. It is observed that amount of NOX found to be the smallest with ten hole injector due to reduced local temperature from poor mixture formation. Shijun Dong, Can Yang [4] presented an article based on investigation on the effect of nozzle hole number on combustion and emission characteristic of dual fuel engine. It has been observed that the fuel nozzle hole lead to more concentrated diesel distribution and larger orifice diameter result in poor fuel atomization. When the ethanol proportions are 0.33 dual fuel operation exhibits single stage combustion with intense heat release rate for all the nozzle cases.

The objective of the present project is to study the performance and emission characteristics of single cylinder diesel engine with the following parameters

- To study the performance parameters by increasing the injector nozzle hole number and also by decreasing the nozzle hole diameter.
- To study and compare the emission characteristics of modified fuel injector nozzle with base fuel injector nozzle

II. METHODOLOGY

A. Experimental setup

The experiment is conducted on TV1-KIRLOSKAR Single Cylinder Four Stroke Diesel Engine. A computerized single cylinder diesel engine was employed to study the effect

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A potential application of polyethyleneimine-reduced graphene oxide nanocomposite sensing film coated on interdigitated electrode prepared from copper-clad for carbon dioxide detection

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ABSTRACT

In the present investigation, the response capabilities of the sensors fabricated by the drop-casting process were examined at room temperature. Polyethyleneimine (PEI) and synthesised reduced graphene oxide (RGO) with varied weight percentage are the materials selected for sensing Carbon dioxide (CO_2). The novelty of the present work resembles the preparation of interdigitated electrodes (IDE) from patterning the copper clad. Four different varieties of sensors with a varied weight percentage of RGO in PEI were fabricated by drop-casting the sensitive films on prepared IDE. Capabilities of resistance over CO_2 concentration, sensitivity, repeatability, measurements of response and recovery time were examined. It was found that appropriate weight ratio of RGO and PEI was critical for sensing response. A comparison between sensing responses of the fabricated sensors to CO_2 under nitrogen (N_2) was done. Addition to that appropriate sensing process was also analysed.

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KEYWORDS
–IDE; copper clad; RGO; PEI; composite films; gas sensors; CO_2 & room temperature

1. Introduction

Carbon dioxide is invariably the fourth-most in abundance gain the prevailing atmosphere. It typically belongs to the specific group ofabundantgases called responsible greenhouse gases for global warming [1]. It is necessary to constantly check the reasonable amount of CO_2 released into the prevailing atmosphere through various means like efficient combustion of fossil fuels in modern vehicles and typically burning of abundant coal in thermal power plants. Carbon dioxide poisoning constitutes, furthermore, a severe threat to people working in confined places like industries and laboratories [2]. Therefore, it is critical to producing economically cheap, fast and reliable CO_2 sensors for sensing and monitoring regularly. Many appropriate materials have been used as sensing element like metallic oxides, polymer-based sensors, electrolyte sensors, etc., in CO_2 sensors [3]. Sensors based on metallic sensing elements frequently require high-temperature processes for fabrication [4]. This can be prevented by employing polymer-based sensing elements and also, utilized to detect a vast range of analytes [5]. Graphene-based metal oxide nanocomposites allow a vast scope in gas sensing application [6]. Reduced Graphene Oxide (RGO) has demonstrated tremendous promise in gas sensing application due to its ability to detect a broad range of analytes [7]. Addition of filler contributes greatly with measurable increase in the performance of the composite materials [8]. The resistance value increases with the coating layers as Zno thin films with 4- and 8-times coated results in increase with 110 & 125 Ω for etched and un-etched substrates [9]. It is also tuneable and can be carefully tailored to accurately detect specific analyte with acute sensitivity. Its nanostructure naturally allows us to fabricate sophisticated sensors with miniature size and capable of detecting very low concentrations of the analyte. Thin films and micro and nanostructures are very promising candidates for novel applications in sensing [10]. AccurateCO_2 detection can be typically developed based precisely on RGO with polymers films at room temperature [11,12].

In this investigative work, PEI-RGO coated on IDE prepared from copper-clad to sense abundant CO_2 gas scientifically based on resistance change. Physisorption between ideal CO_2 gas & RGO and room temperature interactions of the amino group with CO_2 to form carbamates efficiently are the primary sensing mechanism for detecting CO_2. All sensors (0.25, 0.50, 0.75 & 1.00 Wt%) could accurately detect 200–1,000ppm CO_2 gas.

2. Materials and methods

2.1. Synthesis of reduced graphene oxide

Materials required for synthesising graphene oxide (GO) and reducing it to RGO were graphite powder which acts as a precursor material for synthesising GO. Sulphuric acid for the graphite oxide intercalation, sodium nitrate for basal planes oxidation, potassium permanganate acts as catalyst and oxidiser, hydrogen peroxide for terminating the reaction and removing excess of $KmNO_4$ & hydrazine hydrate for reducing GO to RGO. Figure 1 shows the graphical representation of synthesising GO, which typically involves eight steps;

(1) Sonication of graphite & sulphuric acid mixture.
(2) Notable addition of sodium nitrate &constantly stirring the fine dispersion.

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PAPER

Antifungal activity of biosynthesized silver nanoparticles from *Candida albicans* on the strain lacking the *CNP*41 gene

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Keywords: *Candida albicans*, *CNP*41 gene, silver nanoparticles, drug susceptibility, fluconazole

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Abstract

The upsurge of immunocompromised patients has led to extensive study of fungal infections with *Candida albicans* being the frontline model of pathogenic yeast in humans. In the quest to find novel antifungal agents, this study reports the potential usage of wild-type *C. albicans* strain C86 to biosynthesise silver nanoparticles by microwave assisted technique. Visual colour change and UV-spectrophotometer were used for primary detection of silver nanoparticles. Additionally, the FTIR peaks confirm the particles' formation and surface characterisation techniques such as FESEM and EDX suggests that the silver nanoparticles were sized in the range of 30–70 nm. Furthermore, pioneering work of homologous recombination technique was systematically employed to delete uncharacterized gene *orf*19.3120 (*CNP*41) in the C86 strain creating the deletion strain C403 of *C. albicans*. To amalgamate the two significant findings, biosynthesized silver nanoparticles were subjected to antifungal studies by disk diffusion assay on the strain C403 that lacks the gene *orf*19.3120 (*CNP*41) of *C. albicans*. As a synergetic approach, combinational effect was studied by incorporating antifungal drug fluconazole. Both individual and enhanced combinational antifungal effects of silver nanoparticles and fluconazole were observed on genetically modified C403 strain with 40% increase in fold area compared to wild-type C86 strain. This can be attributed to the synergetic effect of the bonding reaction between fluconazole and AgNPs. Taken together, this first-ever interdisciplinary study strongly suggests that the *CNP*41 gene could play a vital role in drug resistance in this fungal pathogen.

1. Introduction

Diverse populations of microbes like bacteria and fungi have advertently inhabited the human race with the passage of time. Although some of the microbial interactions have been beneficial, yet their detrimental effects are numerous. Of late, with increase in the number of immunocompromised patients, the study of fungal infections has gained more prominence in medical research with *Candida albicans* being one of the frontline model of pathogenic yeast in humans [1]. *C. albicans* is a diploid fungus, polymorphic in nature having the ability to grow as yeast, pseudohyphae and true hyphae [2, 3]. Several studies demonstrated that *C. albicans* is the most prevalent fungal pathogen that can cause multiple diseases ranging from superficial infections of mucous membranes to life-threatening systemic candidemia [1, 4].

In the last few decades, several antifungal drugs have been developed to treat *Candida* infections. Based on their chemical composition and mode of action, antifungals have been classified into different groups such as allylamines, azoles, echinocandins, 5-fluorocytosine and polyenes [5]. Among these groups, azole class of antifungals are preferred due to its broad spectrum activity, high efficacy and low toxicity. However, long-term

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RESEARCH ARTICLE

CO_2 detection: using the polyethyleneimine–cerium oxide nanocomposite sensing film coated on interdigitated electrode prepared from copper clad

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ABSTRACT

In this effective work, Polyethyleneimine (PEI) and Cerium Oxide (CeO_2) with disparate weight percentage were designated for sensing Carbon dioxide (CO_2). Four heterogeneous varieties of sensors with a varied weight percentage of CeO_2 in PEI were fabricated by drop-casting the sensitive films on prepared Interdigitated electrodes (IDE) from copper-clad. Morphological, compositional, absorbance and X-ray studies were led on the cerium oxide nanoparticles by field-emission scanning electron microscopy (FESEM), energy dispersive X-ray analysis (EDAX), UV-Visible spectrometer and X-ray diffractometer (XRD). Response capabilities of all the four sensors at room temperature were attentively scrutinized. Unique capabilities of Repeatability, sensitivity, error-free measurements of the response time and recovery time were carefully inspected. It was summarized that the appropriate weight ratio of CeO_2 and PEI was critical for sensing response. A feasible comparison between sensing responses of the fabricated sensors to CO_2 under nitrogen (N_2) was typically done. Relevant sensing process was investigated too.

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KEYWORDS
IDE; copper clad; cerium oxide; PEI; nanocomposite films; gas sensors; CO_2; room temperature

1. Introduction

In recent times, for forecasting global climate changes diverse climate models have been used extensively. Increase in greenhouse gases like carbon dioxide (CO_2) concentration in the atmosphere, resultant in increasing temperature connected to the surface of the earth as well as in the troposphergreenhouse gases like carbon dioxide (CO_2) surge in the atmosphere, resultant in increasing temperature connected to the surface of the earth as well as in the troposphere [1]. Discharge of CO_2 in the atmosphere effects on human health by displacing oxygen. Due to the rise in the level of CO_2 breathing becomes tougher for mankind. CO_2 can lead to cause headaches and health complaints in closed zones [2]. It is necessary to constantly check the amount of CO_2 being released into the atmosphere through various means like efficient combustion of fossil fuels in vehicles, burning of coal in thermal power plants. Carbon dioxide poisoning constitutes additionally a severe threat to prominent people cautiously working in confined places like key industries and independent labs [3]. Therefore, it is significant to produce economically cheap, fast and reliable CO_2 sensors for sensing and monitoring regularly. Many necessary materials have been used as sensing element like metallic oxides, polymer-based sensors, electrolyte sensors, etc., in sophisticated CO_2 sensors [4]. Sensors scientifically based on metallic sensing elements frequently require high-temperature processes for modern fabrication [5]. This can be prevented by employing polymer-based sensing elements and also, they can be utilised to detect a vast range of analytes [6]. Metal oxide nanocomposites allow a broad scope in gas sensing application [7]. Cerium oxide has been extensively used in biological and optical applications [8]. Over here we are carefully checking the possible application of cerium oxide in gas sensing. Its nanostructure allows us to fabricate sensors with compact size and capable of detecting very low concentrations of the analyte. Addition of filler contributes greatly with a measurable increase in the performance of the composite materials [9,10]. The resistance value increases with the coating layers as ZnO thin films with 4 and 8 times coated results in increase with 110 and 125 Ω for etched 50 and un-etched substrates [11]. Thin films and micro and nanostructures are very promising candidates for novel applications in sensing [12]. Accurate CO_2 detection can be typically developed scientifically based on nanoparticles with polymer films at room temperature [13–15]. In this scholarly work, PEI-CeO_2 coated on IDE prepared from copper-clad to sense CO_2 gas scientifically based on resistance change. Physisorption between considered CO_2 gas and CeO_2 and room temperature interactions in common is the primary sensing mechanism for detecting CO_2. All sensors (0.25, 0.50, 0.75 and 1.00 wt%) could accurately detect 200–1,000 ppm CO_2 gas.

2. Materials and methods

2.1 Synthesis of cerium oxide

Necessary materials required for synthesizing cerium oxide (CeO_2) in common were cerium (III) nitrate as a precursor material or potential source of cerium, ammonium hydroxide acts as a precipitating reagent and ethanol. Figure 1 shows the graphical representation of synthesizing CeO_2, which typically involves five steps.

Step 1. The cerium (III) nitrate was primarily dissolved in the individual H_2O or C_2H_5OH/H_2O (1/1 by vol.).

Step 2. The reaction mixture was heated sufficiently with the constant stirring for comfortably reaching an effective temperature.

Step 3. Added NH_4OH solution. Instantly, a precipitate of Ce $(OH)_3$ convincingly shown by the light brown coloration was

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Investigation on performance of DC motor in exhaust application using vibration based condition monitoring

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Keywords: Motor, X-viber, paint shop, computer

ABSTRACT

In allusion to the issue of the preventive maintenance in industry 4.0 a proactive approach on maintenance such as predictive maintenance is gaining more and more scope. This paper provides a brief insight on the basic methodology for analysis of complex vibration signals taken from the machine of interest. In the past several years there have been several developments in the field of condition monitoring however reducing the complexity of the analysis has helped in achieving better results. This paper has proposed a novel and effective method to simplify the use of vibration-based condition monitoring analysis of a motor in a industrial segment. Also using the method of vibration based condition monitoring it was possible to establish the efficacy and efficiency of the given method in a industrial space.

1. Introduction

As we move to industry 4.0 the demand for automation in the industries have increased. The reliability safety, efficiency, productivity all depend upon the technologies which do not fail and can be predicted. Unplanned stoppages, can lead to decreased market adaptability of a company. Time based maintenance primarily focuses on a conservative method of preventive maintenance which happens in a fixed period of time. This system has been flanked by various disadvantages due to which there has been exploration into other kinds of

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Effect of Iron Oxide Nano Particles on Biogas Production and Study of Microbial Analysis and its Slurry uses in Agricultural Field

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Abstract

Nano particles have recently attracted enormous attention in the field of agriculture and bio fertilizers for the better yield of plant crops. This experiment will show the effect of iron oxide Nano particles in biogas production and analysis of effect of those nanoparticles on microbes and study of advantages of biogas slurry on plants and plant crop. Biogas is produced by the putrefactive bacteria's which breakdown under anaerobic or aerobic conditions. And this bio digestion involves slow chemical reactions which intern result in the production of gas in the slow release manner. So the addition of iron oxide Nano particles will increase the production rate and as it will reduce CO2 to form ch4. So as increase in the methane quantity will increase the gas production. As iron oxide is biodegradable further slurry will be added to the plants and effects are studied. Slurry samples collected and studied about the microbes and its advantages.

Keywords- Nano Particles, Plant Crops, Bacteria, Methane, Aerobic, Anaerobic

I. INTRODUCTION

In today's world all are having concern towards how to save energy for tomorrow. And most of the people think about the use and availability of the energy. Canada spends a lot on Gas, Propane, and oil. These fossil fuels are used continuously [1]. Because we use that continuously and availability will go down and need will go up [2]. So, in that time we have to look into other sources where it is environmentally friendly and which costs less [3]. This has been lead to the search for new energy sources [4].

In this one excellent source of energy is biogas [5]. Biogas produces when organic decaying materials produces gas that is by methane producing bacteria in Aerobic or anaerobic condition. Methane is the main component in Biogas. And it is having clean burning and colourless [6].

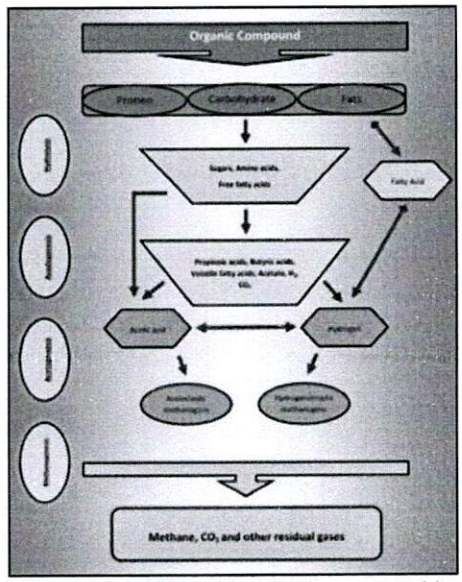

Fig. 1: CO_2 and biomethane formation in an anaerobic process

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Comprehensive Approach towards M Shopper's Shopping Behaviour using Shopping Apps – TAM Model Analysis

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ABSTRACT

In current digital era, the mode of retail business is undergoing rapid change. Retailers are shifting their businesses from brick and mortar to e commerce especially m commerce i.e., business transactions via mobile phones because smartphones are turning to be one of the smart commercial channel. At the same time we see the lifestyle of people also has changed. People depend more on smartphones in their daily life, thanks to the internet. People are also choosing to shop over the mobile phones for convenience purpose. In order to grab this opportunity the e retailers are trying to adapt themselves to m commerce via mobile applications. The success of the m commerce companies depend upon the customer's willingness to accept the usage of technology (smart phone and applications). In this paper the attempt has been made to find the perception regarding the acceptance of technology by m shoppers and to assess the factors that influences the acceptance of usage of apps for m-shopping using TAM model. For this study Questionnaire was designed to find the factors influencing m shopping using apps. The questionnaire includes the variable such as Perceived usefulness, behavioural intention, Perceived ease of use, attitude, Perceived Risk, Perceived Enjoyment from TAM model. Likert scale was used to measure the variables. 102 responses from the shoppers who shop using shopping applications are used for this study. The findings of this study supports the hypothesis framed. High negative correlation is observed between perceived risk and perceived ease of use. Attitude and shopping intention has high positive correlation. From the variables under study with score ranging from 5 to 25, perceived ease of use has highest mean and perceived risk has the minimum mean. Finally, the study also finds that low internet connectivity, low quality of product, low clarity about authentication of product, return policies are the problems faced by shoppers while shopping using mobile apps.

KEYWORD: *m- Shopping, Behavioural intention, Perceived ease of use, Perceived usefulness, Perceived Risk, Perceived Enjoyment, attitude*

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INTRODUCTION

The Technology acceptance model (TAM) is an information systems theory that models how users come to accept and use a technology proposed by Davis, 1989. This model is a foundation for examination of customers approval of online shopping (Stoel and Ha 2009; Umair Cheema et al).The major components of TAM model are perceived ease of use, perceived usefulness, attitude and intention. (Xiaoni Zhang & Victor R. Prybutok 2003). In this digital era, technology has a crucial function in lives of many people. Mobile devices, in particular, have become an important product to many individuals and have been expected to further increase in their usage (JatiKasuma, et.al 2020).

Mobile Apps:

With the increased popularity of mobile apps, there has been a consequential magnification in the number of mobile app developers. Mobile App is one of the paramount marketing implements for any product/service. It might build/eradicate the brand equity and brand adhesion, according to its performance. (Venkata N Inukollu, et.al 2014). Mobile app includes native apps which live on the device and are accessed through icons on the device home screen. These are installed through an application store, Web Apps are not real applications. These are stored on a remote server and delivered over the internet through a browser interface (Gagandeep Kaur; Gagandeep Kaur 2016). Smartphone driven Apps has exciting spaces for today's online community, and India's young economy is no exception. India is world's third largest internet user, after US & China (K Lalitha; ArockiaRajasekar 2018). Compared to traditional mobile web sites, mobile apps provides several advantages for marketers because mobile apps offer greater security features as well as allow consumers bypass competitors' information and go directly to the marketer's self-contained environment (Taylor and Levin, 2014); (TsuangKuo et.al,2016). M commerce Companies are offering the favourite way of shopping through apps for the shoppers and getting equipped with better connectivity and

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FIRE DETECTION FOR SURVEILLANCE OF FOREST USING IMAGE PROCESSING

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Abstract - *Fire outbreak is a common issue and the damage caused by these types of incidents is tremendous toward nature and human interest. The main causes of outbreaks in rural areas are agricultural burning and conversion of forests to croplands, burning forests to improve hunting, and arson. Due to this, the need for an application for fire detection has increased in recent years. The proposed algorithm works on rule-based color model which are specified based on luminance and chrominance contents present in an image. YCbCr color space effectively separates luminance from chrominance compared to other color spaces like RGB. The proposed algorithm separates fire flame pixels and also isolates high temperature fire center pixels by taking into some of statistical parameters of fire image in YCbCr color space like mean and standard deviation. In this algorithm four rules are defined to separate the true fire region from the fire image. Two rules are defined for segmenting the fire region and other two rules are defined for segmenting the high temperature fire center region in fire image. The results are obtained and tested for a 50 images and achieves 98.83% of higher true fire detection rate and less false detection rate. The proposed methods can be used for real time forest fire detection with moving camera or UAV.*

Keywords: Fire detection, image processing, RGB color model, standard deviation.

1. INTRODUCTION

A fire alarm is very useful for security reasons. To reduce the loss of life and the property from fire, an early warning is an imperative. Presently almost all the fire detection system uses sensors. For high precision fire detection systems, large numbers of sensors are required in the case of outdoor areas. The sensors also need a frequent battery charge which is impossible in a large open space. Sensors detect fire if and only if it is close to fire. This will lead to damaging of sensor. Computer vision-based systems replaces conventional fire detection systems, due to rapid development of the digital camera technology and video processing. The performance of the fire detection system depends on the fire pixel classifier which generates major areas on which rest of the systems operates. Thus, a precise fire pixel classifier is needed with a high true detection rate and less false detection rate. However, four rules are specified for fire pixel classification. Fire pixels classification can be considered both in gray scale and color video sequences. Many rules have been proposed for detection of fire in an image. Each method gives a robust result for specified set of images. However, results may be varying due to image orientation, size, contrast and color. In non-documented images, detecting fire is more challenging because of variation in fire size, position and color.

2. OBJECTIVE

Fire detection system is the most important component in the surveillance system to discover fires early in their development when time will still be available for the safe evacuation of occupants. Fire has been one of the major disasters, even though it is so important to fulfil certain activities in day-to-day life. Fire disasters will cause severe damage to human properties and cause terrible mental and physical injuries. Traditional method also plays a significant role in protecting the safety of emergency response personnel. Property loss can be reduced and downtime for the operation minimized through traditional method because control efforts are started while the fire is still small. The Fire detection systems provide information to emergency responders on the location of the fire, speeding the process of fire control.

3. MODEL FOR FIRE DETECTION

In order to create/derive the color model for fire, we analyzed several images having fire. Since the color of fire is generally closer to red and has high illumination, we can use property of fire to derive the required color model.

3.1. RGB COLOR MODEL

A fire images can be explained by using its color properties. There are three different parts of color pixels: Red, Green and Blue (RGB). The color pixel can be removed into these three individual elements R, G and B, which is used for color detection. RGB color model is used to detect red color details in image. In terms of RGB values, the corresponding inter-relation between R, G and B color channels: Red>Green and Green>Blue. The combined condition for the captured image can be written as: Red>Green>Blue. In fire color detection Red should be more stressed then the other color component, and hence R becomes the domination color channel in an RGB image for fire. This imposes the condition for R as to be over some predetermined threshold value Red Threshold value (RTH).

Conditions for fire colors in image are summarized below:

Condition1: R > RTH

Condition2: Red> Green > Blue.

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Whatsapp Chat Analyzer

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Abstract – **The most used and efficient method of communication in recent times is an application called WhatsApp. WhatsApp chats consists of various kinds of conversations held among group of people. This chat consists of various topics. This information can provide lots of data for latest technologies such as machine learning. The most important thing for a machine learning models is to provide the right learning experience which is indirectly affected by the data that we provide to the model. This tool aims to provide in depth analysis of this data which is provided by WhatsApp. Irrespective of whichever topic the conversation is based our developed code can be applied to obtain a better understanding of the data. The advantage of this tool is that is implemented using simple python modules such as pandas, matplotlib, seaborn and sentiment analysis which are used to create data frames and plot different graphs, where then it is displayed in the flutter application which is efficient and less resources consuming algorithm, therefor it can be easily applied to largest dataset.**

Keywords: WhatsApp chat data, Pandas, Seaborn, matplotlib, sentiment analyzer, Flutter application etc.

1. INTRODUCTION

This tool is based on data analysis and processing. The first step in implementing a machine learning algorithm is to understand the right learning experience from which the model starts improving on. Data pre-processing plays a major role when it comes to machine learning. In order to make the model more efficient we need lots of data, so we turned our focus primarily on one of the largescale data producers owned by Facebook which is nothing but WhatsApp. WhatsApp claims that nearly 55 billion messages are sent each day. The average user spends 195 minutes per week on WhatsApp, and is a member of plenty of groups. With this treasure house of data right under our very noses, it is but imperative that we embark on a mission to gain insights on the messages which our phones are forced to bear witness to.

1.1 PROBLEM STATEMENT

WhatsApp-Analyzer is a statistical analysis tool for WhatsApp chats. Working on the chat files that can be exported from WhatsApp it generates various plots showing, for example, which another participant a user responds to the most. We propose to employ dataset manipulation techniques to have a better understanding of WhatsApp chat present in our phones.

1.2 EXISTING SYSTEM

There is a lot of development in the current system. In the older version there was no feature to display status, there was no feature to share documents and there was no feature to share location. In the current version, all of these features are available. In older version we couldn't share images through doc's format. In this system user is able to access WhatsApp in windows through WhatsApp web application, which can be connected through QR code. There is another feature called export chat where user can send or share or get the chat detail for data analysis through email, Facebook or some messenger application.

1.3 PROPOSED SYSTEM

Data pre-processing, the initial part of the project is to understand implementation and usage of various python-built modules. The above process helps us to understand why different modules are helpful rather than implementing those functions from scratch by the developer. These various modules provide better code representation and user understandability. The following libraries are used such as numpy, scipy pandas, csv, sklearn, matplotlib, sys, re, emoji, nltk seaborn etc.

Exploratory data analysis, first step in this to apply a sentiment analysis algorithm which provides positives negative and neutral part of th chat and is used to plot pie chart based on these parameters. To plot a line graph which shows author and message count of each date, to plot a line graph which shows author and message count of each author, Ordered graph of date vs message count, media sent by authors and their count, Display the message which is di not have authors, plot graph of hour vs message count.

1.4 OBJECTIVE

In this decade the upcoming technologies are mainly dependent on data. This data can only be obtained if there is some research applied on the context of the requirements of the tool. Since a lot of machine learning enthusiasts develop models which helps solve multiple problems the requirements of appropriate data are very large scale this project aims to provide a better understanding towards various types of chats. This analysis proves to be better input to machine learning models which essentially explore the chat data. These models require proper learning instances which provides better accuracy for these models. Our project ensures to provide an in-depth exploratory data analysis on various types of WhatsApp chats.

2. LITERATURE SURVEY

As a demo Survey analysis on the usage and Impact of WhatsApp Messenger [1]: Various Studies and analysis has been done on the usage and impact of WhatsApp. Some of these studies are for finding the impact of WhatsApp on the students and some are based on for the general public in a local region.

