In recent years, demand for small antennas in wireless communication has rapidly increased. Antenna plays a major role in wireless systems. Antenna works with great efficiency only in certain range of frequencies, this means that the design of antenna greatly impacts the overall performance of wireless system. Most of the applications using radio communication are not secure and reliable. This can be overcome by using Bluetooth. For a Bluetooth connection to be well established, efficient antenna is required. This project is a step towards improving performance of the Bluetooth antenna, thus improve the overall efficiency of wireless systems. This Bluetooth antenna is designed using HFSS software with FR4 epoxy as substrate. The simulated antenna will be operating at resonant frequency of 2.47 GHz, which is also the frequency range for a Bluetooth communication. Good gain and directivity can be obtained using this Bluetooth antenna which is desirable for wearable communication devices in military application.

Srivalli Gundala
Srinivasa Baba VSSN

Compact Wearable Bluetooth Antenna

Dr. Srivalli has completed B.Tech in ECE, M.Tech. in Microwave Engineering and Ph.D. in Microwave Communications. She has 23 years of teaching and research experience and published 25 research papers in various national and international journals. Currently, she works in Dept. of ECE, GNITS, Hyderabad, India.

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Srivalli Gundala
Srinivasa Baba VSSN

Compact Wearable Bluetooth Antenna

Srivalli Gundala
Srinivasa Baba VSSN

Compact Wearable Bluetooth Antenna

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INDEX

Digital image processing is the use of computer algorithms to perform image processing on digital images. Digital image processing has many advantages over analog image processing. It allows a much wider range of algorithms to be applied to the input data and can avoid problems such as the build-up of noise and signal distortion during processing. Digital image processing allows the use of much more complex algorithms for image processing, and hence, can offer both more sophisticated performance at simple tasks, and the implementation of methods which would be impossible by analog means.Medical images are produced rapidly recent years. Almost every day, huge medical visual data are produced from X-ray, Computed Tomography (CT) scanner, Magnetic Resonance Imaging (MRI) scanner and so on. The images, if processed appropriately can provide very useful information to assist doctors in diagnosis.Tumor is one of the most common brain diseases, so its diagnosis and treatment have a vital importance for more than 400000 persons per year in the world (based on the World Health Organization (WHO) estimates).

Chindam Hari Prasad

MRI Image Segmentation for Detection of Brain Tumors

Chindam Hari Prasad is an Assistant Professor with Twenty Two years of Teaching experience working with G. Narayanamma Institute of Technolgy & Science. He specializes in Embedded Systems.

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Chindam Hari Prasad

MRI Image Segmentation for Detection of Brain Tumors

Chindam Hari Prasad

MRI Image Segmentation for Detection of Brain Tumors

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INDEX

This book mainly focusses on a safety system for workers in mining industry. Mining is the process of extracting valuable minerals from the earth. There are about 11 coal mines, 13 iron ore mines, 9 bauxite (aluminum ore) mines, 5 manganese mines, 5 copper mines, 3 diamond mines and 2 gold mines in India. In mining industry there is a high safety risk due to problems like mine ventilation, danger from hazardous gases, incidents like rock fall and head injuries. Some small incidents often occur in the mining industry but two major mining hazards that occurred in India lead to think about the safety of miners more deeply. The Chasnala mining disaster killing 372 miners and the Jharkhand coal mine incident that killed 11 miners and trapped over 50. Thus, a safety device is necessary to protect miners and rescue them even in case of such incidents.

Tulasi Sowjanya B

Mining Safety System

The author is working as professor at one of the engineering colleges in India. She is in this profession since 18+ years and currently pursuing PhD from a reputed university.

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Dining is enjoyed by everyone whenever people go on vacations, holidaying and other activities. The quality of service provided by restaurants is always appreciatable if they serve as per our needs and this all depend on the dining and the quality of service provided by them to the customers. But sometimes there is a delay in this service and the customers get irritated. It is not totally fault of either the hotel-staff due to work load of taking continuous orders and customers are also in a jiffy to move ahead in their routine work. So, remedy to the issue is that a smart restaurant menu ordering system which is direct connection between customer and the hotel chef and the order will be placed directly to kitchen.

Parupalli SriPadma

Smart Restaurant Menu Ordering System

The author is a Faculty in a reputed engineering college, interested in research in the areas of Image Processing, Artificial Intelligence

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Data transmission is the most common functionality our modern Human civilizations rely on. Securing Data during communications or transmissions has become a pressing issue to deal with. Initial ways to secure included cryptography and encryption techniques. Recent studies revealed promising security implementations possible with Physical layer techniques. A new field called Information Theoretic security studies has been developed to study physical layer techniques. This study considers a main legitimate channel and an Eavesdropper's channel. Various metrics such as Secrecy Outage Probability, Strictly positive secrecy capacity are derived to characterize the channels to understand security. Randomness is understood to be the key element in Physical layer security. In this paper, we consider Fading in channels to enable randomness. For different fading channels, defined metrics are derived. To overcome the limitations of Outage Probability, a new metric called General Secrecy outage probability is derived. In this paper, how various factors such as SNR ratios, Rician factors affect those characterized metrics is observed. For different theta values, secrecy conditions are analyzed.

Sujatha Allipuram Reddy

Secrecy Performance of the Wiretap Channel

Sujatha Reddy A. completed Bachelor and Master's Degree from JNTUH, and currently is working as assistant professor in GNITS.

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Sujatha Allipuram Reddy

Secrecy Performance of the Wiretap Channel

Sujatha Allipuram Reddy

Secrecy Performance of the Wiretap Channel

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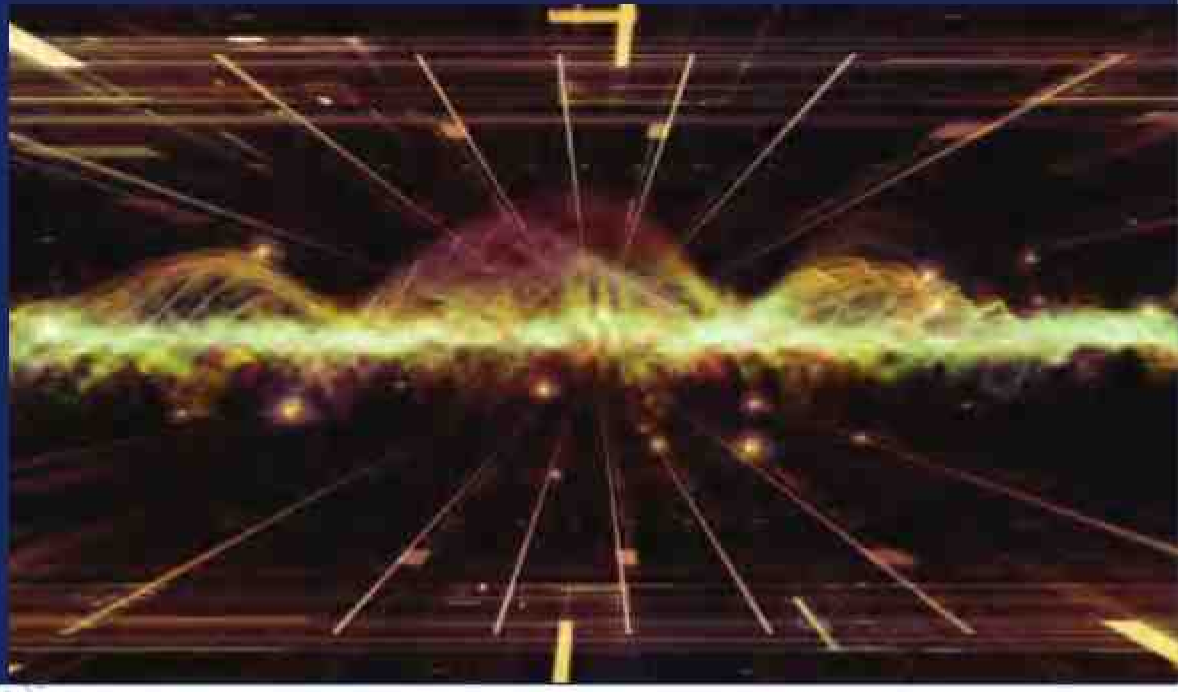
Wireless communication plays an important role in the surveillance and control systems deployed in the marine environment. Currently, there is an increasing concern with the information security in various marine projects including offshore hurricane monitoring, offshore earthquake surveillance, offshore wind farms, etc. In the marine environment, usually there exists a line-of-sight (LOS) between the transmitter and the receiver, thus the RF fading can be characterized by the Rician distribution. In the present work, we conduct an analysis on the security of various Fading channels in the context information theoretic secrecy (ITS). Communication security is critical in the marine environment as information maybe transmitted over large open areas like high seas. In this work, an analysis will be conducted on the probability of secrecy capacity for wireless communications over various fading channels. In particular, a closed form expression for the probability of strictly positive secrecy capacity is derived. The result is applicable to the scenarios of Rayleigh/ Rayleigh, Rician/ Rayleigh, Rayleigh.



Sujatha Allipuram Reddy

Probability of Strictly Positive Secrecy Capacity of Fading Channels

Sujatha Reddy A. completed Bachelors Degree and Master's Degree from JNTUH, and currently is working as assistant professor at GNITS.

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Sujatha Allipuram Reddy

Probability of Strictly Positive Secrecy Capacity of Fading Channels

Sujatha Allipuram Reddy

Probability of Strictly Positive Secrecy Capacity of Fading Channels

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The results obtained in this system using MFCC+LPCC with SVM are commendable. The recognition rate ofsystem is 81.2% for IITKGP-SESC, 78.6% for EmodB and 70% for real time recorded database. The MFCCs and LPCCs corresponding to each utterance of the each emotion of databases have been computed and their fusion is used for feature extraction along with their delta and double-delta coefficients. These extracted features of training files are trained to the SVM model. Later the features of test files are given as input to SVM classifier for prediction. Then the classification of testing samples is done and the percentage of both matched and mismatched emotion is computed using confusion matrix. The performance of the real time recorded database is limited by the external factors which affect the speaker's utterances like noise in signal, environment where recording is carried out. The performance can be increased by using high quality audio devices in noise free environment. Also large number of training samples turn out to increase performance. To conclude, it can be firmly stated that despite certain limitations, this system provides appreciable efficiency and accuracy.

Chandrasekhar Paseddula

Support Vector Machine Based Speech Emotion Recognition

A Practical Implementation

Chandrasekhar Paseddula. Assistant Professor, ECE, G. Narayanamma Institute of Technology and Science, Hyderabad.

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Chandrasekhar Paseddula

Support Vector Machine BasedSpeech Emotion Recognition

Chandrasekhar Paseddula

Support Vector Machine BasedSpeech Emotion Recognition

A Practical Implementation

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SUPPORT VECTOR MACHINE BASED SPEECH EMOTION RECOGNITION

Chandrasekhar Paseddula

Assistant Professor

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGG

G. NARAYANAMMA INSTITUTE OF TECHNOLOGY & SCIENCE

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We convey our gratitude to all the staff members, family & friends those who have directly or indirectly involved in completing this book.

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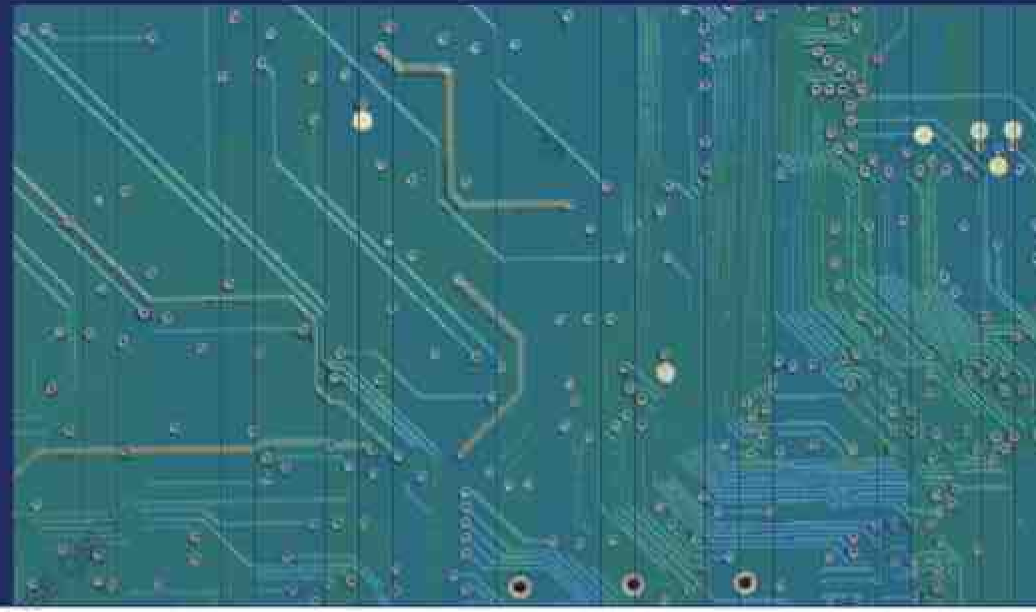
The results obtained in this system using and interfacing several modules are commendable. "Smart and safe child rescue system from open bore well" is mainly designed to save many lives of children who fall inside the bore well. In the past 10 years, lots of lives had been lost by falling in to the bore well because digging a pit beside the bore well is very tedious and time consuming process. By using bigger motors, arms and advanced technology this system can be implemented more successfully. Thus through this system, we developed a rescue robot which goes into the bore well through the wheels employed and rescues the child.

The performance of real time child rescue robot is limited by lack of internet connectivity deep down as the depth increases. In deeper bore wells where there are no connections, alternative technologies like Lo-Ra modules can be used. Also, if the weight of the baby is so high that the robotic arms cannot carry, there is a risk of dropping the baby down. To conclude, it can be firmly stated that despite certain limitations, this system provides considerable efficiency.



Chandrasekhar Paseddula

Smart and Safe Child Rescue System from Borewell

A Practical Implementation

P. Chandrasekhar, Assistant Professor, G. Narayanamma Institute of Technology and Science, Hyderabad.

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Chandrasekhar Paseddula

Smart and Safe Child Rescue System from Borewell

Chandrasekhar Paseddula

Smart and Safe Child Rescue System from Borewell

A Practical Implementation

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Smart and Safe Child Rescue System from Borewell

Author: Chandrasekhar Paseddula,
Assistant Ptofessor,
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Hyderabad

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Many thanks to our parents who have been a great source of strength all through this work and to our friends whose support was very valuable in completion of the work. We will be indebted to them.

INDEX

India is home to the second largest road network in the world with a total road length of approximately 62.1 lakh kilometres. This massive network serves as the nation's lifeline transporting over 64.5% of all goods within the country in addition to being the preferred option for move of over 90% of India's passenger traffic. Drowsy driving is one of the major causes of road accidents and death.
Hence, detection of driver's fatigue and its indication is an active research area.
Most of the conventional methods are either vehicle based, or behavioural-based or physiological based.

Padmaja C.

DRIVER DROWSINESS SYSTEM USING VISUAL BEHAVIOUR AND MACHINE LEARNING

Dr. C. Padmaja working as Assistant Professor in ECE Department at GNITS, Hyderabad. She published 9 International Journals and 6 International conferences in her credit.

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In the past few decades, there has been a significant rise in the number of female participation in forced industrialization. Because of this, a lot of female employees must travel to and from work every day and taking care of infants has now become a challenge for such females. Such females need to rely on a third person to take care of the baby. Mother always worries about the well-being of the baby. The proposed idea in this prototype of a smart cradle will allow the cradle to efficiently integrate itself with a smartphone typically an Android device. An Arduino Uno microcontroller will be used to assemble all the sensors and hardware components required. There will be continuous observation of the infant inside the cradle. The cradle is suitable for parents who are not able to invest all their time at home sitting near the baby.

TALLURI SRILATHA

SMART CRADLE SYSTEM

Srilatha Talluri
Working as an Assistant professor in a Reputed engineering college. Author's research interests are doing hardware projects based on various microcontrollers and sensors.

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TALLURI SRILATHA

SMART CRADLE SYSTEM

TALLURI SRILATHA

SMART CRADLE SYSTEM

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SMART CRADLE SYSTEM

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The main aim of the project is to design a system which is capable of automatically deducting the amount of petrol dispensed from user card based on RFID technology. The project mainly aims in designing a prepaid card for petrol bunk system and also petrol dispensing system using RFID technology. In current days the petrol systems are operated manually. These petrol pumps are time consuming and require more man power. All these problems are sorted out by the use of unmanned power pump which requires less time to operate, it is effective and can be installed anywhere.

TALLURI SRILATHA

RFID BASED AUTOMATED PETROL PUMP SYSTEM

TALLURI SRILATHA
Assistant professor in an engineering college, India. Academic interests are guiding the students to do hardware projects in electronics.

9 786206 738107

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TALLURI SRILATHA

RFID BASED AUTOMATED PETROL PUMP SYSTEM

TALLURI SRILATHA

RFID BASED AUTOMATED PETROL PUMP SYSTEM

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In agriculture there is need for a technology that is more easily understood, implemented and used by the farmers. Equipment that requires less human effort and time with less cost of implementation is much required for success in agricultural industry. Farmers face problems such as lack of timely availability of efficient workforce, as many have migrated from country side. Hence, to reduce the burden of farmers, robotization in the field of farming is necessary. Autonomous robots built with less maintenance and that are portable as well as customizable according to the requirements might serve the purpose here and thus this project presents you the design of a four-wheel drive robot that does the work of seed sowing in ploughed agricultural land avoiding the human effort by tracing the path and sowing seeds at equal intervals using the field area parameters (length and breadth) and seed spacing intervals as inputs specified by the user. The project also helps to determine whether the plant is normal or diseased. The normal growth of the plants, yield and quality of agricultural products is seriously affected by plant disease.

SWATHI KARUMURU

Agribot for Seed Sowing and Fertilizer Spray

Internet of Things

Mrs K Swathi received her B. Tech degree in Electronics and Communication Engineering from Sri Sarathi Institute of Engineering and Technology and M. tech degree in Digital Electronics and Communication Engineering from GNITS and faculty of ECE, GNITS.

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SWATHI KARUMURU

Agribot for Seed Sowing and Fertilizer Spray

SWATHI KARUMURU

Agribot for Seed Sowing and Fertilizer Spray

Internet of Things

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1. INTRODUCTION

1.1 Overview

In current world, every process is getting automated and people are getting used to adopt smart techniques to get their work done. It can be seen that with flow of time, how seed sowing techniques and equipment's have kept on progressing [1]. Proper seed sowing is very important part of agricultural process and for the same purpose hand operated seed sowing machine have been designed and developed [4]. Despite agriculture being one of the most important fields for determining the growth of a country, it is lagging in terms of smart working. One of the biggest ironies is agriculture being the main occupation in many countries still it lags in using the smart techniques in this field. If technology is introduced in farming techniques there are chances that ever-growing populating in the coming future might be fed adequately. To suffice such a large amount, agricultural yield must also be increased rapidly. Due to poor seed quality & inefficient farming practices, and lack of cold storage and harvest spoilage, nearly 30% of the farmer's produce is wasted. Not in just theory practically we can see how automation helps in increasing output of farming, in US, where automation techniques in agricultural farming has already been implemented the cereal yield is nearly 6600 Kg/Hectare which is three times more than in India whose cereal yield is just 2600 Kg/Hectare approximately. These figures clearly shows that there is great need of introducing automation techniques in every small and big agricultural farming because, if appropriate measures are not taken at the right time, even though currently many countries has adequate stock of food to suffice its population, a time may come when same will not be able to feed its entire population. As a result of it the development of such countries will severely be affected and they may not be able to become a developed nation. Automation in seed sowing will help in proper use of available resources. To implement automation in the process of sowing seeds in agricultural farming, the machines that are already being used can be improved in design or new machines or attachments can be developed to do the necessary operations. But these machines or attachments should be cost effective and be affordable to the farmers. Hence a less expensive, distinct machine or attachment has to be designed and developed so that it can be used for different crops and in different seasons. It will help to increase output with same amount of input by sowing the seed at proper distance so that each seed gives best output as it is known that sowing of seed with proper gap is an important parameter in farming. For an agriculture sector to be successful one needs to add the booming technologies as input and take care of the processes and at the same time knowing the behavior of the technology and the major role that it is going to play in the sector of one's interest. In the present growing aspect the need to utilize the available technologies has become necessity in order to gain the best result. Roshan et al [1] discussed about sowing the seeds and composting them in a line at a desired depth, so that appropriate cover of soil is provided to the seeds. The developments in the seed sowing equipment were highlighted and distinctive sorts of seeding hardware's examined by Ramesh et al [2]. During the years, the machine is subjected to different design modifications with the focus on mechanical system design, to realize the objective of improving the performance in the fields [3-7]. The automation of different processes involved in the seed sowing machine were also investigated, like solar powered systems, utilization of seed metering systems, use of sensors with Bluetooth modules etc., [8-10]. With all these information and thoughts, automation of seed sowing machine using ESP8266 wifi module, relay and step down module has been developed in this research work. The fabricated machine is very convenient and the technology used to feed command to machine is IoT which lets the user to command the machine from anywhere. This will reduce the human effort and time taken to sow same area with better and constant spacing between seeds.

The Discovery of Agriculture is the first big step towards civilized life. And the agriculture sector has been under pressure in keeping pace with rising demand and shortage of man-power. In areas where 'Green Revolution' technologies had major impact, growth has now slowed. The land area under agricultural production has declined over time.

Farmers have been following traditional methods like manually opening of furrows by a country plough and dropping seeds by hand, and dropping seeds in the furrow through a bamboo/meta funnel attached to a country plough (Pora). For sowing in small areas dibbling i.e., making holes or slits by a stick or tool and dropping seeds by hand is practiced. In the current generation most of the countries do not have sufficient skilled man power specifically in agricultural sector and it affects the growth of developing countries. Future growth needs to be more rapid, more widely distributed and better targeted. Advancement of agricultural tools is the basic trend of agricultural improvement. So, there is a need to automate agricultural activities using Robotics as farming is the main livelihood in India.

The objective of "Iot Based Agri-Bot for Seed Sowing, Smart Leaf Infection Identification and Fertilizer Spray" is to develop a Raspberry Pi based system that helps in on-farm operations like Seeding, fertilization and monitoring soil parameters like soil moisture, Temperature and Humidity remotely using GSM. This project develops a system which minimizes the working cost and also reduces the time for linear seed sowing operation and fertilization. This brings down labor dependency. Seed sowing and fertilizing Agri-Bot will move on various ground contours and performs sowing the seed and fertilizing the crop. Energy requirement to this machine is less as compared to tractors or any agricultural instrument. Wi-Fi based Blynk App is used to manoeuvre robot in the field with the help of remote switches. The soil parameters can be monitored remotely by farmers from a registered GSM mobile number.

An IoT-based Agribot for seed sowing is an agricultural robot that leverages Internet of Things (IoT) technologies to automate the process of seed sowing in farming and gardening. It combines robotics, sensing devices, connectivity, and data analytics to enhance efficiency, precision, and productivity in seed sowing operations. Here's an introduction to the concept:

1. Automation and Robotics: The Agribot is a mechanized device equipped with robotic arms or mechanisms specifically designed for seed sowing. It can autonomously navigate through the field or garden, eliminating the need for manual intervention in the seed sowing process.
2. Seed Sowing Mechanism: The Agribot incorporates a seed sowing mechanism that is capable of handling various types of seeds. It ensures accurate seed placement at the desired depth and spacing, resulting in consistent plant growth and optimized use of resources.
3. IoT Connectivity: The Agribot is equipped with IoT connectivity capabilities, allowing it to communicate with other devices, sensors, and the internet. This connectivity enables real-time data exchange, remote monitoring, and control of the Agribot's operations.
4. Sensor Integration: The Agribot incorporates a range of sensors to gather data about soil conditions, moisture levels, temperature, and other environmental parameters. These sensors help optimize seed placement decisions based on real-time data, ensuring that seeds are sown in optimal conditions for germination and growth.
5. Data Analytics and Decision Making: The collected sensor data is processed and analyzed using data analytics techniques. This helps in making informed decisions regarding seed sowing patterns, adjusting seed density, selecting appropriate planting locations, and optimizing resource allocation.
6. GPS and Mapping: The Agribot may integrate GPS technology to accurately navigate the field or garden. This allows for precise positioning and mapping of the areas where seeds have been sown, providing valuable information for subsequent agricultural activities.
7. Integration with Farm Management Systems: The Agribot can be integrated with farm management systems and IoT platforms, enabling seamless data sharing, task scheduling, and coordination with other agricultural operations. This integration

provides a holistic view of the farming process and supports data-driven decision-making.

Benefits of an IoT-based Agribot for seed sowing include increased efficiency, reduced labor requirements, precise seed placement, optimized resource utilization, and improved crop yield and quality. By automating the seed sowing process and leveraging IoT technologies, farmers and gardeners can streamline their operations, enhance productivity, and make more informed decisions for sustainable agriculture.

It's important to note that the specific design and capabilities of an IoT-based Agribot for seed sowing may vary depending on the manufacturer, project requirements, and target crops. However, the underlying concept revolves around leveraging IoT connectivity and smart technologies to enhance the seed sowing process in agriculture.

1.2 Literature Survey

Amrita Sneha. A, E. Abirami, A. Ankita, Mrs. R. Praveen, Mrs. R. Srimeena conducted a research work on "Agricultural Robot for Automatic Ploughing and Seeding", 2015, IEEE International Conference on Technological Innovations in ICT. This explains on building a robot equipped for performing tasks like sowing, seed a partitioning. It likewise gives manual control when required and monitors the moisture with the assistance of dampness sensors. The fundamental segment here is the AVR At mega microcontroller that regulates the whole cycle. On the field, the robot works in an automated mode, however outside the field is carefully worked in manual mode. [1]

P. Usha, V. Maheswari, Dr. V. Nandagopal conducted a research work on "Design and Implementation of Seeding Agricultural Robot", IJRASET. This describes how can a robot be utilized to build up the way toward developing farming area without the utilization of labor. The point of this paper is to reduce the labor and time and also to increment the profitability rate. [2]

Nikesh Gondchawar, Prof. Dr. R. S. Kawitkar worked on "IOT Based Smart Agriculture", 2016, IJARCCE. It is an undertaking model for horticulture robot is depicted about the fresher situation of diminishing water tables, evaporating of streams and tanks, flighty climate presents a critical need of appropriate use of water. [4]

1. IoT-based Agribot for Seed Sowing:
    - Research focuses on the design and development of autonomous robotic systems for seed sowing in agriculture.

- Studies explore the integration of IoT technologies, such as sensors, connectivity, and data analytics, to enhance the efficiency and precision of seed sowing operations.
- Investigations into navigation algorithms, path planning, and obstacle avoidance for agribots in various terrains and field conditions.
- Analysis of IoT-enabled communication, remote monitoring, and control of agribots for improved decision-making and resource management.
- Evaluation of the impact of IoT-based agribots on crop yield, quality, and overall agricultural sustainability.

2. Smart Leaf Infection Identification:
    - Research focuses on the development of automated systems to identify and diagnose leaf infections or plant diseases.
    - Investigations into the use of IoT technologies, image processing, machine learning, and computer vision techniques for accurate and real-time detection of leaf infections.
    - Studies explore the integration of sensors, cameras, and imaging devices to capture leaf images and analyze them for disease identification.
    - Development of algorithms and models to classify and identify different types of leaf infections based on visual patterns, color analysis, and texture analysis.
    - Evaluation of the effectiveness of smart leaf infection identification systems in early disease detection, prevention, and crop management.
3. Fertilizer Spray:
    - Research focuses on optimizing fertilizer application methods, including the use of IoT technologies for efficient and precise fertilizer spraying.
    - Investigations into IoT-enabled devices and systems for monitoring soil conditions, nutrient levels, and crop requirements to determine the appropriate timing and dosage of fertilizer spray.
    - Studies exploring the integration of sensors and actuators to automate fertilizer spray operations based on real-time data and predefined thresholds.
    - Analysis of the impact of IoT-based fertilizer spray on nutrient uptake, plant growth, yield, and environmental sustainability.
    - Development of decision support systems and algorithms for intelligent fertilizer spray planning and optimization.

By conducting a literature survey, you can access up-to-date research and gain deeper insights into specific studies, methodologies, findings, and advancements in IoT-based Agribots, smart leaf infection identification, and fertilizer spray in agriculture.

1.3 Objectives

The main objectives of "IoT Based Agri-bot for Seed Sowing, Smart Leaf Infection Identification and Fertilizer Spray" are given below

- To construct a multi-purpose Agri-Bot
- To provide Automated Seed Sowing mechanism
- To provide Automated Fertilizer Spraying mechanism
- To monitor parameters like Humidity, Temperature remotely
- To control robot using Blynk App

1.4 MATERIALS AND METHODS

1.4.1 Problem Definition:

Growing the crop means ploughing the field and sowing the seeds into it. Three steps are mainly taken to sow the seed; Spreading the seeds over the soil, separate germination of seeds, and sowing the seeds into the soil. The two latter processes take more time and labour to complete the work. It being the area of concern needs to be looked upon. Hence, an idea to implement the automation in the process of seed sowing raised.

Therefore the aim was to design and develop a less expensive, distinct attachment to the machine so that it can be used in a easy way. For the fabrication, components were decided based on the material, factor of safety and the calculations were done to find out the speed of the machine at various output of the motor to be used to match the requirements. The design parts were modeled using solidworks software and the assembly was done to finalize the best position of the components.

At the manufacturing end, the chassis was fabricated to form the skeleton for the hardware. The belt and pulley drive was installed with the wiper motor for proper functioning of the prototype. For better transmission, the angle of contact of belt and pulley is kept near 180 degrees. The automation part was done after the fabrication was completed. The code was generated and the connections were made and testing performed successfully for the finally manufactured prototype.

1.5 Components of Seed Sowing Machine

The figure 1 shows the schematic diagram.

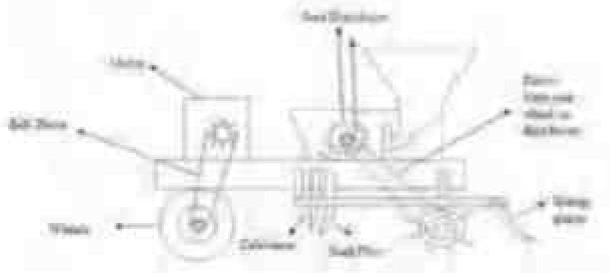

Fig. 1 Components

1.6 Basic Components

A Seed sowing machine is constructed using the following components:

D.C. Motors

It is used in the model to drive the front wheels which further drives the distributer.

Hoppers

It stores the seeds to be sown in the soil. Higher the capacity less the need to refill the hopper during process.

Seed Distributor

It consists of fluted rollers which are driven by rear wheel with the help of belt and pulley.

Cultivator

The work of the cultivator is to tilt the soil to the required depth so the distributer mechanism can sow the seed.

Belt and pulley drive

For transmission of power from motor to wheels belt and pulley drive is used in the machine and also to drive seed distributer.

The material used in fabrication of the machine is mild steel grade (MS). MS are used for manufacturing of truck-trailers, cranes, ship building, boilers, agricultural equipment and in many more fabrication and engineering industries.

1.7 Electrical Components

For automating the seed sowing operation, the following electrical components are used:

- Single channel relay
- Step Down module

• Wi-Fi ESP8266 microcontroller

• Jumper wires

• Battery (12 V)

1.8 Specifications of the Machine

The specifications of the machine is presented in table 1.

Table 1 Specifications of the seed sowing machine

Length	610 mm
Width	356 mm
Height	254 mm
Power transmission	Built and pulley
Hopper limit	1 Kg medium size seeds
Number of distributor rollers	2
Distribution mechanism	Fluted roller
Distributor driver	Rear wheel

2. IoT TECHNOLOGY

2.1 Introduction to IoT

The Internet of Things (or commonly referred to as IoT) based Home Automation system, as the name suggests aims to control all the devices of your smart home through internet protocols and cloud-based computing. There are more than 15 different smart home frameworks available for IoT developers to use and build their next generation of connected home products. Some of these frameworks are open source and some are closed-source.

The concept of Home Automation aims to bring the control of operating your everyday home electrical appliances to the tip of your finger, thus giving users affordable lighting solutions, better energy conservation with optimum use of energy. Apart from just lighting solutions, the concept also further extends to have an overall control over your home security as well as build a centralized home entertainment system and much more.

The IoT based Home Automation system offers a lot of flexibility over the wired systems as it comes with various advantages like ease-of-use, ease-of-installation, avoid complexity of running through wires or loose electrical connections, easy fault detection and triggering and above and all it even offers easy mobility. IoT based Home Automation systems consist of servers and sensors. These servers are remote servers located on the Internet which help you to manage and process the data without the need of personalized computers. The internet-based servers can be configured to control and monitor multiple sensors installed at the desired location.

The Internet of Things (IoT) refers to a network of interconnected physical devices, vehicles, appliances, and other objects that are embedded with sensors, software, and network connectivity, allowing them to collect and exchange data. These "smart" devices are capable of communicating with each other and with humans over the internet, enabling a wide range of applications and services.

The concept of IoT revolves around the idea of connecting everyday objects to the internet, allowing them to interact and share information autonomously. These objects can include anything from smartphones, wearables, and home appliances to industrial machinery, vehicles, and infrastructure components. By connecting these devices and enabling them to communicate, IoT creates a network of interconnected systems that can work together to gather data, analyze it, and generate valuable insights.

The fundamental components of an IoT system include:

1. Devices or Things: These are the physical objects that are equipped with sensors, actuators, and connectivity capabilities. They can range from simple sensors to complex devices with embedded processors and storage.
2. Sensors and Actuators: Sensors collect data from the environment, such as temperature, humidity, motion, or light levels. Actuators, on the other hand, enable devices to interact with the physical world by performing actions based on received data, such as turning on/off lights or opening/closing doors.
3. Connectivity: IoT devices use various communication technologies to connect to the internet and exchange data. This can include Wi-Fi, cellular networks, Bluetooth, Zigbee, or other wireless protocols.
4. Data Processing: The collected data from IoT devices is transmitted to a central system or cloud-based platform for processing and analysis. This involves extracting meaningful insights, detecting patterns, and making informed decisions based on the data.

5. Cloud Computing: The cloud serves as the backbone of IoT infrastructure, providing storage, computing power, and scalability. Cloud-based platforms enable data storage, processing, and hosting of IoT applications.
6. Applications and Services: IoT applications and services leverage the data collected from devices to provide valuable functionality and experiences. This can include smart home automation, industrial automation, healthcare monitoring, environmental monitoring, and many other use cases.

The potential of IoT lies in its ability to improve efficiency, enhance decision-making, and create new business models across various industries. It has the potential to revolutionize sectors such as healthcare, transportation, agriculture, manufacturing, and energy management by enabling real-time monitoring, automation, and optimization of processes.

However, the widespread adoption of IoT also raises concerns about data privacy, security, and interoperability. As billions of devices get connected, ensuring the confidentiality, integrity, and availability of data becomes crucial to protect against cyber threats and privacy breaches.

Overall, the Internet of Things holds great promise for transforming the way we interact with technology and the world around us, opening up new opportunities for innovation and connectivity.

2.2 Components of IoT

The 6 major components of IoT are

- **Sensors or End Devices**

For any IoT use case, the components of the endpoint are sensors. Sensors capture electric pulse or analog signals which are passed through the IoT ecosystems. Based on the use case and domains RFID, temperature sensors, light sensors, electromagnetic sensors, etc. are used. For example, smartphones and smart wearables are equipped with sensors like accelerometer, Gyroscope sensors, etc. Data obtained from these IoT endpoints can be used in various domains like Human activity recognition, medical stability, etc. Based on the use case and precision requirements sensors can be chosen keeping the following parameters in mind.

- **Network or Connectivity Layer**

In a typical IoT ecosystem, sensors are connected with computation layers and intelligent layers via network or connectivity layers. IoT endpoints need to be always connected with various other components seamlessly over the connectivity layer. An IoT network consists of various network components like routers, gateways, switches, various network protocols, etc. Based on the use case and domain proper network infrastructure is needed to be chosen.

- **Security Layers**

The heart of any industry-grade IoT user story is 'data'. In a standard use case, analog or digital signal is acquired by sensors and the signal is then converted to a format on top of which AI/ML components can work. In the total flow of data, proper security systems and methodologies need to be enforced. The data can be compromised in any layers starting from the data acquisition to business insights derivations. We can enforce proper security by using strong encryption in various layers of communication, using proper firmware and anti-malware systems, etc.

- **Compute Engines**

Industry grade IoT systems typically use multiple technology stacks inside an umbrella. For example, insurance premiums can be calculated as a variable component as per the driving pattern of the insurer. The data collected from smart devices are converted and preprocessed to a format on which machine learning models are developed. Customers can use any cloud partners of their choice or develop their own infrastructure to execute a use case. For example, the compute engines from PaaS (Product as a service) or IaaS (IoT as service) will differ from on-premise systems.

- **Technology and Governance Standards**

Sensitive information flows over the various components of the IoT ecosystem. To cope up with this the systems need to adhere to proper technique and governance standard. Typical Technical standards: Wi-Fi, WAN, etc. Network Protocols: HTTP, TCP/IP, UDP, etc. IoT systems need to follow the regulations and quality standards of respective regulatory authorities and business standards.

- **Intelligent Insights and Actions**

Most of the practical and industry-grade IoT use cases are intended to derive business insights or actionable recommendations. The preprocessed data need to be integrated with ML components and the trained models are deployed to the production environment. The choice of the technology stack to develop the intelligent business component is dependent on the compatibility with the in-house existing systems, the scale of the business, the complexity of the use case, and precision and latency requirements of the domain, company partnerships, etc. For example, in the heavy manufacturing industry, the data obtained from various machinery can be used to predict the fault of the machine which can help to reduce manufacturing downtime and increase efficiency.

2.3 IoT Hardware Devices

The building blocks of an IoT device are remarkably similar, whether undertaking projects related to the wearable device, an integrated lighting system, or even a jet engine. Wireless sensor nodes consist of three major hardware components: sensors, microcontrollers, and communication medium.

- **Sensors**

Sensors are the most critical hardware in IoT applications and are used to gather information from the surroundings. These systems are made up of power management modules, RF, energy and sensing modules. Communication from Wi-Fi, Bluetooth, transceiver, BAW, and duplexer is managed by an RF module.

- **Microcontrollers**

A microcontroller is a device in a single integrated circuit devoted to executing a single task and running an application. This contains programmable peripherals for containing programmable memory unit, and a CPU. Microcontrollers are designed primarily for embedded applications and are widely used in remotely operated electronic devices such as mobile phones, washing machines, microwaves, and cameras.

- **Other IoT hardware**

Smart wearable devices such as smart memory, glasses, rings, and shoes are examples of IoT hardware. Smart devices allow us to access more of the content and resources that we love and create a new approach to collaboration as part of an IoT network. Desktop, mobile phones, and tablets are standard command centers and remain an integral part of IoT application. Other network distribution devices like switches, hubs, and routers act as a key connector in IoT applications.

2.4Features of IoT

The Internet of Things (IoT) is a network of physical devices, vehicles, appliances, and other objects embedded with sensors, software, and connectivity capabilities. These devices interact and exchange data with each other and with cloud-based systems, enabling them to collect, analyze, and share information. Here are some common features and characteristics of IoT:

1. Connectivity: IoT devices are connected to the internet or other networks, allowing them to communicate and exchange data with other devices, systems, or users. This connectivity enables seamless integration and data sharing in the IoT ecosystem.

2. Sensing and Monitoring: IoT devices are equipped with sensors that can collect various types of data, such as temperature, humidity, light, motion, location, and more. These sensors enable real-time monitoring and data acquisition from the physical environment.
3. Data Processing and Analytics: IoT systems often employ data processing techniques and analytics algorithms to extract meaningful insights from the collected data. This analysis helps derive valuable information, make informed decisions, and optimize processes.
4. Remote Control and Actuation: IoT devices can be remotely controlled and operated through network connections. Users can interact with IoT devices, monitor their status, and trigger actions or changes in their behavior.
5. Interoperability: IoT systems strive for interoperability, allowing different devices, platforms, and technologies to work together seamlessly. This interoperability enables integration and collaboration across diverse IoT ecosystems.
6. Automation and Intelligence: IoT devices can automate tasks and processes based on predefined rules, sensor inputs, or user-defined settings. They can adapt and respond intelligently to changes in the environment or user requirements.
7. Scalability: IoT systems are designed to accommodate a large number of devices and data sources. They can scale up or down to handle increased device deployments, data volume, and user demands.
8. Security and Privacy: IoT systems need to address security and privacy concerns due to the sensitivity of the data being collected and transmitted. Robust security measures, such as encryption, authentication, and access control, are essential to protect IoT devices and data.
9. Real-time Communication: IoT devices often require real-time or near-real-time communication to support time-critical applications. This enables instant response, alerting, and decision-making in various domains, such as healthcare, transportation, and industrial automation.
10. Energy Efficiency: IoT devices are often designed with energy efficiency in mind to prolong battery life or reduce power consumption. This allows for prolonged device operation, especially in scenarios where constant power supply is challenging.

These features collectively enable the IoT ecosystem to create smart and connected environments, facilitate automation and decision-making, improve efficiency and productivity, and enhance user experiences across various domains and industries.

Any IoT device comes up with the following features as shown in Fig. 2.1

- Connectivity
- Sensing
- Active Engagements
- Scale
- Dynamic Nature
- Intelligence
- Energy
- Safety
- Integration

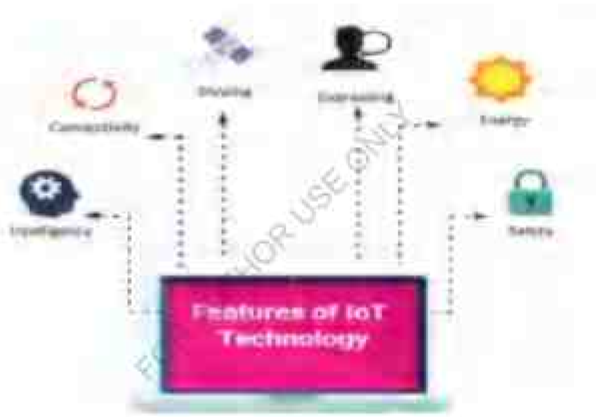

Fig. 2.1 Features of IoT Technology

3. HARDWARE REQUIREMENTS

3.1 RASPBERRY PI 3B

The Raspberry PI is a solitary PC board of low cost, credit-card sized computer that fills in as microcontroller and can be plugged into a computer monitor or TV, and uses a standard keyboard and mouse. It is a capable little device with wide scope is shown in Fig. 3.1

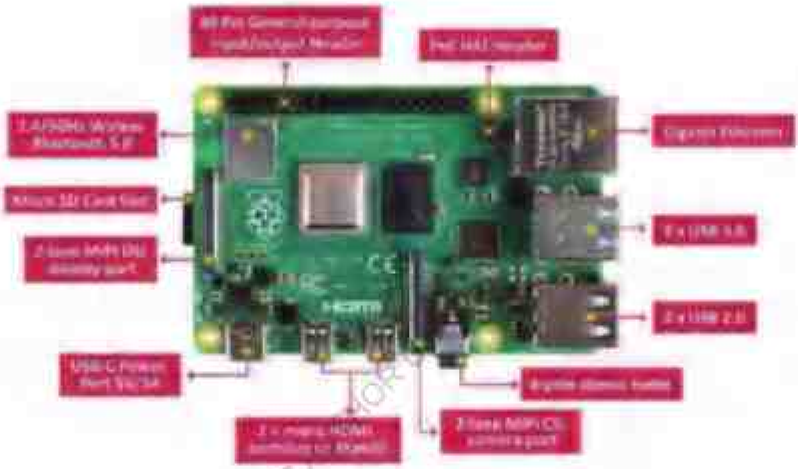

Fig. 3.1 Raspberry Pi 3 B+

Features of Raspberry Pi 3b+

The main features of Raspberry Pi 3b+ are

- CPU is 64 cycles with 1GB RAM (self-assertive access memory)
- It comes with CSI camera port and DSI port to connect to camera and touch screen display respectively
- It has built-in Wi-Fi and Bluetooth modules
- It consists of 40 pins (26 GPIO), 4 USB 2.0 ports, Gigabit Ethernet, 2-pin reset header
- BCM43438 wireless LAN and Bluetooth Low Energy (BLE) on board
- Micro SD connection for loading operating system and storing data
- Micro USB power connector, used for moving ability to the contraption

The 40 GPIO pins of Raspberry Pi 3b are description is shown in below Fig. 3.2

Fig. 3.2 Raspberry Pi 3B+ 40 GPIO pins

3.2 DHT11–TEMPERATURE AND HUMIDITY SENSOR

The DHT11 is a commonly used Temperature and humidity sensor which comes with a dedicated NTC to measure temperature and an 8-bit microcontroller to output the values of temperature and humidity as serial data.

The DHT11 is a popular and cost-effective temperature and humidity sensor commonly used in various IoT projects and applications. It is a digital sensor that provides accurate readings of temperature and relative humidity. Here are some key features and details about the DHT11 sensor:

1. Temperature Measurement: The DHT11 sensor can measure temperature within a range of 0 to 50 degrees Celsius with an accuracy of ±2 degrees Celsius.

2. Humidity Measurement: It can measure relative humidity within a range of 20% to 90% with an accuracy of ±5%.
3. Digital Output: The DHT11 sensor uses a one-wire digital protocol to communicate with microcontrollers or other devices. It provides data in a 5-bit format, where each bit is sent sequentially.
4. Single Bus Interface: The sensor utilizes a single wire for both data transmission and power supply, making it easy to connect to microcontrollers or other devices with limited I/O pins.
5. Low Power Consumption: The DHT11 operates at low power, making it suitable for battery-powered applications.
6. Sample Rate: The sensor requires a minimum time interval of 2 seconds between consecutive sensor readings to ensure accurate measurements.
7. Compatibility: The DHT11 is compatible with various microcontrollers such as Arduino, Raspberry Pi, ESP8266, and other platforms commonly used in IoT projects.

When using the DHT11 sensor in a project, you typically need to connect it to a microcontroller or a development board. The sensor has four pins: VCC (power supply), GND (ground), DATA (data signal), and NC (not connected). You provide power to VCC and GND pins, and the data signal is connected to a digital input pin of the microcontroller.

To read data from the DHT11 sensor, you need to follow the protocol specified by the sensor's datasheet. This involves sending a start signal, waiting for the sensor's response, and then receiving the temperature and humidity data bit by bit. Libraries and code examples are available for various platforms, simplifying the integration of the DHT11 sensor into your projects.

It's important to note that while the DHT11 sensor is affordable and easy to use, it has some limitations compared to more advanced temperature and humidity sensors. Its accuracy and range may not be suitable for some precision applications. In such cases, you might consider using sensors like the DHT22 or other alternatives that offer higher accuracy and extended measurement ranges.

Overall, the DHT11 temperature sensor is a popular choice for hobbyists, beginners, and low-cost IoT projects where general temperature and humidity measurements are required.

The below Fig. 3.3 shows a DHT11 Sensor module

Fig. 3.3 DHT11-Temperature and Humidity Sensor module

Pin description of DHT11 sensor module

Pin No	Pin	Description
1	Vcc	Required power supply is 3.5V to 5.5V
2	Data	Provided output contains both Temperature and Humidity serial Data
3	Ground	It should be connected to the ground

DHT11 Specifications

The DHT11 Temperature and Humidity sensor specifications are

- The operating Voltage should be of range 3.5V to 5.5V
- The operating current range is 0.3mA (measuring) 60uA (standby)
- The provided output is in the form of Serial data
- The temperature range is in between 0°C to 50°C
- The range of humidity is in between 20% to 90%
- Resolution of DHT11 is, Temperature and Humidity both are 16-bit
- Accuracy level of DHT11 is ±1°.

3.3 SOIL MOISTURE SENSOR MODULE

A soil moisture sensor module is a device used to measure the moisture content in soil. It is commonly used in agriculture, gardening, and environmental monitoring applications to determine the water levels in the soil and help optimize irrigation and watering processes. Here are some key details about soil moisture sensor modules:

Working Principle:

Soil moisture sensor modules typically use the principle of electrical conductivity to measure soil moisture. They consist of two or more electrodes that are inserted into the soil. When the soil is moist, it conducts electricity, and the sensor measures the conductivity to determine the moisture level.

Analog or Digital Output: Soil moisture sensor modules can provide either analog or digital output. Analog output sensors provide a continuous voltage or current proportional to the moisture level, while digital output sensors provide discrete readings indicating whether the soil is wet or dry based on a predefined threshold.

Calibration:

Soil moisture sensors usually require calibration to establish a baseline moisture level. This involves taking readings from the sensor in both dry and saturated soil conditions to determine the appropriate thresholds for moisture levels.

Interface:

Soil moisture sensor modules can be interfaced with microcontrollers or other devices using analog or digital input pins. Analog sensors require an analog-to-digital converter (ADC) to convert the analog signal into a digital value that can be processed by the microcontroller.

Power Requirements:

Soil moisture sensor modules typically operate at low power and can be powered by the same power source as the connected microcontroller or device.

Protection and Encapsulation:

Some soil moisture sensor modules come with protective coatings or encapsulation to make them resistant to moisture and corrosion, ensuring their durability and longevity when exposed to soil conditions.

Integration:

Soil moisture sensors can be integrated into automated irrigation systems, data loggers, or IoT platforms to enable real-time monitoring, data logging, and remote control of irrigation processes based on soil moisture levels.

When using a soil moisture sensor module, it's important to consider factors such as the sensor's sensitivity, accuracy, and response time. Different types of soil and environmental conditions may require specific calibration and adjustments to achieve accurate moisture measurements.

It's worth noting that there are various types of soil moisture sensors available in the market, including resistive, capacitive, and frequency domain sensors. Each type has its own working principle and characteristics, and the selection of a sensor depends on the specific application requirements and environmental conditions.

Overall, soil moisture sensor modules play a vital role in optimizing irrigation and water management practices, allowing for more efficient use of water resources and better plant health in agricultural and gardening applications.

This soil moisture sensor module is used to detect the moisture level present in the soil. It measures the volumetric content of water present inside the soil or the field and gives us the moisture level as output. The module has both digital and analog outputs and a potentiometer to adjust the threshold level in which we mostly use is the digital output.

Features and Specifications of DHT11

The following are the features and specifications of DHT11

- This Moisture sensor module includes a Moisture sensor, Resistors, Capacitor, Potentiometer, Comparator LM393 IC, Power and Status LED in a consolidated circuit.
- The working Voltage is in the arrive at 3.3V to 5V DC
- Operating Current reaches to 15mA
- The digital output signal and analog output signal produced ranges from 0V to 5V
- Small in size
- LM393 IC based
- Easy to use with Microcontrollers or even with regular Digital/Analog IC
- Small, humble and effectively available.

Soil Moisture Sensor Module Pin Configuration

Pin No.	Pin name	Pin Description
1	Vcc	It powers the module when connected to +5V

2	Gnd	Ground connection
3	D0	Digital Out pin to get digital output
4	A0	Analog Out pin to get analog output

Fig. 3.4 Soil Moisture Sensor Module

3.4 DC MOTOR

A DC motor is any of a class of rotary electrical motors that converts direct current electrical energy into mechanical energy. A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field windings. The below Fig. 3.5 shows DC Motor Wiring.

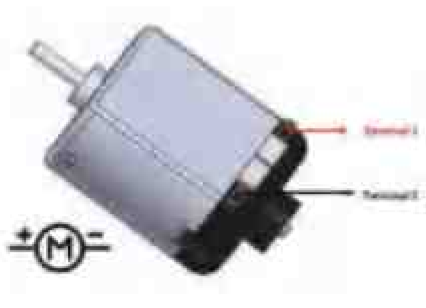

Fig. 3.5 DC Motor Wiring

Pin Description

No:	Pin Name	Description
1	Terminal 1	A normal DC motor would have only two terminals which works on dc voltage. Since these terminals will be connected together only through A coil, they won't have any not polarity. Reversing the connection will only reverse the direction of the motor
2	Terminal 2	

In the event that you need to invert the speed of the engine essentially trade the terminals and heading will likewise be turned around.