In a study of southern part of India was conducted on the age group of between 18 to 23 years to investigate the importance of WhatsApp among youth. Though this study,

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Fire Detection in Video Using Image Processing Technique

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***Abstract*: Fire outbreak is a commonplace difficulty occurring in Amazon and the damage resulting from these forms of incidents is amazing in the direction of nature and human interest. Due to this, the need for a fire detection device more demands in the extended years. Proposed work is a fire detection algorithm based totally on image processing techniques which are like minded in surveillance devices like CCTV, wireless digital camera to UAVs. Proposed algorithm technique using image processing adopts rule-based totally color model because of its much less complexity and effectiveness. YCbCr color model is effectively separates luminance from chrominance compared to other colour areas like RGB and rgb (normalized RGB) proposed approach not best separates fire flame pixels however additionally separates excessive temperature fire region center pixels via taking in to account of statistical parameters for detection of fire in a picture in YCbCr coloration area like suggest and well known In this method for the separations of fireplace region different regulations are applied.**

***Keywords*: Image processing technique.**

1. Introduction

Application of fire detection tool has increased due to the common occurrence of prolonged fireplace with results on human fitness and security. The existing fire detection techniques that are based totally on electronic sensors are commonly relying on heat and stress sensors. However, those methods have a lethal flaw where they may first-rate paintings when a specific circumstance has reached. In the worst-case scenario, the sensors may set broken or not being configured properly can cause heavy casualty in case of real fireplace. This type of systems gives numerous distinguish benefits over those conventional detection strategies. For example, the rate of the usage of this form of detection is inexpensive and therefore the implementation of this sort system is greatly easier compare to those conventional techniques. Secondly the response time of hearth detection tool is faster study to the other conventional detection strategies due to the fact that a imaginative and prescient sensor based totally fireside detection machine would now not required any type situations to purpose the sensors and it has the potential to display a huge location is predicated upon on the camera used. The most gain of fire detection is that the fire deliver are frequently saved at some point of a type of picture or video which may be used for selling the diversification of the hearth detection technique greatly.

A. Objective

Fire detection system is that the most vital component within the closed-circuit television. Fire has been one among the main failures, albeit it's so essential to fulfil positive activities in daily life. Fire disasters will reason severe damage to human properties and motive terrible intellectual and physical injuries, if they may be no longer detected at the proper stage Fire detection structures play a vital position in safeguarding places towards fire. to minimize fireplace danger and its impact, any company have to apply sound hearth detection method. A key component of fireside protection is to spot a growing fire speedy and to alert the building's occupants and fire emergency organizations. A necessity of a hearth Detection System is that the detection of fireside situations as early as possible, to supply enough time for Automated Systems Fire personnel for effective counter actions.

2. Model for fire detection

In order to make the color version for fire region we analyzed several snap shots having fire. Since the shade of the fire is generally towards crimson and has excessive illumination, we will use these belongings to derive the required color version.

A. RGB Color model

A fire region in a picture are frequently defined by the usage of its shade properties. There are three of coloration pixel: R, G and B. The coloration pixel are often extracted into these 3 character factors R, G and B, that is hired for coloration detection. RGB colour model is hired to hit upon crimson colour facts in picture. In RGB values, the corresponding relation between R, G and B colour channels: R>G and G>B. The combined situation for the captured photograph are regularly written as: R>G>B. In hearth color R should be extra burdened then the other component, and consequently R becomes the domination color channel in an RGB photo for fireplace. This imposes the circumstance for R as to be over a few predetermined threshold price RTH All of these situations for fireplace coloration in photo are summarized as following: Condition1: RED> RTH.

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ROAD SAFETY IN GHAT SECTION

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Abstract: Nowadays people own more than one vehicle for transportation which may cause a problem of high traffic and this will lead to road accidents which is getting increased day by day. There are many dangerous roads present across the world that are very narrow and T roads, hairpin roads, curved roads are largely seen in the ghat areas.

One of the common problems that we face in ghat areas specially is the drivers are not able to see the vehicle that is coming from the other end of the curved road. And if the incoming vehicle is in great speed, it is highly impossible to control the vehicle. Hence there is much need of road safety system. To avoid this vehicle accidents in ghat areas we have proposed a vehicle accident prevention system which makes use of Arduino Board, IR sensors, LED lights, LCD display, GSM and Buzzer. When the vehicle enters from zone 1 of the curved road IR sensor senses the vehicle and turns the LED light into RED colour and raises the buzzer indicating that there is danger. And turns the LED light in to green once the vehicle comes out of the other end which is zone 2. In this way we can prevent the vehicle accidents in ghat areas.

Keywords: **Accident prevention, Arduino board, Curved roads, Ghat areas.**

I. INTRODUCTION

A rapid growth in transportation and vehicles has resulted in an increase of accidents every day. Accidents mainly occur due to carelessness, breaking traffic rules and bad conditions of the road. As a major component of road geometric design, curved road segment, due to their alignment characteristics are most prone to traffic crashes among all road geometric elements. According to a survey, crashes on curved segments accounted for 10% of total number of traffic crashes. Correspondingly, the number of deaths accounted for 13% of total number of deaths. In Narrow roads, Hilly areas, Ghats sections', negotiating hairpin bends and curves is not an easy task. Driver has to be alert all the time while driving in such situations. Accidents mainly occur due to over speeding of vehicle while driving [1]. While driving on roads at ghat section many drivers faces accident which results them intoserious injuries or even death is the main reason behind this accident is curves and bends of roads while turning in ghats. It becomes difficult to see vehicles coming from other lane and turning drivers usually have to assume a way for turning at such critical section [2].

II. EXISTING SYSTEM

In the past, lot of devices to detect rash driving has been made. Most of the approaches require human concentration and involve a lot of effort, which is difficult to implement. Present day automobiles do not have effective lighting system. Due to this many accidents are taking place during night times especially in ghat sections. Conventional Head lights tend to illuminate the side of the road while cornering or shine off the road entirely, which can lead to unsafe condition.

III. PROPOSED SYSTEM

The accidents can be prevented by making use of LED screen, LCD display and Buzzers it will give a clear picture and distinct view of vehicles coming from the other end of the road. It does not make any distraction to drivers while driving. When two cars pass from the opposite side of the curved road the IR sensor senses the car and the LED colour turns into red and raises the buzzer giving danger signal and then the LED colour turns into green to allow the one car to pass and then the other LED colour turns green .Due to the simple techniques it is beneficial to use in large number of places and even in critical cross section of roads. . GSM model is used to receive SMS and alert the officer. We have implemented automatic Alert System within fixed limit of period. If the vehicle does not cross the ghat within given time limit then alert message will be sent to the nearest police station. This will solve the problem of those people who will face problem within the ghat section due to landslide, animals or other reason.

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Road Safety in Ghat Section

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Abstract: ***This paper describes the safety measures to be taken in the ghat section. The main reason for these safety measures is to prevent the accidents that is most common on the ghat road. The main problem in these curve roads is that the drivers are not able to see the vehicle that is coming from another end of the curve. If the vehicle is in great speed then it is difficult to control, which leads to disasters. Therefore the main aim is to prevent such problems. We have proposed this vehicle accident prevention system. Here we use sensors that is powered by Arduino board, which consists of IR sensors, LED lights, LCD display, GSM and buzzer. When a vehicle has entered one end ,the sensor alerts the driver by flashing a red light in another end, and when the road is clear it will turn on to green light.***

Keywords: Accident prevention, Alerting the driver, Curve roads sensor, IR sensor.

I. INTRODUCTION

Nowadays along with the population the transportation of vehicle has also increased which leads to high traffic, and also leads to accidents. There are many dangerous road such as narrow and T roads, curved roads which are largely seen in the ghat section. Large number of accidents mainly takes place in such roads. The main problem in these curve roads is that the drivers are not able to see the vehicle that is coming from another end of the curve. If the vehicle is in great speed then it is difficult to control, which leads to disasters. Therefore the main aim is to prevent such problems. Driving on ghat section is not an easy task. Driver must get some alert signals while driving.

Accidents mainly occur due to many reasons in ghat roads, firstly due to over speeding of vehicle while driving, secondly driver is unable to see the vehicle coming from another end of the curve.

In Ghat section or in curve roads , first preference should be given to vehicles moving an upward slope. But, problem is rules are not strictly followed and thus resulting accidents[1].

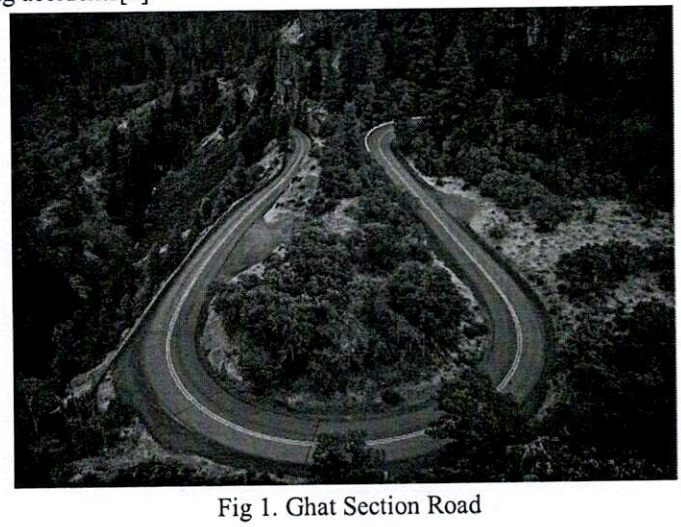

Fig 1. Ghat Section Road

Now a days accidents have become common reason for deaths. The main reason for accidents are rash driving, signal jumping, drunk and driving, due to minor drivers etc. While driving on roads at ghat section many drivers faces accident which results them into serious injuries or even death. This is the main reason behind this accident is curves and bends of roads in ghat section. It becomes very difficult for driver to see vehicles coming from other end and drivers while taking a turn has to assume a way for turning at such critical section this leads to a great risk of life, other reason for accident in ghat section is that only one vehicle can pass at a time in such lane [2]. The number of accidents in India is highest in the world.

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AIR QUALITY PREDICTION USING BIG DATA

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ABSTRACT

Having recent air or respiratory pure healthy air has become extinct during this generation. Pollution is one amongst the most important and heavy challenges facing our cities these days. All types of life together with plants and animals rely upon air for his or her basic survival. Thus, all living organisms would like sensible quality of air that is freed from harmful gases to continue their life. Writing by The Hindu says that pollution in Bengaluru to travel up by 74 percent by 2030. It'll be primarily owing to vehicle exhaust, construction dirt, and on-road dirt within the town. In this paper, we tend to use Big Data analytics technique to predict pollution and quality prediction model as there's accessibility of meteoric information and sensor information. This may facilitate the society to stay track of pollution and awareness on the pollution happening.

KEYWORDS: Air Pollution, big data, Map Reduce, Vehicle Count

I. INTRODUCTION

According to the study by Urban emissions along with researchers from the middle for Study of Science, Technology and Policy (CSTEP), the calculable PM10 (that is, stuff of but ten microns in size) pollution could increase by seventy four percent by 2030, LED primarily by vehicle exhaust, construction dirt, and on - road dirt. Researchers established an urban emission inventory for larger Bengaluru that coated sources like transport (over seventy 100000 vehicles currently), diesel generator sets, industries, brick kilns, urban road dirt, and open waste burning, among others. For 2015, the town emitted an calculable 31,300 tons of PM2.5 and 67,100 tons of PM10, states the study printed recently within the journal, part Pollution analysis. The increasing population, its cars and industries are polluting all the air at an alarming rate. Pollution will cause semi-permanent and short health effects. It's found that the aged and young youngsters are lot of stricken by pollution. During this work we are going to be grouping datasets of traffic and pollution from numerous websites like Kaggle and filter and scale back those datasets using hadoop with Map Reduce programming, at the moment we tend to can merge each data and obtain a trained model and so by using java server pages we tend to develop a UIand take current real time traffic data of a route from traffic sensors or live traffic websites and therefore predict the pollution.

II. CONNECTED WORK

In the past few years, several researches and aspects were taken under consideration using Air quality. It is one amongst the foremost alarming considerations for India these days. Addressing this concern, within the past decades, several researchers have spent many time on finding out and developing completely different models and ways in air quality analysis and analysis. One amongst the most comes that projected was Am Agent based Traffic Regulation System for Air quality control [1] to mix the advantages of agent technology with each machine learning and massive information tools. An Artificial Neural Networks (ANN) model and also the Dijkstra algorithm was used for air quality prediction and also the least polluted path finding within the road network.All information processing tasks were performed over a Hadoop based framework: HBase and Map Reduce. In Air Quality Prediction: huge information and Machine Learning Approaches [2]Investigates numerous big-data and machine learning primarily based techniques for air quality prediction. In [3] pollution prediction through Internet of things technology and Big data analytics that examines the likelihood to create a fusion between the two new ideas within the context of predicting pollution that happens once harmful substances; like NO2, SO2, CO and O3 were introduced into Earth's atmosphere. In [4] says that pollution in Bengaluru to travel up by seventy four percent by 2030. In [5] period pollution prediction model supported Spatiotemporal huge information Introduces a mixture of an extended immediate memory (LSTM) unit for statistic information and a Neural Network model for different pollution impact factors like weather to make a hybrid prediction model. This model is easy in design however still brings sensible prediction ability.

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Traffic Regulation Over Air Quality

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***Abstract*: A system for molding the urban road network infrastructure, endowing the period and foreseen pollution indexes in numerous road segments and locations and generating recommendations and regulation proposals for road users. This will facilitate reducing vehicle emissions within the most. This project describes on-road air quality watching and management approach by proposing a impure road sections, optimizing the pollution levels whereas maximizing the vehicle flow.**

In this project, we have a tendency to use datasets gathered from Kaggle, an internet community of information scientists and machine learners, closely-held by Google and conjointly Microsoft Research website, this knowledge are going to be employed in the air quality indexes calculation and so the generation of a dynamic traffic network. This network is represented by a weighted graph during which the perimeters weights evolve consistent with the pollution indexes. During this work, we have a tendency to propose to mix the advantages of agent technology with Big Data knowledge tools and Java. a man-made Neural Networks (ANN) model and also the Dijkstra rule area unit used for air quality prediction and also the least impure path finding within the road network. All processing tasks are going to be performed over a Hadoop primarily based framework: Map Reduce, Eclipse for Java and hypertext markup language for Frontend.

***Keywords*: Air quality, Dijkstra rule, Map Reduce, Road network, Trajectory, Traffic prediction.**

1. Introduction

Many aspects have told that the risks connected with fitness and metabolism morbidity Increase with chronic exposure to pollution. Also, acute inhalation of pollutants even for a brief amount of your time will cause a malfunction within the fitness system and respiratory organ perform as in most cities, the fundamental pollution drawback arises as a result of the residential area unit as are removed from offices, leading to daily giant population movements. Thus, transport particularly road traffic could be a major reason for pollution in most of the cases. It includes to fifteen of the carbonic acid gas emissions in India.

In Indian urban atmosphere, there's a spread of pollutants within the atmosphere with the eligibility to cause damage to each humans and also the nature, as well as CO, chemical element oxides, sulfur dioxide, explicit matter, Volatile organic compounds, Ozone, and Hydrocarbons; therefore, our several interest in resolution this issue native authorities face a tricky instance with endless and same increase in road traffic, resulting in congestion and travel times that area unit at the same time growing. This ends up in a rise in fuel consumption and waste emissions, particularly throughout peak hours. Emissions in cities typically exceed the tolerated level; studies have shown that the consequences of pollution cut back life and induce huge value to society. Meanwhile, the present technology and technique for air quality and traffic jam management haven't been terribly effective attributable to the shortage of autonomy, adaptation, and collaboration between the actual entities. This issue desires the employment of associate integrated system for traffic management and air internal control, which aims to collectively solve or cut back traffic and air quality. Therefore, associate economical intelligent transport system taking under consideration air quality is of nice importance for society.

In this work, we have a tendency to area unit notably fascinated by traffic regulation and generating commendations to require under consideration to determine air quality indices in metropolitan areas, to come up with bound information to users and propose recommendations concerning the simplest ways to require. This is often done supported waste knowledge collected from Kaggle that offer properties associated with road fundamentals and air quality to the system. It should take into charge the constraints of geographical distribution and dynamics of the matter seen the actual fact that air quality levels amendment over time and also the actual variety of users that demand recommendations and so the amount of vehicles to direct to different ways is unknown. Therefore, the system should be established to user desires, taking under consideration of these factors whereas making certain an excellent performance in handling the big amounts of information (pollutants, weather, etc.) collected from completely different sources (Kaggle, weather knowledge records, etc.) which will regularly increase overtime. For this, we have a tendency to propose the employment of associate approach supported agent technology and large knowledge analytical tools so as to live calculate and management the condition of air with a better spatiotemporal resolution and to involve users in trailing their exposure to pollution through custom embedded tools. Moreover, thanks to giant amounts of information, the process task has become an excellent challenges to deal with this drawback we recommend the employment of Hadoop framework to make sure an excellent flexibility and speed in

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Sixth Sense on Personal Assistant

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ABSTRACT

Paper focuses on designing and developing an user interface to help out the dumb community in making a better use of the personal assistance devices such as Amazon Echo, Alexa etc. It mainly deals with making services of the personal assistance to be easily accessible by the dumb community using sign languages. This web design is based on data science collected from standards of Indian Sign Languages (ISL) and can be built using machine learning tools. TensorFlow library is used as the machine learning package. Sixth sense on personal assistance project is implemented in Anaconda software using python language. Implementation can be done in 3 phases. First phase involving design of the GUI for end user to scan the user image, the second phase deals with implementation of machine learning algorithms to categorize the uploaded article and third phase involves the displaying of categorized results. By using keyword extraction algorithm with category classification and topic discovery algorithm. The results of the project is a software which efficiently reads the users sign languages and converts it into user defined languages which is easily understandable by the personal assistance tools. Maintenance and further development of application as well as the feedback provided by the end users is encouraged.

Keywords: Tensorflow, Squeeze net and Indian Sign Language.

I. INTRODUCTION

Every personal assistance is useful for people who can use voice as their input, but these types of personal assistance cannot be used by the people who cannot speak. There have been countless articles popping up about personal assistance which is becoming a competition for large companies to become the voice activated home assistant of choice. The dumb community usually communicate with different standards of sign languages which has become the backing idea of this project that is to convert these image processed sign languages into voice activated notes which could be understood by the personal assistant and made use of. The algorithm used here helps in classifying the sign languages as interpreted using a digital camera and then the algorithm converts them into text which is then converted into voice notes. It seems like voice interfaces are going to be a big part of the future of computing, Personal assistance are now ruling over the internet but is of no use when it comes to the dumb community. Thus the problem statement revolves around the idea of a camera-based sign language recognition system that would be in use for the dumb for converting sign language to text and then text to speech. Earlier, data gloves where used for getting the statistics of the hand movement which was then converted into text. It had two components mainly the flex sensors and measuring sensors. These components helped in recognizing a pattern of the hand movement. These samples are not predictive and sometimes may give false results. There is no proof of accuracy in the existing systems.

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Segmentation of Brain Tumor from MRI using Deep Learning

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Abstract: ***In the medical field Brain Tumor Segmentation plays an important role that helps to detect the tumor in brain. Today there are various methods for tumor detection like manual segmentation, but all these methods are time consuming. So, In this paper automatic brain tumor segmentation is been used for tumor detection. There are many steps involved in brain tumor detection. First process is Pre-processing, second method is Feature Extraction and final method used is Segmentation. For the implementation python programming language is used. When a training image is given it will be first scanned for each pixel. In order to detect the area prone to have tissue which may be malignant or benign. This will help to decide if the cell is cancerous or normal. All this is done by image processing. By this the doctors and medical experts can easily get information about tumorous tissue in the brain so the patients can be easily diagnosed from brain tumor.***
Keywords: Malignant, Benign, Pre-processing, Feature Extraction, Segmentation.

I. INTRODUCTION

In these days cancer has become so common that any individual can be prone to it. Brain tumor is one kind of tumor. But early detection and diagnosis can help to heal the cancer. Today in medical field thee are various techniques to detect brain tumor. Segmentation of brain tumor from MRI using deep learning is one of the methods used to detect brain tumor. In this method undergoes brain tumor detection by learning the properties of the cancerous tissues and diagnose the tumor. It will also note whether the condition the of brain is normal or abnormal.

As there is problem in segmentation of brain tumor for multi modal images due to not predicted shapes and size of tumors in brain. Sometimes there are many variations in tumor structures and representations and also the position where the tumor is present, hence we require automatic methods for the purpose of brain tumor segmentation. Some of the operations on these image can be performed by using image processing.

To get enhanced image or in order to retrieve some of the important information from it. Various MR sequences give information about the lesion in the volume. Here in this proposed method it makes use of Convolutional Neural Networks (CNN's). this is used when the number of dataset is large to perform brain tumor segmentation by MR scan.

II. EXISTING SYSTEM

In artificial intelligence system image processing and machine learning is important issue. Existing system makes use of algorithms like clustering algorithms which is used to classify images to different two groups where one group will contain brain tumor and the other group is the one which do not have tumor that is cancerous. Also these existing systems made use of steps like feature extraction that is very important to obtain and retrieve the necessary informations from the data that is original that is done by making use of various techniques that can be used when the size of the image is not in specified range or the image that is large. The next step that is used in the existing system is K-nearest algorithm that will combine the points of K-nearest based on factors like their distance and this will also join into clusters. After this all these clusters will be evaluated before the final step. Now the last step used in the existing system used is C-means algorithm. The main work of this algorithm is to remove the clusters that are empty.

The main drawback of this existing system is that these do not make use of Pre-processing step, because of which this will result into robustness toward the noise. These noise are present in training dataset. When there is large dataset this existing system do not work well. Another disadvantage of this existing system is that the actual shape, size and type of the tumor cannot be predicted.

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Classification of Knee MRI

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Abstract:- Magnetic resonance magnetic imaging (MRI) is the preferred method for identifying knee problems. Perception of knee MRI, however, is time-intensive and prone to error and variance in the treatment. An automated knee translation MRI system would provide preference to high-risk patients and assist physicians in making diagnoses. Deep learning methods are well suited to modelling the complex relationships between patient data and their interpretations in order to easily learn layers of functionality. We developed a deep learning model in this study for the diagnosis of particular disorders and particular diagnoses on knee MRI examinations. In the field of orthodontics, the patient-specific implant design and pre- as well as intra - operative planning are becoming highly prevalent. Timely and effective classification of knee structures from MRI is essential for clinical viability of these techniques. Manual classification, however, is labour intensive and subject to variation between and intra-observer. The challenge in implementing automatic classification techniques for MRI data mainly exists in the problem of heterogeneity and the poor resolution between knee bone and surrounding tissue. The main objective is to first train a dataset in a convolutional neural networks (CNNs).

Keywords:- *MRNet, CNN, AlexNet and MRI.*

I. INTRODUCTION

Magnetic Resonance Imaging (MRI) is the standard technique of care image analysis for evaluating knee disorder, and even more MRI studies are conducted on the knee than on any other region of the body. MRI provides a safe and non-invasive way to study internal tissues and create detailed musculoskeletal models of the body. Classification is a method of computation that sorts images into classes as per their similarities. An automated knee MRI image system has a range of uses, such as timely prioritization of high-risk patients in the radiologist workflow and helping radiologists make diagnoses. During the past five years, new waves of medical data mining tools have greatly affected the healthcare industry by strengthening medical disease diagnosis and reducing physician time pressure. For the diagnosis of meniscal and cruciate ligament pathology, MRI has frequently demonstrated high accuracy and is regularly used to classify those that may benefit from surgery. Classification approaches are well suited to modelling the complex relationship between medical images and their description in order to automatically learn layers of features. Different knee bone tissues tend to vary more in appearance with each other than with the surrounding muscle tissue. A fully integrated deep learning method to analyse knee MRI, and to equate the efficiency of the model with that of general pathologists. Finally, this model should work for external dataset.

II. PROBLEM STATEMENT

Magnetic resonance imaging (MRI) is the standard tool for diagnosing knee injuries. Nevertheless, knee MRI interpretation is time-intensive and subject to diagnostic error and variability. Knee MRI Images can be obtained rapidly, non - invasive method and without exposure to ionizing radiation in any direction. MRI technology is based on the application of a powerful persistent magnetic field, lining up the hydrogen atoms in the imaged tissue, and additional radio frequency fields, that are used to alter the magnetization alignment and to produce a scan tool-detectable effect. MRI is a non - invasive procedure in radiology that generates functional and anatomical body pictures, and is especially useful for neurological, outpatient, neurological, muscular and muscular imaging. It allows parameters to differ, such as repeat time and echo time. In MR imaging techniques there are many pulse sequences available which lead to an optimization method. Depending on the anatomy of the interesting structures, the correct pulse sequence has to be selected such that the tissues of interest can be distinguished optimally and the classification procedure can be performed.

III. METHODOLOGY

To decide whether the clinically significant increase in accuracy in the identification of ACL breaks with system assistance depended on the grade of performance. To make a proper decision regarding a case, the radiologist usually looks at MRI scans from different planes to have a global view.

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Fruit Recognition Using SVM Technique

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Abstract: ***The ability to identify the fruits based on the quality in food industry is very important nowadays where every person has become health conscious. There are different types of fruits available in the market. However, to identify best quality fruits is cumbersome task. Therefore, we come up with the system where fruit is detected under natural lighting conditions. The method used is texture detection method, color detection method and shape detection. For this methodology, we use image segmentation to detect particular fruit. Fruit Detection project is implemented in MATLAB image processing toolbox. The project is implemented for both Real time and Non-Real time. The proposed method has four stages: First is Pre-Processing and second is Feature Extraction and third is Segmentation and fourth Recognition. In case of Non-Real time, the first stage is used to browse the image, second stage is extraction of the features from images using Grey Level Co-occurrence Matrix (GLCM), RGB and Color Histogram. System will convert the image from RGB to grayscale image for further processing. The color histogram represents the distribution of colors in an image. Since image is captured under different illumination condition. In the third stage, the three extracted image is obtained in the form of red, green and blue. In the fourth stage, the extracted features are used as input to Support Vector Machine (SVM) classifier. Then name of the fruit is output is obtained.***

Keywords: realtime, non-realtime, SVM

1. Introduction

Recognizing different kinds of vegetables and fruits is a difficult task in supermarkets, since the cashier must point out the categories of a particular fruit to determine its price. The use of barcodes has mostly ended this problem for packaged products but given that most consumers want to pick their products, they cannot be pre-packaged, and thus must be weighed. A solution is issuing codes for every fruit, but the memorization is problematic leading to pricing errors. Another solution is to issue the cashier an inventory with pictures and codes, however, flipping over the booklet is time consuming. Automatic classification of fruits via computer vision is still a complicated task due to the various properties of many types of fruits. The fruit quality detection technique which was based on external properties of fruits such as shape, size and color.