Motor Specifications

The following are the specifications of DC MOTORS

- It is standard 130 Type DC motor
- Its operating Voltage: 4.5V to 12V
- The recommended/Rated Voltage for a dc motor is 6V
- The current at No load condition is 70mA (max)
- The No-load Speed condition is 9000 rpm
- Loaded current should be approximately 250mA
- The rated Load is 10g*cm
- The motor size specifications are 27.5mm x 20mm x 15mm
- Weight: 17 grams

Applications

The following are some of the applications of DC MOTORS.

- Toy vehicles
- Windmill ventures
- Basic Electronics ventures
- As Robot wheels

3.5 5V 5-Pin Relay

A relay is an electrically operated switch. It consists of a set of input terminals for a single or multiple control signals, and a set of operating contact terminals. Relays are necessary when there must be electrical isolation between controlled and control circuits, or when multiple circuits need to be controlled by a single signal. The below Fig. 3.6 shows 5V Relay Pin Diagram.

Fig. 3.6 5V Relay Pin Diagram

Features of 5-Pin 5V Relay

The following are the features of 5-pin 5V Relay

- Trigger Voltage (Voltage across coil) is 5V DC
- Trigger Current (Nominal current) is 70mA
- Compact 5-pin configuration with plastic molding
- Operating time of 5-pin 5v relay is 10msec and its Release time is 5msec.
- Maximum switching of it should be 300 operating/minute (mechanically)

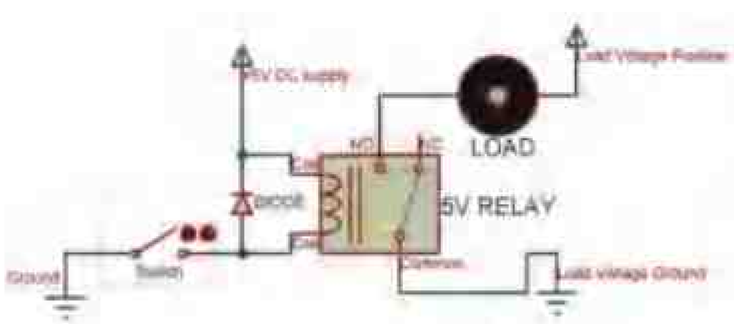

Fig. 3.7 Relay circuit

Relay Pin Configuration

Pin Number	Pin Name	Description
1	Coil End 1	Used to trigger (On/Off) the Relay, normally one end is connected to 5V and the other end to ground
2	Coil End 2	Used to trigger (On/Off) the Relay, normally one end is connected to 5V and the other end to ground
3	Common (COM)	Common is connected to one End of the Load that is to be controlled
4	Normally Close (NC)	The other end of the load is either connected to NO or NC. If connected to NC the load remains connected before trigger
5	Normally Open (NO)	The other end of the load is either connected to NO or NC. If connected to NO the load remains disconnected before trigger

Uses of Relay

The following are the uses of Relay

- Commonly utilized in exchanging circuits.
- For Home Automation ventures to switch AC loads.
- To Control (On/Off) Heavy loads at a pre-decided time/condition.
- Used in Automobiles hardware for controlling markers glass engines and so on.

3.6 L293D MOTOR DRIVER IC

L293D is a typical Motor driver or Motor Driver IC which allows DC motor to drive on either direction. L293D is a 16-pin IC which can control a set of two DC motors simultaneously in any direction. It means that you can control two DC motor with a single L293D IC.

The L293D is a popular integrated circuit (IC) used as a motor driver or motor control driver in various electronic projects. It is specifically designed to drive small DC motors or stepper motors and provides the necessary circuitry to control their direction and speed. Here are some key features and characteristics of the L293D:

1. Motor Driver: The L293D is a dual H-bridge motor driver, which means it can control two DC motors or one stepper motor independently. It can drive motors with voltages up to 36V and handle continuous current of up to 600mA per channel (1.2A peak).
2. H-Bridge Configuration: The IC is designed with four input/output pins (2 per motor) that control the direction (forward or reverse) of the motors. By applying appropriate logic signals to these pins, the motor can be driven in either direction or stopped.
3. Enable Pins: The L293D also includes enable pins (1 per motor) that can be used to enable or disable the motor outputs. When the enable pin is HIGH, the motor is enabled and can be controlled; when the enable pin is LOW, the motor is turned off.
4. Built-in Diodes: The IC features built-in flyback diodes (also known as freewheeling diodes) across the motor outputs. These diodes help to suppress voltage spikes generated by the motor during switching, protecting the IC and other components from potential damage.
5. Power Supply: The L293D requires an external power supply to drive the motors. It has separate pins for motor power (Vcc1) and control logic power (Vcc2), allowing the use of different voltage sources for the motors and control circuitry.
6. Thermal Shutdown Protection: The L293D includes thermal shutdown circuitry that helps prevent overheating. If the IC's internal temperature exceeds a safe threshold, it will shut down the motor outputs until the temperature drops to a safe level.
7. Compatibility: The L293D can be easily interfaced with microcontrollers, Arduino boards, and other digital control systems. Its control inputs are compatible with standard logic levels (TTL and CMOS), making it widely compatible with various microcontroller platforms.

The L293D is commonly used in robotics, automation, and hobbyist projects where precise control of DC motors or stepper motors is required. It provides a convenient and cost-effective solution for motor control and is widely available in the form of a DIP (Dual In-line Package) or a surface-mount package.

The L293D IC receives signals from the microprocessor and transmits the relative signal to the motors. It has two voltage pins, one of which is used to draw current for the working of the L293D and the other is used to apply voltage to the motors. The below Fig. 3.8 shows L293D Motor Driver IC.

Fig. 3.8 L293D Motor Driver IC

Fig. 3.9 Motor Driver IC L293D Pinout

Engine voltage Vcc2 (Vs) is 4.5V to 36V. Most extreme Peak engine current is 1.2A. Most extreme Continuous Motor Current is 600mA. Gracefully Voltage to Vcc1(VSS) to work this module is 4.5V to 7V. Transition time of L293D is 300ns (at 5V and 24V). Automatic Thermal shutdown is available in this circuit. It can be available in 16-pin DIP package.

Applications

- It is utilized to drive high current Motors utilizing Digital Circuits.
- Can be utilized to drive Stepper engines.
- High current LED's can be driven.
- Transfer Driver module (Latching Relay is conceivable)

4. SOFTWARE REQUIREMENTS

4.1 RASPBIAN OS: Downloading NOOBS

Using NOOBS is the easiest way to install Raspbian on your SD card. To get hold of a copy of NOOBS, go to the website raspberrypi.org. Below Fig. 4.1 shows the NOOBS software website.

Fig. 4.1 NOOBS software website

We can see a box with a link to download NOOBS files. Click on the link to start Installation. Below Fig. 4.2 shows NOOBS software installed.

Fig. 4.2 NOOBS software download

The simplest option is downloading the zip archive of the files. Below Fig. 4.3 shows How to download NOOBS zip file.

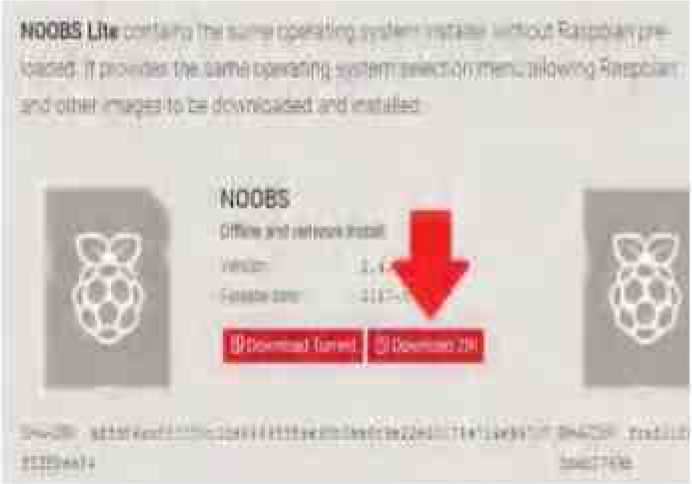

Fig. 4.3 NOOBS zip file to download

Formatting the SD card

If the SD card on which we wish to introduce Raspbian right now has a more established version of Raspbian on it, back up the documents from the card first, as they will be overwritten during this cycle. Visit the SD Association site and download SD Formatter 4.0 for Windows or Mac. Follow the instructions to download the software. Insert the SD card into the laptop's SD card reader and make a note of the drive letter associated to it, for example, F:/. In SD Formatter, select the drive letter for the SD card, and format it.

Extracting NOOBS from the zip archive

Next, we will need to extract the files from the NOOBS zip archive we downloaded from the Raspberry Pi website. Go to Downloads folder and find the zip file we downloaded. Extract the files and keep the resulting Explorer/Finder window open.

Copying the files

Now open another Explorer window and explore to the SD card. It is ideal to situate the two windows next to each other. Select all the records from the NOOBS envelope and drag them onto the SD card. Below Fig. 4.4 demonstrates these steps accurately.

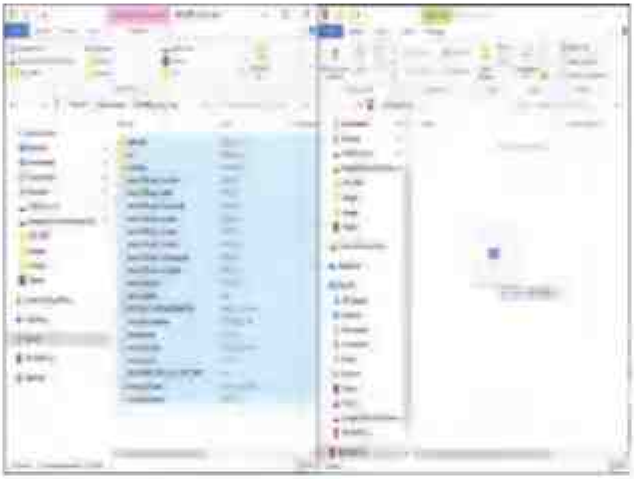

Fig. 4.4 selecting all the records from noobs envelope

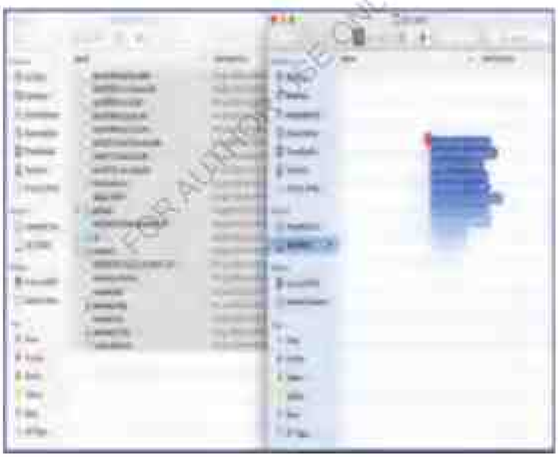

Fig. 4.5 drag onto SD card

Now Eject the SD card.

Booting NOOBS

Once the files have been copied over, insert the micro-SD Card into the Raspberry Pi, and plug the Pi into a power source. We will be offered a choice when the installer has loaded. We should check the box for Raspbian, and then click Install as shown in the below Fig. 4.6

Fig. 4.6 Noobs Installation

Click yes at the warning dialog, and then sit back and relax. It will take a while, and Raspbian will install as shown in the above Fig. 4.6

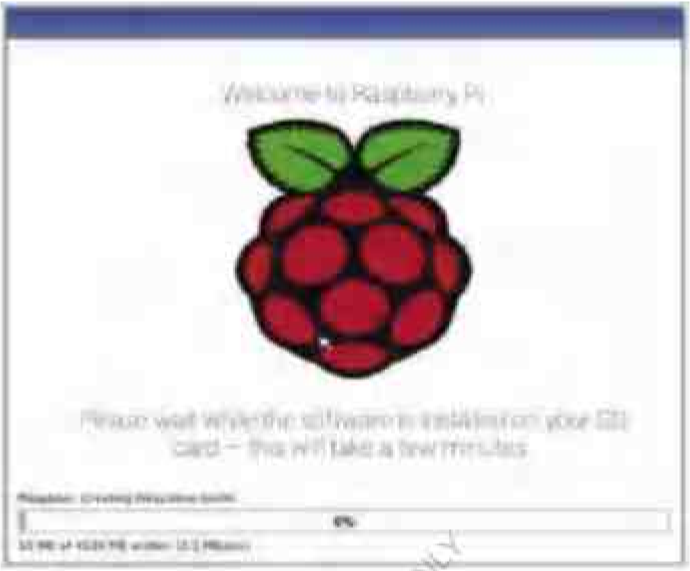

Fig. 4.7 status bar of installation process

When Raspbian has been installed, click OK and our Raspberry Pi will restart and Raspbian will then boot up. Our OS has been installed successfully as shown in below Fig. 4.8

Fig. 4.8 OS installed notification

4.2 Advanced IP Scanner

Advanced IP Scanner is a fast and efficient software which is also free, it is used for network scanning. It allows us to quickly detect all network computers and to access them. Advanced IP Scanner is compliant with Microsoft's highest security standards to ensure successful operation when used in Windows.

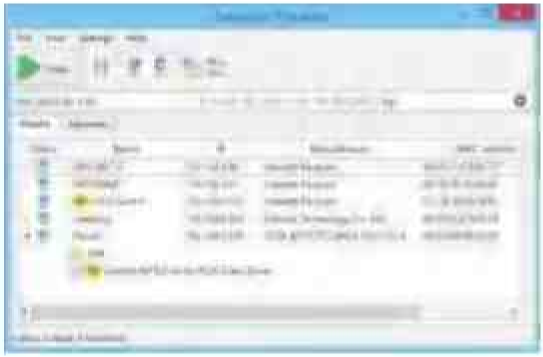

Fig. 4.9 Advanced IP Scanner

4.3 VNC viewer

VNC represents Virtual Network Computing. Some of the time it is not advantageous to work legitimately on the Raspberry Pi. Possibly we might want to take a shot at it from another gadget by controller. VNC is a graphical work area sharing framework that permits us to distantly control the work area interface of one PC (running VNC Server) from another PC or cell phone (running VNC Viewer). VNC Viewer sends the console and either mouse or contact occasions to VNC Server, and gets updates to the screen consequently. We will see the work area of the Raspberry Pi inside a window on our PC or cell phone. We have the option to control it like we are dealing with Raspberry PI itself. The below Fig. 4.10 demonstrates how to download VNC viewer.

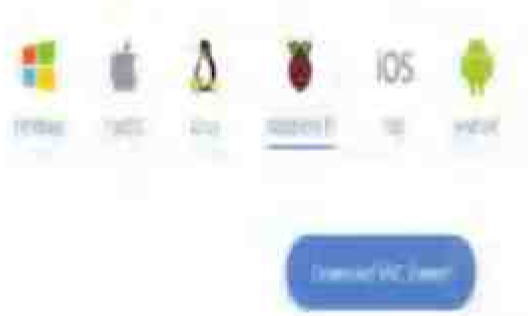

Fig. 4.10 Download VNC viewer

4.4 PYTHON

A program written in a high-level language is called source code. Python language translators like compilers and interpreters are needed to translate the source code into machine language. Python uses an interpreter to convert its instructions into machine language, so that it can be understood by the computer. An interpreter processes the program statements one by one, first translating and then executing. This process is continued until an error is encountered or the whole program is executed successfully. In both the cases, program execution will stop. On the contrary, a compiler translates the entire source code, as a whole, into the object code. After scanning the whole program, it generates error messages, if any. Here in our Project, python code is written for every function of the bot in the VNC viewer and it is then run by clicking run module.

4.5 BLYNK APP

Blynk is a full suite of software required to prototype, deploy, and remotely manage connected electronic devices at any scale. Blynk was designed for the Internet of Things. It can control hardware remotely, it can display sensor data, it can store data, visualize it.

With Blynk one can connect their hardware to the cloud and build no-code Android, and web applications to analyze real-time and historical data coming from devices, control them remotely from anywhere in the world, to receive important notifications.

Applications made with Blynk are ready for the end-users. We can configure the way users get access to the data by setting roles and configuring permissions.

There are three major components in the platform:

Blynk App - allows us to create amazing interfaces for our projects using various widgets provided.

Blynk Server - responsible for all the communications between the smartphone and hardware. We can use our Blynk Cloud or run our private Blynk server locally. It's open-source, could easily handle thousands of devices and can even be launched on a Raspberry Pi.

Blynk Libraries - for all the popular hardware platforms - enable communication with the server and process all the incoming and outcoming commands.

Every time you press a Button in the Blynk app, the message travels to the Blynk Cloud, where it finds its way to our hardware. It works the same in the opposite direction and everything happens at a high speed.

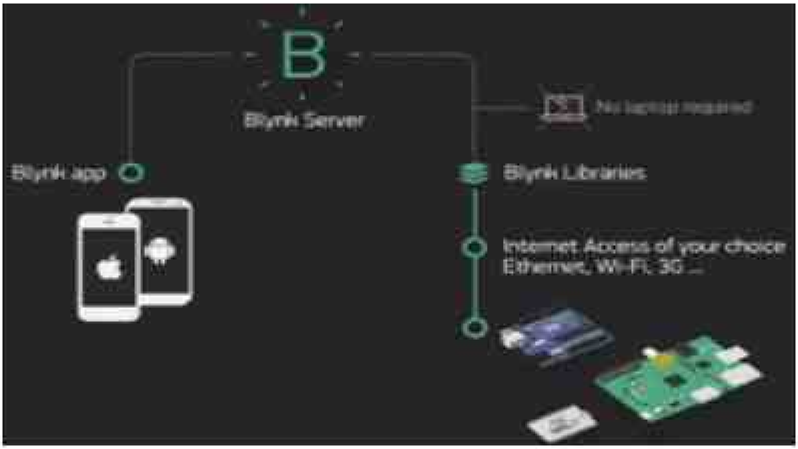

Fig. 4.11 Blynk app Connection

Features of Blynk App:

The main features of Blynk app are

- API & UI for all supported hardware & devices
- Connection to the cloud
- Wi-Fi
- Bluetooth and BLE
- Ethernet
- USB (Serial)
- GSM
- Set of easy-to-use Widgets
- Direct pin manipulation with no code writing
- Easy to integrate and add new functionality using virtual pins
- History data monitoring via Super Chart widget
- Device-to-Device communication using Bridge Widget
- Sending emails, tweets, push notifications

5. WORKING METHODOLOGY

5.1 BLOCK DIAGRAM

The schematic diagram to build a "IoT Based Agri-bot for Seed Sowing, Smart Leaf Infection identification and Fertilizer Spray" is shown in Fig. 5.1 below

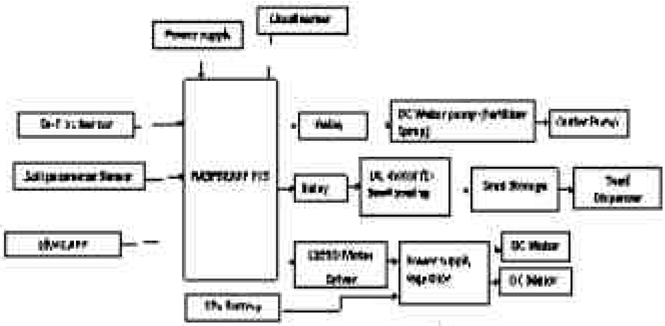

Fig. 5.1 Block Diagram for Agri-Bot

5.2 Construction of Multi-Purpose Agri-Bot

For the construction, the components required are wheel belt, wheels, chassis, dc motors, dc motor driver and power supply. There is a wheel belt present which consists of 4 wheels and upon it chassis is placed. Among the 4 wheels, two of the front side wheels are non-operative wheels whereas the two back side wheels are operative.

The pins GPIO 7, GPIO 8, GPIO 24 and GPIO 25 of raspberry Pi 3 are connected to the four inputs of the L293D motor driver respectively. Out of the four output pins of the L293D motor driver, two of them are connected to one DC motor and the another two are connected to another DC motor. The two remaining pins of the motor driver are connected to the Vcc and ground of the power supply. The two pins from battery are connected to the power supply, one of them is positive and the another is negative. A small PCB board is used to provide access to extra grounds and Vcc connections from everywhere as and when required. The below Fig. 5.2 shown as Circuit Diagram for Motor Driver.

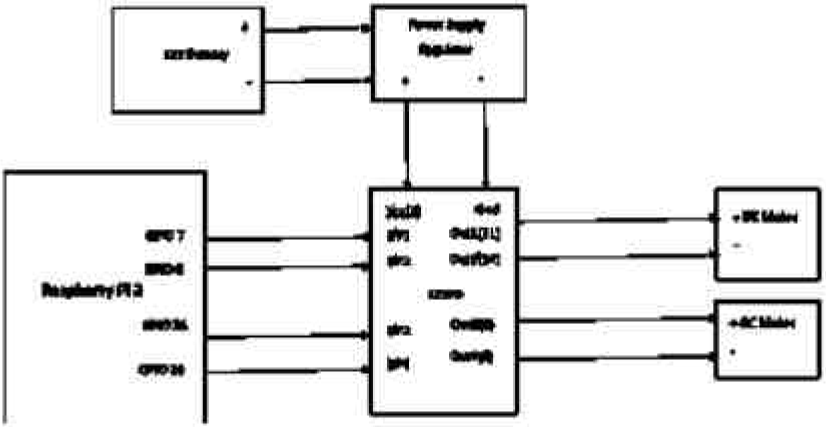

Fig. 5.2 Chassis Circuit Diagram

The power is supplied from power supply board to motor driver and this motor driver is further connected to DC motors which operates the backward two wheels, the front side two wheels are non-operative wheels and are easily carried along when the backward wheels move. The two wheels are hence operated by the two dc motors, and these dc motors are driven by L293C motor driver. The wheel belt of Agri-bot is shown in Fig. 5.3

Fig. 5.3 Wheels and wheel belt of one side of the Agri-Bot

5.3Seed Sowing Mechanism

A seed sowing mechanism refers to a device or system designed to automate the process of planting seeds in agriculture or gardening. It helps improve efficiency, accuracy, and uniformity in seed sowing, saving time and effort for farmers and gardeners. There are different types of seed sowing mechanisms available, each with its own working principle. Here are a few commonly used mechanisms:

1. Manual Seed Sowing: This is the traditional method where seeds are sown by hand. It involves manually placing seeds in the soil at appropriate depths and intervals. While this method is simple and inexpensive, it can be time-consuming and may result in inconsistent seed placement.
2. Mechanical Seed Drill: A mechanical seed drill is a machine pulled by a tractor that uses rotating mechanisms and seed tubes to plant seeds. It typically consists of a seed hopper, seed metering system, and coulters or disks for creating furrows in the soil. The seed drill ensures consistent seed spacing and depth, improving efficiency and reducing seed waste.
3. Pneumatic Seed Sowing: Pneumatic seed sowing mechanisms use air pressure to propel seeds from a hopper through tubes or nozzles into the soil. The seeds are usually coated with a material to improve flow and accuracy. Pneumatic seeders can be attached to tractors or used as handheld devices, providing precise seed placement and flexibility in different soil conditions.
4. Precision Seed Planters: Precision seed planters are advanced machines that employ technology such as GPS, sensors, and computerized controls. These planters can automatically adjust seed spacing, depth, and planting rates based on specific crop requirements. They offer high accuracy and allow for precise placement of seeds, resulting in optimal plant density and uniformity.
5. Seed Tape and Seed Pellets: Seed tape and seed pellets are innovative seed sowing methods that involve pre-spacing seeds on a biodegradable tape or within compact pellets. These ready-to-use seed strips or pellets are placed in the soil at the desired spacing, eliminating the need for individual seed placement. They are particularly useful for small seeds or when precise seed spacing is required.
6. Seedling Transplanting Systems: In some cases, instead of sowing seeds directly in the field, seedlings are grown in a controlled environment and then transplanted using specialized machines. These systems automate the transplanting process, reducing labor and ensuring consistent plant spacing.

The choice of a seed sowing mechanism depends on factors such as the scale of farming or gardening operations, crop type, soil conditions, and available resources. Different mechanisms offer varying levels of precision, automation, and scalability. Farmers and gardeners often select the most suitable seed sowing mechanism based on their specific needs and budget.

For performing Seed Sowing Mechanism, along with Raspberry pi 3 we require a DC motor, relay Board, Seed Storage container, Funnel and a Seed Sowing Wheel.

Vcc and GND of the Raspberry Pi are connected to Vcc and GND of Relay Board. 21st GPIO is given to the Triggering pin of Relay Board. DC Motor's Vcc and GND are connected to Vcc and GND of Relay Board. The DC Motor is connected the seed sowing wheel. A circular hole is made on to the chassis board where a funnel is placed. A seed storage container is attached to the Seed Sowing wheel as shown in Fig. 5.4

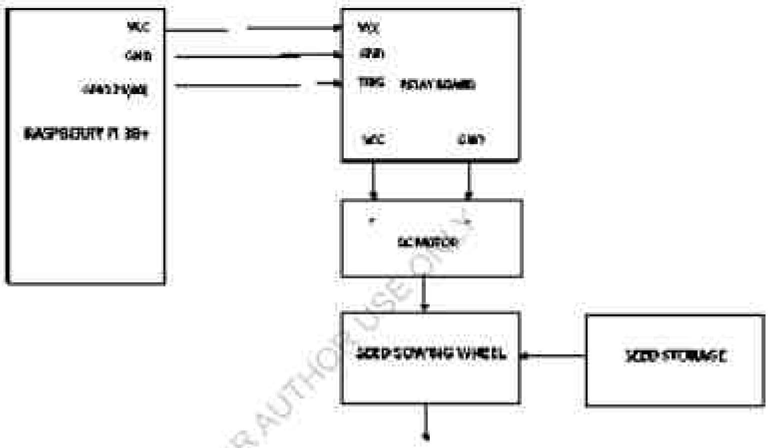

Fig. 5.4 Circuit diagram for Seed Sowing

Raspberry PI turns on when power supply is provided. Here, Relay drives the low current signal from Raspberry PI into a high current signal for DC motor. After it is ON, through Blynk App, when seed sowing button is turned ON, the DC Motor turns ON. As DC motor is turned on, the wheel connected to the motor rotates in Clockwise direction. The wheel collects the seeds from the storage container and carries the seed forward. This wheel works similar to that of a water wheel. Here the seed wheel constructed from wood consists a wheel with a number of edges cutdown forming the driving surface. The seed is carried by the wheel and thrown into the funnel through which the seed gets dispersed on to the ground. The seed sowing mechanism on Agri-Bot as shown in Fig. 5.5

Fig. 5.5 Seed Sowing

5.4 Fertilizer Spray

Fertilizer spray, also known as foliar fertilizer application or foliar feeding, is a method of applying fertilizers directly to the leaves of plants. It involves spraying a liquid fertilizer solution onto the foliage, allowing the plant to absorb nutrients through its leaves. This method provides a supplemental nutrient supply to the plant and can complement traditional soil-based fertilization.

Here are some key points to consider when it comes to fertilizer spray:

1. Nutrient Absorption: Plants have the ability to absorb nutrients through their leaves, stems, and other above-ground plant parts. Foliar application allows for rapid nutrient uptake by bypassing the root system. Nutrients are absorbed through the stomata (small openings on the leaf surface) or through the cuticle (outer protective layer of the leaf).
2. Nutrient Mobility: Foliar fertilization is particularly effective for supplying nutrients that are mobile within the plant, such as nitrogen, potassium, and certain micronutrients. These nutrients can be quickly transported from the leaves to the rest of the plant, addressing nutrient deficiencies or promoting specific growth and development processes.
3. Fertilizer Formulation: Fertilizer solutions for foliar spray are typically formulated with water-soluble nutrients, ensuring easy absorption by the plant. These solutions may contain macro and micronutrients, growth enhancers, or other beneficial compounds depending on the specific plant requirements.
4. Application Timing: The timing of fertilizer spray is crucial for optimal results. It is often done during periods of active plant growth, such as the early morning or late afternoon

when stomata are open, and the leaf surface is cooler. Avoid spraying during hot, sunny periods to prevent the risk of leaf burn.

5. Spraying Technique: Proper spraying technique ensures good coverage and uniform application. Use a fine mist sprayer or specialized sprayers designed for foliar application to achieve even distribution of the fertilizer solution on the leaves. Aim to cover both sides of the leaves without excessive runoff.
6. **Compatibility and Concentration**: When using foliar fertilizers, it's important to consider compatibility with other sprays or chemicals that may be applied simultaneously. Additionally, follow the recommended concentration guidelines provided by the fertilizer manufacturer to prevent leaf burn or damage.
7. Supplement to Soil Fertilization: Foliar fertilization should not replace soil-based fertilization but rather complement it. Soil fertilization provides a long-term nutrient supply, while foliar application can offer quick nutrient correction or provide additional nutrients during critical growth stages.
8. Fertilizer spray can be particularly beneficial in situations where the soil is deficient in certain nutrients, when plants are experiencing nutrient deficiencies, or when foliar uptake offers advantages over traditional soil application. However, it is important to understand the specific nutrient needs of the plants and follow appropriate application practices to avoid over-application or potential negative effects on the plants.

For performing Fertilizer Spray Mechanism, along with Raspberry pi 3 we require relay Board, capacitor and a water pump. Here we took water pump which operates with 120lit/hour.

Vcc and GND of the Raspberry Pi are connected to Vcc and GND of Relay Board. 20^{th} GPIO is given to the Triggering pin of Relay Board. Relay board of Vcc and GND are connected to Vcc and GND of capacitor. Vcc and GND of Relay board are connected to Vcc and GND of water pump.

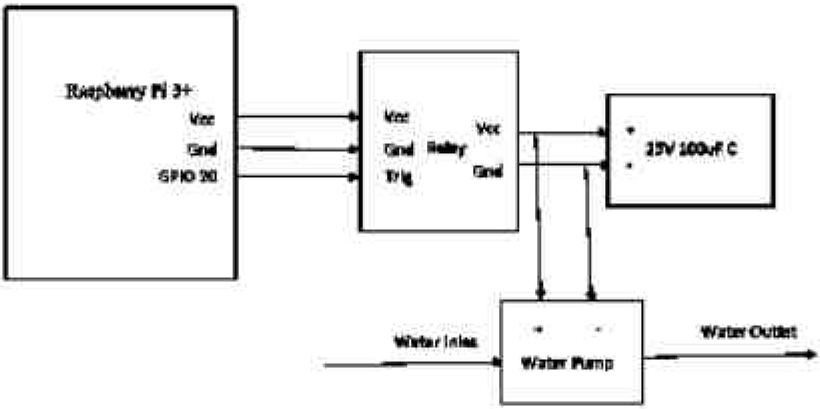

Fig. 5.6 Circuit diagram for Fertilizer Spray

Raspberry Pi turns on when power supply is provided. Here, Relay drives the low current signal from Raspberry Pi into a high current signal for water pump. After it is ON, through Blynk App, when water button is turned ON, the water pump turns ON. As water pump on, through the water inlet of water pump it will take fertilizer from water container and it will outlet the fertilizer into the field.

Fig. 5.7 Fertilizer Spray

5.5 Agriculture Parameters - Temperature & Humidity

For measuring soil parameter, along with Raspberry pi 3B+ we require DHT11 sensor module, probes. 37th (26th GPIO) pin of the Raspberry Pi is connected to Data pin of DHT11 sensor module. The data from DHT11 sensor module is received into Raspberry pi. 2^{nd} & 6^{th} pins of the Raspberry pi 3B+ are given to the Vcc & GND pins of DHT11 sensor module.

The Data and Ground pins of Soil sensor probes are connected to Soil sensor module. The Data from Soil sensor probes will be received into Raspberry Pi 3B+ using D0 pin of Soil moisture sensor which is connected to 27^{th}(GPIO 16th) pin of Raspberry Pi 3B+. The Gnd and Vcc pins of Soil moisture sensor of Raspberry pi connected to Vcc(5V) and Gnd of Raspberry Pi. Raspberry Pi turns on when power supply is provided. Here, DHT11 sensor module will sense the humidity and temperature from atmosphere. Once the sense data button is pressed in Blynk App, then the data will be uploaded into ThingSpeak server. We can view and analyze the temperature and humidity of the atmosphere in the field in ThingSpeak platform.

The Raspberry Pi 3B+ connection with DHT11 and Soil moisture sensor is shown in Fig. 5.8

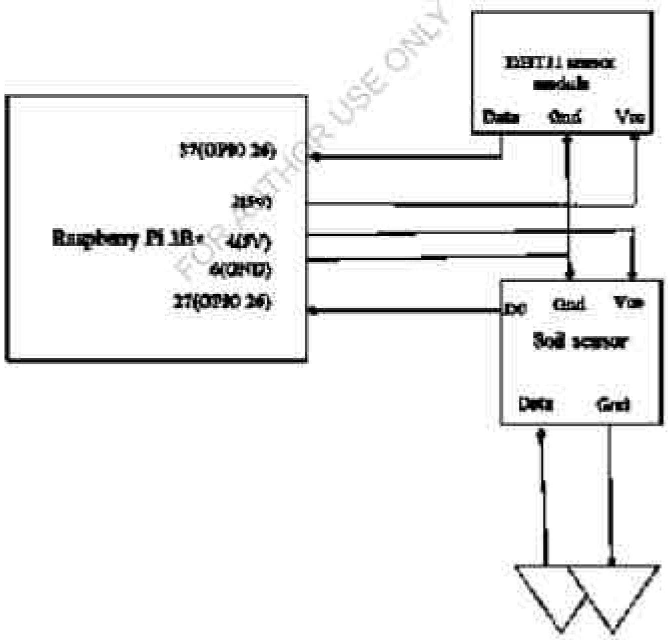

Fig. 5.8 Circuit diagram for Agriculture Parameters- Temperature & Humidity, Soil moisture

5.5BLYNK APP

Blynk is a popular mobile application that allows users to control and monitor IoT devices remotely. It provides a user-friendly interface for creating custom dashboards and controlling various IoT projects without the need for extensive programming knowledge. Blynk supports both iOS and Android platforms and offers a range of features to enable seamless communication between the app and IoT devices.

Key features of the Blynk app include:

1. Customizable Dashboard: Blynk allows users to create personalized dashboards with customizable widgets such as buttons, sliders, gauges, graphs, and notifications. These widgets can be arranged and configured to control or display data from connected IoT devices.
2. Device Connectivity: Blynk supports connectivity with a wide range of IoT platforms and microcontrollers such as Arduino, Raspberry Pi, ESP8266, NodeMCU, and more. It provides libraries and APIs that facilitate easy integration with these devices, enabling data exchange and remote control.
3. Real-time Data Monitoring: The app enables real-time monitoring of sensor data, device status, or any other data collected by IoT devices. Users can view this information on the app's dashboard, allowing them to track and analyze the performance of their connected devices.
4. Control and Interaction: Blynk allows users to send commands to IoT devices through the app's interface. For example, you can toggle switches, adjust settings using sliders, or trigger actions by pressing buttons on the app. This feature enables remote control and automation of IoT devices.
5. Notifications and Alerts: Blynk supports customizable notifications and alerts based on predefined conditions. Users can set up notifications to receive alerts when certain events occur or when specific thresholds are reached, providing real-time updates about the status of their IoT devices.
6. Data Logging and History: Blynk offers data logging capabilities, allowing users to store and analyze historical data from IoT devices. This feature is useful for tracking trends, generating reports, and gaining insights from the collected data.
7. Sharing and Collaboration: Blynk enables users to share their IoT projects and dashboards with others. This feature facilitates collaboration, remote troubleshooting, and showcasing projects to a wider audience.

To use the Blynk app, you typically need to create an account and set up a new project within the app. The app generates a unique authentication token that is used to establish a connection between the app and the IoT device. You then configure your IoT device to communicate with the Blynk platform using the provided libraries or APIs.Blynk offers both a free and a paid subscription model, with the paid version providing additional features and increased capacity for larger-scale projects.

Overall, the Blynk app simplifies the process of creating intuitive interfaces and controlling IoT devices from a mobile device. It empowers users to build their own IoT applications without extensive programming skills and offers flexibility and convenience in managing IoT projects remotely.

The Hardware model Raspberry Pi 3 B has been selected from the list of options and set up a WI-FI connection between Agri-Bot and Blynk App with Project name as "Agri" after creating a new project. The unique Authorization token is given in Python Code is shown in Fig. 5.9 below.

Fig. 5.9 Blynk App Device and connection selection

Click on + Button to add widgets and give button names and select mode option as PUSH from push/Switch options and give labels for on as "ON" and OFF as "OFF" as Fig. 5.10 below

Fig. 5.10 Button settings for various widgets

The login credentials of Blynk App are shown in Fig. 5.11 below.

Fig. 5.11 Login credentials for Agri-Bot project

After logging in, one can click on Play button to start controlling Agri-Bot remotely. The Blynk app screen will be shown as in Fig. with created four direction widgets along with Stop widget for ON/OFF and control direction of the bot and to start controlling seed sowing (Seed), fertilizer spraying (Pump), Data Upload to monitor soil parameters such as Humidity, Temperature and Soil moisture (Data) using ThingSpeak server remotely.

Fig. 5.12 Blynk App screen

5.6 THEORETICAL ANALYSIS

5.6.1 Calculations Related to the Design

5.6.2. Calculation for rpm and shaft radius of the motor from motor power

Assuming the force required for ploughing of the field is around 300 N [11] and for motor with one horse power, the following calculations are made,

1 HP = 746 Watts

Power Input, Pin = 746 Watts

Power output, Pout = Pin x Efficiency (1)

Efficiency of an electric motor to convert electrical energy to mechanical for the work to be done is assumed to be as 10%.

At 10 % efficiency, Power output, Pout= 746 x 0.1 = 74.6 Watts.

To determine the shaft radius, Power = Torque x angular velocity = T x ω (2)

Power = Force x shaft radius x angular velocity

74.6 = 300 x r x ω r x ω = 0.25 m/sec (3)

ω = 2 x π x n/ 60

Using above equation, equation 3 can be written as,

r x n = (0.25 x 60)/2 x π r x n = 2.42 m-rev per minute (4) At n = 60 rpm [12],

Substituting n value in equation 4, r = 40.33 mm The moving speed of the vehicle at this rpm can be calculated as, Velocity = angular velocity x radius of the front wheel (5)

Velocity = 2 x π x 60 x 0.12 / 60 = 0.75 m/sec = 2.7143 km/hr.

The velocity of the vehicle obtained at 60 rpm is 2.7143 km/hr which is less than average walking speed of humans i.e., 5km/hr. At this speed, the area that can be covered is,

Area covered = vehicle speed x space between 2 rows of ploughing blade x 2 (6)

Area covered = 2.7143 x 1000 x 0.20 x 2 = 1085.72 m 2 /hr.

This means on 1 acre (4046.86 m 2) land, the seeds can be sown in 3 hours 45 minutes.

At n = 100 rpm Substituting n value in equation 4, r = 24.2 mm.

The moving speed of the vehicle at this rpm can be calculated as,

Velocity = angular velocity x radius of the front wheel

Velocity = 2 x π x 100 x 0.12 / 60 = 1.2566 m/sec = 4.5239 km/hr.

The velocity of the vehicle obtained at 100 rpm is 4.5239 km/hr which is less than average walking speed of humans i.e., 5km/hr.

At this speed, the area that can be covered is,

Area covered = Speed of the vehicle x space between 2 row of ploughing blade x 2

Area covered = 4.5239 x 1000 x 0.20 x 2 = 1809.56 m 2 /hr. This means on 1 acre (4046.86 m 2) land, the seeds can be sown in 2 hours 15 minutes.

5.6.3 Calculation of distance between two seeds

As we have maintained the gear ratio as 1 between rear wheels and the seeder, one revolution of the rear wheel will transmit one revolution to seeder mechanism. As the radius of the rear wheel is 70mm, for one revolution of the rear wheel the distance (D) travelled is given by, D = 2 x π x radius of rear wheel D = 2 x π x 70 D = 440 mm (approx.)

This is large distance between two seeds. Hence we have to provide two slots in the seeder/profiler so that distance can be reduced between two seeds. Therefore, the distance between two seeds if two slots are provided will be 220 mm.

5.6.4. Calculation of Moment

During the sowing process the joint of cultivator and the machine will experience force. The moment acting on the joint of cultivator is,

Moment = Shear force x perpendicular distance Moment

= 300 x 0.65 = 195 N-m

5.7 IMPLEMENTATION

The steps to connect Raspberry pi, Blynk App and Laptop are:

Step-1: Connect both laptop and mobile phone with same hotspot.

Step-2: Open the Advance IP Scanner, and look for the IP address of Raspberry pi.

Step-3: Now, click on the IP address of Raspberry pi and enter the Credentials of VNC viewer. Later, enter the IP address of Raspberry pi in VNC viewer.

Step-4: On the VNC Viewer window, go to Source Code and run the Code by clicking Run Run Module.

Step-5: The code gets run and the Agri-bot gets connected to Blynk App.

Step-6: By selecting the button we can operate the robot through Blynk App. Forward, Left, Right and Back Buttons helps in controlling the Robot remotely.

Step-7: For seed sowing, by clicking on Seed button, DC motors turns ON. The DC motor is connected to the wheel which will carry forward the seeds from the seed storage container to the funnel. From funnel the gets dispersed onto the ground.

Step-8: For fertilizer spray, by clicking on Pump button, DC water pump gets turn ON. Water is taken from inlet pipe and sprays out from the outlet pipe.

Step-9: For monitoring the agriculture parameters, click on Sense data button in Blynk App, Login to the ThingSpeak account, by clicking on the channel we can view and analyze the parameters from chart.

6. DESIGN OF THE MACHINE

The seed sowing vehicle is designed based on two criterion. One is to keep the design in such a way that the working is as simple as possible and the other is to maintain low weight of the frame and reducing the number of pulleys used. The figure 2 shows the model of the seed sowing machine developed using Solid works software. The optimum position of the components is decided through the help of the software model.

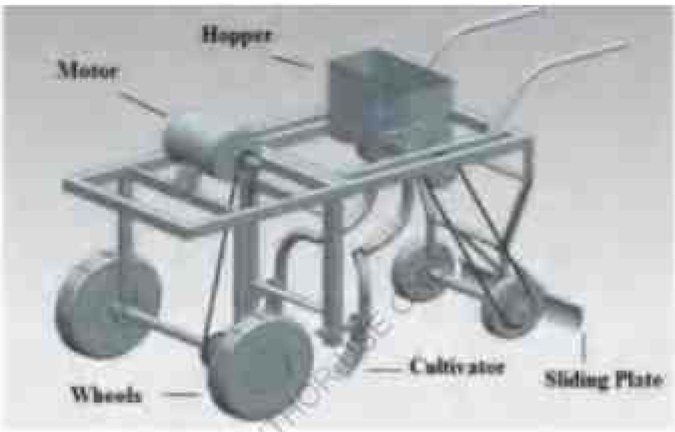

Fig. 6.1 Overview of the design

Fig. 6.2 Top View

Fig. 6.3 Side View

6.1 WORKING PROCEDURE

The block diagram of the circuit for automation is presented in figure 4. The battery positive is connected to stepper positive input terminal and negative terminal of battery to negative input terminal of stepper. The stepper steps down the voltage from 12 V to 5 V. This 5V is received at the output terminal of stepper. Using jumper wires this output voltage is supplied to input terminals of ESP8266 wifi module. The positive of stepper is connected to 3.3V pin while the negative output terminal of stepper is connected to Gnd pin of the wifi module. As the microprocessor works on 5V, step down module is used to lower the 12V supply to 5V. Other 3.3V and Gnd pins of microprocessor provides input to relay through Vcc and Gnd pins of relay respectively. GP01 pin of ESP8266 is connected to IP pin of relay and provides input as on or off. The negative of the battery is connected to motor's negative and positive of battery is connected to com port of relay.

The positive of motor is connected to NO (normally open) port of the relay. The circuit is now complete and is online. The codes are uploaded to the microprocessor ESP8266 and then it is connected to mobile hotspot which is going to act as the controller of the machine.

The microprocessor connects to specific hotspot which is specified in the code. As the on command is given through controller, the motor switches on and the motion is transmitted to front wheel through belt and pulley. For transmission, V belt and pulley system is used to have a positive drive. As the vehicle moves, the rear wheel transmits motion to seed distributer which leads to sowing of seed into soil.

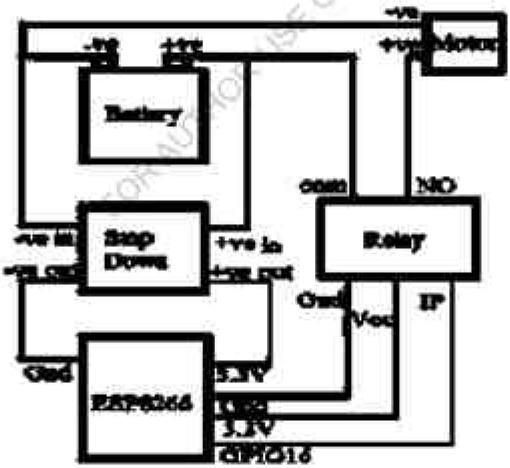

Fig. 6.4 Block diagram

When command is given through android phone the motor transmits motion to the front wheels through belt and pulley mechanism. When the machine moves the rear wheel drives the seed distributer hence the seeds are sown at regular intervals from the hopper into the soil. The figure 6 shows the photographic views of individual electrical components used in the process of automation.

7. RESULTS

7.1 Multipurpose Agri-Bot

A multipurpose Agri bot is constructed which can perform Seed Sowing, Fertilizer Spraying and monitor soil parameters remotely. The Agri-Bot is shown in Fig. 6.1 below

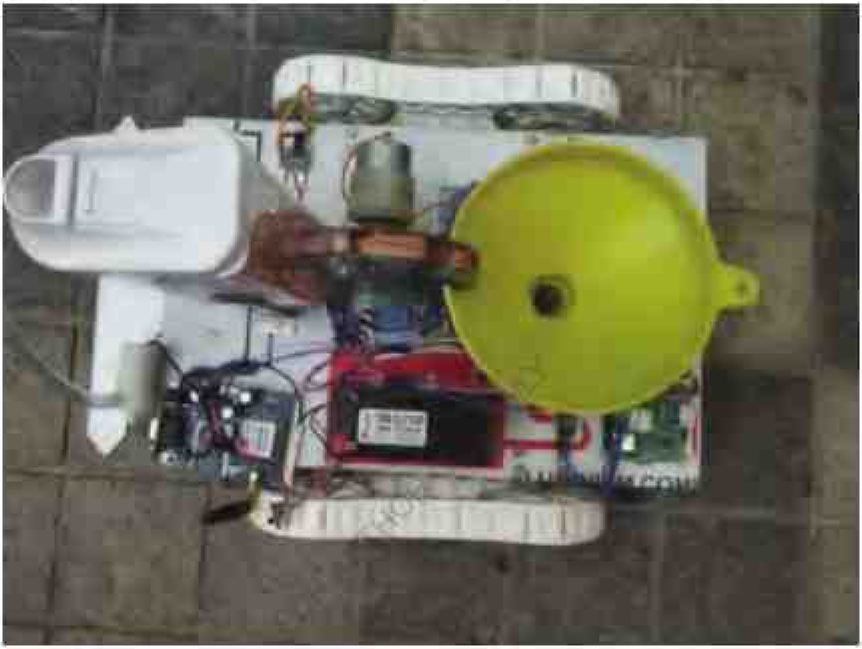

Fig. 7.1 Multi-purpose Agri-Bot

7.2 Seed Sowing

The Seed sowing results of Seed drop mechanism in Agri Bot is shown in Fig. 6.2

Fig. 7.2 Seed Sowing

7.3 Fertilizer Spray

The results of DC water pump controlled by Blynk App is shown below Fig. 6.3

Fig. 6.3 Fertilizer Spray

7.4 Agriculture Parameters- Temperature & Humidity

The Temperature and Humidity values sensed by DHT11 sensor on the bot are uploaded to ThingSpeak server. The values at various instances in Thingspeak server are shown in Fig. 6.4 and Fig. 6.5 below

Fig. 6.4 Temperature Graph in ThingSpeak

Fig. 6.5 Humidity Graph in ThingSpeak

8. ADVANTAGES, DISADVANTAGES, APPLICATIONS, FUTURE SCOPE & CONCLUSION

8.1 ADVANTAGES

The following are the some of the advantages of "IOT BASED AGRI-BOT FOR SEED SOWING, SMART LEAF INFECTION IDENTIFICATION AND FERTILIZER SRRAY"

- The robots do not get sick or tired and they do not need the time off, they can operate with closer tolerances (so, every round is at full field capacity), they offer fewer errors and at higher speeds, and the higher quality products can be sensed by the machines accurately.
- Helps farmers to be more efficient.
- It consumes very less time for entire processing.
- Water management
- Simplifies techniques of farming and helps to gain smart farming
- Avoids the farmer being exposed to toxic fertilizer produced during the spraying
- Saves the time and energy
- Increases the productivity of yield
- It is used for automatic seed and spray pesticides

8.2 DISADVANTAGES

The following are the disadvantages of the "Iot Based Agri-Bot For Seed Sowing, Smart Leaf Infection Identification And Fertilizer Spray"

- Significance installation costs
- These robots can change the culture/emotional appeal of agriculture

8.3 APPLICATIONS

The applications of "Iot Based Agri-Bot for Seed Sowing, Smart Leaf Infection Identification And Fertilizer Spray" are

- Agricultural sector
- Nursery planting
- Greenhouse automation

8.4 FUTURE SCOPE

In future, the Agri-bot finds many applications in order to reduce manual labor and increase productivity. Agri-bot will be self-sufficient for playing out different agriculture activities. It is obvious from the exploration that there is a huge potential for applying the self-sufficient framework. We can add AI for this to improve the future presentation of this task. We can utilize night vision camera for checking evening times. Addition of ML&AI mechanisms to the Agri-bot lead towards self-framework and self-investigation for plant infections.

8.5 CONCLUSION

The aim of "IoT based Agri-bot for seed sowing, Smart Leaf Infection identification and Fertilizer Spray" is to reduce the manual labor with the use of smart technology. This project introduces wireless technology in the field of agriculture. An Android App called Blynk App has been used which helps Farmers significantly. It provides a flexible user interface to farmer to control the machine effectively.

The Agri-bot can work in any sort of climatic conditions. The Agri-bot works with high efficiency and takes less time. It is a one-time investment which reduces the overall farming cost considerably. It reduces manual labor requirement which is a boon to the farmers. This Agri-Bot acts as a gateway to automated smart farming.

The seed sowing machine has been designed and fabricated and the process of seed sowing is automated using IoT in order to minimize the human effort. The modification in the selection of the micro-processor is done to achieve wireless connectivity between machine and the controller. ESP8266 has been used in order to host an application from another application processor. Relay is used to control a high- voltage circuit using a safe low-voltage circuit. As all connections are made and as soon as the circuit is closed, the electricity flows through the circuit and machine comes online to receive command from the controller which is android phone or laptop.

With the command the machine operates in the forward direction. The cultivators tilts the soil as machine moves forward and the seeds are dropped at regular intervals into the soil through distributer mechanism which consist of hopper and seed flow system. Thus, the model fabrication and its automation have been done to overcome the difficulties of farmers by achieving regular distance between rows and consecutive seeds.