The proposed method is based on the use of Support Vector Machine (SVM) with the desirable goal of accurate and fast classification of fruits. Support Vector Machines (SVMs) is a classification method based on machine learning theory. SVMs have significant advantages because of their high accuracy, elegant mathematical tractability, and direct geometric interpretation. Besides, they do not need a large number of training samples to avoid over fitting. The task here is to automatically detect and classify the fruits image acquired from database. Assuming that the different images are present and some are overlapped on one another. The proposed work mainly gives a review that what steps are performed throughout the entire process to detect particular fruit. Since image is captured under different natural condition. The framework mainly consists of two phases. In the first phase textural features are extracted from fruit and in the second phase fruit is classified as detected fruit. The measurements obtained from the study of textural feature are given as input to the SVM classifier for training in order to classify it. Finally, system will detect objects and will display as an output. The objective of Fruit Recognition using image processing is to design an incremental model to recognize the fruits based on size, shape and color of the fruit ignoring external features like environment, noise and background. This just focus the image of particular fruit and identify the fruit. An approach of classification using Support Vector Machine Classifier that has very good working efficiency produces the accurate results. The system helps to improve the performance. Maintaining the project is easy and manageable.

2. Literature Survey

In [1], they have recognized nine different classes of fruits. Fruit image dataset are obtained from web as well as certain images are acquired by using mobile phone camera. These images are pre-processed to subtract the background and extract the blob representing fruit. For representing fruits and capturing their visual characteristics, combination of color, shape and texture features are used. These feature datasets is further passed to two different classifiers multiclass SVM and KNN. The color image is firstly converted to grayscale by GLCM (Gray Level Co-occurrence Matrix). The image is further converted to binary image. Further, Morphological operations are used to fill the holes and extract the largest blob or object from the image which would further be considered as fruit. After that this largest blob is cropped and the binary values are replaced with original intensity values. From the experiments it can be concluded that the combination of color texture and shape gives better or comparable results in most of the cases than when any two categories of features are used. Also, the second conclusion which can be made is that KNN gives better results for this case than SVM.

In [2], has different steps of the training process in this research which are as follows: Initially collect fruits image, then feature extraction process using FCH & MI method to

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IDENTIFICATION OF BUTTERFLY SPECIECS USING VGG-16

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ABSTRACT

Butterflies are abundant species on the earth, and the task of identification of butterflies is complex. How to apply image processing methods to automatic identification of butterfly species is a hot issue in current research. In this paper, the problem of automatic detection and classification of butterfly species using buttery photographs is studied. A model needs to be trained first and training too deep it's not good because if done so then even background will be trained. So that small change in background it gives results as not a butterfly. Pooling method used and also tensor flow used for training CPU and GPU. Therefore only like 75% to 80% images should be trained remaining directly should be tested. This paper uses pre-trained model VGG-16 with Convolutional Neural Network (CNN) to classify butterfly images.

KEYWORDS: Convolutional Neural Network (CNN), Image Processing, Pooling, VGG-16, Tensor flow.

I. INTRODUCTION

In the world there are around 18,000 butterfly species were exists. These different butterflies are having different characters like unique patterns, large wings, etc., so they are named using there external morphological features. Butterflies plays a very important role in the environment by pollination and also it is a prey to many predators to balance the ecosystem. Currently, for the sake of further reveal the evolution of the species ecological status, scientists are focused and maintaining the diversity of species in each ecosystem, as their number have dramatically decreased. Therefore, the classification of species is crucial but complicated and difficult. Traditional methods of insect's taxonomy differentiate species of butterflies by analyzing the color and size of the wing spot, the wing veins and other anatomical features. Many automatic methods have been developed to help entomologists with identification. Here VGG-16 method is used which is shown in figure 1. First the image is to be trained then the data need to be augmented. Then the augmented data is to be pre-trained using the VGG-16, which pre-trained data need to be validated and feed the data to testing, after testing the butterfly species is identified.

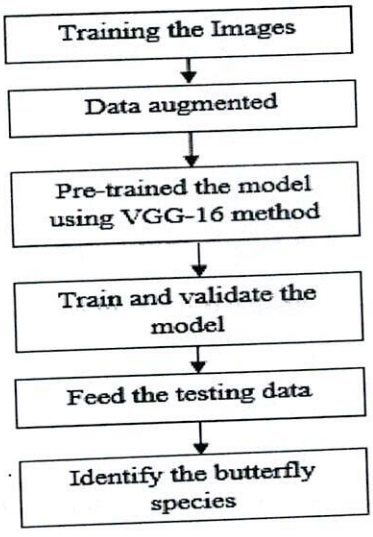

Fig-1: Block diagram

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Foot Step Power Generation

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***Abstract*: Now-a-days power has become a major and basic need for human life. As the population is drastically increasing day-by-day an also conventional resources are decreasing, there comes the necessity of depending on the non-conventional sources for generation of power. Hence the main focus is given n renewable resources like wind energy, solar energy and tidal energy. So our project is based on generation of power by human footsteps. Basically, while walking or dancing, humans possess some kinetic energy which is being wasted. So by utilizing this kinetic energy we can produce power by using the arrangement of "Tiles".**

As per our idea of this power generation project, when a person walks particularly on the tiles fixed releasing kinetic energy. Hence the piston fixed to the tile will compress the air allowing the air to flow to the tank. This tank will store the pressurized air. As the tank outlet is connected to the motor, this pressurized air will be passed to through the outlet, which enables the air motor to run. This motor is coupled to the generator which produces electricity. The electricity produced in this project will be stored using battery.

The energy saved in this project during daytime can be used for traffic signals, street lights, apartment, public mobile charging spots, electric vehicles charging spots and many more. The energy produced can also fulfil the future demands. The working principle of our project is based on Compressed Air Energy Storage (CAES).

***Keywords*: Foot, Generator, Power, Pressure tank, Tiles.**

1. Introduction

A. Overview

As there is increase in power demand for power, the necessity for non-conventional resource is being desired. There are many alternate ways of producing electricity. One of it could be footstep power generation which is effective method of producing electricity.

The most basic activity human being possess in daily life is walking. When a person walks, he will lose energy in various forms unknowingly. This happens due to the transfer of his weight on earth when he walks every single step. Hence this wastage of energy can be utilized and converted into electrical energy [1]. Our project describes how the electricity can be generated when people walk on floor.

The working principle of our project is based on CAES i.e. Compressed Air Energy Storage; which means to drive the compressor to compress air at high pressure and then to store the energy produced using this process.

B. Problem Statement

One of the daily requirements of human beings is electricity. Even for today, some of the countries are still a developing country. Several places in these developing countries suffer through the crisis of power-cuts of several hours which is not acceptable when we are living in such advanced technology generation. Another reason would the increase in population, because of which the power demand increases. Hence desire for using the renewable resource increases. As another alternate solution, we can utilize footsteps energy to produce power which will be stored and can be used when there is any cut-off of electricity.

C. Project Objective

The main objective of this project is to generate electricity by utilizing the energy of human footsteps from footpaths, staircase, platforms, etc. at cheapest cost and to fulfil the future demands, and also providing electricity in the area of requirement, when power is cut-off, to promote the saving of conventional resources and increase the usage of non-conventional energy resources. It is also simple in construction and installation with low maintenance cost. It is eco-friendly with no pollution occurrence.

D. Scope of Project

Using the principle of Compressed Air Energy Storage, we can use this system in the crowded area, where there is lot of human activities going on. We can use this system in staircases, in dance floor, railways and etc. So by installing these systems in crowded areas we can generate continuous power without interrupting people. As there is no mode of pollution, eco-friendly this system is adaptable. It is economical and also easy to install with less maintenance.

2. Literature Survey

T. R. Deshmukh has explained about footstep power generation system using 3D modelling software along with the

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Currency Recognition for Blind

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Abstract: ***In this paper, we proposed a system for automated currency recognition using image processing techniques. The method proposed in this system can be used for recognizing both the country origin and denomination or value of a given currency note. Only paper currencies have been taken here. The proposed method will first work by identifying the country of origin using certain predefined areas of interest and then extracting features using characteristics such as size, color, or text on the note to find the denomination of the notes. Feature extraction depends on how much the notes within the same country differ. The output will be given in graphical user interface format and also in audio format. Our system is able to identify the test notes quickly and accurately.***

Keywords: Image Processing, Feature extraction, Signal processing, Binarization, Denomination, Binary image, Origin, Currency recognition.

I. INTRODUCTION

There are around two hundred plus currencies presently circulating around the world. Each of these currencies unique features such as size, color and texture. Comparing to the olden times, the trade and commerce between other countries have increased in all sorts of levels. It has been extremely important for acquiring knowledge about all the currencies by the banks. However for any human to recognize each note correctly is not possible. Thus there is the need for an efficient automated system that helps in recognizing notes is important for the future.

We proposed an automated system for currency recognition using Image processing techniques. Our system works for 10 of the most commonly used currencies.

The method used in currency recognition system is shown in hierarchy in Fig. 1. Firstly the nature of each image is refined to convert it into a usable input to extract various pictorial information in pre-processing phase. Secondly system then extracts the region of interest based on features such as size, color and text. Using these regions of interest, the system first determines the country of origin of the currency note and then

the denomination of the currency note will be identified using the differentiating characteristics of each note within the same currency. The chosen characteristics would be size, color or text based on the country of origin of the currency note.

This paper consists of many sections as follows. Section 2 is about the previous works done in the field of currency recognition. Section 3 will explain about the method proposed with the various techniques used in detail. Section 4 presents conclusions of the paper. Section 5 contains the results. Finally, Section 6 consist the reference.

II. BACKGROUND

First the image input is scanned. Then the image is read using MATLAB. Image processing is performed by gray scale conversion and then by binary scale conversion. If any noise is introduced it is removed. Then feature extraction is performed. After performing these steps for both real currency and fake currency pattern matching is done considering unique characteristic like black strip [1].The system can work for assisting visually impaired people to correctly determine denomination of the currency notes. It can help to distinguish original note from counterfeit note. If any damage occurs in middle of the process then the image need to be scanned again.

Radial bias function is used for classification. Saudi Arabian paper currency case method is used as a model. Here the bank notes are collected and scanned .The image is processed and noise or any disturbance if present is removed. Feature extraction is done based on weighted Euclidean distance [2]. Lastly the recognized results will be given. System takes almost 3 seconds per image in average for classification. System will not recognize other currencies other than Saudi currencies. The system is not concerned with verification of the validity of paper currencies. Image analysis and image processing are the main techniques in this system. Image processing is pre processing followed by signal processing. The output of the system can be either a set of characteristics or an image or the parameters related to the image.

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Shadow Detection and Removal

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***Abstract*: A Shadow is caused when an illumination of a light source is obstructed, partially or completely by an object. In reality shadows in images lead to clarity issues, and displaced image quality and it can also alter the shape of an image, and it may be projected or seems to be on another figure. The shadow leads to unwanted information about the real images and may lead to confusion. Hence the objective is to create a Systematical detection of shadow automatically and remove the shadow regions and also from real images.**

***Keywords*: Shadow, Real image, Clarity.**

1. Introduction

Shadows are created when an illumination of any light source is obstructed. The obstruction caused is visually seen as Shadow. Shadows can be seen as good or bad, it depends on either we ignore it or we want it to be visible. To Experience a better quality and clarity of images it's suggested to remove them from images. The shadow removal in images not only improves clarity and visual looks, but also enhances the image and shadow can be detected on shapes of object, whether it falls on ground. Detected shadows give us the information about the illumination. If shadows are ignored they might create confusions between real image edges and shadow edges, and it may lead to wrong visual assumptions. For these reasons shadow detection and removal process is considered to be an important task. Decomposition of a shadow image and shadow free image is an difficult task, because of difficulties in solving them by implementing geometrical scales and due to different illumination. There are many techniques which have come up for detection and removal of shadow but still it remains a challenging task.

2. Background

Here we explain about the methods used for shadow detection and removal.

A. Shadow Detection and Removal

In Shadow detection and Removal, the goal is to remove shadow by detecting it from image. For Every image we choose im2bw function to convert the pixel values into points after the detection. Gray scale image is converted into black and white shadow image by using gray thresh function. After the detection of shadow in the shadow detection frame, after all the conversions pixels into points the comparison will be done on intensity of the shadow-free image. The better methods are found in order to match the pixel values for shadow-free image and shadow image, in order to find perfect shadow removal process. Some of -the Methods used for shadow detection and removal are Clustering algorithm [1], Model based on Convolution Neural Network [2], Mathematical model YCbCr colour space [3], other are Mathematical model using Top-down and Bottom-Up approach [4], Based on two aspects (a)image-line analysis. (b) Illumination direction of light source [5]. There are many methods carried out in previous works.

3. Shadow Detection

Shadow detection plays a very important role when it comes to visual effects of any image. For detection we initially convert the RGB image to LAB equal image. LAB has channels where L is for Lightness and A B are two different color channels. They differ in their values, L ranges up to 0-100, for shades of black and white combination. Thus even A and B also have the ranges, for different colors.

The shadow regions will be dark and less of illumination. It very easy to find them in L channel. The A and B channels will provide information of other colors present in image and in outdoor images. By Combination of L and B values of channels, the pixel values will be less than threshold will be found and stated as shadow pixels.

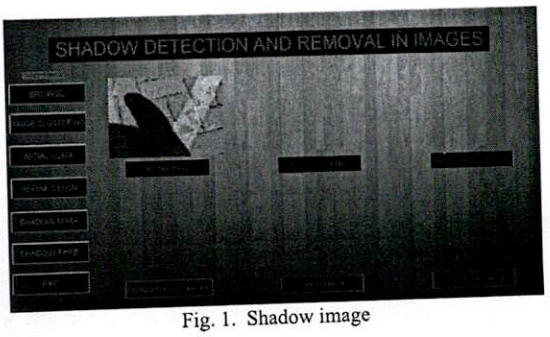

Fig. 1. Shadow image

The intensity of light differs from Shadow part to non-shadow parts comparatively.

The intensity gradually increases in shadow present region. For removing the shadow completely, we need to also consider

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Shadow Detection and Removal in Images

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***Abstract*: A Shadow detection and removal in images plays a very important role when it comes to visual effects, clarity of images captured. The main reason for shadow being present is, when an illumination of light source is disturbed by objects fully or partially. It becomes very important to detect the shadow present in image before removal of it from image. There are many previous works and methods carried out to detect the shadow part and remove it completely, here it is explained how better can be the implementations and methods can be used and make the perfect picture look good and increase the clarity by removing the shadows from it.**

***Keywords*: Shadow, Images clarity, Detection, Visual effects.**

1. Introduction

To Experience a better quality and clarity of images it is good to remove shadow from images. The shadow removal in images improves clarity and visual looks, and also enhances the image and shadow can be detected on any shapes of object. Detected shadows give the information about the cause for it and how intense the shadow is. Shadows cannot be ignored because they might create confusions between real image edges and shadow edges, and it may lead to wrong visual assumptions. For these reasons shadow detection and removal process is considered important. The challenging task here is to decompose the shadow; it is not an easy task when it comes to detecting a shadow in image. Sometimes there will be confusion between the real image edge and shadow image edge hence, there are many techniques which have come up for detection and removal of shadow but still it remains a challenging task. Most popular approaches are, lightness algorithm which was studied and worked by Finlayson and colleagues by different methods based on color conditions and lightness. Using illuminant invariant approach [3]-[5]. These works are done on removing the shadow effect from image.

2. Background

Here we explain about the methods and algorithms used for shadow detection and removal.

A. Shadow detection and removal in image

We show how the algorithm automatically can work to detect shadow and remove them from the single images by using simple photograph. The application is very useful to remove shadow caused by objects to ground; it is developed using Matlab and C++ programming skills. The recent algorithms are learnt to detect shadows in single images from training the database and their corresponding labeled images. The work [6] is based on graph-cut to solve the labeling of shadow and non-shadowed images. The removal of shadow is done using matting approach and the shadow free image is coped by relighting each pixel in shadow.

3. Shadow Detection

For detection we initially represent the image in YCbCr color space. The color space has different channels, by focusing on Y channel and we compute the Histogram, it gives more contrast image at Y channel. Then the average of image at Y channel is fully computed. By performing sliding window iterations through image, the sliding widow size is reduced iteratively. The shadow regions will be dark and less of illumination. To decide the pixels of shadow, the intensity is compared to some range to full average and computes the non-shadow point's average for the sliding window. By comparing the intensity values to full average we can consider the shadow pixel values. In Fig.1 detection and removal of Shadow, the intensity of light differs from Shadow part of image to non-shadow parts comparatively.

The intensity gradually increases in shadow present region. For removing the shadow completely, we need to also consider the saturation of shadow image. By using segmentation algorithm and it can be used to each of the segments of shadow and it can be removed.

4. Shadow Removal

The removal of shadow is done using a simple shadow removal model when two types of light sources are present that is direct and ambient light. The direct lights comes directly from source and other one is obstructed source of light, the shadow is completely removed by the model by comparing values to average calculated and shadow edges are corrected by using lightness and some filters if its necessary.

5. Results and Discussion

Fig. 1 shows the results of our implemented method on images.

The implementation shows how the color space YCbCr worked on the shadow image and the shadow image. The

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Smart Luggage Carrier

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ABSTRACT: This paper, outlines the development and innovation of a 3-in-1 luggage carrier. It highlights the GPS (Global Positioning System) tracker, Auto-drive and manual drive. This paper was designed and made for the goods carriers to be reliable while transporting or during any occasion where we carry our luggage. While providing convenience to the goods carriers, the prototype also features a security of the luggage through proximity details. The GPS device is used to track the luggage carrier. The application helps in communication between the user and the carrier and controls the carrier manually.

1. INTRODUCTION

Bags have always been an integral part of travel life whether it is a travel bag or a plastic bag or even a luggage bag. Every bag has its own importance and carries different functions and utility. Dragging the luggage all over the place has been done since the golden ages. Thinking of a luggage which tracks its location, which follows the user automatically or manually, by the touch of the present technology to the old baggage it may bring out its true potential. This has motivated us to do the research all along so that it is user-friendly, eco-friendly and could be operated by a Smartphone. This paper, outlines the development and innovation of a 3-in-1 luggage carrier. It highlights the GPS (Global Positioning System) tracker, Auto-drive and manual drive. As per our research, we have developed and designed a goods carriers to be reliable while transporting or during any occasion where we use luggage carriers and also helps them go green. The GPS device is used to track the luggage carrier. It also can follow the owner and ease of interaction. Auto-drive and manual-drive option is given so that the user can choose any one option depending or the situation. For example, in case of the situations where there might be heavy traffic and hence there are lot of obstacles, the user can manually drive the carrier.

2. PROPOSED SYSTEM

There are a lot of applications to the luggage but all of them are not controlled from the luggage instead the commands are sent from the mobile phone to the luggage via Machine to machine communication. The mobile phone has a pre-installed application software with a pre-installed set of instructions. They wait for the user to send the commands. After the microcontroller embedded inside the luggage receives instruction from the user it acts accordingly. This can either be for tracking its location and send it to the user or send the luggage weight also the charge of the batteries.

3. LITERATURE SURVEY

3.1 Smart Bag using Solar and RFID Technology

In this paper they have used method used here is solar cell and Radio Frequency Identification (RFID). The solar cell is attached to the front part of the bag, it charges the rechargeable battery. Using which the phones can be charged. It has a Liquid Crystalized Display (LCD) display, which displays the timetable for the users. It has an alert system, which tells the user if any additional books are kept in the bag. Tracking using Radio Frequency Identification (RFID) is very tedious job hence not preferred. It is mainly useful for day scholars of schools and colleges. As the bag is connected to a Bluetooth module it is not widely used. The advantages are useful for tracking the people who are kidnapped, it also has an alert system. The disadvantage is solar cells won't be useful all the time.

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Malaria Detection Using Image Processing

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ABSTRACT

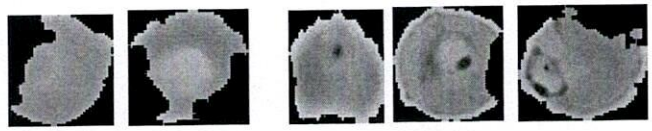
Malaria is one of a serious infectious disease in the world caused by a peripheral blood parasite of the genus Plasmodium. Traditional microscopy method, for malaria diagnosis is old method and has been occasionally proved inefficient since it is time consuming and results are difficult to reproduce. As it constitutes a serious global health problem, the evaluation process is of high importance. In this work, an accurate, easy, rapid and affordable model of malaria diagnosis using stained thin blood smear images was developed. The method makes use of the intensity features of Plasmodium parasites and also erythrocyte or red blood cell images. Images of infected and non-infected red blood cells were taken, pre-processed, and then relevant features were extracted from them and eventually diagnosis was made based on the features extracted from the images. A set of features based on intensity have been proposed, and the performance of these features on the red blood cell samples from the database have been evaluated using an artificial neural network (ANN) classifier. The results have shown that these features could be extremely successful if used for malaria parasite detection.

Keywords : Malaria, erythrocyte, blood smears, Parasite, Digital Image Processing, grayscale image.

I. INTRODUCTION

Malaria is life threatening disease caused by plasmodium parasites and the severity of Malaria varies based on the species of plasmodium. According to the World Health Organization(WHO) statistics, in 2000, it was estimated that there were 262 million cases of malaria globally, leading to 839.000 deaths across the world. By the year 2015, it was estimated that the number of malaria cases had decreased to 214 million, and the number of deaths decreased to 438.000.

This is due to the fact that, the environmental conditions are suitable for mosquitoes, in addition to the poor socio-economic conditions which make access to health care and disease prevention resources difficult. There are various techniques to diagnose malaria, of which manual microscopy is considered to be the standard.



a b c d e

The manual approach of diagnosis is time consuming and may also lead to inconsistency. And, it also demands trained, experienced technicians or pathologists. This approach if digitized once, it will reduce the time taken for screening the disease. This study helps to investigate the use and application of digital image processing for detecting malaria parasites using microscopic color images. Therefore,

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Arecanut Crop Disease Prediction using IoT and Machine Learning

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Abstract: *A prevailing recession in the agricultural goods sector is evident from the present scarcity and lack of food supplies. A major reason for this scarcity is the inherent growth of diseases in essential crops. A major development is thus required in this field for avoiding these problems in the future. This development is intended to simplify the management tasks of different roles in agricultural industries. A proper intimation of the importance of disease prediction and environmental factors must be done to the less aware farmers. To address these challenges, we have proposed a disease prediction system that takes into consideration temperature (°C), humidity(%), rainfall(cm), wind flow(m/s) and soil moisture (%) around the region of crop and developed a model to predict the occurrence of disease. This system will provide information prior to the occurrence of disease by analyzing different relationships among environmental factors.*

Keywords: *Arecanut, Disease Prediction, Crop Diseases, Difference Algorithm, IoT, Koleroga.*

1. Introduction

Agriculture is the most important aspect in India. But many problems arise in agriculture which includes the diseases that occur in plants which decrease the production of crops. This work is based around the Areca crops. It is cultivated largely around the southern part of India and is commercially available in dried, cured and fresh forms. It is also known as betel nut, as it is commonly used for mastication with betel leaves. It is economically important and is consumed by hundreds of millions of people worldwide. India is one of the largest producers of arecanut in the world and it is mainly concentrated in the states of Karnataka, Kerala and few eastern states.

As the spread increases, the effects of different environmental conditions vary widely and results in few diseases being attacked. The diseases like 'Koleroga', Yellow Leaf Disease, Foot Rot are few of them. One among these is the Mahali/Koleroga/Fruit Rot. The characteristic symptom of Fruit Rot is the rotting and excessive shedding of immature nuts, loss of natural lustre and usually lighter weight and presence of vacuoles in the nuts. The disease is a reason for huge losses of productivity and it is important to determine the spread of these to avoid the possibilities of infections [3].

A proposal is established where the innate relationship between crop disease and surrounding environmental conditions are identified and monitored continuously to predict the possibilities of a disease infection. The collected data can be used to mine further information and provide suitable counter measures to accomplish the aforementioned tasks.

II. Material and Methods

Prediction of these diseases is challenging and is considered to be expensive. Machine learning is used for performing several tasks in computers without the need of human help. We can use algorithms like Regression, Random Forest algorithm (RF), Gradient Descent (GD), or Support Vector Machines (SVM) for predicting and

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Fingerprint Based Smart Bike

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ABSTRACT

At the point when an accident or theft happens, data related with those accidents is not recorded, and if the bike is in isolated area emergency numbers cannot be reached to help to be user. Apart from that key is the only way to get the access into the bike. This project aims at the development of self-starting motorcycle based on finger print. By using this project owner can easily start his motorcycle using fingerprint. Here owner don't have to carry key every time, also owner able to know the location of the vehicle. Another alert is that if the vehicle is met with an accident 5 friends of the owner will get alert message with location. It also provide a theft alert if someone try to stool the vehicle. Here this project proposing another technique for the authentication that is, fingerprint based authentication for the bike and accident detection system with live GPS tracking.

Keywords : IOT, Fingerprint, GPS Tracking, Accident detection

I. INTRODUCTION

Fingerprint based smart bike is having functionality of reading users/owners fingerprint details (biometric details) and cross verified with recorded database data for the successful authentication. It also provides ignition start by the help of fingerprint sensors. This bike also provides real-time GPS tracking system along with accident detection with anti-theft alarm. For non-interrupted live GPS tracking in isolated area, the system updates the location details in every minutes. A large number of vehicles currently on the roads have that record information in the event of crash. That's why it is important to have an accident detection system, which provides the exact vehicle location where the accident took place. It also records the number of accidents occurred in the database for the better investigation purposes. This system also provides anti-theft alarm from unauthorized access from theft or anyone who is not registered their biometric details.

At the point the bike can be only accessed using keys. This can be hijacked using cloned keys. In case of accident the emergency contacts cannot came to know about the accident occurred and safety is missing here. Apart from accident the theft is more often nowadays in case of theft existing system cannot provide any further securities. So in this we introducing anti-theft alarm and notification system. That is in case of theft the owner can get to know the exact live location updates and he can turn of the entire bike system remotely by using application or by sending commands as message.