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Appendix 1

CODE

```
import RPi.GPIO as GPIO
import blynklib
import time
from urllib.request import urlopen
import sys
import Adafruit_DHT
import urllib3
import os
import cv2
import smtplib
from Adafruit_IO import Client, Feed, RequestError
import os.path
from email.mime.text import MIMEText#email.mime.text.MIMEText(_text[, _subtype[,
_charset]])
from email.mime.multipart import MIMEMultipart
from email.mime.base import MIMEBase#email.mime.base.MIMEBase(_maintype(e.g. text
or image), _subtype(e.g. plain or gif), **_params(e.g.key/value dictionary))
from email import encoders
m11=8
m12=10
m21=12
m22=16
di=3
moisture=15
rain=18
weeder=23
pump=16
GPIO.setwarnings(False)
GPIO.setmode(GPIO.BOARD)
GPIO.setup(m11, GPIO.OUT)
GPIO.setup(m12, GPIO.OUT)
GPIO.setup(m21, GPIO.OUT)
```

```
GPIO.setup(m22, GPIO.OUT)
GPIO.setup(rain, GPIO.IN)
GPIO.setup(weeder, GPIO.OUT)
GPIO.setup(pump, GPIO.OUT)
GPIO.setup(dt, GPIO.IN)
GPIO.setup(moisture, GPIO.IN)
sensor=Adafruit_DHT.DHT11
GPIO.output(m11, 0)
GPIO.output(m12, 0)
GPIO.output(m21, 0)
GPIO.output(m22, 0)
BASE_URL = "http://embagribot.wizzie.online/save_values.php?"
email = 'majorprojectgnits4@gmail.com'
password = 'm@jorproject'
send_to_email = 'Accmajorproject@gmail.com'
subject = 'msg from agribot'
message = 'location image received'
file_location = '/home/pi/Desktop/AGRI0.png'
msg = MIMEMultipart()#Create the container (outer) email message.
msg['From'] = email
msg['To'] = send_to_email
msg['Subject'] = subject
'''as.string()
msg.attach(MIMEText(message, 'plain'))#attach new  message by using the Message.attach
auth_token = '83GK2RqUNkAgAiwEFBGxEtpOQY_h5S2i'
blynk = blynklib.Blynk(auth_token)          # Initialize Blynk
@blynk.handle_event('write V0')
def write_handler_pin_handler(pin, value):
    robo = (format(value[0]))
    if robo =="1":
      print ("LEFT")
      GPIO.output(m21 , 0)
      GPIO.output(m22 , 0)
      GPIO.output(m11 , 1)
      GPIO.output(m12 , 0)
```

```
    else:
        GPIO.output(m11 , 0)
        GPIO.output(m12 , 0)
        GPIO.output(m21 , 0)
        GPIO.output(m22 , 0)
@blynk.handle_event('write V1')
def write_handler_pin_handler(pin, value):
    robo = (format(value[0]))
    if robo =="1":
        print ("RIGHT")
        GPIO.output(m21 , 1)
        GPIO.output(m22 , 0)
        GPIO.output(m11 , 0)
        GPIO.output(m12 , 0)
    else:
        GPIO.output(m11 , 0)
        GPIO.output(m12 , 0)
        GPIO.output(m21 , 0)
        GPIO.output(m22 , 0)
@blynk.handle_event('write V2')
def write_handler_pin_handler(pin, value):
    Doorlock = (format(value[0]))
    if Doorlock =="1":
        print ("STOP")
        GPIO.output(m11 , 0)
        GPIO.output(m12 , 0)
        GPIO.output(m21 , 0)
        GPIO.output(m22 , 0)
@blynk.handle_event('write V3')
def write_handler_pin_handler(pin, value):
    robo = (format(value[0]))
    if robo  =="1":
        print ("FORWARD")
        GPIO.output(m21 , 1)
        GPIO.output(m22 , 0)
```

```
        GPIO.output(m11 , 1)
        GPIO.output(m12 , 0)
    else:
        GPIO.output(m21 , 0)
        GPIO.output(m22 , 0)
        GPIO.output(m11 , 0)
        GPIO.output(m12 , 0)
@blynk.handle_event('write V4')
def write_handler_pin_handler(pin, value):
    robo = (format(value[0]))
    if robo =="1":
        print ("BACK")
        GPIO.output(m21 , 0)
        GPIO.output(m22 , 1)
        GPIO.output(m11 , 0)
        GPIO.output(m12 , 1)
    else:
        GPIO.output(m21 , 0)
        GPIO.output(m22 , 0)
        GPIO.output(m11 , 0)
        GPIO.output(m12 , 0)
@blynk.handle_event('write V5')
def write_handler_pin_handler(pin, value):
    robo = (format(value[0]))
    if robo =="1":
        humidity, temperature = Adafruit_DHT.read_retry(sensor,dt )
        water=GPIO.input(moisture)
        raindrop=GPIO.input(rain)
        s=raindrop
        soil=water
        r=raindrop
        y = int(temperature)
        x = int(humidity)
        z = int(water)
        a=int(r)
```

```
        print('Temp={0:0.1f}*C Humidity={1:0.1f}%'.format(temperature, humidity))
        print("MOISTURE VALUE(I.E DRY=1,WET=0)=",water)
        print("rain VALUE(I.E DRY=1,WET=0)=",s)
        soil=water
    hom='http://embagribot.dbandroid.online/save_values.php?'+'tmp='+str(y)+'&&humidity='+str(x)+'&&soil='+str(z)+'&&id=user1'
        http = urllib3.PoolManager()
        resp = http.request('GET', hom)
        print(resp.status)
        print(hom)
        print("sent")
        print("Response: {}".format(conn.read()))
        conn.close()
@blynk.handle_event('write V6')
def write_handler_pin_handler(pin, value):
    robo = (format(value[0]))
    if robo =="1":
        print ("IMAGE UPLOADING")
        print("with in camera")
        camera = cv2.VideoCapture(0)
        for i in range(10):
            return_value, image = camera.read()
            cv2.imwrite('AGRI'+str(i)+'.png', image)
            print('AGRI IMG captured')
            time.sleep(2)
            break
        del(camera)
        filename = os.path.basename(file_location)#function returns the tail of the path
        attachment = open(file_location, "rb") #"rb" (read binary)
        part = MIMEBase('application', 'octet-stream')#Content-Type: application/octet-stream , image/png, application/pdf
        part.set_payload((attachment).read())
        encoders.encode_base64(part)
        part.add_header('Content-Disposition', "attachment; filename= %s" % filename)#Content-Disposition: attachment; filename="takeoff.png"
```

```
        msg.attach(part)
        server = smtplib.SMTP('smtp.gmail.com', 587)#Send the message via local SMTP server.
        print("SENDING MAIL")
        server.starttls()#sendmail 3 arguments: sender's, recipient's address and message to send
        server.login(email, password)
        text = msg.as_string()
        server.sendmail(email, send_to_email, text)
        print("mail sent")
        server.quit()
@blynk.handle_event('write V7')
def write_handler_pin_handler(pin, value):
    robo = (format(value[0]))
    if robo =="1":
        print ("pump ON")
        GPIO.output(pump , 1)
    else:
        print ("pump OFF")
        GPIO.output(pump , 0)
@blynk.handle_event('write V9')
def write_handler_pin_handler(pin, value):
    robo  = (format(value[0]))
    if robo =="1":
        print ("seeder ON")
        GPIO.output(seeder , 1)
    else:
        print ("seeder OFF")
        GPIO.output(seeder , 0)
try:
    while True:
            blynk.run()
```

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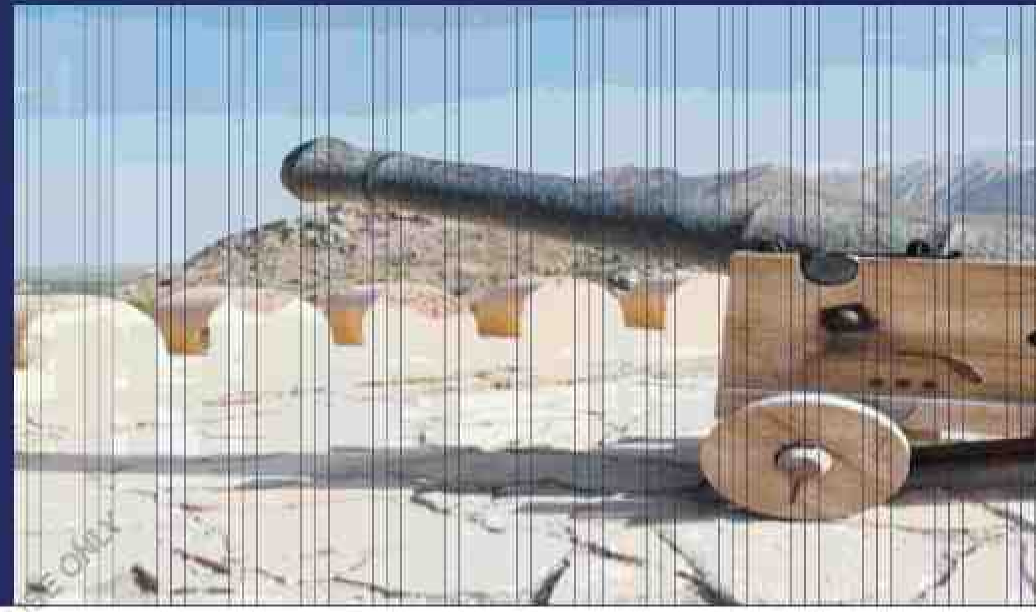
The usage of the Kalman Filter algorithm is proposed to estimate and track the location of inbound missiles for interception by firing countermeasures. In this respect, prediction of the missile's location and trajectory is essential to enable the countermeasures fired to intercept the Enemy's missile accurately.The Kalman Filter produces estimates of hidden variables based on inaccurate and uncertain measurements. Also, the Kalman Filter provides a prediction of the future system state based on past estimations.



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KALMAN FILTER DESIGN FOR BALLISTIC MISSILE DEFENSE APPLICATION

KALMAN FILTER DESIGN

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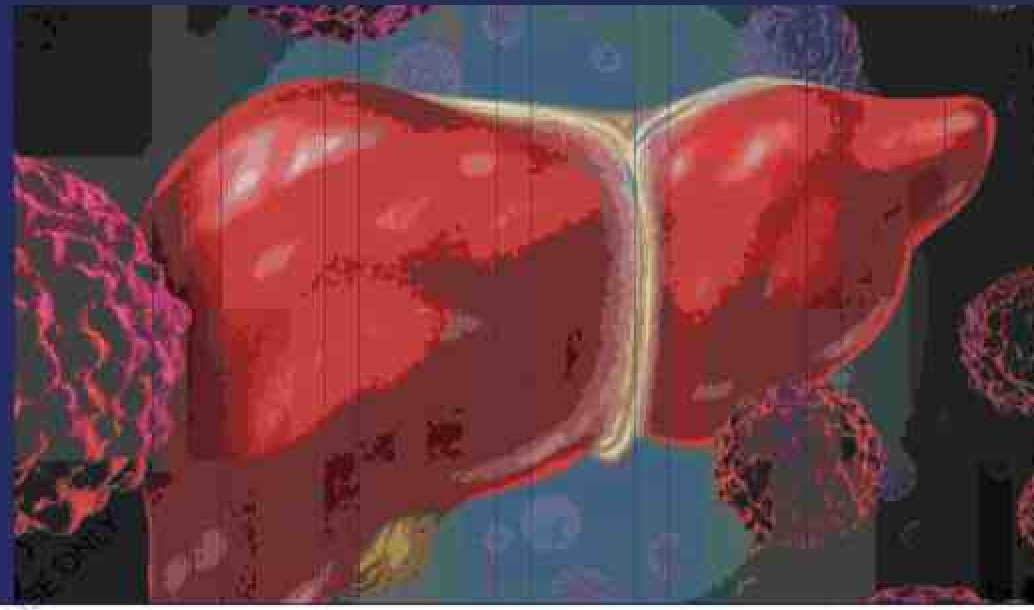
INDEX

Liver imaging using abdominal CT images has been widely studied in the recent years and it is still a challenging task. Processing CT image includes the automatic diagnosis of liver and lesions part. Because of the high intensity similarity between liver tissues and nearby organs of liver it is difficult to segment liver and tumor. Segmentation of extracted region as an imaging biomarker forms an essential component of "Radiomics". This book presents brief intro to liver tumor in CT Scan images, different methods in detecting liver tumor, automatic liver tumor segmentation from abdominal CT scan images is presented. A statistical parameter-based approach is used to distinguish liver tumor tissue from other abdominal organs. The existing segmentation methods such as region growing and intensity based thresholding methods are investigated and compared with statistical parameter-based method.



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Liver Tumor Detection from CT Scan images using DIP

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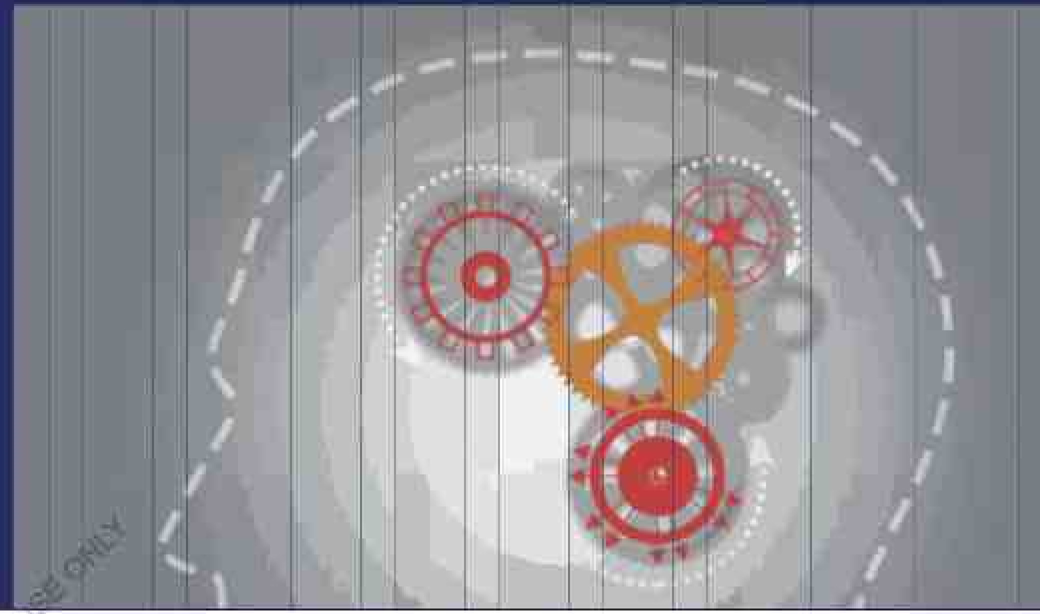
Contents

One of the most precious gifts of nature to the human breed is the ability to express himself by responding to the events occurring in his surroundings. Every normal human being sees, listens and then reacts to the situations by speaking himself out. But there are some less fortunate ones who are deprived of this valuable gift. The deaf and the dumb, rely on some sort of sign language for communicating their feelings to others. In the era of advanced technologies, where computers, laptops and other processor-based devices are an integral part of day-to-day life, efforts are required to be done for making the disables more independent in life. This project consists of image processing and machine learning methods for this purpose. Our aim is to design a human computer interface system that can recognize language of the deaf and dumb accurately. In this paper, vision-based hand gesture recognition system has been discussed as hand plays vital communication mode, considering various techniques available for hand tracking, segmentation, feature extraction and classification are referred. Implementation of the project is as; images are captured using webcam and are processed.



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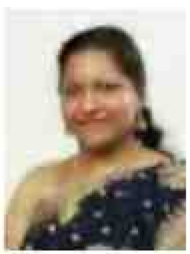
SIGN LANGUAGE TO TEXT CONVERSION USING IMAGE PROCESSING AND MACHINE



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Harini Nerella

SIGN LANGUAGE TO TEXT CONVERSION USING IMAGE PROCESSING AND MACHINE

Harini Nerella

SIGN LANGUAGE TO TEXT CONVERSION USING IMAGE PROCESSING AND MACHINE

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Security is always become a basic necessity in remote areas. It is not always possible for the police to patrol all the areas and a watch man to secure the premises all the time. In this scenario having the best security system makes life safer and more comfortable. The system uses GPS and GSM for securing any premises.
The robotic vehicle will keep on detecting the sound and if any sound is detected, it moves towards the sound. It then takes pictures of the area using four ESP32 camera modules covering 360-degree view and transmits the images of that area to the preassigned Gmail ID and the location information through GPS is sent as an SMS alert to the effected person pre- defined number in terms of latitude and longitude with the help of GSM. A Buzzer is also interfaced to robot which make alert sound whenever it detects any sound from surroundings. Thus, we put forward a fully autonomous robot that operates tirelessly and patrols large areas on its own to secure the facility. It also acts as a surveillance system which reduces the human work.

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Surveillance Robot

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Surveillance Robot

GVNSK Sravya

Surveillance Robot

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PREFACE

Security is always become a basic necessity in remote areas. It is not always possiblefor the police to patrol all the areas and a watch man to secure the premises all the time. In thisscenario having the best security system makes life safer and more comfortable. The systemuses GPS and GSM for securing any premises.

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CONTENTS

A terrifying spread of COVID-19 (which is also known as severe acute respiratory syndrome coronavirus 2 or SARS-COV-2) led scientists to conduct tremendous efforts to reduce the pandemic effects. Fast and accurate Artificial Intelligence (AI) techniques are needed to assist doctors in their decisions to predict the severity and mortality risk of a patient. Early prediction of patient severity would help in saving hospital resources and decrease the continual death of patients by providing early medication actions.

Vadthyavath Shankar

Prediction of Covid-19 Severity by Applying Machine Learning Technique

Testing of Covid-19

V. Shankar Assistant Professor, working in ECE department, I have 15 years of experience in the field of engineering.

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Vadthyavath Shankar

Prediction of Covid-19 Severity by Applying Machine Learning Technique

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Prediction of Covid-19 Severity by Applying Machine Learning Technique

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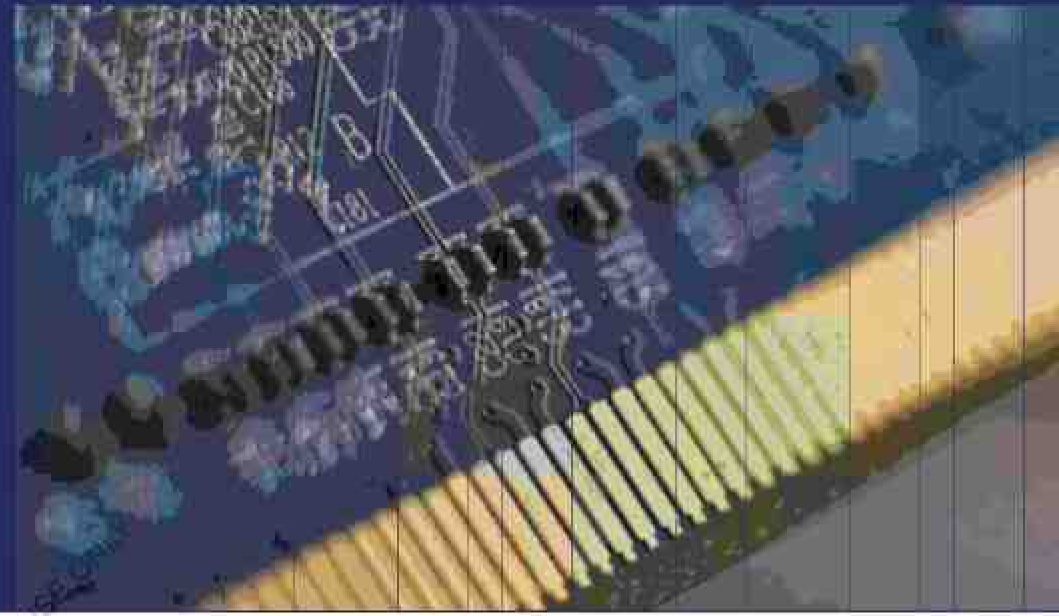
Privacy and Security are two of the most important universal rights. Over the course of last decade, security and automation systems have been gaining extreme popularity because of the enhancement in the field of science and the concomitant risks of breaking in the system and face recognition is playing a huge part in it. Face recognition play a vital role in variety of applications from biometrics, surveillance, security, identification to the authentication. In this project we are planning to design and implement a smart security system for highly secured places where access is limited to people whose faces are available in the training database.



I am Mr. Sridhar Babu, Awarded Masters from NIT.

Sridhar Babu C

SMART SECURITY SYSTEM USING Arduino

Using Face Authentication

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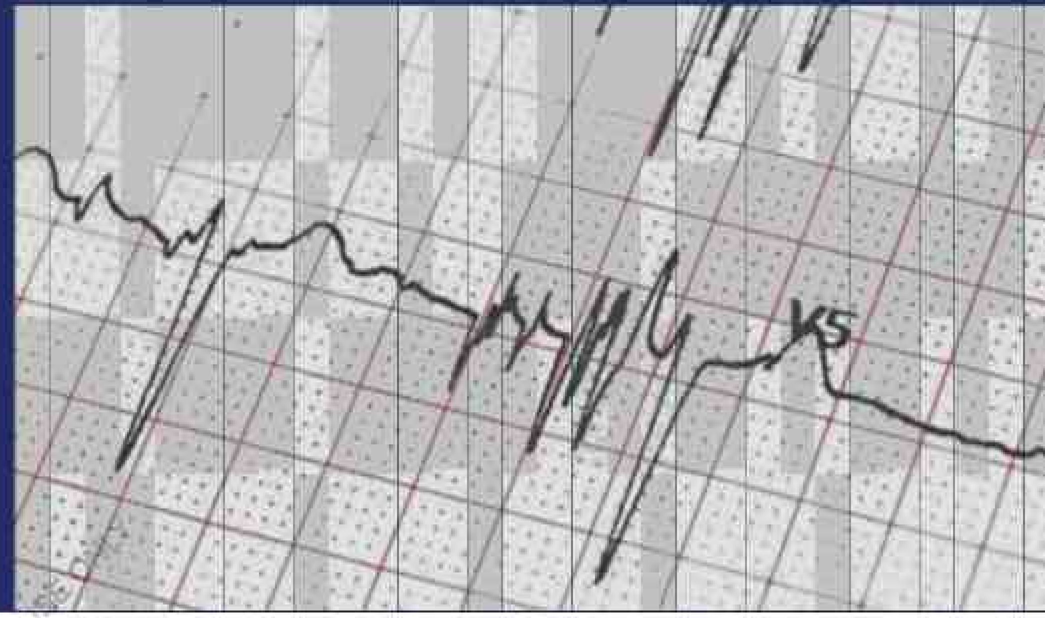
INDEX

Signal processing today is performed in the vast majority of systems for ECG analysis and interpretation. The objective of ECG signal processing is manifold and comprises the improvement of measurement accuracy and reproducibility (when compared with manual measurements) and the extraction of information not readily available from the signal through visual assessment. In many situations, the ECG is recorded during ambulatory or strenuous conditions such that the signal is corrupted by different types of noise, sometimes originating from another physiological process of the body. Hence, noise reduction represents another important objective of ECG signal processing; in fact, the waveforms of interest are sometimes so heavily masked by the noise that their presence can only be revealed once appropriate signal processing has first been applied.



P. Satyanarayana Goud

OP-AMP BASED ECG SIGNAL PROCESSING FOR COMPUTATION OF BPM

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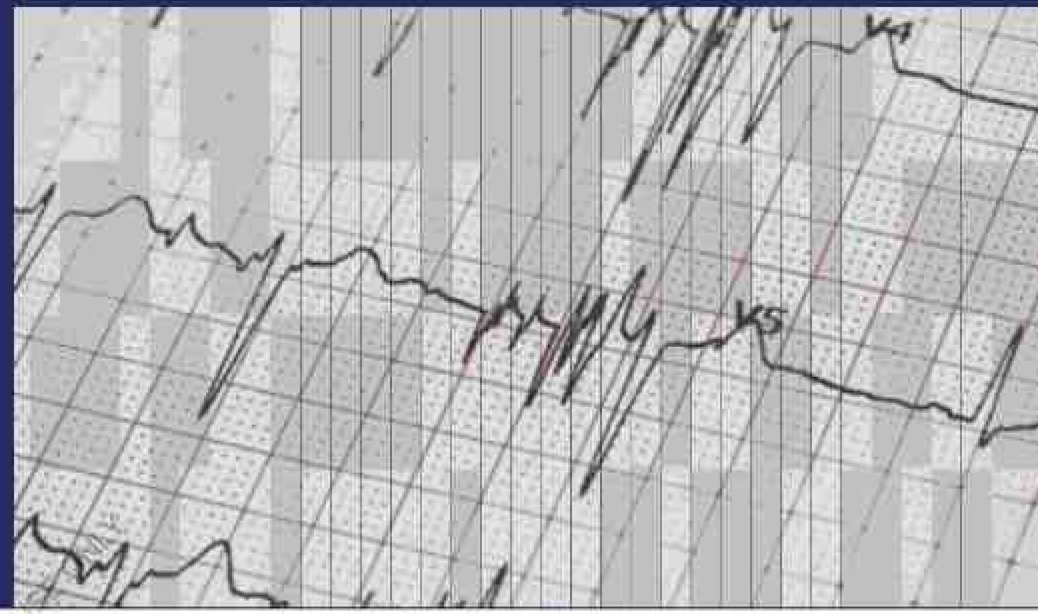
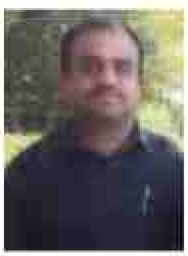
INDEX

ECG signal is contaminated by various kinds of noise such as the patient's contraction muscles, respiration, 60 Hz interference, place of recording (ambulatory recording), which can change the positions of electrodes which record the signal. All these factors affect the signal and disrupt it, this gives a signal whose baseline is wandering. In order to obtain the best extraction of the QRS complex of an ECG signal, we will need to correct this baseline and to make it horizontal. In this project, we will use this correction in order to use a fixed thresholding in the application of the Pan Tompkins Algorithm. This method reduces the processing time and complexity for the concerned algorithm.



PUDARI SATYANARAYANA GOUD

COMPUTATION OF BPM USING PAN-TOMPKINS ALGORITHM IN ECG SIGNALS



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COMPUTATION OF BPM USING PAN-TOMPKINS ALGORITHM IN ECG SIGNALS

PUDARI SATYANARAYANA GOUD

COMPUTATION OF BPM USING PAN-TOMPKINS ALGORITHM IN ECG SIGNALS

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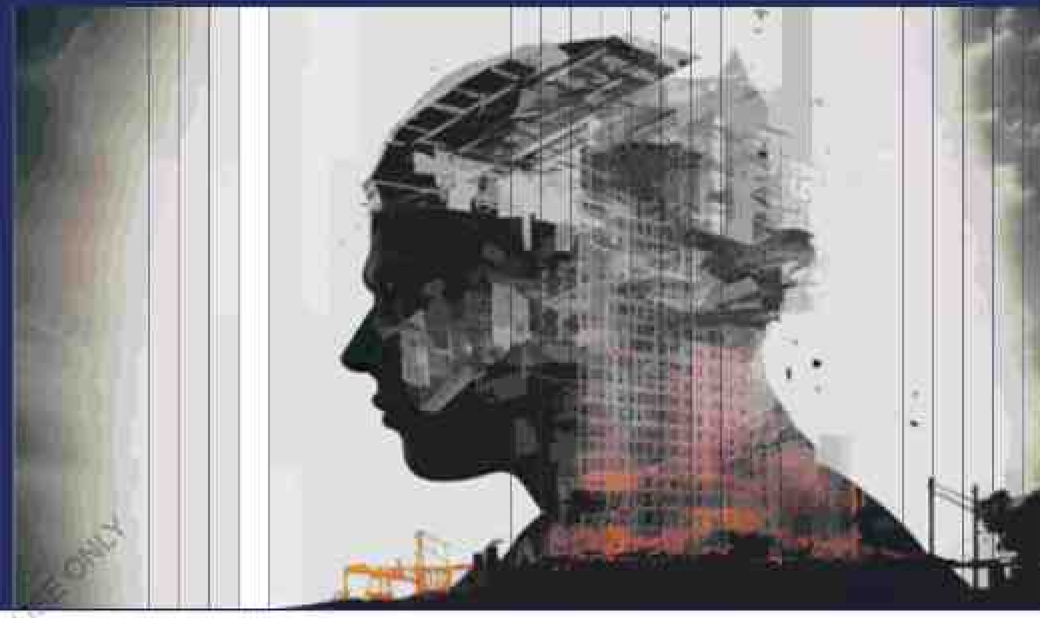
INDEX

India's overall COVID-19 cases load has swelled to 26.9 million, the second-highest globally. Social distancing is of key importance during the current pandemic. It helps limit the spread of COVID-19 by observing distance between disease spreading individuals. Now it is not possible to station a person 24×7 at each queue to monitor social distancing violations at Banks, Public Offices, Malls, Schools, Theatres etc., usually see long queues for hours every day. To ensure social distancing in queues we hereby design a Smart Queue Monitoring BOT.Presently, at some places the automatic traffic light queuing system robot which encourages social distance maintenance are employed and there are also few robots that were designed but they are not yet implemented. The BOT we are proposing instantly makes buzzer sound, if it finds any individuals with less than 3 feet distance between them. If the violation persists, it sends alert messages of these violations along with a camera picture to Gmail account using Wi-Fi over IOT to inform the higher authorities/head office to update them about violations with proof so instant disciplinary action can be taken.



Pathem Lavanya

Smart Queue Monitoring Robot

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Smart Queue Monitoring Robot

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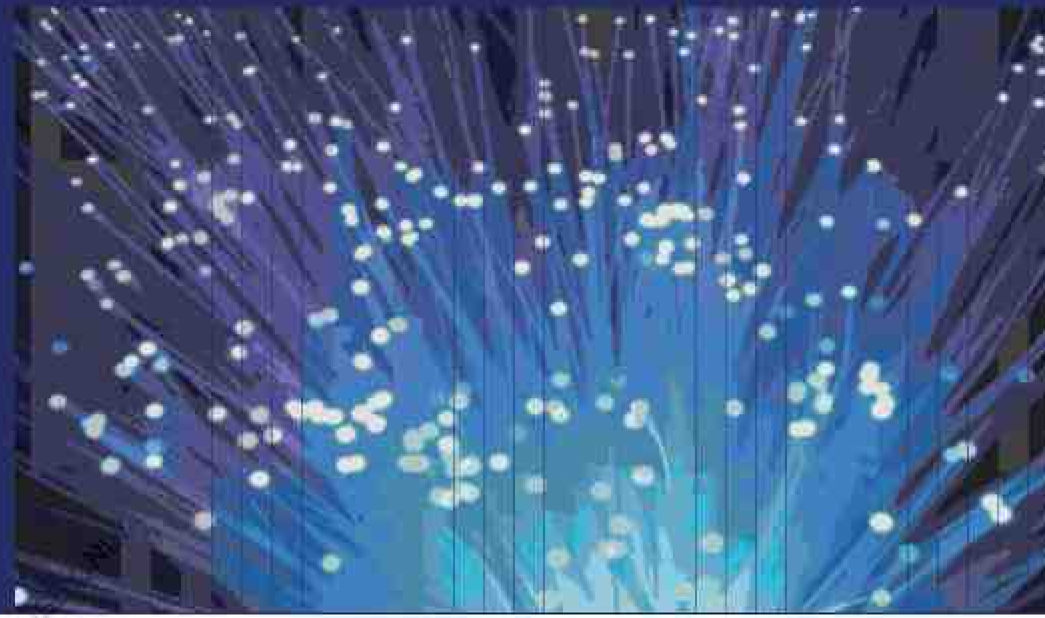
Contents

This book gives the details about Optical Ethernet as a high speed data networking technology that uses optical fibers to transmit Ethernet frames over long distances. It combines the reliability and security of optical fiber with the flexibility and simplicity of Ethernet, making it a popular choice for high-performance LANs and WANs. Optical Ethernet works by converting electrical signals from Ethernet devices, such as computers and routers, into optical signals that can be transmitted over fiber optic cables. The optical signals are then received by optical transceivers at the other end of the fiber, which convert them back into electrical signals for use by the receiving Ethernet devices. One of the key advantages of optical Ethernet is its high speed. Optical Ethernet can transmit data at speeds of up to 10 Gigabits per Second (Gbps) or more, which is much faster than traditional Ethernet, which typically tops out at 1 Gbps. This high speed makes optical Ethernet ideal for applications that require large amounts of data to be transferred quickly, such as Video streaming, Cloud computing and Big data analytics.



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Optical Ethernet

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CONTENTS

Today in society there is a growing need to assist seniors. One very important task is taking prescribed medication. There are issues concerning seniors' ability to remember to take and handle their medicine on their own. Many seniors who suffer from dementia or Alzheimer's may not remember when to take their medication or what medication to take. In addition, seniors often have difficulty handling their medication, as pills can be small and their containers difficult to open.

Prakash Yelaki

Automatic Medication Dispenser

I am Mr.Y.Prakash B.E Graduated from VTU University Belgaum Karnataka and master's degree from the same university working in G.Narayanamma institute of technology and science Hyderabad from past seven year.

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Prakash Yelaki

Automatic Medication Dispenser

Prakash Yelaki

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This project includes a smart and modest bank door lock enhanced with a fingerprint interface. For implementing this project, we will be using arduino uno and biometric based locker technique for locking system. We are using fingerprint technique to make an air tight security system. The fingerprint sensor will be integrated in the locker panel, facing outer side of the locker, so that people can't have access to the controlling systems from outside. As thefts are increasing day by day it is our responsibility to make our belongings secure.The fingerprint sensor will take the finger image of the user and forward to it the microcontroller to match with its existing fingerprint record. If the print matches with one of the previous fingerprints of the sensor's flash memory, then the microcontroller will lock or unlock the latch, based on its true state. If the fingerprint is foreign to the microcontroller, then lcd will display the corresponding status. The system will be reset once a known print will be entered. This System has keys to increment or decrement the id while enrolling new fingerprint to store the fingerprints in different locations in flash memory of the sensor.

KRISHNA KISHORE

FINGERPRINT BASED BANK LOCKER SYSTEM USING ARDUINO UNO

ASSISTANT PROFESSOR IN ECE DEPT. , G.NARAYANAMMA INSTITUTE OF TECHNOLOGY AND SCIENCE

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KRISHNA KISHORE

FINGERPRINT BASED BANK LOCKER SYSTEM USING ARDUINO UNO

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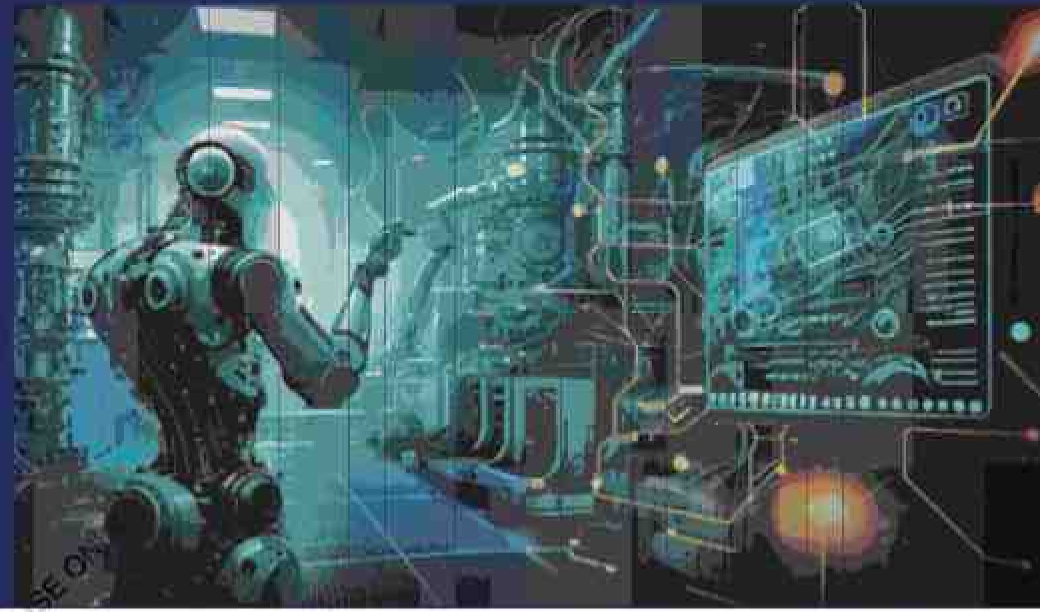
INDEX

Door plays an important role in home security. To secure the house, the occupants of the house will always have the door locked. We propose an application called Door Security System which is based on Android using Internet of Things (IoT) technology.

The objective of this book is to facilitate the user with a simple and customized technology to effectively manage visitors flowing to his/her premises. It is a real time smart doorbell notification system for home security which combines the functions of a smart and a house network system. Facial recognition is added to provide additional security and to replace the traditional lockandkey.

In an existing system, there is only RF based security system. The main drawback in this system is whoever has RF card, it allows that person to enter into the house and it doesn’t look for any facial recognition. With this we can conclude that the existing system has weak security.



G.krishna Kishore , Assistant professor, Electronics And communication Engineering, G. Narayanamma Institute Of Technology And Science

G. Krishna Kishore

Wi-Fi BASED SMART DOORBELL SECURITY SYSTEM USING IOT

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G. Krishna Kishore

Wi-Fi BASED SMART DOORBELL SECURITY SYSTEM USING IOT

G. Krishna Kishore

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Wi-Fi BASED SMART DOORBELL SECURITY SYSTEM USING IOT

INDEX

The necessity for healthcare assistants is growing at present situations in particular for the elderly people who are suffering from long-term chronic diseases such as Alzheimer's, Parkinson's, Paralysis and so on. In the early 90's, a number of studies began to highlight the problem of the increasing number of people with Alzheimer's disease. It is a neuro - degenerative disease that occur when the brain no longer functions normally, where in the early stage the symptoms may be minimal, but as the disease causes more damage to the brain, symptoms worsen. The most common symptom in the early stage is the shortterm memory loss (difficulty in remembering events). IoT devices with intelligent applications can be used for monitoring the health condition of such patients.

G KRISHNA KISHORE - ASSISTANT PROFESSOR, ECE, GNITS.

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ALZOT: AN IOT BASED HEALTH CARE ASSISTANT FOR ALZHEIMER'S PATIENT

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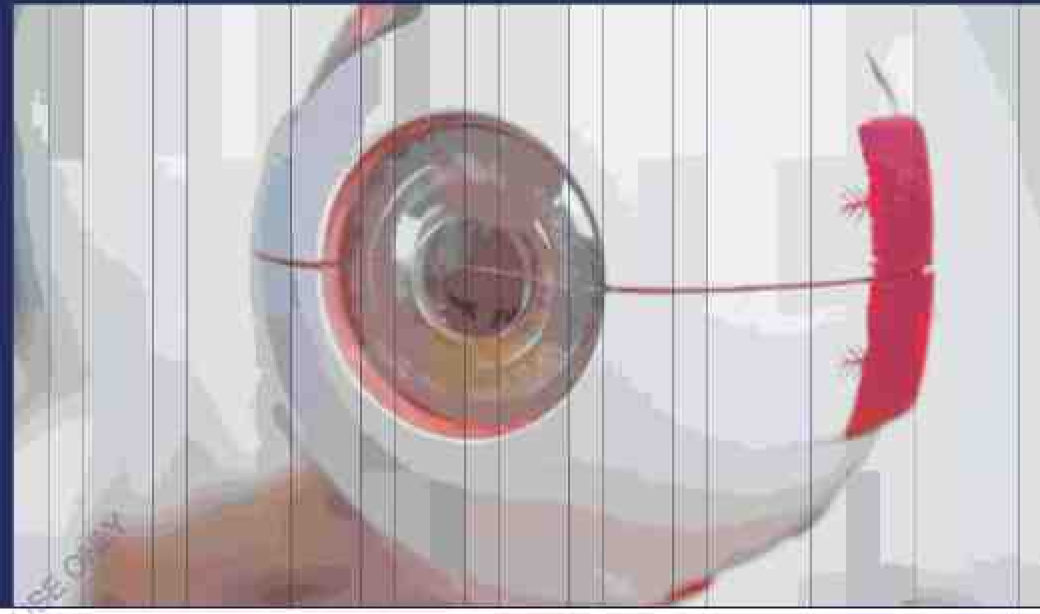
ALZOT: AN IOT BASED HEALTH CARE ASSISTANT FOR ALZHEIMER'S PATIENT

INDEX

Diabetic retinopathy is a chronic progressive eye disease associated with a group of eye problems as a complication of diabetes. This disease may cause severe vision loss or even blindness. Specialists analyze fundus images in order to diagnose them and to give specific treatments. Fundus images are photographs taken of the retina using a retinal camera, this is a non-invasive medical procedure that provides a way to analyze the retina in patients with diabetes. The correct classification of these images depends on the ability and experience of specialists, and also the quality of the images. In this paper, we present a method for diabetic retinopathy detection using MATLAB. This method is divided into three stages: the first stage is pre-processing which involves disk segmentation and vessel segmentation. In the next stage which is feature extraction various features like variance, mean, skew, and standard deviation of texture are calculated using LBP and watershed algorithms. Finally, the classification is done using the SVM by creating a hyperplane and comparing the features with a dataset.



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DETECTION OF DIABETIC RETINOPATHY USING LOCAL BINARY PATTERN

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Purna Chandra Reddy V.

DETECTION OF DIABETIC RETINOPATHY USING LOCAL BINARY PATTERN

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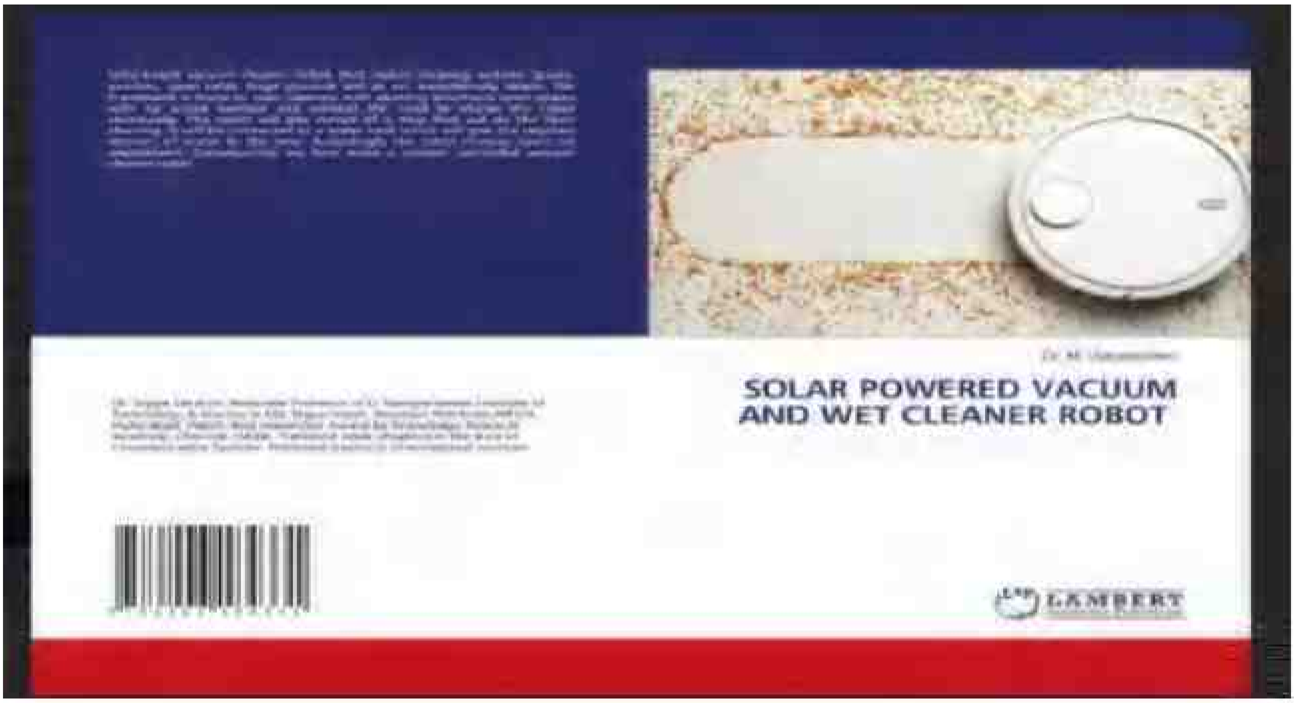

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Nowadays people are going to shopping malls to by glossary and daily need items. There is heavy rush in them during billing. This can be avoided by using IOT and RF ID technology. In this , card is charged for specific amount and during selecting glossary items during scanning and placing in cart, money will be automatically debited from card and no need of waiting for billing. In this RF ID technology and IOT were used.

Vadde Radha Krishna

IOT Based Smart Shopping Cart using RF ID

I am V.Radha Krishna, working as Asst.Prof in G.Narayanamma Institute of Technology and Science [For Women],Hyderabad. My area of interest is VLSI designing and IOT. I have more than 20 years of experience

9 786206 184171

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Every aspect of daily life necessitates electricity, but conventional energy sources are becoming less abundant due to the growing population growth. The lack of electricity is a challenge that many people in India are dealing with. Of those that made an effort, everyone finds the supply of electricity to be erratic and inconsistent. There aren't enough dependable, renewable energy sources like electricity in India. In the modern world, one measure of a country's standard of living is the availability and use of electricity. Energy is important taking into account all sectors of a country's economy.

The Author has completed her post-graduation in Engineering and interested to work in Signal Processing filed.

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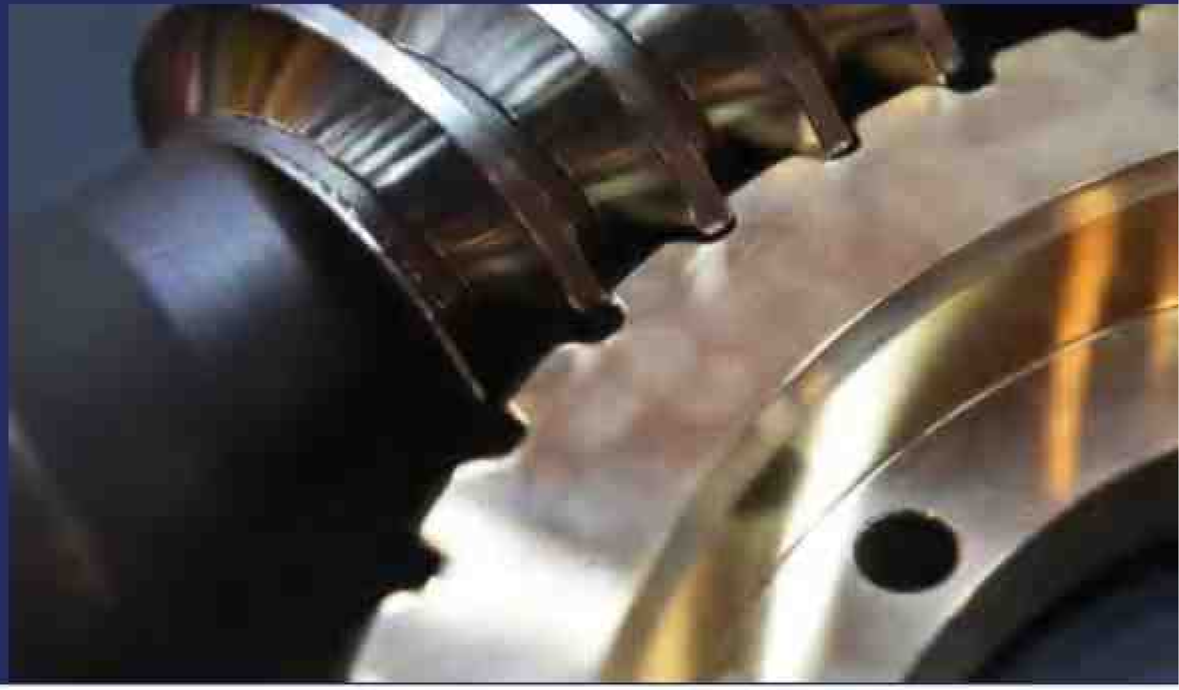

Sarada A.

ELECTRICITY GENERATION from Speed Breakers

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Image super-resolution, which is used to restore high-resolution image from a single low-resolution (LR) image, is a difficult challenging problem in computer field. In recent times, dominant deep learning algorithms have been applied to Single image super
resolution and have shown a highly efficient performance.SR methods are usually based on two important algorithms, high quality spatial (in-frame) up-scaling, and motion compensation for finding corresponding areas in neighbour frames. The aim is to understand in a better manner, the application of super-resolution images in the future by understanding how things work in the digital world

Parupalli SriPadma

SUPER RESOLUTION OF IMAGES

Using deep learning

The author is a faculty in a reputed engineering college. She has completed her PG and is now pursuing PhD.

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Third eye for blind is an assist to the blind people. The system uses audio and vibration signals to notify the user about upcoming hurdle. As the distance between glove and obstacle decreases, frequency of both audio and vibration signals increases. Thus the system helps to ease the navigation process for the needy. This system offers a low-cost, reliable, portable, low power consumption and robust solution for navigation with obvious short response time.

P. Roopa Ranjani

Third Eye for Blind using Arduino

P. Roopa Ranjani works as Assistant Professor in G. Narayanamma Institute of Technology and Science. He has 9 years of teaching experience. He is pursuing Ph.D from KL University, Hyderabad.

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International Conference on Electronics, Communication and Computing Systems (ICECCS-2023)
23^{rd} - 24^{th}, June 2023

Certificate

Paper ID: ICECCS-2023-159

This is to certify that ***Dr. K. Ragini, Professor, Department of ECE, G. Narayanamma Institute of Technology and science.*** has presented a Research Paper entitled ***Design of A RISC-V Processor Using Booth Algorithm*** in the International Conference on Electronics, Communication and Computing Systems (ICECCS-2023) from 23^{rd} to 24^{th} June, 2023 organized by the Department of Electronics and Communication Engineering, Vasavi College of Engineering (Autonomous), Hyderabad - 31, Telangana State, India.

Dr. K. Veera Swamy	Dr. E. Sreenivasa Rao	Dr. S.V. Ramana
Coordinator - ICECCS-2023	Prof. & HoD-ECE	Principal

Rishabh Kumar
School of Computing Sciences and
Engineering
Galgotias University

Prashant Sonkar
School of Computing Sciences and
Engineering
Galgotias University

It is important to resolve initial stage on which patients requires ICU admissions in managing COVID-19 exclusively when medical resources are in short. Delay in ICU admissions is associated with negative conclusion such as temporality and cost. Consequently, early identification of patients with a high risk of respiratory failure can prohibit complications, enlarge risk stratification, and improve the conclusions of severely-ill hospitalized patients. In this paper, we developed a model that uses the characteristics and information collected at the time of patients' entrance and during their initial period of hospitalization to accurately predict whether they will need ICU admissions. We use the data explained and organized in a window-based manner by the hospital team (published on Kaggle). Preprocessing is tested, including imputation, cleaning, and feature selection. In the cleaning process, we remove zero-variance, unnecessary, and /or highly correlated features. We use different algorithm such as KNN, Logistic Regression, Random Forest, SVM (Support vector Machine), Decision Tree Classifier with early stopping as a predictor in our developed model and found that Decision Tree Classifier is giving the highest accuracy. We achieve sensitivity 92.5%, specificity 93.44% and AUC score 80%.

98.FOOTBALL MATCH PREDICTION USING RF CLASSIFIER

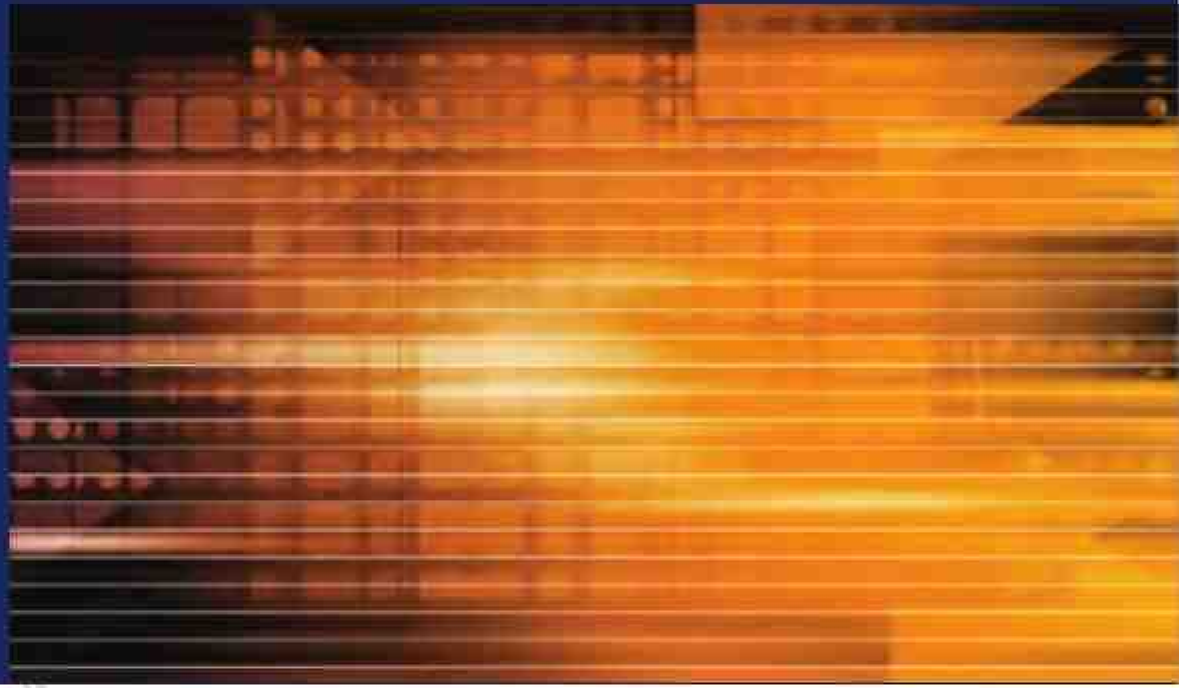
Nagamani T, Rishi B, Rohith Vignesh E, Pravin B, Nandhakumar R G
Department of Computer Science and Engineering, Kongu Engineering College, Perundurai, Erode, TN, India

- Trying to predict the results of football games is a fascinating task, as football is one of the most popular and widespread games. Forecasting is also beneficial.Choosing the greatest options will aid clubs and administrators in winning associations and competitions. Given the significant financial risks associated with gambling, this sector is interested on high prophetic accuracy. This research study focuses on machine learning techniques that help in very accurate outcome prediction rather than the conventional strategies based on quantifiable inspection and AI technologies. The supervised learning method The well-known machinelearning method Random Forest is included. It is based onthe concept of supervised methods, which is a way ofmerging classification models to handle a complicated issue and enhance performance model. In this research study, the outcome of a football coordinate is predicted using RFC and an attempt is made to alter it for better results.