We are proposing another technique for the authentication that is, fingerprint base authentication for the bike and accident detection system with live GPS tracking. In case of theft we proposing a new

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Segmentation of Bones Using MRI

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Abstract:- Segmenting bone tissue automatically in Magnetic Resonance Imaging(MRI) scans is difficult for low signal-to-noise ratios, lack of consistency in lighting conditions is very high, and variability within bone cells in the scanned images. Current methods available are either it is partially automatic system or depends on databases of prior manually segmentation result. Fast and accurate segmentation of knee structures from MRI is essential for clinical feasibility of these techniques. However, manually segmenting bone tissue is time consuming. The main objective is to first design a system for automatic segmentation of bone structures for MRI data with a bilateral filtering and clustering based methods.

Keywords:- *Segmentation, Bilateral filtering, K-means, Fuzzy C-means, MRI.*

I. INTRODUCTION

Magnetic Resonance Imaging (MRI) helps a doctor diagnose an injury or disease, and it can monitor how well you're doing with a treatment. MRIs can be done on different parts of your body. MRI scan is useful for looking at soft tissues and the nervous system and also to examine bones, joints, and soft tissues, structural abnormalities such as tumors, inflammatory disease. Musculoskeletal models created by MRI scanning can be used to in the field of education to teach students, clinics and hospitals. To obtaining musculoskeletal models, manually segmenting bones and muscles is required and also manually segmenting bone structure is too much time consuming process; segmenting single bone structure takes an hour. Automatic segmentation could allow clinical experts and doctors to quickly identify segmented region of bones. Completely automatic segmentation is difficult for following reasons. First, identifying different tissues in bone is difficult even for human labelers and medical experts due to difference in signal intensity between the background and the area of interest. Second, making global image processing difficult because lack of consistency in lightning conditions is very high during MRI scanning causes background in other regions to be lighter than the white cancellous bone tissue in some region. Third, different bone tissues and blood vessels tend to vary largely in appearance with each other than with the surrounding blood vessels and muscle tissue. Methods in segmentation procedure must yield good result to inconsistencies.

II. PROBLEM STATEMENT

MRI is a specific radiology method for generating functional and structural image of the body, and particularly useful for neurological, muscular, oncological and skeletal imaging. Structural images of the body can be obtained in any position, specifically, rapidly, and without uncovering to ionizing radiation. MRI uses a strong magnetic field and radio waves to create detailed images of the organs and tissues within the body. Radio waves is used to produce an effect detectable by the scanner and to alter the alignment of the magnetization. We can observe optimization problem in MR imaging techniques due to in more pulse sequences. Based on the structure of bone, the optimal pulse sequence must be chosen in order to optimally differentiate the cells or organs of interest and to carry out the segmentation procedure [2].

III. METHODOLOGY

Segmentation is always delayed due to noise present in the image and difficulty in understanding structure of bones because of streaks. Therefore, the bilateral filter which returns structural edge information by reducing noise present in the image. Bilateral filtering algorithm is a nonlinear, edge preserving algorithm.

A. Bilateral Filtering

Bilateral filtering algorithm works based on the idea of a combination of domain and range filtering. A bilateral filter is a noise reducing and smooths images while preserving edges, by means of a nonlinear combination of nearby pixel values in the image. From Gaussian distribution weights are calculated. Crucially, the weights on the radiometric differences, not only on Euclidean distance of pixels. Bilateral filter in image has a significant noise reduction and also edges are well preserved [6]. The bilateral filter is a specially varying filter that better preserves edges than the Gaussian filter [1].

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Image Out painting with GANS

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ABSTRACT

The difficult task of image out painting (extrapolation) has received relatively very little attention in respect to its cousin, image-inpainting (completion). Consequently, we tend to present a deep learning approach supported [4] for adversarial perceive a network to comprehend past image boundaries. We use a three-phase training schedule to stably train a DCGAN design on a set of the Places365 dataset. In line with [4], we additionally use native discriminators to reinforce the standard of our output. Once trained, our model is ready to out paint 256×256 color images relatively realistically, thus allowing algorithmic out painting. Our results show that deep learning approaches to image out painting are each possible and promising.

Keywords: Tensorflow, Deep Learning, CNN, GANS, Neural Networks.

I. INTRODUCTION

The advent of adversarial training has led to a surge of latest generative applications inside computer vision. Given this, we aim to use GANs to the task of image out painting (also referred to as image extrapolation). In this task, we are given an $m \times n$ supply image I_s, and that we should generate an $m \times n + 2k$ image I_o such that:

- I_s seems in the centre of I_o
- I_o appears real and natural

Image out painting has been comparatively uncharted in literature, however an identical task referred to as image inpainting has been widely studied. In distinction to image out painting, image inpainting aims to revive deleted parts with in the interiors of pictures. Although image inpainting and out painting seems to be closely connected, it's not in real time obvious whether techniques for the previous are often directly applied to the latter.

Image out painting is a difficult task, because it needs extrapolation to unknown areas within the image with less neighbouring data. Additionally, the output images should seem realistic to the human eye. One common methodology for achieving this in image inpainting involves applying GANs [4], that we aim to repurpose for image out painting. As GANs will be tough to train, we might have to alter the typical training procedure to extend stability.

Regardless of the challenges concerned in its implementation, image out painting has several novel and exciting applications. For instance, we are able to use image out painting for panorama creation, vertically filmed video enlargement, and texture creation.

In this project, we concentrate on achieving image out painting with $m = 128$, $n = 64$, and $k = 32$.

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Identification of Gender Using Facial Images

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***Abstract*: The objective of this project is to identify the gender of a person by looking at his/her photograph. This is a case of supervised learning where the algorithm is first trained on a set of female and male faces, and then used to classify new data. We have not taken genders other than male and female into account. We divided the input dataset into training and testing dataset and experiments are performed by varying different parameters relevant to the respective classifier. The outcomes of each of the experiments are analyzed and presented in an apt way.**

***Keywords*: Age prediction, Camera, Gender classification.**

1. Introduction

The objective of this project is to identify the gender of a person by providing the facial image as input to the computer. This is a case of supervised learning where the algorithm is first trained on a set of female and male faces, and then used to classify new data.

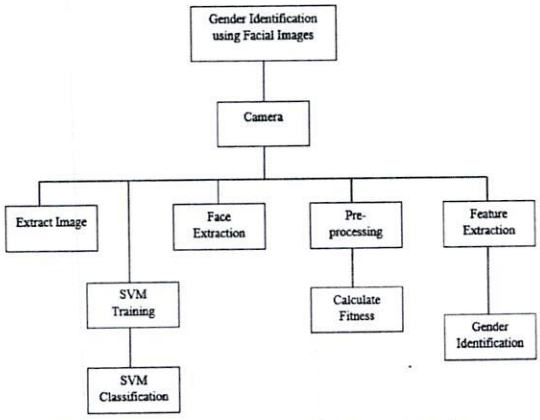

Fig. 1. High level design of gender identification

Gender classification using facial images has been of interest for quite some time. Humans are very good at determining gender from facial images. Even if the face is cropped to remove all gender cues, we can identify gender with very high accuracy. More recently automated gender classification from facial images has gained much interest in the computer vision and machine learning community. This is because of it's extreme importance in human computer interaction, demographic research, and security and surveillance applications. It can also augment other important areas like face recognition, age and ethnicity determination. Several approaches have been taken to classify facial images based on gender. This report addresses few of these approaches using dimensionality reduction techniques. One of the challenges of automatic gender classification is to account for the effects of pose, illumination and background clutter. Practical systems have to be robust enough to take these issues into consideration. Most of the work in gender classification assumes that the frontal views of faces, which are pre-aligned and free of distracting background clutters, are available.

2. Method

A general pipeline of any image recognition system involves two main parts, Selection of feature type and Selection of classifier type. Both of these are dataset and problem statement specific. In our case, we use the image itself as the feature vector. To remove redundancy in these features, we use Principal Component Analysis(PCA) to reduce their dimension. With respect to classifier type, we experiment with SVM, KNN, Logistic Regression, NaiveBayes.

A. Age and Gender Prediction

1. Begin
2. The face detection is done using the function getFacebox
3. Predict gender
4. Load the gender network into memory
5. Pass the detected face through the network
6. The above procedure gives the probabilities or confidence of the two classes
7. Take the max of the two outputs and use it as the final gender prediction
8. Predict age
9. Load the age network
10. Use the forward pass to get the output

We take the max out of all the output to get the predicted age group

11. End

3. Dataset

This database contains 13,230 face images of 5,749 different persons. Among them 4,263 are male and 1,486 female. Images

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Language To Language Translation System

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ABSTRACT

The system used in Language to Language Translation is the phrases spoken in one language are immediately spoken in other language by the device. Language to Language Translation is a three steps software process which includes Automatic Speech Recognition, Machine Translation and Voice Synthesis. Language to Language system includes the major speech translation projects using different approaches for Speech Recognition, Translation and Text to Speech synthesis highlighting the major pros and cons for the approach being used. Language translation is a process that takes the conversational phrase in one language as an input and translated speech phrases in another language as the output. The three components of language-to-language translation are connected in a sequential order. Automatic Speech Recognition (ASR) is responsible for converting the spoken phrases of source language to the text in the same language followed by machine translation which translates the source language to next target language text and finally the speech synthesizer is responsible for text to speech conversion of target language.

Keywords :- Automatic Speech Recognition, Voice Synthesis, Machine Translation.

I. INTRODUCTION

Language to Language Translation System represents a technology which automatically translates one language to another language in order to enable communication between two parties with different native tongues. To translate a voice in one language to another voice in a different language, Language to Language Translation Technology is used. Speech Recognition Technology, which recognizes the utterance of a person's and converts it into a text; Speech Synthesis Technology, which translates the text during a certain language into a text in another language; and Speech Synthesis Technology, which converts the translated text into a speech. Additionally, the technology to understand the natural language and the user interface-related technology integrated with the UI (User Interface) also play an important role in the Language to Language Translation System. Currently, Language Translation Technology is available as product that instantly translates free form multi-lingual conversations. Language Translation systems instantly translate continuous speech. Challenges in accomplishing the interpretation include overcoming speaker-dependent variations a la mode of speaking or pronunciation are issues that need to be addressed so as to supply top quality translation for all users. Moreover, speech recognition systems must be ready to remedy external factors like acoustic noise or speech by other speakers in real-world use of Language translation systems. The existing system has the problem of cross-lingual conversion of intent, with respect to intonation in speech. The existing system also created a parallel speech database for the English-Portuguese language pair that is publicly

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A Linear Model based on Principal Component Analysis for Disease Prediction

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Abstract - *Analysis of a disease is tough task in the medical field. Various classification methods are used to predict the diseases. Diagnosis of diabetes can be analyzed by checking the level of blood sugar of patient with the normal known levels, blood pressure, BMI, skin thickness, and so on. The main aim of this paper is to build a statistical model to predict the diabetes. The feature extracted using Principal Component Analysis and then modeled using Linear Regression Model. The accuracy obtained by this method is 82.1 % for predicting diabetes.*

Key Words: **Principal Component Analysis, Linear Regression Model, Diabetes, Pima Indian Diabetes Data.**

1.INTRODUCTION

Analysis of diseases is a difficult task in medical field. **Diabetes** is a metabolic disease that causes high blood sugar.The paper presesnts the stastistical model to predict the diabetes. Principal Component Analysis(PCA) is used to extract feature and then modeled using Linear Regression Model.The dataset used is Pima Indian diabetes dataset(PIDD).

Feature extraction is main step in examining the PIDD dataset. PCA is reduction method which considers the PIDD as set of rows representing characteristics in a high dimensional space and all rows are put up to a directions which represents the best set of features.The original features of PIDD are approximated with fewer dimensions which are an overall of original PIDD using PCA.The model is build using linear regression model.

2.RELATED WORKS

H. Roopa, T. Asha[1] proposed a A Linear Model Based on Principal Component Analysis for Disease Prediction. It uses PCA and LRM.Polat et al. [2] proposed a Least Square Support Vector Machine (LS-SVM) classification method to obtain an accuracy of 79.16%. Generalized Discriminant Analysis (GDA) was used at preprocessing stage for discriminating variables of PIDD and then LS-SVM technique was applied.

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COMPARISON OF SUPPORT VECTOR MACHINE AND LONG SHORT-TERM MEMORY FOR STOCK MARKET ANALYSIS

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Abstract: *The stock price prediction methods used by the individual stock traders vary depending on the accuracy of the method and on the trader. In this paper we can see the comparison between the two prominent methods of predictions. The Support Vector Machine method and the Long Short Term Memory method. The methods are chosen from machine learning and deep learning respectively.*

KEYWORDS: Stock Market, Data Prediction, Long Short Term Memory, Machine Learning, Deep Learning

1. INTRODUCTION

Financial markets are one of the most interesting inventions of our time. They have had a huge effect on many fields like industry, education, employment, technology and therefore on the economy. A stock market is a public market for the sale of company stock and its derivatives at an agreed price. Shares represent an ownership claim on the product, and consequently a claim on potential sales. The stock market is also called the secondary market because it includes trading between two investor. Stock market brings investors together to buy and sell their stake. Stock market gets stakeholders together to buy and sell their share. Shareholders in the stock market want to maximize their returns by buying or selling their investments at a suitable time. Many new technologies and procedures have been suggested over the years to try and forecast stock prices via many avenues, thanks to the demanding and ever-changing landscape of stock markets. Machine learning and artificial neural network techniques have been used more to get the accurate of predictions. Companies list shares of their stock on an exchange in a mechanism called an initial public offering, or IPO. Investors buy those shares, which helps the company to raise capital to expand its business. Investors may then buy and sell these stocks among themselves, and the exchange monitors the supply and demand of each listed stock. That supply and demand help decide the price for each security, or the levels at which stock market players that is the investors and traders are willing to buy or sell. Computer algorithms usually do most of the calculations. Buyers give a "bid," or the highest price they're willing to pay, which is typically smaller than the price sellers "ask". The most important drawback is that you will lose your entire investment if the stock price falls to zero. If the company goes bankrupt, stock owners are compensated after bondholders. Of this reason, stock investing may be an emotional rollercoaster. If investors believe the economy is slowing or declining, they may then invest in bonds, which are a safer investment, but they do come with their own risks. Bonds offer a fixed return over the life of the bond, and usually perform well during the contraction period of the business cycle. When stock market prices decline less than 10 percent, that's known as a stock market correction. When prices fall that much or more in one day, it's known as a stock market crash or the financial crisis. A bad crash might even cause a recession. Therefore, in the recent times market analysis is done using advanced computer algorithms.

2. RELATED WORK

The paper discusses a solution to the difficult of the researchers and analysts even investors who are into the research area of stock price prediction. Recurrent neural networks (RNN) [1] is one of the most powerful models for processing sequential data. Long Short-Term memory is that successful RNNs architectures. The paper mainly deals with the prediction of stock returns of NIFTY 50 using LSTM. We collection of 5years of historical data of NIFTY 50 and used it for the training and validation purposes for the model. Root Mean Square Error (RMSE) is being used for analyzing the efficiency of the system. The usage of RMSE is an excellent general purpose error metric for numerical predictions. Recurrent Neural Network and Long Short-Term Memory unit is one of the most precise forecasting technology which helps investors, analysts or any person interested in investing in the stock market by providing them a good knowledge of the future situation of the stock market.

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Blackbox System for Vehicles

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Abstract: ***The main purpose of the paper is to develop a prototype of Black Box system that can be installed into any vehicle. This paper describes real-time data collection while driving a vehicle and to check the driving behavior and a car status. This data helps the accident investigators to find out the cause of the accident. The accident is indicated by the use of sensors and the GPS. The car black box is a tool used to record speed, tilting condition, and information about accurate location of the vehicle.***
Keywords: Black Box, Microcontroller, Global Positioning System (GPS), Liquid Crystal Display (LCD).

I. INTRODUCTION

In order to avoid these collisions the Black Box system may be the primary step towards the solution. By using the identical concept of black-box utilized in flights we will implement it into vehicles to analyze vehicle crash.
This system could be the solution for investigation and insurance claims and also to enhance the vehicle designs and safety features for future. When an accident or crime happens, data related with those accidents is expected to find the reason for the accident or the wrongdoer of the crime.
The accident is indicated by the use of sensors and also the location and intensity of the accident may be sent via SMS(Short Message Service) via GSM(Global System for Mobile). The car recording equipment could be a tool used to record engine temperature, interruption, speed, vehicle driving, and data about accurate location of the vehicle. The outputs of those parameters are displayed in LCD(Liquid Crystal Display).
The data recorder stores the values of all sensors communicated with the controller. Then this information is transmitted via a wireless network. This collected information are going to be sent to the police server, ambulance via the GSM(Global System for Mobile) network. We are proposing another technique utilizing black box to discover how an accident happened. So as to avoid this collisions the Black Box system are often the first step towards the answer.

II. SYSTEM REQUIREMENT

The main purpose of System Requirement Specification is to translate the ideas in the minds of a client into a formal document. Through System Requirement Specification the client clearly describes what it expects from the proposed system and the developer clearly understands what capabilities are required to build the system. The purpose of this document is to serve as a guide to developers and testers who are responsible for the development of the system.

A. Software Requirements

1) *Language:* C#.net
2) *Operating Source:* Windows 7,8,10
3) *Backend:* MYSQL 5.0

B. Hardware Requirements

1) Regulated power supply
2) Arduino UNO
3) Hall effect sensor
4) GPS receiver
5) ADXL335 accelerometer
6) Switch array
7) Voice module APR9600
8) Speaker

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A Geo-Location Authentication Application for Mobile Banking

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***Abstract*: Mobile banking is a service provided by a bank or other financial institution that allows its customers to conduct financial transactions remotely using a mobile device. Mobile banking will also allow the users to conduct banking activities such as receiving account alerts, checking balances or making payment through a smartphone or a tablet. One of the most challenging issues in mobile banking is to provide the security to data access control as it is available on cloud. Everyday new challenges come in security and many technologies are working to resolve the issues and challenges. Accessing mobile banking services through mobile browsers are dangerous because there might be a chance of attacks and misuse of data. The common attacks targeted on Mobile Browsers are Proxy Trojans, Man in the middle attack, Boy in the middle, clickjacking, etc. Hence an application called GeoPay is developed for secure mobile banking. GeoPay application is implemented using Android Studio. CNN technique is used for image processing. The project is implemented for both Real time and Non-Real time. In addition to the existing two factor authentication scheme using user ID, password and OTP, the face detector and geo location is used to authenticate the user. While performing mobile transaction, the multifactor authentication ensures the security. For obtaining the location of a user the GeoPay makes use of IP address of the mobile device. The proposed application provides high security for mobile banking.**

***Keywords*: Face recognition, Banking application, GPS location, Pattern matching.**

1. Introduction

One of the most common authentication mechanism is based on the use of password. People generally choose weak passwords and use the same ones for multiple services. As a result, accounts get hacked, people lose money, and privacy is breached etc. In order to counter those problems, security critical services, such as online banking, started to use multi-factor authentication solutions. For example, pattern matching, face recognition and OTP based authentication. The use of more than one factor has been observed to be more secure than depending only on a single factor. Most solutions depend on factors that fall under three categories, namely: (1) what you know e.g. password, personal identity number (PIN); (2) what you have e.g. smart cards, token, etc.; and (3) what you are e.g. biometrics, such as fingerprints, voice recognition, face recognition, palm scanning or retinal scans. Even though these factors are sufficient for most cases, there is still additional room for improvements and alternatives. One of these factors is user's location. There are several existing systems that utilize location information to provide authentication and authorization solutions. However, these solutions usually require a specially designed infrastructure and special devices that can be used to determine their locations.

2. Literature Survey

Nowadays wireless network and mobile technology are interconnected together to make the human life easier. This section of surveys shows various author approaches and their discussion.

Dipak Auti, Krishna Landage, Swapnil Chavan proposed a Location Based Security for Online Transaction. Global Positioning System is used for tracking a location of the user.

System will allow the user to perform the secure transaction from mobile with the help of Geo-encryption algorithm and anti-spoof GPS. In case of physical attack, system creates a virtual environment with extra key in password for the user to perform the transactions. In Global Positioning System, latitudes and longitude are the two techniques which are used to the get the correct position of the user to determine the new key for the encryption. This key is made by using the combination of the AES and GPS location with the TD. Latitude is the measurement of distance in degrees north and south of equator. Longitude is the measurement of the distance in degrees east or west of the prime meridian. System will determine which latitude line and which longitude line meet where user are standing. Tolerance distance is used to create a geographical area to the user. User will perform all transaction process inside the tolerance distance area for the security purpose. If user goes out of the tolerance distance area, then this process will be performed again and new TD and new key is generated for encryption and decryption.

S. Sana Dawood Khan, Yogeshwar S. Borse, proposed a Geographic Location Based Authentication System. The

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Expert System using Artificial Intelligence

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Abstract – **The idea of expert system as assistant in improving healthcare was a plan to transform industrial robots into precision machines for surgery and beyond. But no matter how impressive, robotics in healthcare is still a system controlled by humans. The real magic of the 21st-century expert system will come from artificial intelligence systems that can learn so much that it will outperform the best doctors by combining all the available knowledge in all medical repositories. However, most experts agree that AI will not replace trained medical staff, just make them more efficient in several areas. Expert System using Artificial Intelligence interacts with the patients with the help of the Natural Language Processing (NLP) and takes the required information or data regarding the disease. The Expert System then calculates the possible outputs or diseases and their root causes and says those predictions back to the patient.**

Keywords – **Natural Language Processing (NLP), Artificial Intelligence, Expert System, Machine Learning.**

II. INTRODUCTION

The real power of AI, lies in detecting patterns that describe various conditions by studying healthcare records and other data. The machine can scan thousands of cases and look for correlations between hundreds of variables, some of which are not even listed in current medical works. Tests so far have proven that robotic systems can rival the best doctors and even surpass them in some areas.

There is much work in a hospital, and not only doctors can use a helping hand. Nurses and hospital personnel can benefit from the help of robots as assistants. The existing system follows manual process to collect the data from patients.

In which the expert system predicts the disease and describes the causes for the disease. But these systems are just collecting information through keyboard and gives the predictions ion the screen. So, the existing system consumes more time to do a piece of work for this reason, the expert system using artificial intelligence is used. The proposed system also uses NLP(Natural Language Processing) for the face to face interaction with the user.

The objective of Expert System using Artificial Intelligence is to interact with the patients with the help of the Natural Language Processing(NLP) and takes the required information or data regarding the disease. The Expert System Then calculates the possible outputs or diseases and their root causes and says those predictions back to the patient.

1. Expert system language

Expert Systems language is a set of programs which allow the building of an expert system through the creation of knowledge and rules. Expert systems have three essential components

- **User interface:** presents questions to the user and accepts inputs from them.
- **Knowledge base:** contains data, facts, rules and objects in a specific knowledge domain. The knowledge base obtained from the human expert is prepared by a knowledge engineer as most human experts are not skilled in computer programming.
- **Inference engine:** this is software that matches the users input with data contained in the knowledge base to reach appropriate answers. This is done using inference rules e.g. IF conditions THEN statements ELSE statements rules.The proposed expert system as assistant in improving healthcare was a plan to transform industrial robots into precision machines for surgery and beyond.But no matter how impressive, robotics in healthcare is still a system controlled by humans. The real magic of the 21st-century expert system will come from artificial intelligence systems that can learn so much that it will outperform the best doctors by combining all the available knowledge in all medical repositories. However, most experts agree that AI will not replace trained medical staff, just make them more efficient in several areas.

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Disease Recognition in Rice Crops using Image Processing

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Abstract: ***Most of the farmers are not in a position to apply optimum amount of inputs to their crops, which are crucial for growth within the production of crops. They may additionally also no longer recognise the right fertilizer required for the infected plants and as a consequence it is able to lead to unbalanced use of fertilizer. They may additionally also not know what amount and which pesticide/insecticide to be used for the diseased plants, subsequently the yield receives affected. This venture affords the information concerning the diseases in a rice crop and offers the name of the ailment and its affected vicinity. The farmer clicks the picture of the inflamed crop with the help of cellular telephones or virtual cameras and uploads it. The picture is then processed with the usage of the Image Processing strategies and the disorder can be detected. The information of the diseases such as name of the disease and the area affected in the conjunction with the quantity of pesticide/insecticide for use are sent to the farmer and the farmer can see the information of crop in his application. This may additionally result in the blessings in monitoring big amount of plants in a field, and thus robotically detects the symptoms of illnesses as soon as they seem on plant leaves.***

Keywords: Rice Crop Disease, Image Acquisition, Image Pre-Processing, Image Segmentation, Feature Extraction, Disease Classification.

I. INTRODUCTION

An Image is a dimensional signal. Image processing is a way to perform some of the operations on a picture, so that it will get an enhanced image or to extract some of the useful information from it. The arrival of latest technology together with such as Digital photo processing and Image analysis technology has many applications inside the biological field. As about 78% of the farmers are marginal farmers in across the country and are also bad in resources. Therefore, they are not in a feature to use optimum quantity of inputs to their crops which are essential for increase within the manufacturing of crops. Most of farmers may not knowledge the proper quantity of fertilizer required for production of plant life and thus it is able to the reason of an unbalanced use of fertilizer and they may additionally no longer realise what amount and which pesticide/insecticide to be used for the diseased plants. Hence the yield will be affected.

A user friendly utility set up on Android phone may cause some extent help to the farmers, to clear up the problems of detecting diseases in plants. The farmer clicks the photo of the infected crop with the help of mobile phones or digital cameras and uploads it. The photograph is then processed using the Image Processing techniques and the disorder can be detected. The details of the diseases such as name of the disease and the area affected along with the amount of pesticide/insecticide for use are sent to the farmer and the farmer can see the details of crop in his utility.

II. PROPOSED SYSTEM

In the proposed system, at the first farmer should upload the photograph of the infected crop. The photographs are acquired from the farmer through the Android Application which is evolved to offer services to the farmers. The picture uploaded by the farmer with the aid of choosing the suitable photo of the inflamed leaf using the Choose File option.

The uploaded picture by means of the farmer is then processed by means of the MATLAB. Then image-processing strategies are performed to the uploaded photograph to extract some features that are useful for further evaluation of inflamed crop. After that, several analytical strategies are used for classifying the ailment in the picture in accordance to the specific problem at hand. The name of the disorder which is affected to the crop is detected and displayed by way of the MATLAB. Affected area is also displayed at the side of the disorder name, to identify the severity of the disorder. The pesticides for the detected sickness and what amount to be used are entered into the database. The farmer can see all these information in his application.

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Application of Image Processing Techniques in Rice Crops for Disease Identification

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***Abstract*: Image processing has always proved to be the efficient apparatus for inspection in various fields and applications. Agriculture sectors where the frameworks like shade, product yield were the key features as of farmer's opinion. Most of the times expert's advice may not be economical and their services may take excess time. Image processing along with possibility of network for communication can change the situation of getting the advice from expert within some time and at fair cost. Many farmers are not in a situation to use optimal quantity of inputs for their crops that are essential for expanding the production. They may not be aware of the quantity of fertilizers that are required for crops and thus it may guide to biased use of fertilizers and they may also not know which pesticide/insecticide should be used for the infected crops. Hence the yield gets altered. The farmer clicks the image of the rice crops and sends it to the system. The image is then handled using the Image Processing techniques and the disease is identified. The particulars of the disease and the affected area along with the quantity of pesticide/insecticide will be sent to the farmers and the farmers can view the details in their application. This may provide benefits in observing wide fields of crops, and thus detects the signs of diseases as soon as they appear on rice plant leaves.**

***Keywords*: Rice crops, Image acquisition, Image processing, Image segmentation, Feature extraction, Disease classification.**

1. Introduction

Diseases in plant life are one of the reasons for the reduction of pleasant and quantity of agricultural plant life. Reduction in both capabilities can immediately or no longer without delay affect the overall production of the plant life in a country. The main trouble is a want of non-stop searching at the plants. Sometimes novice farmers are not aware of the illnesses and its happening period. Generally, diseases can arise on any plant and in any time. However, a continuous observing may stop sickness infection. Image processing strategies can be implied on external features of infected plants. However, the signs of illnesses range for unique plants. Each ailment has its own particular characteristics. Diseases vary in form, size, and coloration of disorder symptoms. Sometimes farmers get anxious and will not be able to take correct selections for choosing the pesticides.

Capturing the photographs of infected leaves from vegetation and assemble the facts about the sickness is a way to put off loss of crops due to infection. These photographs are then sent to device for inspection of illnesses. The device can become aware about the disease and offer information of the sickness and pesticide to be used. The system first erases the background in an image and then by using K-means clustering algorithm, it extracts the sickness quantities from the leaf. After the application of K-means clustering, a few undesirable green location is erased from diseased portion by the usage of thresholding technique. Support Vector Machine (SVM) model is used to distinguish the ailment.

2. Types of Rice Diseases

The disease that occurs in rice crops can lower grains quality. It can occur due to bacteria, viruses, or fungi. The extremity of the plant disease has different symptoms as described below:

A. Bacterial Leaf Blight

Bacterial blight is due to *Xanthomonas oryzae* pv. *oryzae*. It gives rise to drooping of seedlings, yellowing and drying of leaves. This disease most likely occurs in areas that have weeds and stubbles of diagnosed plants. It can also appear in tropical as well as temperate environments, especially in irrigated and rain-fed plain areas.

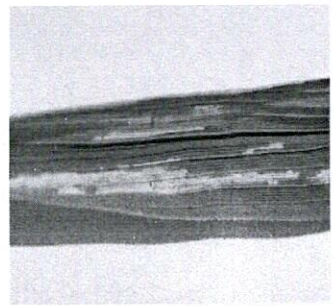

Fig. 1. Bacterial leaf blight

B. Brown Spot

Brown spot occurs at all stages of crop production, but the problem is most crucial during the maturation process of the rice crops. The most recognizable harm is the number of large spots on the leaves which can destroy the whole leaf. When bug occurs in the seed, unfilled seeds or rusted grains are

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Mobile Based System Control

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ABSTRACT

The project primarily focuses on protection of connection establishment at the primary level. Consider a LAN setup with a server and all clients connected via mobile phone to the administrator. Using the mobile phone, the administrator can track and manage the client 's actions in a LAN; for example, a small text file residing in any client or server machine can be opened in your mobile. This product is cost-effective. It will provide remote control and monitoring of the LAN network, and enable network security against intrusion in the absence of an office administrator. Consider a WIFI setup with a server machine and all clients connected via mobile phone to the administrator. Using the mobile phone, the administrator will track and manage client activities in a WIFI; such as opening a small text file in some of the servers or client machines on the mobile phone. It's a cost-effective fix. It will provide remote control and monitoring of the WIFI network, and allow network protection against intrusion in the absence of an office administrator.

Keywords: Android, Feasibility, UML diagram, Wireless Media, Remote Monitoring & Control, AT Commands, Password Security, Android based Mobile phone.

1. INTRODUCTION:

Day by day the usage of mobile phone is increasing rapidly. We have the ability to control various activities through the mobile phone. Our project aims to monitor and control the network from anywhere regardless of distance from our wireless handheld device ,i.e. the cell phone. Consider that a LAN is installed at the office. You want to know the LAN status when you stay at home. You can do so by storing and executing the project in your mobile phone. Wireless devices are most commonly used in this generation of cell phones and these wireless devices are widely used in every part of our daily life, but remote monitoring of networks via mobile devices remains a challenge. Project based on Mobile Device Control app is an attempt to make this illusion a reality. That is where this project 's idea rests. Let's consider a LAN connected to the server machine and all clients are connected to the administrator with the help of mobile devices; for example, a small text file residing on any server or client machine can be opened on your mobile phone which is controlled and monitored by administrator. It is a cost-effective solution that offers remote control of the LAN network and allows for protection in the absence of an office administrator

2. PROPOSED SYSTEM

Proposed system, with the following functionality:

- Offers useful wireless connectivity.
- It is cost-effective because our application s doesn't require GSM modem.
- The area of the services covered is more than the current system.
- Compared with this system , the current system requires more time to establish data connections.
- The commodity would be less serviced.

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IDENTIFICATION OF GENDER USING FACIAL IMAGES

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ABSTRACT

Identification of gender using facial images have been interesting part as of now. People are very good at identifying gender from facial images. Recently, identification of gender from facial images has gained much profits in the computer vision and machine learning concepts. This is because of greatest importance in Computer Interaction, demographic research, and security and surveillance applications. It can also buildup in other important fields such as recognition of faces, age prediction, object prediction etc. The aim of this project is to determine the gender of a person by providing the facial image as input to the computer. This is a case of training datasets where first the algorithm is trained on some set of male faces and female faces, and then the results are used to arrange new data.

KEYWORDS: Gender Recognition, Support Vector Machine, Image Processing, Image Enhancement, Feature Extraction.

I. INTRODUCTION

Over the past decades identification of gender based on images of faces have transcended from esoteric to popular areas of research in computer vision and one of the better and successful application of image analysis. Identification of gender using facial images has become an acute research area cross several disciplines such as pattern recognition, computer vision, cognitive science, image processing, neural networks etc. The goal of identification of gender is to detect whether there are any faces in the images or not and if the image is existing then it gives extent of each face. While this appears as the insignificant job for human beings, it is a very difficult duty for computers. Gender recognition is mainly derived from the mathematical features of a face is apparently the most instinctive appeal to face recognition. One of the initial automated recognition of face systems was represented in marker points (position of nose, eyes ears, lips, chin width) where used to augment feature vector. Newly different methods for a local feature extraction appeared. Gender classification is positioned as dual-class (binary) classification issue where the input facial image is to be fixed to one of them i.e., female or male categories.

(a) (b) (c)

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A Geo-Location Authentication Application for Mobile Banking

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Abstract: ***Mobile banking is a service provided by banks that allows its customers to conduct financial transactions using mobile application . Our application allows the users to conduct banking activities by checking balances or making payment through a Smartphone. One of the most challenging issues in mobile transaction is to provide the security to personal data. Everyday new challenges come in security and many technologies are working to resolve the issues and challenges. Accessing mobile transaction services through mobile application are unsafe because someone might misuse the data. The common attacks targeted on Mobile transaction application are man in the middle attack, phishing attack etc. Hence an application called GeoPay is developed for secure mobile banking. GeoPay application is implemented for both Real time and Non-Real time using Android Studio. In addition to the existing two factor authentication scheme using user ID, password and OTP, the face detector and geo location is used to authenticate the user.***
Keywords: face recognition, banking application, GPS location, pattern matching.

I. INTRODUCTION

One of the most common authentication mechanism is based on the use of password. People generally choose weak passwords and use the same ones for multiple services. As a result, accounts get hacked, people lose money, and privacy is breached etc. In order to counter those problems, security critical services, such as online banking, started to use multi-factor authentication solutions. For example, pattern matching, face recognition, OTP based authentication,

The use of more than one factor has been observed to be more secure than depending only on a single factor. Most solutions depend on factors that fall under three categories, namely: (1) what you know e.g. password, personal identity number (PIN), (2) what you have e.g. smart cards, token, etc., and (3) what you are e.g. biometrics, such as fingerprints, voice recognition, palm scanning or retinal scans. Even though these factors are sufficient for most cases, there is still additional room for improvements and alternatives. One of these factors is user's location. There are several existing systems that utilize location information to provide authentication and authorization solutions. However, these solutions usually require a specially designed infrastructure and Special devices that can used to determine their location

II. LITERATURE REVIEW

Nowadays wireless network and mobile technology are interconnected together to make the human life easier. This section of surveys shows various author approaches and their discussion.

Rohit Joshi proposed a Location based authentication system in which Location is used as an authentication factor. It is used for enhancing the security of banking using mobile applications.

Existing system do not provide high level authentication. It only provides user credentials i.e. username and password. Existing systems do not have any GPS location privileges ,face recognition and depends on basic three factors: what you know (secret), what you have (token), and what you are (biometrics). This Application will make use of the basis of Shamir's Algorithm for Secure Fund Transaction.

The data are being cached, or copied, and archived by the Cloud Service Providers (CSPs), more often without users authorization and control. The Self-destructing data mainly aims to protect the user data's privacy. All the data and their copies become destructive or unreadable after any user specified time, without any user intervention. Moreover, the decryption key is being destructed after the user-specified time.

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STOCK MARKET ANALYSIS USING LONG SHORT-TERM MEMORY

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Abstract: *Stock Market refers to collection of markets and exchanges where regular activities of the buying, selling and shares of publicity held companies takes place. The paper focuses on the use of Long Short Term Memory (LSTM) tensorflow model based on machine learning using open source libraries to predict the future value of the financial stocks of a company. In this paper we will see the implementation bringing the acceptable results. The result will be based on the available dataset.*

KEYWORDS: Stock Market, Data Analysis, Implementation, LSTM, Machine Learning

1. INTRODUCTION

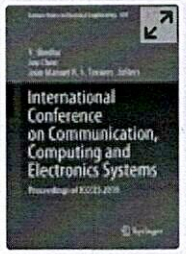
A stock market is a public market for the dealing of company stock and derivatives at an acknowledged price. Shares portray an ownership claim on the company, and consequently a claim on future revenue. The stock market is also called the secondary market as it involves trading between two investor. Stock market gets investors together to buy and sell their share. Shareholders in the stock market want to maximize their returns by buying or selling their investments at a suitable time. Once the shareholder has gained exposure to a stock, they can make money in the following ways. Firstly, they can wait for the price of each share to rise and then sell it. The difference between the purchase and sell price, minus any expenses, is the investor's profits. These profits are known as capital gains. The other way they can make money, is through dividends. The cost of a stock is set through demand and supply. Each buy and sell order go in an order book on the exchange deciding the bid and ask. Through the best bid and ask, the trade works out the mid price, which is then quoted as 'the price'. The basic principle is quite simple. Companies will list their shares in the companies as small products called Stocks. They do so in order to raise money for the firm. A company lists its stock at a price called the IPO or initial public offering. This is the offer price at which the company sells the stock and raises money. After which these stock are the property of the owner and he may sell them at any price to a buyer at an Exchange such as BSE (Bombay Stock Exchange) or NSE(National Stock Exchange).[1]

Demand and supply of a stock can be affected by a number of factors. Short term fluctuations can be due to anything from investor sentiment, to rumors and newspaper articles. Over the long term however, it is often said that the share price will gravitate over its long term averages; which is guided by the stock's value. Since stock market data are highly time-variant and are normally in a nonlinear pattern, forecasting the price of a stock is highly demanding task. The stock's value is determined by the company's intrinsic value as well as other external factors (e.g. being the market leader). That is, how much is the company worth today taking into consideration today's and future profits. Prediction provides knowledgeable details regarding the current status of the stock price variations. Thus this can be utilized in decision making for customers in finalizing whether to buy or sell the particular given stock.

2. RELATED WORK

Artificial neural networks are generally considered to have high predictive power. Time series Model [1] using neural network uses the back propagation feed forward network with one input, output and hidden layer each. Predicting the closing price one day in advance is done by this technique. This method uses the Gradient descent algorithm as the learning function and the sigmoid function as the activation function. This model works well when the noise is less and prediction accuracy is reduced considerably when the noise is increased. In this method the parameter used is closing price of stock. Advantages of this technique is lower prediction error and its performance is better than regression. Disadvantages of this technique is Prediction gets worse when the noise variation is increased.

The process is used to predict the market close value and open value of a share. This model advises the user to either withhold buy or sell a share resulting in good decision capability. Data is obtained from Yahoo Finance and it is represented as a time series model. The model uses artificial neural network method [2] which has three layers namely: input layer, hidden layer and output layer and considers maximum epochs to be 5000. This model takes the mean of both the actual data and predicted data from the training set. Based on these values the model suggests the investor to buy a particular stock or else not to buy the stock wait for particular time to buy the same.



International Conference on Communication, Computing and Electronics Systems pp 725–733

A Novel Technique for Vehicle Theft Detection System Using MQTT on IoT

K. Aishwarya & R. Manjesh

Chapter | First Online: 05 March 2020

Part of the Lecture Notes in Electrical Engineering book series (LNEE,volume 637)

Abstract

Automobile theft is a worldwide immense problem. A vehicle of top-notch security features is usually higher in the cost, and it cannot be afforded by middle-class people. By considering all these parameters, we aimed to design a low-cost, real-time, robust security system for vehicles. The main purpose of this project is to notify the vehicle owner, when the vehicle is moved/theft from the parking area and to monitor the movement of the

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Movement Detection Using Web Camera

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***Abstract*: A theft system control is one of the device that detects the object moving, particularly people. The motion detector is a component of a system that automatically performs a task of motion in an area. Movement Detector includes a vital component of security, automated lighting control, home control, energy efficiency, and other useful systems. An electronic movement detector contains a motion sensor that converts the movement detection into an electric signals. A movement detector can be connected to alarm that is useful to alert the admin or security service after it helps in detecting the motion.**

***Keywords*: Web-based camera surveillance system.**

1. Introduction

One of the most important problems all over the world is security. This project basically concerns on the use of automatic motion detection application using webcams for security purpose. Today in our society security is one of the major issues and having A 24 into 7 human eye is just impossible to maintain. Our project Motion Detection Application which uses the device called Web Camera is just a one of the applications which help us to achieve this goal. In terms of safety measures, it is useful to realize and manage smart surveillance system combined with image processing techniques. These functions are necessary for autonomic monitoring, which is provided by our camera system. This paper presents related recent works and problems of our previous surveillance system. The main objective of the proposed approach is to getting in help of reducing the storage size by storing only the useful frame having motion instead of the sequence of whole video.

2. Problem Statement

In today's world there is significant amount of research in suspicious activity. Security is needed in environment such as banks, jewelers etc. CCTV plays a major role in post event investigation. In traditional security system a daily check should be conducted to ensure that recording equipment is switched on and recording is carried out whenever required. No notification will be sent to the admin reporting about the robbery. In order to detect the suspicious activity entire recorded video has to be viewed.

3. System Configuration

System configuration is the way of describing the architecture, interfaces, and others for a system to fulfill the particular need.

System configuration concentrates on determining which module is needed for the system, the specifications of the given modules that are in the system. System design is also called top-level design where we consider system as a group of component with specifically defined behaviour that communicates with each.

It is one basic approach where issues are solved based on a selection.

Following points are needed while designing the system:

- Rectify data to be extracted.
- List out the user requirements.
- Identity every data for input and output.
- System specification.
- Future benefits of the project in long term.

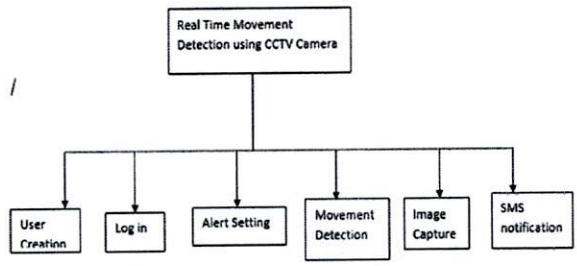

Fig. 1. Design of movement detection

We have six modules in our project they are user creation, login, alert setting, movement detection, image capture, SMS notification. All are equally important for the real time movement detection using CCTV camera.

4. Proposed System

The theft control system is mainly focused on monitoring unseen behavior of the person. A movement detector is a device that detects moving objects, particularly people. A movement detector is often integrated as a component of a system that automatically performs a task or alerts a user of motion in an area. Movement detectors play a most important role in security, home control, automated lighting control energy efficiency, and other useful systems.

In Theft control system unlike the usual CCTV cameras, the continuous monitoring is not required, Instead the image of the

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Agriculture Crop Prediction Using Machine Learning Algorithms

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***Abstract*: India is generally an agricultural country. Agriculture is the single most important provider to the Indian economy. Agriculture crop production depends on the season, organic, and monetary cause. The prognostication of agricultural yield is challenging and pleasing task for every nation. Nowadays, Farmers are hostile to produce the yield because of erratic climatic changes and scarcity of water resource. The consequence of cultivating crops which are not suitable to the current conditions not only affect economic structure but also affect future crop growth. The main objective is collecting agricultural data which can be stored and analyzed for useful crop yield forecasting. To predict the crop yield with the help of data mining technique, advanced methods can be introduced to predict crop yield and it also helps the farmer to choose the most suitable crop, thereby improving the value and gain of the farming area. The increase in crop productivity ultimately enhances country's stature in all aspect.**

***Keywords*: Prediction, Dataset collection, Support Vector Machine, Random Forest.**

1. Introduction

Agriculture is one of the important industrial sectors in India and the country's economy is highly dependent on it for rural sustainability. Due to some factors like climate changes, unpredicted rainfall, decrease of water level, use of pesticides excessively etc. The level of agriculture in India is decreased. To know the level of production we performed descriptive analytics on the agriculture data. The main objective of this research work is to provide a methodology so that it can perform descriptive analytics on crop yield production in an effective manner. Although, some studies revealed statistical information about the agriculture in India, few studies have investigated crop prediction based on the historic climatic and production data. The system developed is a supervised based model. And it will work as mixed approach it means classification technique as well as regression technique. In this project the crop yield classification will perform to categorize on the basis of yield productivity and class labels will be low, mid, and high and range of productivity will be defined and regression will be performed to get the actual crop yield estimated cost.

2. Problem Statement

The production of agriculture is affected by several climate factors. Like as metrological parameters (Humidity, wind speed, temperature, and moisture), precipitation parameters (rainfall, region wise rainfall, irrigation etc.), and soil parameters (PH, organic carbon, phosphorus, fiber etc.). And due to continuously change in climate condition everything is messed. In India farmers still follow the traditional technology which they adopted from their ancestors. But the problem is that in earlier times climate was very healthy everything happened on time. But now most of the things have been changed due to global warming and many other factors. The main problem with agriculture in India is lack of rainfall in seasonal time. Humidity is also necessary for crops but it has been excessive, it also converts as drawback. In this research work, we have proposed a system which is based on descriptive analytics. By which farmers can know what happened in past time and what is going to happen. So here we collect several data from agriculture production, rainfall and soil data and prepare their respective datasets.

3. Methodology

Prediction of agricultural crops involves an approach to analyze large data set. When implementing a more accurate prediction model it might not be sufficient to just consider one or two parameters. Data about weather, irrigation, and yield from several other sources (e.g. meteorological station and irrigation-plan records) for past few decades are collected and analyzed to produce an output which has the highest productivity of each grains in their respective geographical conditions. Simultaneously, the data about weather, soil information, Rainfall, Land area etc. are recorded. From these records using SVM and Random Forest algorithms system can evaluate the perfect crop for the current geographical conditions [5]. Support vector machines (SVM) is set of supervised learning strategies used for classification, and regression. It's a classification technique [2]. Random forests is an ensemble learning algorithm. The basic premise of the algorithm is that building a small decision tree with few features is a

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News Article Category Predictor

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***Abstract*: News article category predictor focuses on designing and developing an application to predict the category of news article intended to upload in the newspaper. This paper presents the algorithm for classification of articles into different genres based on the information retrieval from the article. The algorithm proposed here helps to classify the topic and discover the new topic as they appear in the content or the report provided. The algorithm explained here basically uses keyword extraction algorithm that is applicable to any of the languages.**

***Keywords*: News, Category classification, Information retrieval, Genre predictor, Article classifier.**

1. Introduction

Generally, it's a way to classify the news article according to category. These categories allow us to make group of articles. The prediction can make our work easier in categorizing the article. Suppose a content is related to more than one category, then the algorithm must choose the higher percentage to which it matches. News article category predictor mainly focuses on designing and developing an application to predict the category of news article intended to upload in the newspaper. This project uses different algorithm for classifying the articles into different categories based on the information received from the article. The algorithm helps us to classify the content and discover the new topic. The algorithm explained here basically uses TensorFlow algorithm that is applicable to any of the languages.

This project focuses on designing and developing an application to predict the category of news article intended to upload in the newspaper. It deals with classifying the various news based on the content into economic, financial, political categories. This application is a designed based on data science and can be built using machine learning tools. Using

machine learning model, the application will be capable of identifying genre of news. Machine learning model, the application will be capable of identifying genre of news.

The combination of topics and categories create a hierarchical structure. For example, an article about baseball can be put under sports category also under the achievement's category. So, we can say that there is no one to one relationship between the topic and the article. It's always a one to many relationships, meaning that one topic can belong to many categories.

2. Background

Background details of the category Classification algorithm is as follows:

A. Category Classification

In news article classification, multi-label text classification is a problem. The goal is to assign one or more category label to a news article. For each category, a classifier is used to give either "yes" or "no" answer on which the category should be assigned to a test. It's the example of using binary classifier. Some of the standard algorithms for text classification are Naïve Bayesian Classifiers [1] and support vector machines [2]. Some other Approach to multi-label classification includes boosting [3] and mixture models trained by the em algorithm [4].

A category classification algorithm for news, besides having the required high precision it should also be easily updated. This is because continuously there will be change in the category and events occurring at real world. These will be added to the classifier. By easily updatable, we mean that updating the classifier requires a simple non-exhaustive retraining or no retraining at all.

The previously used methods typically require both positive and negative examples for training data. The initial set of selected training data requires that each article is assigned to at least one positive label. Support Vector Machines offer performance, but they are slow to train and update the training data is not really viable. Category classification deals with broad grouping and such categories are classified on primitive set basis. So, the first step we need to initiate in this algorithm is identifying the primitive sets. Since news is not just related to one particular country or culture, we must assign categories that is applicable to all the country and culture.

3. Implementation

A. TensorFlow

TensorFlow is an open source library for dataflow and differentiable program. It is a math library which is used for machine learning applications such as neural networks. TensorFlow is available on 64bit Linux, macOS, Windows and mobile computing platforms like Android and iOS. TensorFlow are expressed in stateful dataflow graphs. Its architecture allows for easy deployment on different platforms (CPU, GPU, TPU).

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News Article Category Predictor

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Abstract: ***News article category predictor focuses on designing and developing an application to predict the category of news article intended to upload in the newspaper. This paper presents the algorithm for classification of articles into different genres based on the information retrieval from the article. The algorithm proposed here helps to classify the topic and discover the new topic as they appear in the content or the report provided. The algorithm explained here basically uses keyword extraction algorithm that is applicable to any of the languages.***
Keywords: News, Category classification, Information retrieval, Genre predictor, Article classifier

I. INTRODUCTION

Every newspaper or the digital news applications that we use, sort news according to its genre. Categories are high level groupings that allow easier navigation of the articles. The prediction technique makes easier the work of categorizing news articles. If a specific topic is related to more than one category then the algorithm must predict the relative percentage match to each category. The combination of topics and categories create a hierarchical structure. For example an article about baseball can be put under sports category also under the achievement's category. So, we can say that there is no one to one relationship between the topic and the article. Its always a one to many relationship, meaning that one topic can belong to many categories.

The category classification problem can be seen in text classification or the document classification problems. But dealing with news is different than dealing with a document classification. Here the new documents must be processed as they appear. The new report document may contain information that is never seen before. Hence news genre classification requires a dynamic classification which is adaptive to latest news and predicts if it belongs to a new category.

This paper proposes algorithm for category classification that seems to be more effective and more precise. They meet the requirements mentioned that is classification, discovery and relative percentage to each category if they have one to many relationships. In addition to this the algorithm can be developed and implemented to deal with different languages. The paper will further continue as follows: background information and relative work, then the algorithm for category classification and finally present the conclusion and the future scope.

The below given figure describes the categorization hierarchy.

SPORTS

- **Football**
- **Basketball**
- **Cricket**
- **Olympics**
- **World cup**
- **Golf**
- **Tennis**

TECHNICAL

- **Data science**
- **Software**
- **Apple**
- **Windows**
- **Internet**
- **Artificial intelligence**

Fig 1.Categorization Hierarchy

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Prediction of Agricultural Crops using KNN Algorithm

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Abstract- Agriculture is full of uncertainty due to climate change, rainfall, soil type and numerous other factors. Crop prediction in agriculture is a very big dilemma and there is huge dataset where farmers find difficult to predict the yield and seed selection. In this current situation due to rise in the population the production of crops and agricultural products needs to be increased simultaneously to meet the demands of the people. These problems could be solved using machine learning algorithms and this paper focuses on these solutions. The real time environmental parameters like soil type, rainfall, humidity etc of Mangalore, Kodagu, Kasaragod and some other districts of Karnataka state are collected and crop prediction is done along with the accuracy for the crops is done with the help of K-NN algorithm.