99.MACHINE LEARNING BASED ANALYSIS ON BEHAVIOURAL DIFFERENCE BETWEEN DEPRESSION AND ANXIETY

Dr.C.Padmaja
Dept. of ECE
G.Narayanamma Institute of Technolgy
and science(for women)
Hyderabad, India

In a developing nation like India, with advancement in the transportation technology and rise in the total number of vehicles road accidents increase rapidly and there is also tax collecting issues. So in this project, a solution for both problems is discussed and implemented. For collecting tax an automatic tax collecting system using RFID is used. A real-time RFID-CLOUD based vehicle identification system is designed and implemented. This provides a full automation of highway scanning far away from the monitoring station. Once RFID reader broadcasts "Auto-Highway-Scanning" RF signal, each tagged-vehicle within the RF-field of 80m from the reader runs a collision-avoidance. So in our project for accident related issues the implemented system has two Phases-Accident Detection and Accident Prevention. To avoid or prevent the Accidents, we are using Alcohol sensor to detect whether the person is alcoholic or not. If the driver is alcoholic, the sensor will detect the alcohol concentration and if the value exceeds the threshold limit then the vehicle will slow down and comes to stand still, that is the first step to avoid the accidents and the next step is for accident detection.



Ravi Prakash Reddy I

RFID-CLOUD BASED VEHICLE IDENTIFICATION SYSTEM ON HIGHWAY

Dr. I. Ravi Prakash Reddy, working as a Professor and Head, Department of Information Technology, G. Narayanamma Institute of Technology & Science (For Women) with more than 25 years of teaching experience. Areas of Specialization include Operating Systems, DBMS, Cloud Computing, Distributed Systems etc.

9 786206 754053

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S. Ramacharan

Application of Machine Learning for Detection of Heart Disease

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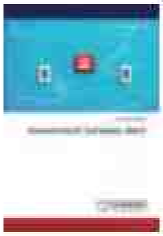

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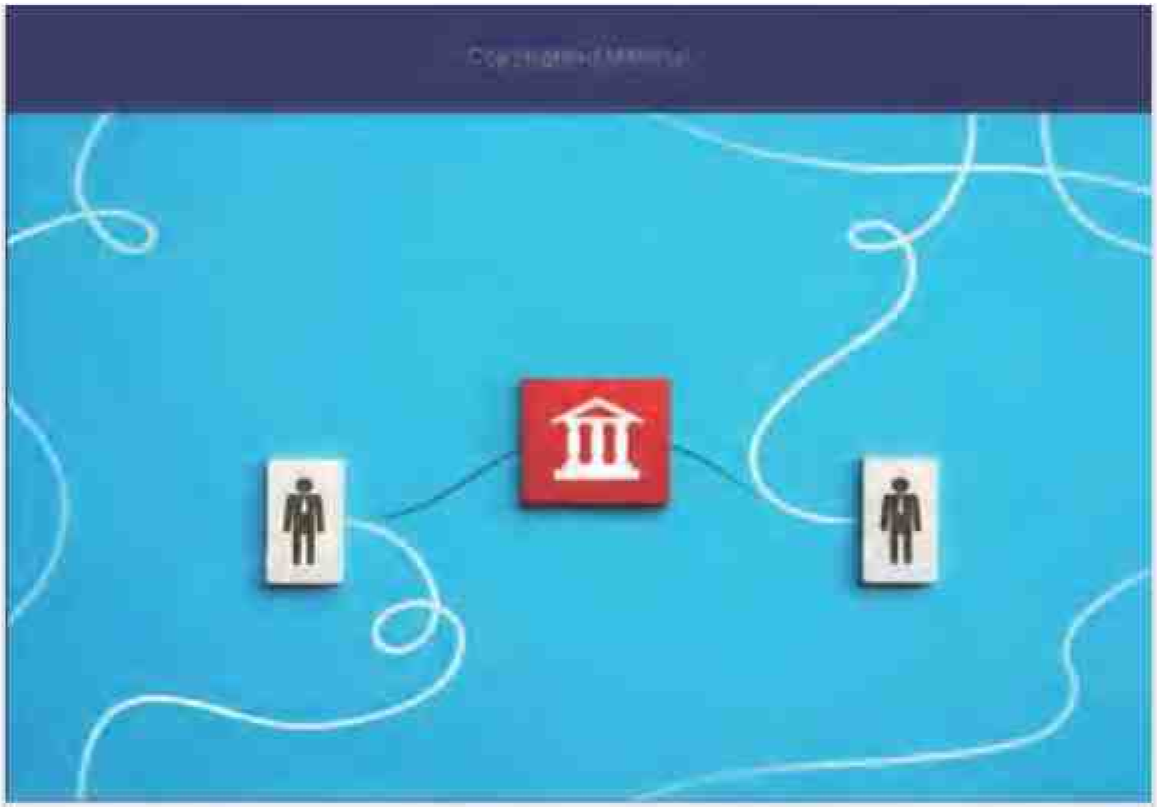

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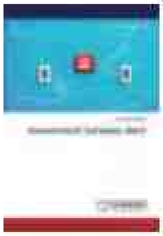

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Artificial Intelligence Unleashed:

Exploring Recent Trends and Applications in Real-Life

SESHA BHARGAVI VELAGALETI

Artificial Inteliigence Unleashed:

Exploring Recent Trends and Applications in Real-Life

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fairness, privacy, and the socioeconomic impact of AI, highlighting the importance of responsible and ethical AI development.

As we explore the frontiers of AI, it is essential to remember that this technology is not meant to replace humans but rather to augment our capabilities. AI systems can assist us in making better decisions, automating repetitive tasks, and solving complex problems. The collaboration between humans and AI is key to unlocking the full potential of this transformative technology.

This book is designed to be a comprehensive guide for readers interested in understanding the recent trends and applications of AI. Whether you are a student, professional, or simply curious about the world of AI, we invite you to embark on this journey with us. It is our hope that "Artificial Intelligence Unleashed: Exploring Recent Trends and Applications in Real-Life" provides you with valuable insights, sparks your imagination, and encourages you to explore the limitless possibilities of AI. By understanding the advancements and ethical considerations surrounding AI, we can collectively shape a future that maximizes the benefits of this powerful technology while ensuring its responsible and beneficial use.

Let us dive into the world of AI and witness the unleashed potential that awaits us.

Happy reading!

-The Authors

Usha Vadde

FARMERS MARKET – A Web Based Application

FARMERS MARKET – A WEB BASED APPLICATION

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Sridevi M

Indirect Tax Compliance

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With the number of entities that were using different ERP Systems to capture the transactions, there was a need of a Tax Software that could not only take care of the Tax, Determination and well as Tax Compliance that the system should be capable of handling the various complex transnational scenarios as well as providing the Tax Managers complete visibility of the transnational data and historical data trails for accurate and upto date information for various tax purposes.
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ONESOURCE enables the group to manage VAT calculations and validations in real-time determining correct tax amounts in milliseconds, using the most current tax rates and rules across transactions and jurisdictions. ONESOURCE Indirect Tax Compliance is a compliance process management tool that is designed to provide automation, structure, control, and security to the management of VAT and GST filings.

M. Sridevi is assistant professor of Information Technology at G Narayanamma Institute of Technology for Women (Autonomous), has 15 years of experience. Her areas of expertise are Computer Networks, Cyber Security.

Internet of Things (IOT) consists of devices that connect to the internet and communicate with each other. It enables these gadgets to collect and exchange facts with a consumer. Smart irrigation system using IOT technology is desinged. Now-a-days every where we are using IOT technology to do a particular task in a smarter way, so first we collect the information from the nature such as temperature, pressure, gas level using sensors for weather monitoring and for crop protection. We use animal detection system and get the SMS alert to the farmer if any animal try to spoil the crop and it give the SMS to the farmer regarding to the soil dryness to control the motoraccording to his requirement.

CHITIRALA SRAVANTHI

Smart Farming

CHITIRALA SRAVANTHI is pursuing PhD in JNT University in Machine Learning had an experience of around 16 years.

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Aparna Tanam

ONLINE VEHICLE RENTAL SYSTEM

Vehicle Renting made simple!

Mrs. Aparna Tanam, working as Assistant Professor in Department Of Information Technology, G.Narayanamma Institute Of Technology and Science, with 20 years of Teaching Experience.

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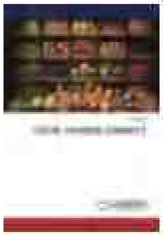

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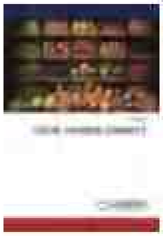

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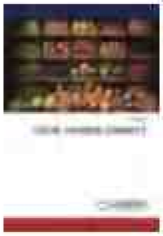

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This website operates as an inter-college online classifieds market place for used items of the students and is accessible through the internet. These items are categorized based on buy, borrow or donate and can be accessed easily. Borrower can contact the lender privately after requesting an item. This will reduce the physical efforts of students meeting different individuals in the college.
Also, it helps the old students to discard the items they no longer use in a proper manner. Apart from this, it also is an environment-friendly solution as it emphasizes on the reuse of items.

M Bhavani

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I, Bhavani, working as an Assistant Professor in IT department, had 12years of experience.

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TABLE OF CONTENTS

India is a country where 15% of the total differently abled population includes people suffering from hearing ailments.
To work towards a more inclusive society, technology can be leveraged to deal with the communication barriers faced by them and provide innovative ideas to resolve those issue. This book shows how we have trained the model to detect the alphabets, digits and words that can be accurately classifies by the model and hence reducing the communication barrier with the differently abled people.

Vijay Kumar Balla , has more than 10 years of experience in academia. He is working in G. Narayanamma Institute of technology and Science(for Women) as an Assistant professor of Information Technology.

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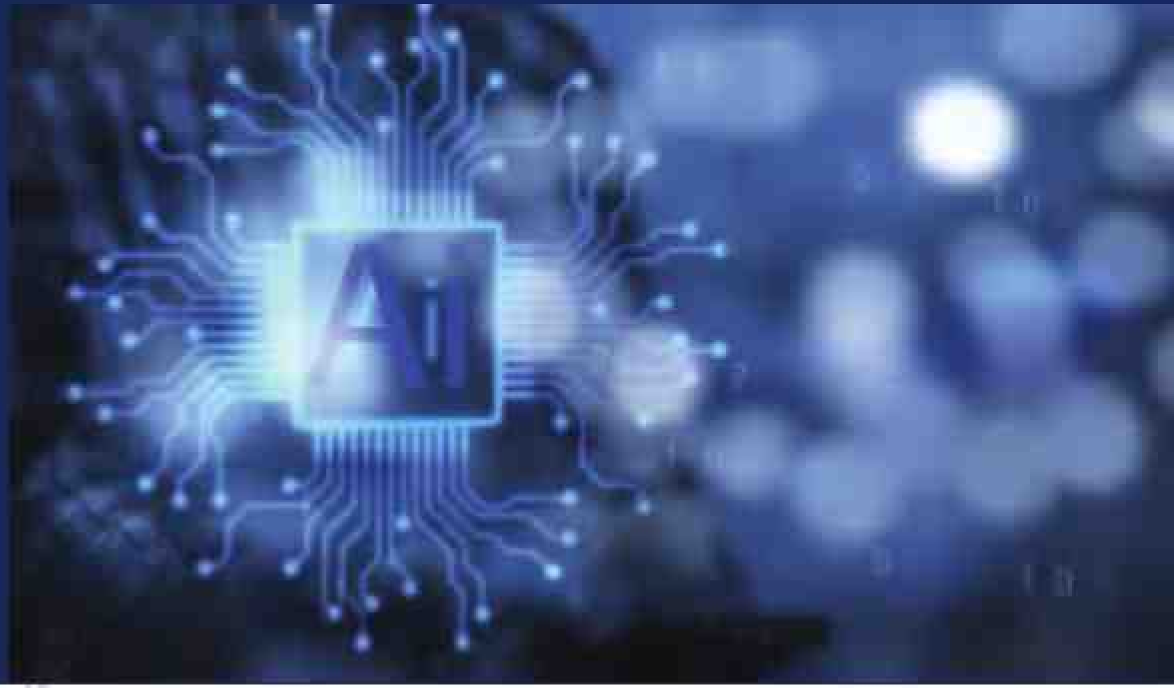

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Sign Language Detection Using Deep Learning

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SIGN LANGUAGE DETECTION USING DEEP LEARNING

Vijay kumar Balla

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Health care diagnosis application is a Deep Learning and Machine Learning based Medical Test online app that predicts numerous diseases such as diabetes, breast cancer, malaria, and pneumonia utilizing the Deep Learning and Machine Learning concepts. We will accomplish this by developing models for various diseases utilizing deep learning techniques such as the Convolutional neural network model and ML algorithms such as the Random Forest algorithm, which can automatically analyze photos and predict the degree of disease in the patient. This automation technique can save a lot of time, screening the process of treating diabetes, breast cancer, malaria, and pneumonia on a wide scale.

Vandana Dharmapuri

Deep Learning and Machine Learning for Medical Diagnosis

The Power of Artificial Intelligence in Modern Medicine

Vandana Dharmapuri is an Assistant Professor in Information Technology, working at G Narayanamma Institute of Technology & Science, for women. Her areas of interest are Cyber Security, Artificial Intelligence.

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Naga Ramya Ponnada and 2 more

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Ethereum Dapp to Track Medical Supplies in Pharmaceutical Supply Chain

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Jayasree Kokkonda

Face Mask Detector: A mask detection model

FACE MASK DETECTOR: A MASK DETECTION MODEL

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Face Mask Detector

A mask detection model

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Jayasree Kokkonda

Face Mask Detector

Jayasree Kokkonda

Face Mask Detector: A mask detection model

FACE MASK DETECTOR: A MASK DETECTION MODEL

Face mask detector uses concepts of machine learning to deduce if a person is wearing a mask or not. The process of detection happens simultaneously with capturing a frame with human face clearly visible to analyzing within the training data and finally cementing a label of mask or no mask on the screen. The algorithms used in this detector are mainly used in object detection systems, facial recognition and authentication and pattern recognition. These algorithms form a base for the mask detection process once a human face is identified.

I, Jayasree Kokkonda, working as Assistant Professor in Information Technology Department in G.Narayanamma Institute of Technology & Science, Hyderabad. The area of interest are Internet of Things, Machine learning, Block chain, Networking.

Nageswari Akula

Door to Dreamland

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ABSTRACT

Today real estate sector is one of the quickest developing markets in the world. The Indian real estate sector has witnessed high growth in recent times with the rise in demand for office as well as residential spaces for example the demand for office space has been increasing in some of the major cities of India like Delhi, Mumbai, Pune, Chennai, Kolkata etc. Meanwhile the demand for residential space is also increasing in various cities like Bangalore, Delhi, etc.

"Door to Dreamland" is a project where we build a website to help the people in purchasing real estates. It helps people in searching their interest in buying different properties in different cities according to their convenience. We collect data regarding various real estates, cities, and facilities available in the respective properties from sellers. The sellers can upload the property details on the website for other buyers to search. The users can know what type of property is available, area of property in terms of square feet, facilities available in those properties, the price of the property, built in year, furniture available, etc. Buyers can buy properties in shares also. Additionally, a map is provided to locate the property. Also, the buyers can set meeting with the sellers to discuss about the property.

TABLE OF CONTENTS

Internet of Things (IoT) conceptualizes the idea of remotely connecting and monitoring real world objects through the internet. Home monitoring and automation is utilized in order to uphold the comfortable living conditions within a home. This IoT project focuses on building a smart wireless home automation system. A low-cost, flexible and reliable home automation system with additional security using ESP 8266 microcontroller, with IP connectivity through local Wi-Fi for accessing and controlling devices by authorized user remotely using Smart phone. Motion and light detection sensors add additional features of controlling the devices in an optimum way when the user is away. The proposed system is server independent and uses Internet of Things to control human desired appliances starting from industrial machine to consumer goods. To demonstrate the effectiveness and feasibility of this system, we present a home automation system using Arduino IDE software and ESP-8266 microcontroller as a connectivity module. It helps the user to control various appliances such as light, fan, TV with just a single click from the web browser through their mobile phones.

GUNA SANTHOSHI

Domotics Robotization using IOT (Node MCU)

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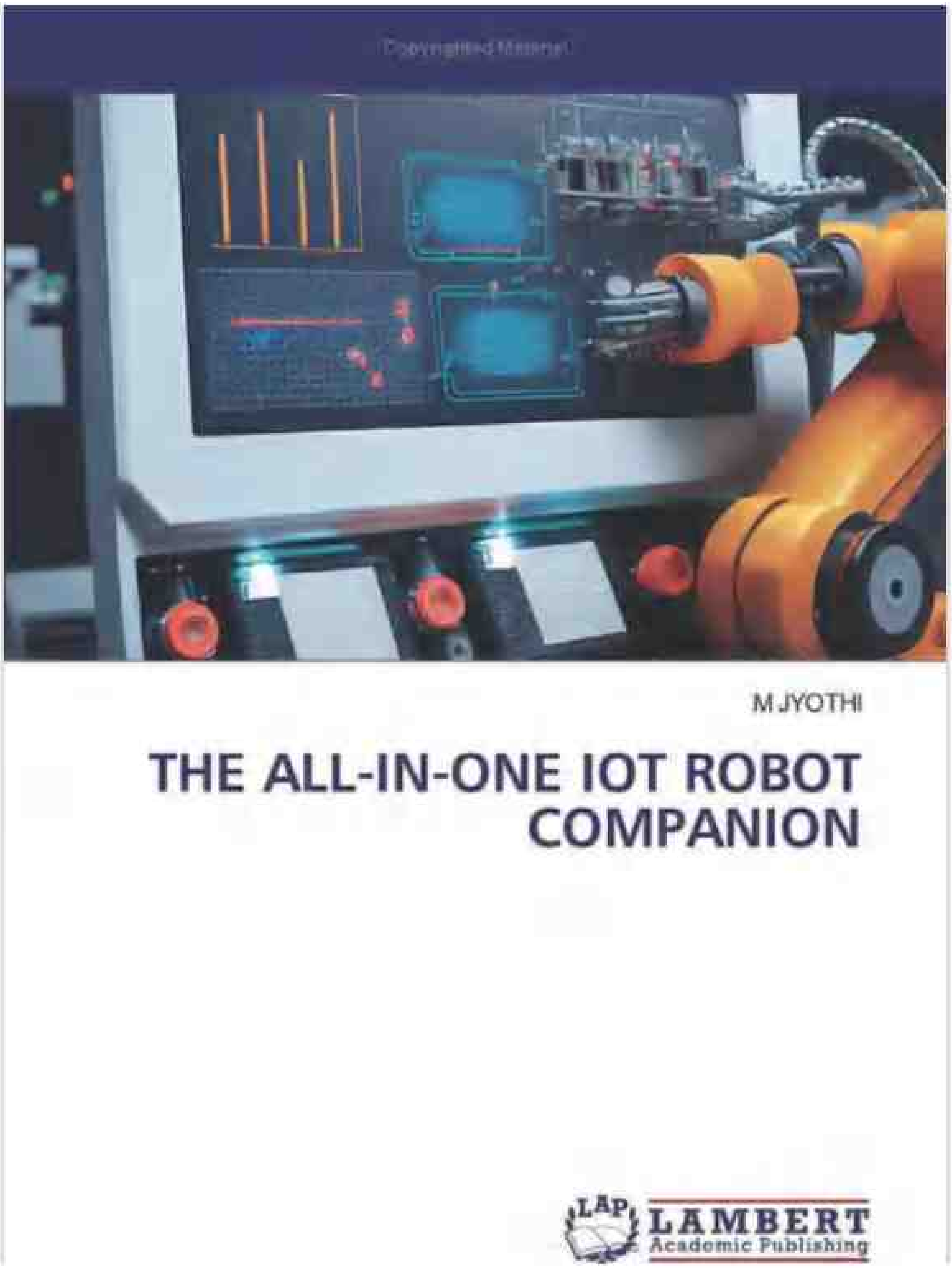

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Podila Mounika

Fake news detection: using ML Algorithms

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COMPUTER vision has become a very important means to obtain the 3-D model of an object. A number of 3-D sensing methods have been explored by researchers in the past 30 years. The structured light has made its progress from single light-spot projection to complex coded pattern, and, consequently, the 3-D scanning operation speeds up from several hours per image to dozens of images per second.It also takes the advantage of easy implementation, and, thus, this method is still the most widely used in structured light systems. The main drawback is that they cannot be applied to moving surfaces since multiple patterns must be projected. In order to obtain a better resolution, a technique based on the combination of gray code and phase shifting is often used. Its drawback is that a larger number of projection patterns (e.g., >20images) are required The first stage of feasible structured light systems came in early 1980 when the binary coding or gray coding methods were employed. This kind of pattern can achieve high accuracy in the measurements. This is due to the fact that the pattern resolutions are exponentially increasing among the coarse-to-fine light projections.

Mrs. K.Pavani is an accomplished author and Assistant Professor in Information Technology department at G. Narayanamma Institute of Technology and Science (For Women). She has completed her M.tech degree in 2013 at SMCET , Hyderabad. She has completed her B.Tech in 2005 at SRR. She has 1 international conference paper.