Keywords:- *Agriculture, Crop-Prediction, K-Nearest Neighbor .*

I. INTRODUCTION

India is an agricultural country. India's economy is determined by agricultural products export and import. Agriculture is one of the important aspects of Indian economy. Due to uncertainty in the crop yield there is a great fall in the economic status. The major crops of India are Rice, Wheat, Pulses and Grains. Day by day the population of India is growing and the crops productivity need to be increased to feed the population. One of the best ways of predicting unknown values is by use of machine learning algorithms. This work intends to develop crop prediction model using machine learning. The application intends to predict crop yield so it could help farmer to choose best seeds for plantation. There are plenty of ML algorithms which could be used, algorithms like Regression analysis, Support Vector Machine, Neural Networks, K-Nearest Neighbor (K-NN) can be utilized. In this work we discuss about K-NN. The k-nearest neighbors (KNN) algorithm is a simple, supervised machine learning algorithm that can be used to solve both classification and regression problems. It's easy to implement and understand, but has a major drawback of becoming significantly slows as the size of that data in use grows. Here objective is to use a model where information focuses are clustered in a few groups in order to predict the classification of another instance. K-NN works based on minimum distance from query instance to the training samples to determine the k-nearest neighbors. Then we collect k-nearest neighbors, we take simple majority of these k-nearest neighbors to be the prediction query object. As mentioned before it can also be used for regression-output, which is the item's reward .Mostly for distance calculation in K-NN algorithm the metric used is Euclidean distance.

II. PROBLEM STATEMENT

In country like India the production of crops are affected by several factors. Factors like Humidity, temperature, rainfall, soil type play a vital role in crop prediction, and factors like these differ by large with respect to region. In India farmers majorly still rely on traditional techniques inherited from their forefathers. These techniques would work earlier when the climate was much healthier and predictable. Now with factors like global warming and pollution affecting the environment people have to be smart and start utilizing modern techniques. It is time to analyze large set of data and come up with a system that can provide sufficient information regarding crop yield. The new age methodology requires large structured data sets and an algorithm capable of providing solution using the provided datasets.

III. METHODOLOGY

A. Dataset Collection

When implementing an accurate prediction model it might not be sufficient to just consider one or two parameters. Data about Rainfall, temperature, humidity and various other factors are collected and analyzed. This analysis will be fed to the prediction model.

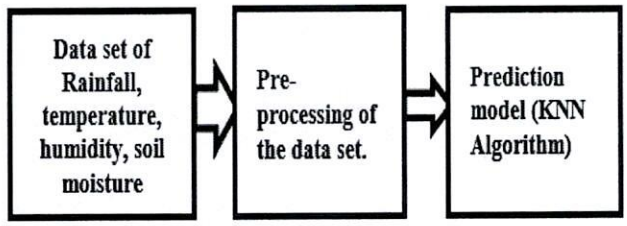

Fig 1:- Flow graph of the methodology Data Collection

Here we gather information from several sources and construct datasets. Plenty of online portals like Raitha-mithra, karnataka.gov.in and Data.gov.in [1] are available for information collection. Annual crop report of each crop is collected Collecting previous crop history data from places like Mangalore, Kodagu, Kasaragod, Mysore, Davangere, Hassan, Shivamogga, Chikkamagalur which belongs to Karnataka State.

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Experimental Investigation on Combustion and Emission Characteristics of Single Cylinder Diesel Engine Modified with Fuel Injector Geometry

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Abstract*— Fuel injection parameters play an important role in diesel engine performance for obtaining proper combustion. The performance and emission characteristics of diesel engine depend on many parameters. An experimental study was conducted on a DI diesel engine at three hole (0.28mm diameter) and four hole (0.23mm diameter) fuel injector nozzle to study its effect on performance and emission by using conventional diesel fuel on the single cylinder four stroke engine with the engine working at different engine loads at compression ratio 16.5. The results obtained revealed that the performance, combustion, and emission characteristics of the modified engine (4-hole nozzle with an orifice diameter of 0.23 mm) were improved except NOX in comparison with those of the conventional diesel engine (3hole nozzle with an orifice diameter of 0.28 mm). The combustion in a diesel engine is governed mainly by spray formation and mixing. Important parameters governing these are droplet size, distribution concentration and injection velocity. Smaller orifices are believed to give smaller droplet size, with increase injection nozzle hole, which leads to better fuel atomization, faster evaporation and better mixing. The performance and emission characteristics were presented clearly to determine that they were found better with four-hole nozzle for the single cylinder diesel engine.

Index Terms—*Emission Characteristics, Fuel injector geometry, Injector nozzle, CI engine combustion.*

I. INTRODUCTION

Due to their relative simplicity, low capital cost, higher power density and higher efficiency, diesel engines have more popularity. From small single-cylinder generator to super-tankers, diesel engines are often the best choice for use as prime movers or at least considered as alternatives. The engine manufacturers constantly trying to further develop the CI engine technology to improve the efficiency and to control the emissions. The traditional diesel engine suffers from relatively high nitrogen oxide and particulate emissions. Thus, there is an increased focus in diesel engine research on reduction of such emissions. Some research works have been focused on investigating the effects of various engine modification, e.g. compression ratio, injection timing, fuel injector holes, orifice diameter etc. on diesel engines. The injection technology is also a main issue for the realization of recent diesel combustion technologies such as homogeneous charge compression ignition (HCCI) and stoichiometric diesel combustion. In case of combustion the fuel spray needs to be injected with smaller droplet size in order to generate a homogeneous charge within a short duration. Much research have been done on fuel injectors for diesel engine, mainly focused on low pressure swirl injectors and narrow spray included angles for preventing wall wetting. At the same time, the nozzle hole size has been reduced to produce smaller droplets. By reducing the nozzle hole size the spray tip penetration is reduced due to the low spray momentum. M Vijay Kumar, A. Veeresh Babu [1] presented the combustion characteristics of diesel engine modified with EGR and nozzle hole orifice diameter. The engine modification done by reducing orifice diameter of 0.28 mm to 0.2 mm diameter with 3 number of holes. Break thermal efficiency was slightly increased by using 0.2mm nozzle hole orifice diameter. This modified nozzle also improved the fuel vaporization and atomization. Cenk Sayin, Metin Gumus [2] presented an article based on effect of injector hole number on the performance and emission of diesel engine. The diesel engine using biodiesel and its blends and also modified with injector hole number where experimentally investigated by running the engine by different load. The result verified that the break specific fuel consumption (BSFC) and break thermal efficiency (BTE) values at higher percentage biodiesel blends (B50 and B100) produce the best results with the increased injector nozzle hole number. B.H Lee, J.H Song [3] presented the article based on the effect of the number of fuel injector holes on characteristics of combustion and emission in diesel engine. The present study considers multi hole injector with 6, 8 and 10 number of nozzle holes were used to perform the experiment. This numerical study shows that the sauter mean diameter is decreased as the number of holes increased. The local penetration of a liquid spray decreased with increasing number of holes. It is observed that amount of NOX found to be the smallest with ten hole injector due to reduced local temperature from poor mixture formation. Shijun Dong, Can Yang [4] presented an article based on investigation on the effect of nozzle hole number on combustion and emission characteristic of dual fuel engine. It has been observed that the fuel nozzle hole lead to more concentrated diesel distribution and larger orifice diameter result in poor fuel atomization. When the ethanol proportions are 0.33 dual fuel operation exhibits single stage combustion with intense heat release rate for all the nozzle cases.

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A Novel Simplified Android Based Virtual Assistant for Windows Users

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ABSTRACT

The software that is designed to perform tasks or services for an individual based on commands or questions is an intelligent assistant or a personal assistant. It takes a lot of manual steps and valuable time to get several tasks done on our own. Hence, several Virtual Assistants (VA) were built to help individuals to make their general task easier by means of voice. Voice control is one of the mean for Virtual Assistant to make life easier. Assistants like Google Assistant, Apple Siri and Microsoft Cortana are built in such a way that they can get things done only on the platform they are installed on. For example, Google assistant on android can't perform tasks on desktop that is powered by Windows operating system. This work focuses on designing and developing a VA for android that can interact with the end user to get things done on PC.

Keywords : AES, Android, Natural Language Processing, Random Forest Classifier, Virtual Assistant, Windows.

Abbreviations : VA, Virtual Assistant; NLP, Natural Language Processing; RFC, Random Forest Classifier.

I. INTRODUCTION

Personal Computers (PCs) have become one of the most important electronic gadget of our everyday life just like a cellphone. User may send E-mails, open apps to perform some functions, listen to music while working with some tasks. While user does most of the things manually, they might need something that can do most of the tasks for them. This is where personal assistants or virtual assistants comes in. For instance, the user may need to navigate to the chrome and type the name of certain thing that he needs to search. Instead, they can simply ask assistant to do that job. It can save users time in most of the cases especially when the task involves a lot of steps. Thats why most of the Windows users use Cortana to get most of the things done in ease. However, there may be times when users need to exchange data between smartphone and PC. Also, users might wish to have control over their PC even when the PC is far especially when given to a friend or family member. In such cases, users wish to track activities and take certain decisions based on the observed activity(For example, if user observes that his/her friend is trying to alter an important document, user can suspend the same and can take further decisions to remotely encrypt important documents or to lock the PC). Along with these features, it can handle most of the basic stuffs like tweaking some system settings, opening apps, streaming music/videos online and much more. The users will be able to chat with this assistant just like how users can chat with Google assistant, Cortana or any other assistant.

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An Approach for Developing Android Based Virtual Assistant for Windows Users

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***Abstract*: An intelligent virtual assistant or a personal assistant is a software that is designed to perform tasks or services for an individual based on commands or questions. Several Virtual Assistants were built to help individuals to get things done through voice which otherwise would have taken a lot of manual steps and valuable time. Virtual assistants makes life easier by means of voice control. Currently available assistants like Google Assistant, Apple Siri and Microsoft Cortana can get things done only on the platform they are installed on. So, Google assistant on android can't perform tasks on desktop that is powered by Windows operating system. This paper concerns the development of VA for android that can perform tasks on Windows PC.**

***Keywords*: AES, Android, Natural Language Processing, Random Forest classifier, Virtual assistant, Windows.**

1. Introduction

Personal Computers (PCs) are what most people use on a daily basis for work or personal use. User may send E-mails, open apps to perform some activities, listen to music while working with some tasks. While user does most of the things manually, they might need something that can do most of the tasks for them. This is where personal assistants or virtual assistants comes in. For instance, the user may need to navigate to the settings and find bluetooth option to turn it on or off. Instead, they can simply ask assistant to do that job. It can save users time in most of the cases especially when the task involves a lot of steps. That is why most of the Windows users use Cortana to get most of the things done in ease. However, there may be times when users need to exchange data between smart phone and PC. Also, users might wish to have control over their PC even when the PC is far especially when given to a friend or family member. In such cases, users wish to track activities and take certain decisions based on the observed activity (For example, if user observes that his/her friend is trying to alter an important document, user can suspend the same and can take further decisions to remotely encrypt important documents or to lock the PC). Along with these features, it should be able to handle most of the basic stuffs like setting an alarm, tweaking some system settings, opening apps, streaming music / videos online and much more. Just like how users can chat with Google assistant, Cortana or any other assistant, the users should be able to chat with this assistant as well.

2. Literature survey

A computer remote control system for the blind and physically disabled people was developed. Blind people experience difficulty in using computers with keyboard and/or mouse. The system provides a way that the blind and physically disabled people can control many functions of a computer system in ease by means of voice control. Users can command smart phone device to perform some tasks through speech; such as sending emails, getting weather info etc. The requested task is then performed immediately. [1]

Electronic devices and PC's are the most important part of one's life. The project describes how a PC can be controlled from remote place through smart phone with the help of the Internet. It is also possible to remotely monitor the connected devices. The project is aimed to develop an application that can connect to a computer running client application. The system uses the MAC address of the target PC to keep an eye on it. The system provides a way to copy files from PC to the android device, open and kill applications, Turn off the PC and more. [2]

One of the brilliant innovation by Apple is "SIRI" which is aimed to provide voice based services to its end users. After this, Google developed even more powerful assistant called "Google Assistant". This Google's innovation has reached beyond the expectation because Google announced that their assistant can call and book an appointment on behalf of the user. These assistants may not work properly without an active Internet Connection. The developed assistant is aimed to work with or without Internet Connectivity. It is given the name Personal Assistant with Voice Recognition Intelligence. It takes voice or text as the input and gives the output in the form of action to be performed or the search result which will be dictated by the personal assistant to the end user. The system is designed in such a way that all the services of the mobile are made available to the end users. [3]

3. Methodology

A. Train and create the machine learning model

Assistant should be able to make good decisions based on the user commands. To do this, assistant must undergo deep

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Performance Prediction of Infiltration Detection system

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Abstract - *This study investigates the "performance comparison of support vector machine, random forest, and extreme learning machine for intrusion detection (Iftikhar Ahmad, May 30, 2018,)", and accurately detects malicious traffic, accuracy, and recall of computer networks. Due to the support vector machine capabilities of the infiltration detection system and the non-linear classification used by a wide range of tasks, the support vector uses the machine and performs better compared to other classifiers. Many classification methods do not follow IDS to increase the efficiency of the discovery rate. Recent work has used multi-layer preceptors, support vector machines and other techniques to address performance concerns. Such techniques imply limitations and are inefficient to use on large samples. Infiltration detection performance depends on accuracy, which needs to be improved to reduce false alarms and increase detection rate. Therefore, an efficient classification method is needed to overcome the problem. This issue is considered in this thesis; providing an overview of ELM, SVM, and RF classification methods for infiltration detection. These methods are popular because of their ability in classification. NSL-KDD uses the knowledge discovery and processing data sets that are estimated due to the evaluation criteria of the infiltration detection system. The results demonstrate the feasibility and efficiency of the proposed cooperative and adaptive penetration detection method. Furthermore, the method is more specific than the methods used by a set of SVM and RF in terms of detection accuracy, precision, and recall rate. The conclusive results demonstrated that ELM overcomes different methodologies.*

Key Words: **IDS, SVM, RF, ELM, ML, NSL_KDD**

1. INTRODUCTION

Network penetration detection software protects a computer network from unauthorized users, perhaps including insides. The task of infiltration detection is to find a predictive model for example a classifier. That is able to distinguish between "unusual" connections and "normal" common connections, known as infiltration or attack. Unnecessary and irrelevant features in the data caused a long-standing problem in network traffic classification. These features not only slow down the classification process but also prevent a classifier from making accurate decisions, especially when it comes to big data. In this thesis, the optimal features for classification of specific SVM, RF, and ELM based algorithms are analyzed. This support vector machine based feature selection algorithm can handle linear, non-linear, classification, and regression dependent data features. Its effectiveness in cases of network penetration is being evaluated. An infiltration detection system named ELM, SVM, and RF is built using the selected features of the proposed feature selection algorithm. The performance of ELM, SVM, and RF is evaluated using the NSL-KDD sample. Evaluation results show that ELM achieves better accuracy and lower computational cost compared to SVM and RF. The raw preparation information is 4 gigabytes of compressed binary TCP dump information from weeks of network traffic. It can handle about five million connection records. Correspondingly, fourteen day test information gives nearly 20 million connection records.

2. METHODOLOGY

As mentioned earlier, the framework is to develop synchronous classifiers that will improve the accuracy of penetration detection. For this purpose, trained and tested information are combined into single synthesis. The ELM, SVM, and RF algorithms do not take the opinion of every expert. To straighten out, the system framework is divided into related phases:

1. NSL_KDD data pre-taking care of
2. Data classification by SVM
3. Data classification by RF
4. Data classification by ELM
5. Evaluation of results for each approach

NSL-KDD knowledge discovery and data mining (Iftikhar Ahmad, May 30, 2018), [1] analysis within dataset. The NSL-KDD contains thousands of connection data's and extracts 41 qualitative and quantitative features. Each set of 41 extracted features represents a survey during a routine or attack. The connection is a series of TCP packets that start and end at certain well-defined times, and the data from one source IP address to the target IP address between them is under some defined protocol. Each connection is labeled as normal or offensive, and exactly one specific attack type. Each connection record contains approximately 100 bytes. To properly evaluate the performance of each classifier, the data is divided into two different databases: one for preparing and other for checking and evaluating classifiers, [8] which can be divided into two stages:

1) Preparing data: (NSL-KDD 80%), this sample is used to train every expert within the fair.

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Experimental Investigation on Combustion and Emission Characteristics of Single Cylinder Diesel Engine Modified with Fuel Injector Geometry

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Abstract*— Fuel injection parameters play an important role in diesel engine performance for obtaining proper combustion. The performance and emission characteristics of diesel engine depend on many parameters. An experimental study was conducted on a DI diesel engine at three hole (0.28mm diameter) and four hole (0.23mm diameter) fuel injector nozzle to study its effect on performance and emission by using conventional diesel fuel on the single cylinder four stroke engine with the engine working at different engine loads at compression ratio 16.5. The results obtained revealed that the performance, combustion, and emission characteristics of the modified engine (4-hole nozzle with an orifice diameter of 0.23 mm) were improved except NOX in comparison with those of the conventional diesel engine (3hole nozzle with an orifice diameter of 0.28 mm). The combustion in a diesel engine is governed mainly by spray formation and mixing. Important parameters governing these are droplet size, distribution concentration and injection velocity. Smaller orifices are believed to give smaller droplet size, with increase injection nozzle hole, which leads to better fuel atomization, faster evaporation and better mixing. The performance and emission characteristics were presented clearly to determine that they were found better with four-hole nozzle for the single cylinder diesel engine.

Index Terms—*Emission Characteristics, Fuel injector geometry, Injector nozzle, CI engine combustion.*

I. INTRODUCTION

Due to their relative simplicity, low capital cost, higher power density and higher efficiency, diesel engines have more popularity. From small single-cylinder generator to super-tankers, diesel engines are often the best choice for use as prime movers or at least considered as alternatives. The engine manufacturers constantly trying to further develop the CI engine technology to improve the efficiency and to control the emissions. The traditional diesel engine suffers from relatively high nitrogen oxide and particulate emissions. Thus, there is an increased focus in diesel engine research on reduction of such emissions. Some research works have been focused on investigating the effects of various engine modification, e.g. compression ratio, injection timing, fuel injector holes, orifice diameter etc. on diesel engines. The injection technology is also a main issue for the realization of recent diesel combustion technologies such as homogeneous charge compression ignition (HCCI) and stoichiometric diesel combustion. In case of combustion the fuel spray needs to be injected with smaller droplet size in order to generate a homogeneous charge within a short duration. Much research have been done on fuel injectors for diesel engine, mainly focused on low pressure swirl injectors and narrow spray included angles for preventing wall wetting. At the same time, the nozzle hole size has been reduced to produce smaller droplets. By reducing the nozzle hole size the spray tip penetration is reduced due to the low spray momentum. M Vijay Kumar, A. Veeresh Babu [1] presented the combustion characteristics of diesel engine modified with EGR and nozzle hole orifice diameter. The engine modification done by reducing orifice diameter of 0.28 mm to 0.2 mm diameter with 3 number of holes. Break thermal efficiency was slightly increased by using 0.2mm nozzle hole orifice diameter. This modified nozzle also improved the fuel vaporization and atomization. Cenk Sayin, Metin Gumus [2] presented an article based on effect of injector hole number on the performance and emission of diesel engine. The diesel engine using biodiesel and its blends and also modified with injector hole number where experimentally investigated by running the engine by different load. The result verified that the break specific fuel consumption (BSFC) and break thermal efficiency (BTE) values at higher percentage biodiesel blends (B50 and B100) produce the best results with the increased injector nozzle hole number. B.H Lee, J.H Song [3] presented the article based on the effect of the number of fuel injector holes on characteristics of combustion and emission in diesel engine. The present study considers multi hole injector with 6, 8 and 10 number of nozzle holes were used to perform the experiment. This numerical study shows that the sauter mean diameter is decreased as the number of holes increased. The local penetration of a liquid spray decreased with increasing number of holes. It is observed that amount of NOX found to be the smallest with ten hole injector due to reduced local temperature from poor mixture formation. Shijun Dong, Can Yang [4] presented an article based on investigation on the effect of nozzle hole number on combustion and emission characteristic of dual fuel engine. It has been observed that the fuel nozzle hole lead to more concentrated diesel distribution and larger orifice diameter result in poor fuel atomization. When the ethanol proportions are 0.33 dual fuel operation exhibits single stage combustion with intense heat release rate for all the nozzle cases.

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Digital V-Card - The Future Security

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ABSTRACT-The paper focuses on designing and developing a user interface to help out the community in making a secure and also a better use of ATM cards using virtual ATM card application. ATM cards are essential in everyday life. Millions of ATM transactions take place in a day. ATM cards are security less when it is lost or stolen. In ATM cards, the PIN is essential and the user should systematically change the PIN. The PIN should not be shared with anyone. If a PIN is known to the hacker then it very easy to use the ATM card. To resolve this the Virtual ATM cards help more. The number of ATM card changes after every transaction. This helps the user to keep the ATM card number more securely for efficient cardless transactions. The virtual ATM card project is implemented using web technology and Android Studio software using java language. Implementation can be done in 3 phases. The first phase involving the design of the GUI for the end-user to scan the QR image in the ATM, the second phase deals with the implementation of a generation of 16-bit Random digit and third phase involves in connection to the server by entering the pin, the bank server checks the authentication and process the transaction. If the user using the online payment for the transaction, then the user requests the bank server for the ATM card number in the Application. After the authentication, the bank server provides the card number to the user. After the transaction, the card number automatically will be destroyed and creates a new card number for the user. The PIN can change, or it can be auto-generated PIN by bank server so that the security can be improved. Maintenance and further development of the application, as well as the feedback provided by the end-users, are encouraged.

KEYWORDS- Android App, Virtual ATM card, and QR code.

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I. INTRODUCTION

V-Card (Virtual Card) is an Electronic Card that play major key role in achieving the goals of a universal electronic payment, a less-cash society created for e-commerce transaction. It provides an easy and secure way of transacting online without providing the Primary Card/Account information to the people. The user has to scan the QR code in the ATM to perform the transaction. The bank server identifies a particular ATM and verifies the user authentication by Personal Identification Number (PIN). After verifying, the Bank server should acquaint ATM to allow access to the user. Then the user can perform the precise transaction. After each transaction, the card number will change. Thus the problem statement revolves around the idea of the ATM card is lost or gets stolen then the security cannot be guaranteed to the user. There are millions of users associated with each bank each one is to be provided with a separate ATM card. This increases the investment in ATM cards in the bank. The cost of the one ATM card for SBI bank costs around 23Rs. For a million user the cost of investing on the card is increased and the ATM card must be carried by the user everywhere to purchase even it is online or offline. The PIN must be remembered by the user, and if the user forgets the pin then it takes more time to reset the pin. The card number is not safe because for every transaction the card uses the same number for the transaction. In this system, the card number changes for every transaction [5].

II. RELATED WORK

Electronic payment refers to the mode of payment, which doesn't include physical cash or cheque. It includes debit cards, smart cards, credit cards, etc. It provides encryption, and requests for more identification in case of doubts [1], the idea is proposed in leveraging a new technology that connects directly to a productive software experience in the customer's hand to help enhance their experience and educate them. A customer can utilize all of their stored information only by opening an app on their phone. Entering a pin, password, or fingerprint and then selecting the information they need to access. The app will utilize information transfer technologies such as Near-field communication to interact with mobile wallet ready payment techniques. This results in reduced fraud since mobile wallets are harder to steal or duplicate than cards [3]. A disadvantage is that only mobile-service people can use such services. The mobile wallet techniques or OTP used can be adapted to our virtual ATM card project, where OTP or QR code can be required to withdraw the money.

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Store Variables Influencing Organized Grocery Retail Store Shoppers

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ABSTRACT

The Indian retail industry is growing at a quicker rate because of growth and shifting demographics of Indian population and progress in the quality of life of urban people. Indian retail industry consists of both organised and unorganised sectors. Organized retail which now constitutes a small percentage of total retail sectors is growing at a higher rate. Growth opportunity in the retail sectors comes with several challenges. There are instances where retailers have failed to know the market and have to suffer losses and in some case had to

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Text Localization and Recognition

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Abstract: ***The text localization and recognition in real time scene text images has become a significant issue in the current scenario. Mobile application and digitization has given a significant and broad impact on real time scene text images. However, the accuracy of recognition rate is based upon the text localization, i.e., higher the clarity of text background segmentation and decomposition, higher the speed of accuracy for the image recognition. In this project, we present a brand new scene text detection algorithm which supports Stroke detection and Hog Transform method. The tactic introduces an approach for character detection and recognition which integrates the benefits of Feature extraction techniques and distribution of Connected Components. Characters are detected and recognized on the image regions and then the image is segmented, then each segment is transformed into a set of connected strokes. The tactic was evaluated on a standard dataset consisting mostly real time images where it achieves advanced results in both text localization and recognition. The results clearly depict the higher accuracy in terms of localization and recognition for real time images.***
Keywords: decomposition, localization, recognition, segmentation.

I. INTRODUCTION

OCR is the acronym for Optical Character Recognition. This technology allows to automatically identify characters through an optical mechanism. Eyes are optical mechanism for humans. The input for brain is the image seen by Eyes, the ability to know these inputs differs in all, in line with many factors. Although OCR isn't able to compete with human reading capabilities, OCR could also be a technology that functions like human ability of reading. OCR can recognize both handwritten and printed text. But the performance of OCR is directly dependent on the quality of input documents. OCR is designed to process images that contain texts, with a little non-textual character which is obtained from the picture captured by camera. Microsoft Office Document Imaging (MODI) enables editing and annotating the texts from the documents. Text generated from the OCR can be saved using MODI. However, MODI produces TIFF files that violate some standard specifications. The OCR engine will de-skew and re-orient the page wherever required, in its default mode. Using its built-in OCR engine, it can convert scanned real time images to text under program control.

A. Problem Statement

The major issues in this area are follows: i) the text intensity affected by lighting conditions such as shadows, low and high light which affects the resolution of natural scene text, ii) a variety of text fonts and colors, iii) language of the text, whether it is English or local language. Text characters and strings in natural scene can provide valuable information, which may be useful in data entry. Because of diverse text patterns and variant background interferences, extracting text directly from natural scene images or videos has become difficult. Reading text from photos is a challenging problem which has received a significant amount of attention and efforts have been made in this area. Two key components of most systems are (i) text detection from real time images and (ii) character localization and recognition, and many recent methods and technologies have been proposed to design models for both.

B. Existing System

Converting images of machine-printed characters into machine-readable characters is the function of OCR engines. Bitmap is utilized to extract images of machine-printed characters. An imaging scanner, faxed, or computer generated is also accustomed to scan the forms to produce the bitmap. There are two separate methods in previous OCR system: First extraction of texts from documents and then text to speech translation. Input characters are converted by an optical scanner, in a very typical OCR system. Each character is then located and segmented. Once the segmentation is completed the resulting character image is obtained. The character image is then fed into a pre-processor for noise reduction and normalization. Certain characteristics are the obtained from the character image for classification.

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Experimental Investigation on Combustion and Emission Characteristics of Single Cylinder Diesel Engine Modified with Fuel Injector Geometry

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Abstract— Fuel injection parameters play an important role in diesel engine performance for obtaining proper combustion. The performance and emission characteristics of diesel engine depend on many parameters. An experimental study was conducted on a DI diesel engine at three hole (0.28mm diameter) and four hole (0.23mm diameter) fuel injector nozzle to study its effect on performance and emission by using conventional diesel fuel on the single cylinder four stroke engine with the engine working at different engine loads at compression ratio 16.5. The results obtained revealed that the performance, combustion, and emission characteristics of the modified engine (4-hole nozzle with an orifice diameter of 0.23 mm) were improved except NOX in comparison with those of the conventional diesel engine (3hole nozzle with an orifice diameter of 0.28 mm). The combustion in a diesel engine is governed mainly by spray formation and mixing. Important parameters governing these are droplet size, distribution concentration and injection velocity. Smaller orifices are believed to give smaller droplet size, with increase injection nozzle hole, which leads to better fuel atomization, faster evaporation and better mixing. The performance and emission characteristics were presented clearly to determine that they were found better with four-hole nozzle for the single cylinder diesel engine.

Index Terms—*Emission Characteristics, Fuel injector geometry, Injector nozzle, CI engine combustion.*

I. INTRODUCTION

Due to their relative simplicity, low capital cost, higher power density and higher efficiency, diesel engines have more popularity. From small single-cylinder generator to super-tankers, diesel engines are often the best choice for use as prime movers or at least considered as alternatives. The engine manufacturers constantly trying to further develop the CI engine technology to improve the efficiency and to control the emissions. The traditional diesel engine suffers from relatively high nitrogen oxide and particulate emissions. Thus, there is an increased focus in diesel engine research on reduction of such emissions. Some research works have been focused on investigating the effects of various engine modification, e.g. compression ratio, injection timing, fuel injector holes, orifice diameter etc. on diesel engines. The injection technology is also a main issue for the realization of recent diesel combustion technologies such as homogeneous charge compression ignition (HCCI) and stoichiometric diesel combustion. In case of combustion the fuel spray needs to be injected with smaller droplet size in order to generate a homogeneous charge within a short duration. Much research have been done on fuel injectors for diesel engine, mainly focused on low pressure swirl injectors and narrow spray included angles for preventing wall wetting. At the same time, the nozzle hole size has been reduced to produce smaller droplets. By reducing the nozzle hole size the spray tip penetration is reduced due to the low spray momentum. M Vijay Kumar, A. Veeresh Babu [1] presented the combustion characteristics of diesel engine modified with EGR and nozzle hole orifice diameter. The engine modification done by reducing orifice diameter of 0.28 mm to 0.2 mm diameter with 3 number of holes. Break thermal efficiency was slightly increased by using 0.2mm nozzle hole orifice diameter. This modified nozzle also improved the fuel vaporization and atomization. Cenk Sayin, Metin Gumus [2] presented an article based on effect of injector hole number on the performance and emission of diesel engine. The diesel engine using biodiesel and its blends and also modified with injector hole number where experimentally investigated by running the engine by different load. The result verified that the break specific fuel consumption (BSFC) and break thermal efficiency (BTE) values at higher percentage biodiesel blends (B50 and B100) produce the best results with the increased injector nozzle hole number. B.H Lee, J.H Song [3] presented the article based on the effect of the number of fuel injector holes on characteristics of combustion and emission in diesel engine. The present study considers multi hole injector with 6, 8 and 10 number of nozzle holes were used to perform the experiment. This numerical study shows that the sauter mean diameter is decreased as the number of holes increased. The local penetration of a liquid spray decreased with increasing number of holes. It is observed that amount of NOX found to be the smallest with ten hole injector due to reduced local temperature from poor mixture formation. Shijun Dong, Can Yang [4] presented an article based on investigation on the effect of nozzle hole number on combustion and emission characteristic of dual fuel engine. It has been observed that the fuel nozzle hole lead to more concentrated diesel distribution and larger orifice diameter result in poor fuel atomization. When the ethanol proportions are 0.33 dual fuel operation exhibits single stage combustion with intense heat release rate for all the nozzle cases.

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Extracted Text To Speech Conversion Using Text To Speech Synthesizer

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Abstract -Now-a-days Image processing has become one in all the peak of technology. Previously it absolutely was impracticable to compute data at higher or faster rate, with the assistance of leading technology it's now possible to process data at higher rate to induce optimized hence better result. Speech is that the oldest means of communication between people and it's also the foremost widely used during this paper an innovative, efficient and real-time cost beneficial technique that enables user to listen to the contents of text images rather than reading through them as been introduced. It combines the concept of Optical Character Recognition (OCR) and Text to Speech Synthesizer (TTS). OCR is employed to recognition of character with high accuracy. Text-to-Speech could be a device that scans and reads English alphabets and numbers that are within the image using OCR technique and changing it to voices the event of a text to speech synthesizer are of great help to people with visual impairment and making through large volume of text easier.

Key Words: Intelligibility, Naturalness, Text-to-Speech (TTS), Speech Synthesis.

1.INTRODUCTION

There is plenty research work has done on Pattern Recognition which comes under Image processing. OCR well-known as Optical Character Recognition is one in every of the leading branch of the Pattern Recognition. The system reduces human efforts together with time. It can even be helpful for the one that doesn't know the pronunciation of particular words. Now a day it's noted that the foremost challenging aspect in Text to speech generating natural sounding speech and thus the final word goal of text to speech synthesizer is to return up with speech from text that sounds natural to the human ear as if it had been somebody's read speech. The strategy of text into speech converting involves two major phases, text processing and speech Synthesis. Text processing involves processing of raw text to supply transcription of the text, together with the required rhythm. Speech synthesis is that the bogus production of human speech. Speech synthesizer are often implemented in software or hardware which gets its input from extracted text process and covert into a speech waveform and even the quality of a speech synthesizer is measured in such a way that its similarity to human being voice. A text-to-speech Synthesizer allows people with visual disability vocally impaired and reading disabilities to concentrate to written works on a knowledge processor. The extracted text are often as an example data from a application, standard ASCII from a mobile text-message, email or scanned text from a newspapers. The extracted text is processed and also the resulting speech is produced. Hence speech synthesis task is to develop transparent and the usual sounding voice which convey the information to a user during a preferred accent, language, and voice.

2.LITERATURE SURVEY

A. A Survey of OCR Applications

OCR in numerous fields and further presents the experimentation for 3 important applications like Captcha, Institutional Repository and Optical Music Character Recognition. They made use of an enhanced image segmentation algorithm supported histogram equalization using genetic algorithms for optical character recognition. The paper uses images of a music script which is used to extract musical signs and encryptions using the different algorithms. The paper presents brief explanations of the applications in various fields along with experimentation into few selected fields. The proposed method benefit is to extract all kinds of bimodal images including blur and illumination. [1]

B. Optical Character Recognition

OCR technology uses scanning acquisition of printed documents as optical images. Recognition- involves converting these images to character streams representing letters of recognized words and also the final element of the words involves accessing and even storing the converted text. Converted text is referred as extracted text. When, the user is ready to capture an image containing text of interest using the Mobile camera. The specified area of the image is processed on the device so on optimize it for transfer and input to the OCR. Speech synthesizer is employed to convert extracted text into the voice. Firstly it analyses text and transforms text into pronounceable speech form. Speech synthesizer performs conversion of grapheme to phoneme form and uses voice characteristics of somebody. Most of the character recognition systems are recognized through the input image with a scanner and computer software. There is a controversy within the scale of the pc and scanner, as computer and scanner requires heap of space. Some to beat problem of computer and also the scanner occupies an oversized space, optical character recognition (OCR) system supported android phone is

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An overview of manufacturing culture in micro and small scale industries and use of computer assisted knowledge management in production process

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This paper highlighted on manufacturing culture in micro and small scale industries. To know the manufacturing culture responses collected from 20 manufacturing industries with 87 questionnaires through survey. All the questionnaires prepared with help of Agile manufacturing enablers. The sample industries are manufacturer of identical products with different shapes and size based on the customer requirement. From the survey it has noted that micro and small scale industries are not working with one single manufacturing methodology and no strategic process was adopted. Most of industries are facing problem of shortage of skilled labor and change of market requirement. The major reason for this problem is poor storage and reuse of the data and poor adoption/ non adoption of knowledge management technique in micro and small scaleindustries.

Topics
Artificial intelligence, **Educational assessment**, **Industry**

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Microcannular electrode/polymer electrolyte interface for high performance supercapacitor

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ABSTRACT

In the present work, the ionic resistance in the activated carbon (AC) electrode and blend polymer electrolyte (BPE) interface is reduced by tuning binder and BPE. A unique microcannulars channel connecting AC, binder and gaur gum (GG)/polyvinylalcohol (PVA) electrolyte is developed for easy Li^+ movement. The use of AC derived from areca nut and natural GG as a binder makes the developed method more environmentally sustainable. The presence of microcannular structures on the electrode surface and BPE was confirmed using SEM and TEM analysis. Combined DSC-TGA data for BPE showed that PVA provides the mechanical support to jelly guar gum. The ionic conductivity, activation energy, dielectric studies were studied to understand the electrode/electrolyte interface mechanism. Dielectric studies revealed that the unique pathway of microcannular structures reduces the charge transfer resistance significantly at the interface. Optimized BPE was used in the fabrication of supercapacitor and specific capacitance was found to be 542 Fg^{-1}. The time constant was 0.4 s and showed consistent cyclic pattern during galvanostatic charge/discharge studies with 99% Columbic efficiency.

1. Introduction

Solid polymer electrolytes (SPE) suitable for storing energy generated from renewable sources such as solar, wind, and waves from the ocean [1] are in limelight among researchers. SPE provides enhanced energy capacity, cyclability, flexibility, non-flammability, better handling and leak-proof features compared to conventional liquid electrolyte based energy devices [2]. Presently, lithium ion-doped polymers have gained market in the field of energy devices due to high energy density and stability. Doping of lithium ions (Li^+) is curial because both Li^+ and its counter anion migrate during charging and discharging, producing irreversible by-products. Moreover, the transport number of Li^+ is less than 0.3 in contrast to its counter ion which moves faster than Li^+ [3]. This implies that compared to the hopping mechanism of Li^+, the anions can move faster but, this movement has no influence on the overall current as they do not involve in electrode reactions [4]. Additionally, the accumulation of a large number of anions will affect the polarization potential and electrode/electrolyte interface [5,6]. On providing a channel for easy movement of Li^+ ions near the electrode/electrolyte interface region, the energy density and power density during charging and discharging would be enhanced. This new concept of introducing channels in the electrode material matrix for the movement of Li^+ showed a significant change in the specific capacitance of supercapacitor in this present work.

Supercapacitors are the devices that have their energy density and power density between capacitor and battery [7]. Few ultracapacitors are already in the market [8,9], but, tuning of polymer-based ultracapacitor/supercapacitors is yet to establish their role in providing efficient devices. Fillers like graphene oxides were reinforced into poly (4-styrene sulfonic acid)/PVA blend matrix has resulted in the enhancement of dielectric constant [10]. Hence, a proper binder with AC electrode material and solid polymer electrolyte would certainly enhance the dielectric constant for portable and flexible energy devices. The role of different binders is significant in electrochemical performance in energy devices wherein binders amazingly enhance the cycle stability, kinetics of ions at the electrodes and bonding capacity [11]. Least attention has been given to binders as to how they improve the properties and mechanical integrity of electrodes in energy devices [12]. Dominic et al. [13] reviewed on most recent developments in the field of green binders for batteries and supercapacitors and explained how

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Comprehensive Approach towards M Shopper's Shopping Behaviour using Shopping Apps – TAM Model Analysis

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ABSTRACT

In current digital era, the mode of retail business is undergoing rapid change. Retailers are shifting their businesses from brick and mortar to e commerce especially m commerce i.e., business transactions via mobile phones because smartphones are turning to be one of the smart commercial channel. At the same time we see the lifestyle of people also has changed. People depend more on smartphones in their daily life, thanks to the internet. People are also choosing to shop over the mobile phones for convenience purpose. In order to grab this opportunity the e retailers are trying to adapt themselves to m commerce via mobile applications. The success of the m commerce companies depend upon the customer's willingness to accept the usage of technology (smart phone and applications). In this paper the attempt has been made to find the perception regarding the acceptance of technology by m shoppers and to assess the factors that influences the acceptance of usage of apps for m-shopping using TAM model. For this study Questionnaire was designed to find the factors influencing m shopping using apps. The questionnaire includes the variable such as Perceived usefulness, behavioural intention, Perceived ease of use, attitude, Perceived Risk, Perceived Enjoyment from TAM model. Likert scale was used to measure the variables. 102 responses from the shoppers who shop using shopping applications are used for this study. The findings of this study supports the hypothesis framed. High negative correlation is observed between perceived risk and perceived ease of use. Attitude and shopping intention has high positive correlation. From the variables under study with score ranging from 5 to 25, perceived ease of use has highest mean and perceived risk has the minimum mean. Finally, the study also finds that low internet connectivity, low quality of product, low clarity about authentication of product, return policies are the problems faced by shoppers while shopping using mobile apps.

KEYWORD: *m- Shopping, Behavioural intention, Perceived ease of use, Perceived usefulness, Perceived Risk, Perceived Enjoyment, attitude*

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IJTSRD38101

INTRODUCTION

The Technology acceptance model (TAM) is an information systems theory that models how users come to accept and use a technology proposed by Davis, 1989. This model is a foundation for examination of customers approval of online shopping (Stoel and Ha 2009; Umair Cheema et al).The major components of TAM model are perceived ease of use, perceived usefulness, attitude and intention. (Xiaoni Zhang & Victor R. Prybutok 2003). In this digital era, technology has a crucial function in lives of many people. Mobile devices, in particular, have become an important product to many individuals and have been expected to further increase in their usage (JatiKasuma, et.al 2020).

Mobile Apps:

With the increased popularity of mobile apps, there has been a consequential magnification in the number of mobile app developers. Mobile App is one of the paramount marketing implements for any product/service. It might build/eradicate the brand equity and brand adhesion, according to its performance. (Venkata N Inukollu, et.al 2014). Mobile app includes native apps which live on the device and are accessed through icons on the device home screen. These are installed through an application store, Web Apps are not real applications. These are stored on a remote server and delivered over the internet through a browser interface (Gagandeep Kaur; Gagandeep Kaur 2016). Smartphone driven Apps has exciting spaces for today's online community, and India's young economy is no exception. India is world's third largest internet user, after US & China (K Lalitha; ArockiaRajasekar 2018). Compared to traditional mobile web sites, mobile apps provides several advantages for marketers because mobile apps offer greater security features as well as allow consumers bypass competitors' information and go directly to the marketer's self-contained environment (Taylor and Levin, 2014); (TsuangKuo et.al,2016). M commerce Companies are offering the favourite way of shopping through apps for the shoppers and getting equipped with better connectivity and

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Progressive Learning through Digital Transformation - Reshaping Learning Facility

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ABSTRACT

Education is the method of facilitating learning, or the acquisition of knowledge and development of the abilities of the mind. Education implies to discipline and development by means of study and learning. One of the foremost crucial benefits of education is that it improves personal lives and helps the society to run smoothly. Education should undergo a thorough digital transformation to be able to meet the wants of the young generation and digitalized future.

With the advent in technology and with the perpetual increase in the strength of the students and the number of departments in the educational institutions, it is laborious to exchange the study materials between the students and the faculties. The main objective of the E-Learning is to help the students get over the traditional methods of learning and make them accustomed to the internet .But the question remains how far the students and the faculties were able to adopt them self to the sudden shift and cope up with the changes .This paper tries to provide an insight on the condition of the students what was their expectation and perception. This research paper helps both the students and the teachers to know impact of digital transformation and the quality of facility learning for growth to survival.

KEYWORD: *Laborious, E-Learning, Coping, Expectation, Perception, Digital Transformation*

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1. INTRODUCTION

Education is the method of facilitating learning, or the acquisition of knowledge and development of the abilities of the mind. Education implies to discipline and development by means of study and learning. One of the foremost crucial benefits of education is that it improves personal lives and helps the society to run smoothly. Education should undergo a thorough digital transformation to be able to meet the wants of the young generation and digitalized future. The COVID-19 pandemic has suddenly and abruptly forced education indeed to interact in such a change. The digital transformation gets started by the corona virus pandemic within the education system of the young generation which cross all the barriers. This pandemic has shown scant respect for manmade borders and it took just three months to bring the earth to a standstill, providing intimately connected we are as earthlings. It gave a first-hand experience to provide quality distance education while battling against pandemic.

The online could also be a serious technological advancement reshaping not only our society but also that of universities worldwide. In light of this, universities got to maximize the online for teaching, and one progressive development of this is often the use of online delivery methods. Online education has generated tremendous excitement both inside and out of doors education. For some, it offers the potential to provide learning delivery and thus the competitive landscape. While e-learning has been on the rise in industry and academic institutions for the past few years, it is also been attraction plenty of criticism because of sort of current limitations. Self-regulation challenges and challenges in using learning technology are the key challenges that students are facing. Teachers facing challenges mainly on the use of technology for teaching. Challenges within the supply of suitable instructional technology and effective training to support teachers are the main challenges faced by educational institutions.

2. Literature review

Yien et al. (2011) pointed out the difference between digital learning and traditional teaching in learning environment and persons. Traditional teaching, with "lecture" in classrooms, was the most traditional and representative teaching method. In short, it referred to instructors delivering teaching materials in the teaching activity to learners through interpretation. With the long history, it has been broadly applied and is still one of favourable teaching methods of instructors.

Sebastian et al. (2012) regarded digital learning as the learning mode the most rapidly developed in past years as well as the learning mainstream in the future. In addition to the time background, it was rapidly developed because it broke through traditional teaching modes and presented various strengths.

Yoon et al. (2012) stated that digital learning (E-Learning) was first proposed by Jay Cross in 1999. With the advance

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3D Printed Sounding Rocket

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Abstract: A 3D printed Sounding Rocket is something that makes the sound while it is launched and its used to measure the Earth atmosphere to a near lower earth orbit is kind of sounding Rockets are used in many applications for studying the atmosphere, temperature, Density and Pressure and sometimes it can also be used to study the availability of Agricultural Land on some Parts of earth. These Rockets are capable of Carrying payloads ranging from 1 to 145kgs. In India as per the current survey there is no3d printed rockets that are currently being launched. It is an instrument-carrying rocket designed to take measurements and perform scientific experiments during its sub-orbital flight. The rockets performance is discussed in detail. This paper deals with the research, design, Literature survey, prior art search and analysis of our 3D printed Sounding rockets that aims in study of the behaviour of 3D printed polylactic materials in the near lower earth orbit and it also aims to became the Countries first 3D printed Soundingrockets.

Index Terms- 3D Printed Sounding Rocket, Scientific Experiment, Sub-orbital Flight, 3D Printed Polylactic Materials.

I. INTRODUCTION:

SOUNDINGROCKET

A sounding rocket, also named as research rocket is specially designed rocket for carrying instruments to perform scientific experiments and certain measurements at its sub-orbital flight. It can also be given name as low altitude rocket as it travels to a shorter altitude compared other space rockets, and that is the reason it is being used for preferably for measuring atmospheric conditions and experiments like agricultural survey and cloud seeding. It can travel upto a height of 48 to 145 Km from above the surface of the earth. The payload range is around 10 to 100 Kg. The rocket is built with the advanced technology, i.e, 3D printed technology. The rocket isdesigned

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Design of an Embedded High Efficiency Intelligent Smart Trolley

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***Abstract*: Now a day's people prefer to shop in big malls and it has become most common activity. As it has become a common activity we can see huge rush during special occasion and discount offers. People buy different product, groceries etc. They put purchased items in the trolley and wait near the billing counter for the payments. Using bar code reader the cashier will generate the bill and give it to the customer. The main aim of this task is to develop a new system and give a solution to above problem. The items are attached with the RFID tags and those items are placed in trolley. All the items in the malls are attached with RFID tags. When a person drops an item into the trolley, the code of an item is detected and item price is stored in the memory. The name of an item and its cost will be displayed on LCD and total cost is sent to billing Counter by Bluetooth module. Total amount of the shopping is also displayed on the LCD display screen.**

***Keywords*: ESP, ESP module, IoT, LCD display, RFID reader, RFID tag, Shopping malls, Trolley.**

1. Introduction

People get the daily needs and requirements in the shopping mall. During some unspecified time the customer will have the incomplete information about the sale and the customer need to wait near the billing counter to pay the bill of shopping. So up gradation in the billing system is required and system of shopping must be changed according to the customer requirements. Currently shopping malls are increasing throughout the world wide as of people demand and their expenditures in shopping in the shopping mall. During the time of festivals, discount sale and on holidays etc. there will be huge crowd in the shopping mall. The cashier use barcode reading technique and it always results in time consuming since the customer has to wait until whole items get scanned and read. This is disadvantages of existing system. It can be avoided and up graded by using IOT based embedded high efficiency intelligent smart trolley proposed in this paper. Instead of barcode here it uses the RFID technique. The new system uses separate RFID reader attached to each trolley and RFID Tag attached with each item. If customer purchases any item the RFID reader will read the tag which is attached to the item. One of the major features of proposed system is that when an item is removed from the trolley the cost of the item is deducted and updated cost is sent to the billing counter. The cost of each item and total bill of the shopping is displayed on the LCD display.

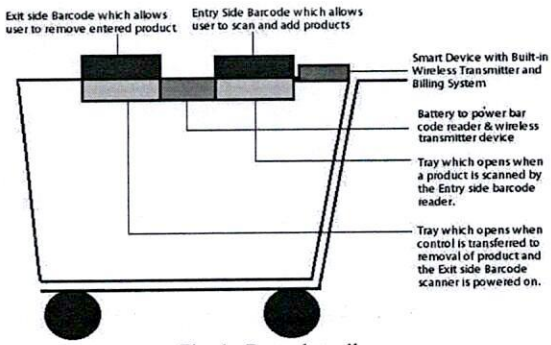

Fig. 1. Barcode trolley

2. Proposed System

The new idea of proposed system will help the customer during their shopping in the shopping mall as the billing system is automated. The proposed system is completely based on RFID reader with some basic technology. In the shopping malls and supermarkets this new system uses separate RFID reader attached to each trolley and RFID Tag attached with each item. This shopping trolley consists of RFID reader, IR sensor, power supply, Arduino and LCD display. Here the customers are given with RFID card for their identification during shopping.

3. Block Diagram of Proposed System

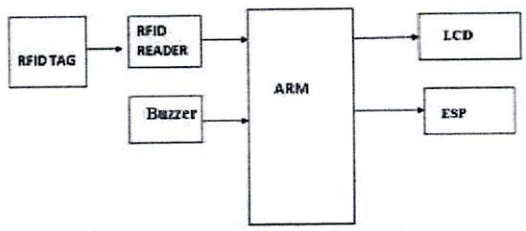

Fig. 2. Block diagram of transmitter

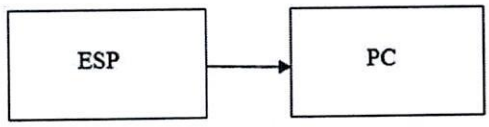

Fig. 3. Block diagram of receiver

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Design of Low Power Consumption Inverter

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***Abstract:** As the technology scaled down, supply voltages are lowered and in-turn gate oxide thickness is reduced to decrease the threshold voltage. This increased the leakage power and continues to be one of the major issues in the design of CMOS circuits in the nanometer technology. Inverters are the fundamental circuits used in the design of VLSI circuits. In this paper, forced NMOS inverter is modified with parallel diode connected PMOS for low power consumption. Design is simulated in Cadence Virtuoso software at 45nm GPDK technology file. It is observed that the proposed design reduces power consumption by about 22%.*

***Keywords:** Inverter, Low power, Nanometer, Technology, VLSI Design*

I. INTRODUCTION

Prediction of Moore's law holds good even after 50 years of his prediction. Over the years, the number of components integrated into an Integrated Circuits (ICs) increased to several billions. Speed, area and power are main constraints for the designer in designing the Very Large Scale Integrated Circuits (VLSI) ICs. With the advances in technology, the complexity of algorithms and implementation has increased. This leads to more power consuming devices. Since most of the devices are run on batteries, power reduction techniques has taken the front seat in research in the recent times. As the technology scaled to lower technology, the percentage of leakage power dominates in the overall power dissipation. The system costs increased because of this and the reliability of the system reduced. In any processors, static power, dynamic and leakage power are the main sources of power dissipation. The static power dissipation is because of the leakage current when the circuit in standby mode. The Dynamic power is due to switching and short-circuit power. Switching power is due to the charging or discharging of the capacitance associated with the devices or nodes in the circuit. Short-circuit power arises because of the instantaneous connection between the ground and the supply voltage during the gate switches from logical 1 to 0 or vice versa [1]. To reduce power consumption, various techniques like clock gating, reduced swing clock, tristate keeper circuit, blocking gate, network restructuring and reorganization and many more methods have been bought forward. According to the literature available in [2], leakage power dominates over the total power dissipation in the nanometer device regime. The paper proposes an approach called sleepy keeper method the leakage current reduced by saving logic state. Leakage current estimation because of die and inter-die process variability is discussed in [3]. Mathematical expressions to find the leakage current probability density function (PDF) in the CMOS gates stacked devices derived in this paper. The Leakage reduction (LECTOR) technique using a control transistor is discussed in [4]. An energy efficient design in terms of multiple-threshold CMOS is proposed in [5]. In [6], the charge pumping technique is used to lower the power consumption by boosting the internal gate voltage. This shifts the operating region from the sub-threshold to a higher region and improves performance and tolerance to PVT changes. Leakage power is reduced in [7] by introducing a new inverter technique by reducing the swing using 2n mos approach. This reduces the power consumption at the cost of delay and area. In this paper, we made an attempt to reduce the leakage power by connecting a parallel diode CMOS with the forced NMOS inverter.

The paper is organized in the following manner. Section 2 describes the proposed method for the design of CMOS inverter for the low power consumption. Different inverter design details are given in Section 3. Simulation results and comparison of different designs are discussed in Section 4. The Conclusion is given in Section 5.

II. PROPOSED APPROACH

In the lower technology transistors, major leakage current is because of sub-threshold leakage current. This leakage current arises due to the transistor operating in the weak inversion mode. This current consists of direct gate current and gate induced current. This effect comes into picture due to the reduced channel length. The leakage current is given in equation 1 [8].

$$I = I_0 \exp\left(\frac{(V_{gs} - V_{th})}{nV_T}\right)\left(1 - \exp\left(\frac{-V_{ds}}{V_T}\right)\right) \quad \text{---- (1)}$$

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SMART IoT BASED WASTE SEGREGATION AND MANAGEMENT SYSTEM

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Abstract: The rising population of India presents genuine dangers as to the accessibility of living space. Waste management (or waste disposal) are the activities and actions required to manage waste from its inception to its final disposal. This includes the collection, transport, treatment and disposal of waste, together with monitoring and regulation of the waste management process. In this proposal, we present IOT based waste management system by incorporating waste segregation and to create awareness by providing short time Internet facility. The proposed system consists of an IOT module that is used to monitor wet and dry waste, also depending on the weight of the waste Internet will be provided to the user. A LDR is used to detect the status of the dustbin and authenticate to the concerned authority about the status of the bin.

KEYWORDS: waste, clean city, waste management, waste segregation.

1. INTRODUCTION

A rage of notable inflation in municipal solid waste generation has been registered worldwide. Table 1 shows the statistics of waste genrated. This has been found due to over population, industrialization, urbanization and economic growth and have caused immense effect on solid waste generation. Overflowing landfills are impossible to reclaim because of the unruly accumulation of wastes on outskirts of cities rooting vital environmental enlace in terms of water pollution and global warming. This has caused the average life time of the manual segregators to reduce [1].

In India, rag pickers play a crucial role in the recycling of urban solid waste. Rag pickers and conservancy staff have higher jejuneness due to infections of skin, respiratory system, gastrointestinal tract and other allergic disorders. Hinging on the rag-pickers can be diminished if segregation takes place at the source of municipal waste generation. The benefits of doing so are that a higher quality of the material is preserved for recycling which means that more value could be recaptured from the waste. The occupational hazard for rag pickers is reduced. Also, the segregated waste can be directly sent to the recycling and processing plant instead of sending it to the segregation plant and then to the recycling plant [2].

Place	Waste Generated
India	62 million tonnes per year
Karnataka	10000 tonnes per day
Bangaluru	6233 tonnes per day
Mangalore	226 tonnes per day

Table 1. statastics of waste generated

The economic value of the waste generated is not realized unless it is recycled completely and there are different techniques available to recycle and reuse the municipal solid waste [3], [4].

When the waste is segregated into basic categories such as wet, dry and metallic, it has an intense prospective of improvement, and accordingly, recycled and reused. The wet waste fraction is often converted either into compost or methane gas or both. Compost can replace demand for chemical fertilizers, and biogas can be used as a source of

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Crop Disease Prediction Using IoT and Machine Learning

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***Abstract*: For the fidelity agriculture, environment factors like rainfall, humidity, wind flow and light intensity are important. Therefore, variation in these environment factors with improper care will minimize the supply of crop because of which diseases occurring in the crop must be predicted so that these problems don't arise. If predicted earlier, farmer can be alerted in advance and appropriate precautions can be taken and the cost on pests will be less which will boost their wealth. Our system uses these environmental factors because of which the diseases in the crop can be known which will be helpful to the farmers. Sensors are used to read the data of these factors, with the help of theses we can if the crop is diseased or not using some of the machine learning algorithms. Because of this farmer can take warned earlier and they can take precautions that are needed priorly.**

***Keywords*: Crop disease, Random forest, IoT Prediction, Machine learning.**

1. Introduction

It is seen that diseases in the crop have become so problematic that reduces the quantity and quality of the crops in the agriculture. So, the experts need to detect these problems which might me expensive. In some of the places, the farmers cannot reach to experts and they have to travel long distances in order to get in touch with the experts. This might be expensive for the farmers and also lot of time will be consumed. Using IoT and machine learning, we can predict if there are any symptoms of disease in the crops or not. Several machine learning algorithms like random forest, regression can be used. This project focuses on every concept that are allied to agriculture. It is important to monitor the crops because even a single diseased crop can be the reason for the occurrence of diseases in many crops. This problem is very devastating that can discourage the farmers to cultivate the crops and because of this some of them have thought of giving up [1].

2. Materials and methodology

We used the two different data sets where one form is research data and another one is real time data which are collected using IoT (Internet of Things) devices. We used Arduino Uno board and the sensors DHT-11 and soil humidity sensors. We used DHT-11 to get the humidity and temperature data and soil humidity sensor is used to get soil moisture values.

It provides a user interface for the user to enter the conditions. The system model uses the machine learning algorithm to process the data so Flask API is introduced to integrate the system model and a web page. Flask API gives the json format of the system model through a web page we displayed the json content and it is in user readable format.

The backend model of the system is built using machine learning algorithms. For the best classification of the researched data we used RFC (Random Forest Classifier) algorithm. In this the data is randomly selected which are subset of the training data set. It creates a decision tree for each subset of training data set and it aggregates every decision tree to get final class of the test data Fig. 1. Gives how the prediction system's work flow goes. Major diseases we can in arecanut is Mahali/fruit and rot/Koleroga. These diseases cause major harm for the tree yield. The major reason behind these diseases are environmental conditions, we consider some important conditions which affect the arecanut tree. Table 1 shows the simple trained data set for prediction of arecanut disease. Which consists of important environment aspects that are affect the tree. The user has to provide the condition of the region and on that basis the system is trained and gives the final class of the test data. Table 2 gives the regional condition of past 2 years provided by CPCRI, Vittal. RFC takes the input randomly from the data set provides decision tree for each input of data it may be in hundreds or may be in thousands. The best class will be the final class of test data. After applying the RFC, it will produce the prediction score ranging from 1-10 based on the MIN_SCORE the occurrences of the disease is predicted. The MIN_SCORE set in the system is 4, if the score from the algorithm is less then it's considered as healthy condition. The threshold set is 8 for the system if the score exceeds the threshold then it is classified as highly probable condition for the tree. The outputs are shown to the user based on their set of conditions [3][5].

3. Results

In this section we used machine learning algorithms for the prediction. The output of the system is final class of the test data. The system is trained and the RFC algorithm will take inputs randomly. Here we used 300 decision trees for the

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Black Box for Vehicles

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***Abstract*: The main purpose of this project is to develop a prototype of the Vehicle Black Box System VBBS that can be installed into any vehicle all over the world. This prototype should be designed with minimum number of circuits. The VBBS can contribute to constructing safer vehicles, improving the treatment of crash victims, helping insurance companies with their vehicle crash investigations, and enhancing road status in order to decrease the death rate. According to the survey of world health organization on road safety 2015, reflecting data of 180 countries shows that total number of road traffic deaths is more than 1.25 million per year. Therefore, in addition to improving the treatment of crash victims and the road status in order to decrease the death rate, constructing safer vehicles, and helping insurance companies with their vehicle accidents investigations, the main purpose of this project is to develop a black box system that can be installed to any vehicle all over the world.**

***Keywords*: Black Box, Evidence collecting system, Global Positioning System (GPS), Global System for Mobile Communication (GSM), Microcontroller, Vehicular network.**

1. Introduction

In order to avoid these collisions the Black Box system can be the first step towards the solution. By using the same concept of black-box used in flights we can implement it into vehicles to investigate vehicle crash. This system could be the ultimate solution for investigation and insurance claims and also to improve the vehicle designs and safety features for future.

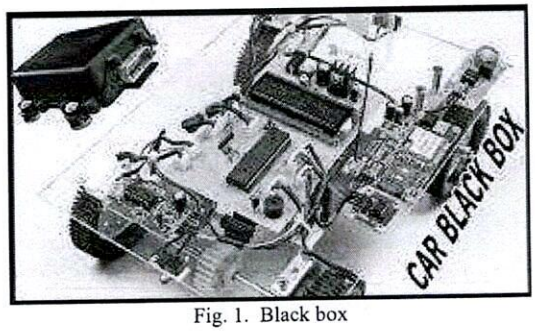

Fig. 1. Black box

A large number of vehicles currently on the roads have electronic systems that record information in the event of crash. That's why it is important to have a video recording system into your vehicle to record the on time vehicle environment activities. This system contains mainly three major units first one is the recording unit, second is storage unit, and third unit contains the recharging system. To send immediate reaction in case of accident & vehicle security breach or any emergency situation. It will help to find out the exact position of the vehicle. It will also help to provide emergency responders with crucial information at the earliest possible time. It helps in reducing the time between when an accident takes place and when it is detected can reduce mortality rates.

2. Proposed System

We are proposing another technique utilizing black box to discover how an accident happened. In order to avoid this collisions the Black Box system can be the first step towards the solution. By using the same concept of black-box used in flights we can implement it into vehicles to investigate vehicle crash. This system could be the ultimate solution for investigation and insurance claims and also to improve the vehicle designs and safety features for future. A large number of vehicles currently on the roads have electronic systems that record information in the event of crash. That's why it is important to have a video recording system into your vehicle to record the on time vehicle environment activities. This system contains mainly three major units first one is the recording unit, second is storage unit, and third unit contains the recharging system.

3. Block diagram of Proposed System

This system involves enhancement of security by preventing tampering of the Black Box data. The Short Message Service (SMS) in the case of occurrence of an accident will sends an alert message to a pre stored mobile number of Black Box. The Arduino controllers are used to regulate the sensors. Minimum number of circuits designed in this prototype. This project contributes to constructing safer vehicles, helping insurance companies with their vehicles crash investigations, improving the treatment of crash victims, and enhancing roads status in order to decrease the death rate.

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Virtual ATM Card - The Next Generation Security

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***Abstract*: Credit card deception is a common problem in today's world. Financial institutions have registered major loses till today due to users being exposed of their credit card information. Based on the data, the bank convoyed a community to simple transaction payment in the market. Bank just used a debit card or a credit card for carrying out the transaction or other ATM services, the banks need more investment for infrastructure and, it is very expensive. Based on that cause the bank needs another solution for low-cost infrastructure. Obtained from solutions that, the bank implementation QR Code authentication online is one solution that fulfills. This application is used for carrying out transactions or other banking service purposes by the account holder. The transaction permits in this study lie in the encryption, or decryption transaction permission and QR Code Scan to uplift communication security and transaction data.**

***Keywords*: Banking, Android app, security, QR code scan.**

1. Introduction

The digital virtual ATM card plays an influential character in securing the account of the customer. Credit card dishonesty is a common problem in this today's world, we see Shoulder-surfing or observation attacks, including skimming and video recording with the tiny hidden cameras while the users perform PIN-based authentication at ATM termini is one of the common threats for common users. Researchers have strived to come up with reliable solutions for secure PIN authentication. In this paper, we introduce Security PIN Authentication for providing security for account holders by using virtual ATM cards and connecting Smart Phones. QR Code is the label for a type of matrix barcode. A QR code is a machine-readable optical label that holds information about the item to which it is imputed. Security PIN Authentication allows a user to scan a QR code from the screen of a point-of-service termini and connects to the bank's server. Security PIN Authentication server to obtain secure one-time-use PIN templates. Here, a PIN template is a sequence of digits with marked positions for the user to enter the actual PIN code. The QR code scanning is done using mobile devices. The virtual ATM card is also used in Security PIN Authentication service that are used via smartphones.

2. Proposed System

The customer uses an android application for the transaction. The bank uses the website to track the customer transaction. Both the user and bank are linked to the same database. When the users scan the QR code in the ATM, Bank server provides secure authentication and asks for security pin to user in android application. After verifying the pin automatically allows the user to access the ATM. After this transaction database automatically update the card number so that the security increases.

3. Literature Survey

A. Electronic Payment System

Electronic payment refers to the mode of payment, which doesn't include physical cash or cheque. It includes debit cards, smart cards, credit cards, etc. It provides encryption, and requests for more identification in case of doubts. Compare the credit card issuing bank's country with billing address country. The risk in electronic payment is the theft of payments data, personal data. The successful implementation of EPS depends on how the security and privacy dimensions perceived by consumers as well as the seller adequately managed [1].

B. Mobile Wallet

Leveraging new technologies connects directly to a productive software experience in the customer's hand to help enhance their experience and educate them. A customer can utilize all of their stored information only by opening an app on their phone. Entering a pin, password or fingerprint and then selecting the information they need to access. The app will utilize information transfer technologies such as Near-field communication to interact with mobile wallet ready payment techniques. This results in reduced fraud since mobile wallets are harder to steal or duplicate than cards. A disadvantage is that only mobile-service people can use such services [2].

C. Biometric Detection

This paper examines policy regarding the biometric approaches towards automated teller machine (ATM) for

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Implementation of Currency Recognition System

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***Abstract*: Currency is a medium of exchange for goods and services. Briefly, it's money, in the form of paper or coins, usually issued by a government and generally accepted at its face value as a method of payment. With the constant development of technologies and digitalization, the utilization of Master cards and other electronic types of payment has drastically increased, yet money is still being broadly utilized for ordinary exchanges because of its convenience. However, taking consideration of visually disabled people or blind people, it is somewhat difficult task for them to identify the paper currency without the help of brail marking on it. In this paper, we proposed a system for automated currency recognition using image processing techniques for Indian banknotes. The method proposed in this system can be used for recognizing denomination or value of a given currency note. Only paper currencies have been taken here. The method first works by image acquisition and pre-processing to increase the visual appearance of images and improve the impact of datasets which is followed by extracting features using characteristics such as size, color, or text on the note to find the denomination of the notes. Feature extraction depends on how much the notes within the same country differ. The extracted features are then used to recognize currency and generate audio output.**

***Keywords*: Image processing, Feature extraction, Aspect ratio, Denomination, Binary image, Currency recognition.**

1. Introduction

There are around two hundred plus currencies presently circulating around the world. The Indian currency called as Indian rupees are issued by Reserve Bank of India. The RBI has issued banknotes in the denomination of Rs. 10, Rs. 20, Rs. 50, Rs. 100, Rs. 200, Rs. 500 and Rs. 2000 till date. Each of these currencies unique features such as size, color, motif and texture. Comparing to the olden times, the trade and commerce within the country have increased in all sorts of levels. It has been extremely important for acquiring knowledge about all the currencies by the banks. However, taking consideration of visually disabled people or blind people, it is somewhat difficult task for them to identify the paper currency without the help of brail marking on it. Thus there is the need for an efficient automated system that helps in recognizing notes and making it easy and efficient for visually impaired.

We proposed an automated system for currency recognition using Image processing techniques.

Firstly, the nature of each image is refined to convert it into a usable input to extract various pictorial information in pre-processing phase. Secondly system then extracts the region of interest based on features such as size, color and text.

On the basis of these regions of interest, the system first determines the denomination of currency using differentiating characteristics of each note within the same currency. The chosen characteristics would be size, color, motif or text on the currency note. The extracted information is then used to generate the audio and display the output.

This paper consists of many sections as follows. Section II is about the previous works done in the field of currency recognition. Sections III and IV will explain about the method proposed with the various techniques used in detail. Section V presents the results obtained by the implementation of the model. Finally, Section VI concludes the paper.

2. Background

First the image input is scanned. Then the image is read using MATLAB. Image processing is performed by gray scale conversion and then by binary scale conversion. If any noise is introduced it is removed. Then feature extraction is performed. After performing these steps for both real currency and fake currency pattern matching is done considering unique characteristic like black strip [1]. The system can work for assisting visually impaired people to correctly determine denomination of the currency notes. It can help to distinguish original note from counterfeit note. If any damage occurs in middle of the process, then the image need to be scanned again.

Image analysis and image processing are the main techniques in this system. Image processing is preprocessing followed by signal processing. The output of the system can be either a set of characteristics or an image or the parameters related to the image. The image is regarded as 2D signal generally and it applies some standard signal processing techniques in which image processing techniques are involved. Image analysis is necessary information from an image is extracted by means of digital image processing techniques. Image segmentation is the

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Butterfly Species Identification Using Convolutional Neural Network

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Abstract: **Butterfly Species Identification project focuses on identifying different butterfly species based on different categories. The main idea of the project is to consider around ten butterfly species for the classification purpose. The gathered data set consist of nearly 830 images of different classes. The manual approaches for butterfly classification is a tedious task and costly as well as it might include gathering the data, recognition and physically archiving specimen images. Therefore, Convolutional Neural Network (CNN) has been implemented as it is an automated method which doesn't require any human intervention. The testing carried witnessed 90% overall classification accuracy on consideration of ten classes of 832 images.**

Keywords: **Butterfly species, Convolutional Neural Network (CNN).**

1. Introduction

There exist nearly 17,000 species of butterfly recordings throughout the globe. These variety of species respond to climate change and also interact with plants. Therefore, the identification of species is crucial inspite of complexity. The classification of species requires information on their morphology. The traditional methods of butterfly's taxonomy differentiates species of butterflies by the analysis of color, texture and size of the wing spot and other anatomical features. The existing system can classify the butterflies by their outer morphological qualities, genetical character which should be carried out manually by preparing genetical slides manually using chemical substances and various processes. Common man doesn't always have the ability to prepare these slides. Therefore, there is a need to computerize the human effort to recognize the butterfly easily and efficiently. So the main objective of this project is to aim at evaluating a computer vision and machine learning system that correctly identifies butterfly species easier, faster and cheaper than traditional methods.

2. Literature Survey

Butterfly Identification using Convolutional Neural Network (CNN): In this paper firstly classification of images, detection of the objects and segmentation is included. CNN is well known for the power focused low assortment in inputs, they require low pre-processor for execution. ResNet, AlexNet, ZFNet and Google Net, the most pre-trained Convolutional Neural Networks that are available. Uploading the butterfly image is the beginning of the application. Images from the data are resized into 224x224 pixels. Google Net which is pre trained is used to classify resized butterfly images. Due to good performance of implementation of CNN technique by using Google Net as CNN, Confusion Matrix is used to calculate accuracy after the completion of the process. Lastly butterfly image will be identified with display of the habitat information. This research involves the division of the data into training and testing for which 80% and 20% of the data is dedicated respectively. The Black, Veined Tiger, Chocolate Grain Yellow, Grey Pansy and Plain Lacewing are the 4 divided types of the testing results of the classified butterfly species. Around thirty images are considered for training and testing the count of TRUE and FALSE outcome of identification in confusion matrix form. Around 97.5% is the overall accuracy of the process conducted. Therefore, implementation of the Convolutional Neural Network is concluded as a successful method for the identification of the Butterfly Species as this involves highest accuracy record.

3. Proposed System

In our project we first considered ten categories of 832 butterflies for the study. The images of butterflies that sums up the characteristics of members of the particular category is defined. The butterfly images are stored in the form of dataframes, to differentiate the types of category. Once, optimum characteristics of each species determined the similarity measures that are simpler therefore faster than image texture methods. First we should resize the images to standard pixel i.e. 128x128. Transform the labels to numeric form by using Label Encoding function and One Hot Encoder function to split the columns which contains numerical categorical data. Out of 832 images we should split major amount of images for training and remaining will be directly for testing. Sequential Model containing about 5 layers and CNN network building is done. Batches of the Dataset is created for which epoch is made equivalent to fit the model, from which the outcome is raised which includes loss and accuracy percentage thus classifying images of various species.

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Classification and Identification of Object in an Image

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***Abstract*: Computer Vision is the branch of the science of computers and software systems which can recognize as well as understand images and scenes. Computer Vision is consists of various aspects such as image recognition, object detection, Supply vector machine. Object detection is widely used for face detection, vehicle detection, web images. In this project, we are using highly accurate object detection-algorithms, SVM and Fast yet highly accurate ones like YOLO. Using these methods and algorithms, based on machine learning requires lots of mathematical and deep learning frameworks understanding by using dependencies such as OpenCV, imageai etc, we can detect each and every object in image by the area object in a highlighted rectangular boxes and identify each and every object and assign its tag to the object. This also includes the accuracy of each method for identifying objects. The Objective is to detect of objects using You Only Look Once (YOLO) approach. This method has several advantages as compared to other object detection algorithms.**

***Keywords*: Convolutional Neural Network, Fast-Convolutional Neural Network, Bounding Boxes, YOLO.**

1. Introduction

Object detection is a technology that detects the semantic objects of a class in digital images and videos. One of its real-time applications is self-driving cars. In this, our task is to detect multiple objects from an image. The most common object to detect in this application is the car, motorcycle, and pedestrian. For locating the objects in the image we use Object Localization and have to locate more than one object in real-time systems. There are various techniques for object detection, they can be split up into two categories, first is the algorithms based on Classifications. CNN and RNN come under this category. In this, we have to select the interested regions from the image and have to classify them using Convolutional Neural Network. This method is very slow because we have to run a prediction for every selected region. The second category is the algorithms based on Regressions. YOLO method comes under this category. In this, we won't select the interested regions from the image. Instead, we predict the classes and bounding boxes of the whole image at a single run of the algorithm and detect multiple objects using a single neural network. YOLO algorithm is fast as compared to other classification algorithms. In real time our algorithm process 45 frames per second. YOLO algorithm makes localization errors but predicts less false positives in the background title also can be copied and paste it, when you need new section and type the section heading as per your requirement.

2. Literature survey

You Only Look Once: Unified, Real-Time Object Detection, by Joseph Redmon. Their prior work is on detecting objects using a regression algorithm. To get high accuracy and good predictions they have proposed YOLO algorithm in this paper. Understanding of Object Detection Based on CNN Family and YOLO, by Juan Du. In this paper, they generally explained about the object detection families like CNN, R-CNN and compared their efficiency and introduced YOLO algorithm to increase the efficiency. Learning to Localize Objects with Structured Output Regression, by Matthew B. Blaschok. This paper is about Object Localization. In this, they used the Bounding box method for localization of the objects to overcome the drawbacks of the sliding window method.

3. Working of YOLO algorithm

First, an image is taken and YOLO algorithm is applied. In our example, the image is divided as grids of 3x3 matrixes. We can divide the image into any number grids, depending on the complexity of the image. Once the image is divided, each grid undergoes classification and localization of the object. The objectness or the confidence score of each grid is found. If there is no proper object found in the grid, then the objectness and bounding box value of the grid will be zero or if there found an object in the grid then the objectness will be 1 and the bounding box value will be its corresponding bounding values of the found object. The bounding box prediction is explained as follows. Also, Anchor boxes are used to increase the accuracy of object detection which also explained below in detail.

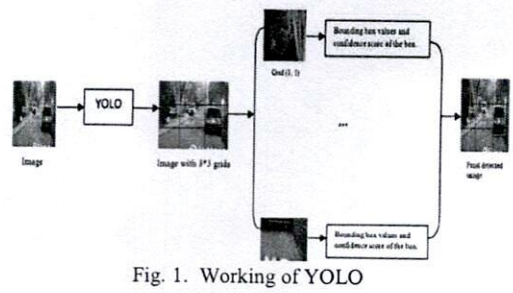

Fig. 1. Working of YOLO

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Design and Development of Hyperloop Train

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***Abstract*: Transportation is an industry in constant flux forced to keep up with ever growing human population. While providing faster and cheaper methods of travel. In hundred years the industry has made great improvements, has seen by the replacement of horses with the large scale implementation of mechanized cars, trains, planes and boats. The Hyperloop, a new transportation concept idealized by Elon Musk. This system is a proposed mode of transportation that propels a capsule like vehicle through a vacuum tube at more them airline speed. Preliminary analysis indicated that such a route might obtain an expected journey time 35 minutes, meaning that passengers would transverse the 350 mile (560 km) route at average speed of around 600 mph (970 km/h) with top speed of 760 mph (1,200 km/h). Hyperloop consists of a low pressure tube with capsules that are transported at both low and high speeds throughout the length of tube. Passengers may enter and exit Hyperloop at stations located either at the end of the tube, or branches along the tube length.**

***Keywords*: Air bearings, Capsules, Hyperloop, Magnetic levitation, Pod, NSDLIM.**

1. Introduction

HYPERLOOP is a very high-speed maglev train that travels by vacuum cylindrical tube to overcome speed limit from wheel–rail friction and air resistance. In superconducting maglev (SCMaglev), which is the fastest magnetic levitation train in Japan with a 603 km/h maximum speed, linear synchronous motor is applied for propulsion, and superconducting electromagnet and null flux coil are applied for both levitation and guidance. At present, there are only systems that perform a maximum of two functions among propulsion, levitation, and guidance. With many devices in the tube, the system gets complex so there are a lot of disadvantages in terms of cost, operation, and control. In this paper, a non-symmetric double sided linear induction motor (NSDLIM) that could conduct propulsion, levitation, and guidance is suggested as an all in one system for hyperloop. NSDLIM concepts such as structure and mechanism of three functions are introduced. NSDLIM is a new system that has not been studied, so requirements are investigated and a basic model is designed with several approx. private assumptions. Then by using the infinite-element method (FEM), characteristics are analyzed and parameters that affect performance are investigated. Through changing parameters, an improved model is derived and its possibility is proposed.

2. Literature review

1. Elon Musk

In August 2013, the CEO of Tesla Motors and SpaceX, Elon Musk released a design document for a new high speed transportation concept. He came up with the idea for a vacuum and maglev powered super-fast train that would travel through a tube. It would be called Hyperloop. In a research paper, he outlined its potential and challenged the other tech companies to develop it for commercialization. This new system would transport passengers and cargo within pressurized capsules that travel through tubes at similar or higher speeds than air travel.

2. The MIT Hyperloop Team

They competed in the SpaceX Hyperloop competition from June 2015 to January 2017. The goal for this competition is to design and build a scaled Hyperloop pod to test in a 1-mile long test track in Hawthorne, California. In doing so, the teams develop technology that could one day be used in a full-scale Hyperloop system. A droplet shaped aero-dynamics shell is most effective at delaying flow separation, lowering the drag substantially. By investigating the performance of the design at transonic speed, it was also found that violating the Kantrowitz Limit could lead to three-fold increase in drag coefficient for an increase in Mach-number from 0.65 to 0.80.

3. Ahmed Hodaib, Samar F. Abdel Fattah (May 2016)

They discussed the "Design of a hyperloop capsule with linear induction propulsion system" which is used to accelerate and decelerate the capsule. They studied that like rotary synchronous motors, linear motors run on 3-phase power and can support very high speeds. However, there are end effects that reduce the motor's thrust force. Linear induction motors are thus less energy efficient than normal rotary motors for any required force output. They also discussed about the manufacturing of linear induction motor in this paper.

4. Jeffrey C. Chin, Justin S. Gray, Scott M. Jones, Jeffrey J. Berton

They discussed about the "Open-Source Conceptual Sizing Models for the Hyperloop Passenger Pod" in this paper. They concluded that the refined analysis illuminates several interdisciplinary couplings that alter two major aspects of the initial concept. First, the pod travel speed and the tube cross sectional area are linked, forcing the tube size to be to be roughly twice the diameter of the original specification, in order for the pod to reach Mach 0.8. Second, the steady-state tube temperature is dominated by ambient thermal interactions