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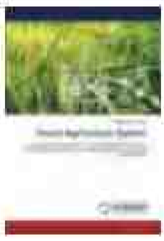

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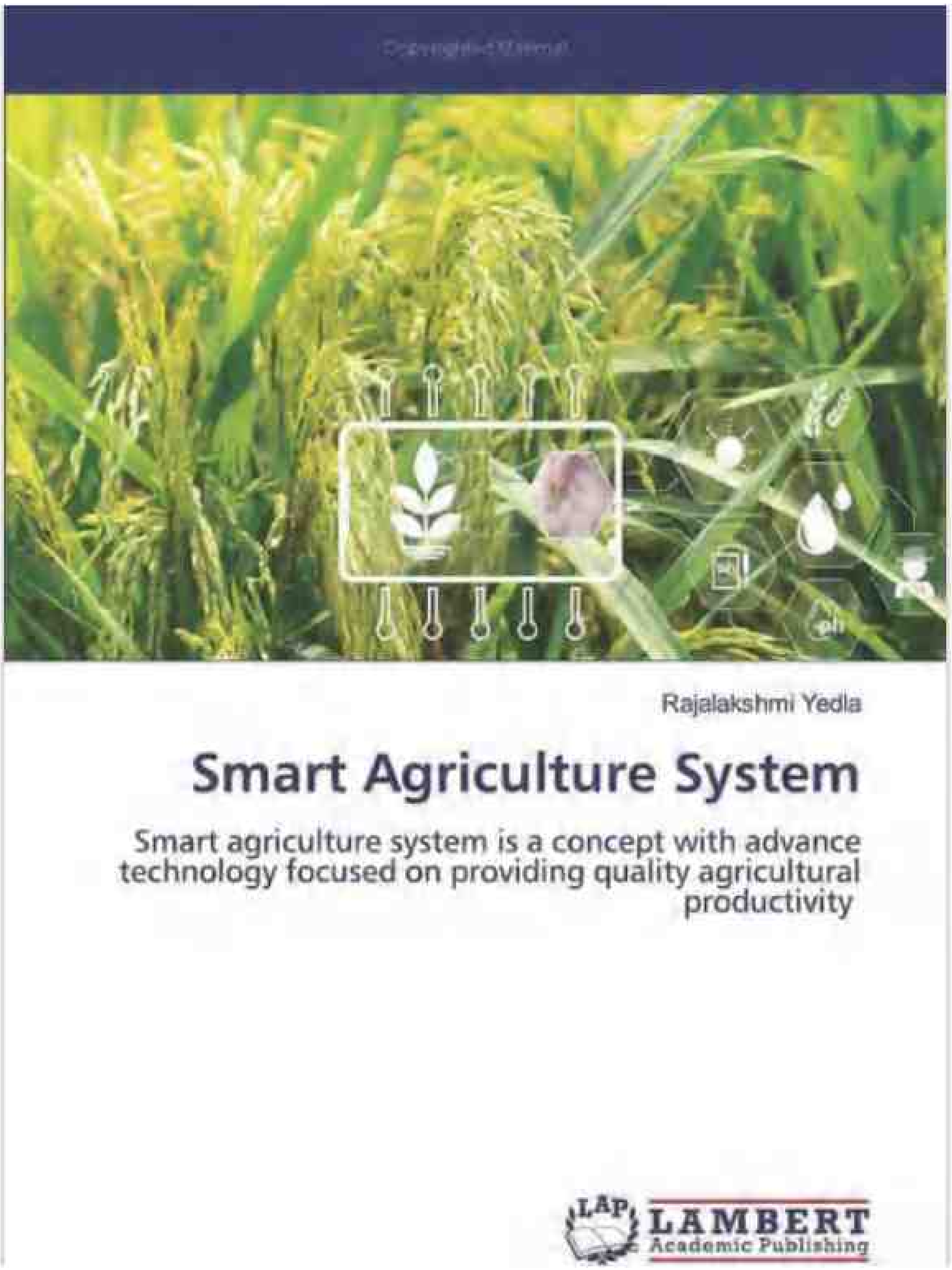

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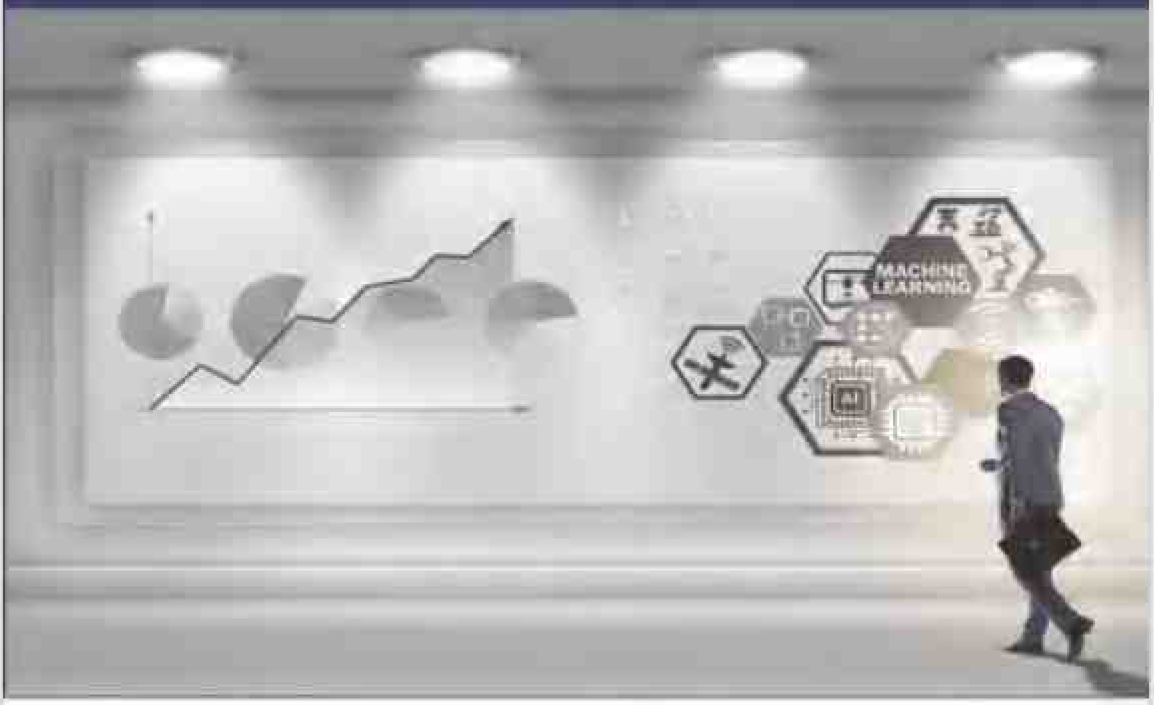

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Purushotham Pidugu

Smart Home Automation System: Using IOT

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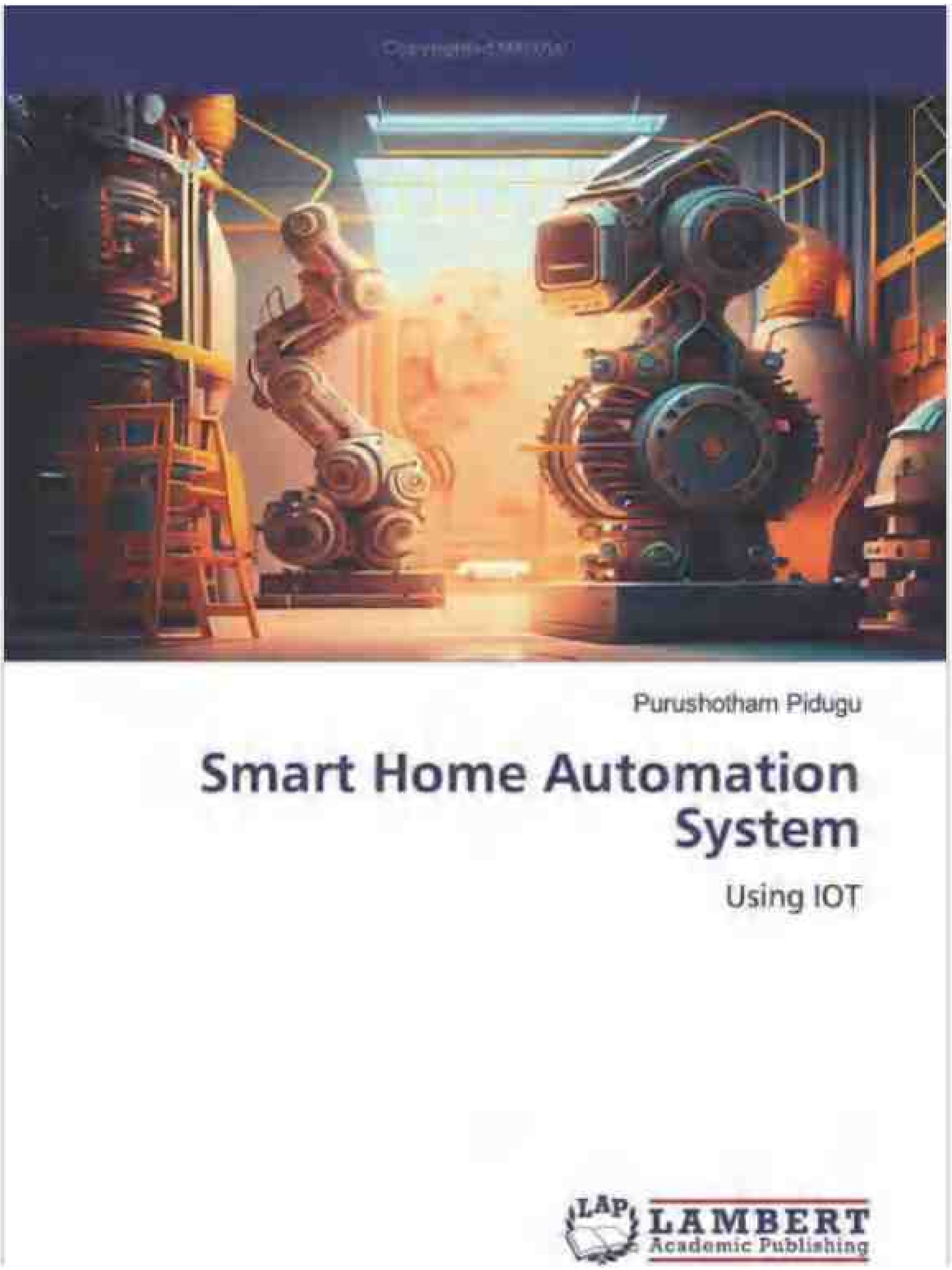

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Smart Home Automation System

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Smart Home Automation System: Using IOT

SMART HOME AUTOMATION SYSTEM: USING IOT

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Purushotham Pidugu is an Assistant Professor of Information Technology Department at the G. Narayanamma Institute of Technology and Science(Women), Hyderabad. He is having 14 Years of experience at college and 5 Years of experience at Software industry.

An android application that aims at providing a platform where book enthusiasts can find it easy to exchange, buy or sell pre-owned books. This project will also let the people discuss things and exchange thoughts about popular books. Through this project, users can find the book that they want at lower price and minimal time. The user can also auction their book by using this application. To develop this application, Android studio IDE with Java and XML will be required. The user would need to register and login in order to buy or sell books, along with that the user is expected to mention their area of interest so as to get suggestions of the books. A buyer can rate and review a seller based on his experience. This project also helps buyers to compare prices from different sellers. It is a great way to generate economy from one's books.

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Appendix

"Utilizing Convolution Recurrent Neural Networks for Image Classification in Instant Messengers" delves into the integration of CRNN models within instant messengers for effective image classification. This book explores how CRNN techniques can enhance the accuracy and efficiency of image recognition, enabling seamless visual communication and expression. The author examines the methodology and implementation of CRNN models, emphasizing their advantages in handling complex visual data. The book discusses the benefits of employing CRNN in instant messengers, including improved classification accuracy and robustness to variations in image content. It also acknowledges the challenges associated with CRNN, such as model complexity and training data requirements. Through this comprehensive exploration, the book offers valuable insights into the potential of CRNN for transforming image classification in instant messengers. It serves as a valuable resource for researchers, developers, and practitioners interested in leveraging advanced neural network techniques for enhancing image-based communication in messaging platforms.

D.SREE LAKSHMI is a renowned expert in the field of deep learning and computer vision. With a strong background in artificial intelligence and image processing, D. SREE LAKSHMI has dedicated their career to exploring the intersection of neural networks and instant messaging platforms.

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SREE LAKSHMI DONE

Convolution Recurrent Neural Networks for Image Classification

Enhancing Visual Communication and Expression in Instant Messaging Platforms

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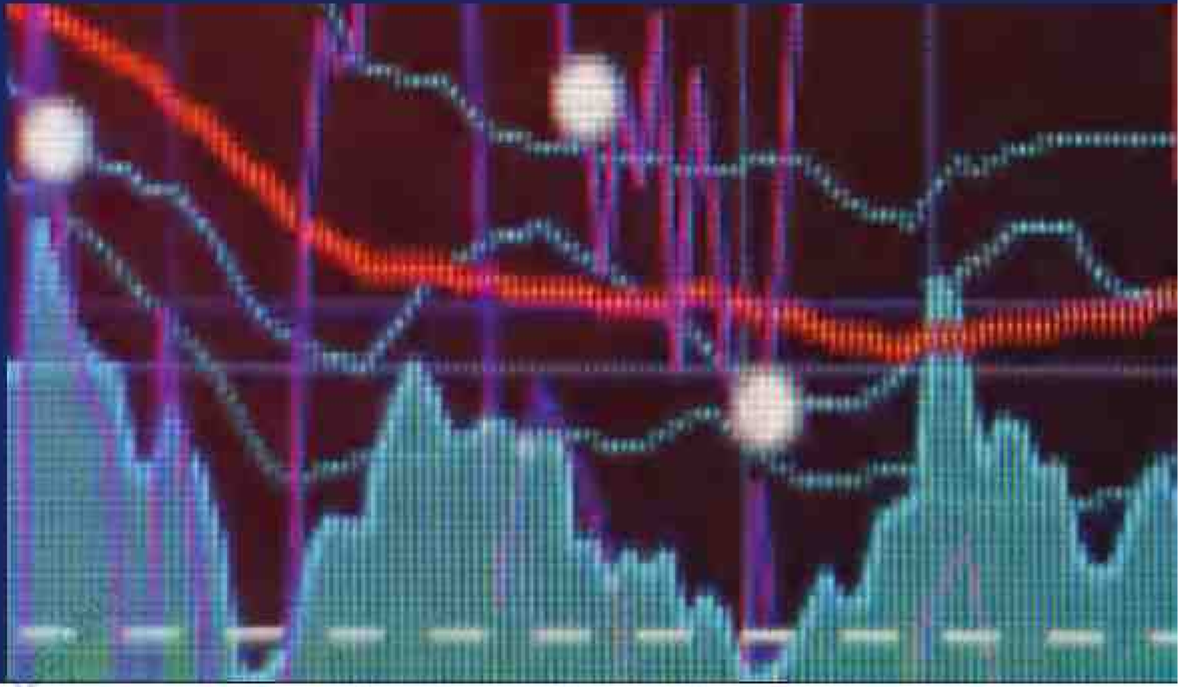
This book is built on a case studies that uses actual data set in a simplified form for classroom use. The case study is a collaboration of Managerial science with industry and business related statistics, This book serves as a valuable resource as it has modern and relevant case studies useful for professionals and researchers for decision making. This book has pictorial and graphical representations of the datasets used in the case study. The case studies are programmed using R.



Ramya Sri Kovvuri

Applied Regression Techniques through Cases Studies Using R

Ramya Sri Kovvuri is an Asst Prof at G Narayanamma Institute of Technology and Science- Hyderabad. She has earned a First Class with Distinction on Computer Science Engineering in Bachelor's degree. She has also earned another First Class with Distinction on Computer Networks and Information Security in Master's degree.

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Ramya Sri Kovvuri

Applied Regression Techniques through Cases Studies Using R

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With the emergence of the digital world, it is imperative that we must represent our day-to-day tasks on the internet in a meaningful way. The primary purpose of this book is to represent the handwritten text in terms of a digital document that can be processed by the computer. Handwritten Text Analyzing is an emerging branch of Optical Character Recognition (OCR). The continuous analog form of written text can be expressed in a digitized manner. This book discusses
Convolutional Neural Network (CNN) that involves feature extraction and classification. This book computes validation accuracy and losses to test the reliability of our model. This book aims to provide an efficient way of recognizing the letter or digit from the input image.

Ramya Sri Kovvuri is an Asst Prof at G Narayanamma Institute of Technology and Science- Hyderabad. She has earned a First Class with Distinction on Computer Science Engineering in Bachelor's degree. She has also earned another First Class with Distinction on Computer Networks and Information Security in Master's degree.

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Ramya Sri Kovvuri

Convolutional Neural Networks- An Advanced Approach of Neural Network

Neural Network to achieve a highly accurate Handwritten Character Recognition System

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E-Voting System using Blockchain Technology

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E-Voting System using Blockchain Technology

E-VOTING SYSTEM USING BLOCKCHAIN TECHNOLOGY

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E-Voting System using Blockchain Technology

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IMPLEMENTATION OF

CLASSIFICATION ALGORITHMS

IN VARIOUS APPLICATIONS

USING MACHINE LEARNING AND DEEP LEARNING

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IMPLEMENTATION OF CLASSIFICATION ALGORITHMS IN VARIOUS APPLICATIONS USING MACHINE LEARNING AND DEEP LEARNING

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ABSTRACT

Classification is a process of categorizing data or objects into predefined classes or categories based on their features or attributes. In machine learning, classification is a type of supervised learning technique where an algorithm is trained on a labeled dataset to predict the class or category of new, unseen data.

The main objective of classification is to build a model that can accurately assign a label or category to a new observation based on its features. For example, a classification model might be trained on a dataset of images labeled as either dogs or cats and then used to predict the class of new, unseen images of dogs or cats based on their features such as color, texture, and shape.In this book we are implementing Classification techniques for two different applications like Inappropriate and spam email detection using hybrid features, Identification of Weeds and Crops.

As an attack of social engineering, phishing email has caused tremendous financial loss to recipients. Therefore, there is an urgent need for phishing email detection with high accuracy. In this project, we propose phishing emails detection based on hybrid features. By analyzing the email-header structure, email-URL information, email-script function and email psychological features, we extract hybrid features. Then we choose Support Vector Machine (SVM), LSTM and CNN classifiers to evaluate our experiments. Experiments are performed on a dataset consisting of legitimate emails and phishing emails. The proposed approach achieves overall true-positive rate, false-positive rate, precision and accuracy. The results show that psychological features can improve the accuracy of detection and reduce the false-positive

rate. Our proposed method has a good performance in detecting phishing emails.

A farm's crop productivity can be greatly affected by the methods used to detect and remove weeds from the field. Recent years have seen significant advancements in image processing thanks to the application of machine learning technology over more conventional methods. There have been significant advances in image processing thanks to deep learning, and not just for better identification. Automated Crop Weed Identification uses these two methods to determine what is a crop and what is a weed in a given image. Weeds in crops can be accurately identified using the machine learning classifiers SVM and KNN, as well as the deep learning model CNN. Finally, we are producing accurate comparison findings between two technologies; this will allow us to select the classifier model that has the highest accuracy for identifying crop weeds. According to the findings of the experiments, the CNN has a classification accuracy that is 95% higher than that of the other well-known methods now in use. In the future, it will be possible to detect it using smartphones by taking a picture of a plant leaf, then using the image to classify and identify weeds and crops using the best prediction model available.

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MACHINE LEARNING APPLICATIONS

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PREFACE

One of the areas of modern computing is machine learning. To make machines intelligent, a lot of study has been done. Numerous application fields have used conventional machine learning methods. To increase that machine-learning algorithms' accuracy, researchers have worked very hard. Applying diverse machine learning approaches to various applications, such as security, facial recognition, and price prediction, is thus the main contribution of this book.

✍ *Author*

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WORD EMBEDDING AND ITS APPLICATIONS FOR TELUGU LANGUAGE

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PREFACE

Word embedding methods are used to represent words in a numerical way. The machine learning or deep learning algorithms process the text data. The machines cannot understand the text data, it understands only numbers so we need to convert the text data to numerical form by using word embeddings techniques. Representing a word using vocabulary. Next map vocabulary to vectors. One-hot vectors are a quick andeasy way to represent words as vectors of real-valued numbers. In perspective of technology, by using the word embeddings are represented in syntactic form only. Whereas by using the predictive based embeddings, the words are represented in semantic form. In perspective of languages, the Indian subcontinent consists of a number of separate linguistic communities each of which share a common language and culture 22 major languages have been given constitutional recognition. We want to try this technology in the Telugu language. we want to build and test the different word embedding model on different machine learning(ML) algorithms. We tested two embedding model on 3 Machine learning algorithms for Telugu language. The main challenge is with the aggloramatives and inflections. In Telugu there are so many inflections. Telugu is a highly inflected as well as morphologically rich language. A slight modification in a word can change its form to express a completely different meaning from the original one. Using the application data set by comparing the two embedding models with Machine learning algorithms Word2vector model works well compared to One hot encoding model.

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THE POWER OF ARTIFICIAL INTELLIGENCE

Exploring Cutting-Edge Technologies and Future Possibilities

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THE POWER OF ARTIFICIAL INTELLIGENCE: EXPLORING CUTTING-EDGE TECHNOLOGIES AND FUTURE POSSIBILITIES

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DRUG DONATION SYSTEM

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DRUG DONATION SYSTEM

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An In-Depth Guide to Plant Leaf Disease Detection

Using Machine Learning, Intrusion Detection in Network Security and Space Note

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PREFACE

This Chapter is about a framework utilizing raspberry PI to detect and prevent plant disease from spreading. The CNN algorithm was used for image analysis. It has numerous focal pointsfor use in vast harvest ranches and in this way distinguishes indications of sickness naturally at whatever point they show up on plant leaves. In pharmaceutical research, the recognition of leaf ailment is essential and a critical theme for research, because it has the advantages of monitoring crops in the field in the form and thus automatically detects symptoms of disease by image processing using an CNN algorithm. The term disease refers to the type of plant damage. This Chapter aims to use the strategy to recognizing plant infections utilizing picture preparing and alarming the ailment brought about by email, SMS and showing the malady name on the framework proprietor's screen display. Automatic detection of symptoms of disease is usefulfor upgrading agricultural products. Completely automatic design and implementation of these technologies will make a significant contribution to the chemical application. The cost of pesticides and other productswill be reduced. This will lead to an increase in farm productivity.

Contrasted with the past, improvements in PC and correspondence innovations have given broad and propelled changes. The use of new innovations gives incredible advantages to people, organizations, and governments, be that as it may, messes some up against them. For instance, the protection of significant data, security of put away information stages, accessibility of information and so forth. Contingent upon these issues, digital fear-based oppression is one of the most significant issues in this day and age. Digital fear, which made a great deal of issues people and establishments, has arrived at a level that could undermine open and nation security by different gatherings, for example, criminal association, proficient people and digital activists. Along these lines, Intrusion Detection Systems (IDS) has been created to maintain a strategic distance from digital assaults. In this Chapter, by using datasets we are going to predict network intrusions. We are grouping all the attacks in dataset into attack classes. The model which is trained by using the dataset predicts the attack class. These predictions can be done by algorithms like Support Vector Machine (SVM), Neural Network (NN), Logistic Regression (LR), Random Forest (RF) helps to identify which algorithm predicts the best accuracy rates which helps to predict best results to identify the attacks in network.

The idea behind this Chapter is to implement real-time sketching, writing with fingers using a web camera to enable users to interact with computer systems. The proposed method has two main tasks. Firstly, it recognizes the no. of fingers and then accordingly performs one of the tasks i.e., to draw, to write, to move around, to erase, screen capture, etc. We capture the video frame using OpenCV. In our framework, the hand region is extracted from the background with the background subtraction method. Then, the palmand fingers are segmented to detect and recognize the fingers. Finally, a rule classifier is applied to predict the labels of hand gestures. The trajectory of the fingertip is smoothed and drawn to become a finger-writing character. Next, it is recognized by the classifier, which is trained with our collected datasets and specific parameters for finger writing recognition. This idea is designed to reduce the difficulty faced during video conferences. The proposed system is a software-based approach and is fast, easy to implement as it doesn't require a keypad, items to write like a marker, duster, or any other device for inputting.

✍ *Author*

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EXPLORING EMERGING TECHNOLOGIES AND THEIR IMPACT ON SOCIETY

D. SREE LAKSHMI

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"Exploring Emerging Technologies and their Impact on Society"

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PREFACE

This book chapter explores the transformative power of emerging technologies and their impact on society. With the rapid advancement of artificial intelligence, blockchain, virtual reality, and renewable energy, these technologies are revolutionizing industries and reshaping our lives. The chapter provides an overview of the latest trends in emerging technologies, examining their applications in sectors such as healthcare, finance, transportation, communication, and more. It critically analyzes the societal implications, considering ethics, privacy, economic disruption, and social dynamics. Real-world case studies highlight practical applications, while discussions on future prospects and considerations speculate on the direction of these technologies. The chapter aims to provide a comprehensive understanding of the transformative potential of emerging technologies, serving as a valuable resource for researchers, practitioners, and individuals navigating the dynamic technological landscape ahead.

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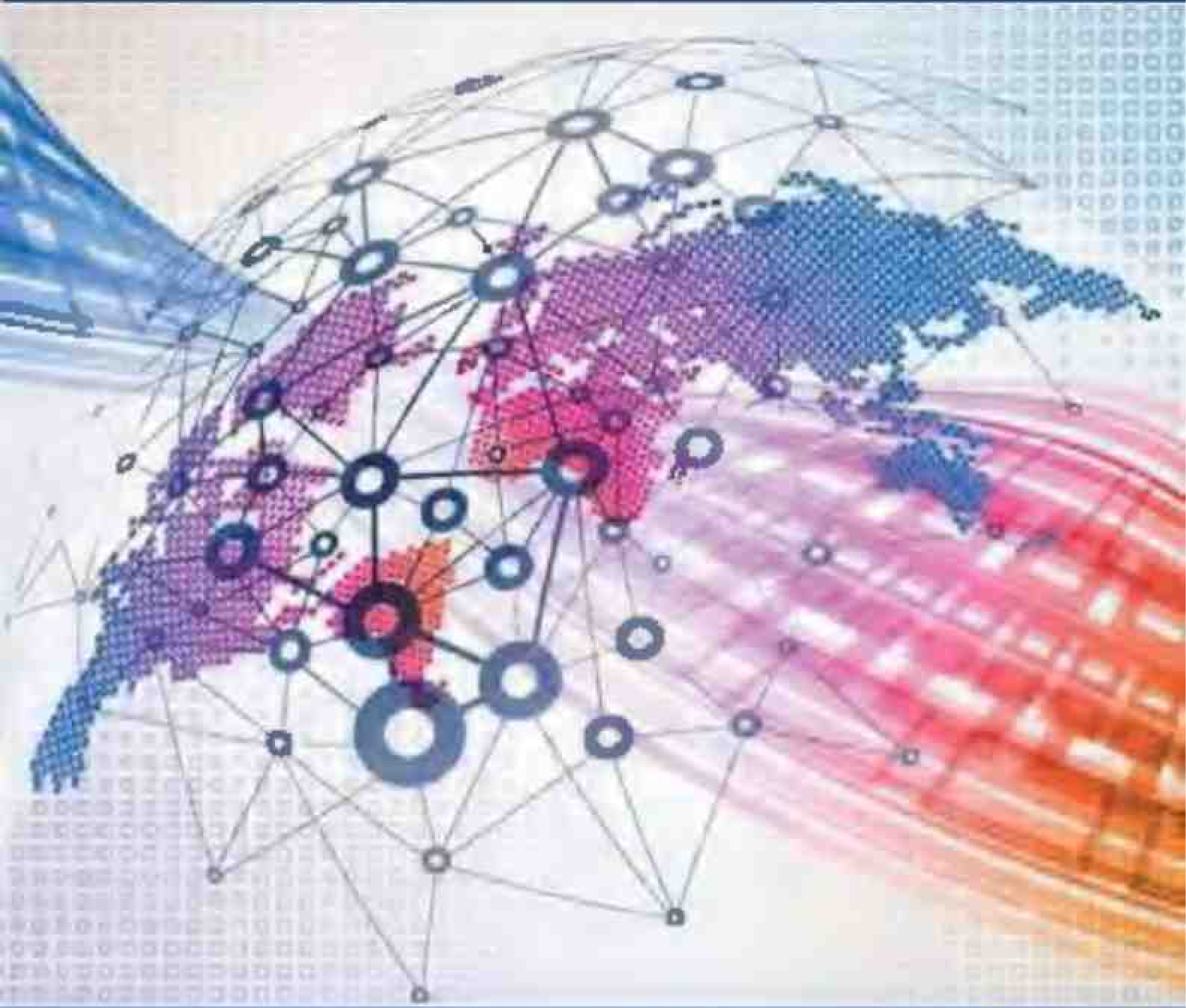

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An Intelligent and Adaptable Energy-Aware Service Model for the Internet of Things

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MACHINE LEARNING TECHNIQUES AND APPLICATIONS

K. Sridevi

Machine Learning Techniques and Applications

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PREFACE

Seasonal Affective disorder and **Bipolar Disorder** are two popular diseases affecting many people. A gloomy day can put many people in a bad mood. But for a small percentage of the population, a whole season can spiral into a serious depression called Seasonal Affective Disorder (SAD). SAD strikes 1 to 10 percent of the population every year, according to a 2009 journal review in Physician and Sports medicine.

Bipolar disorder is a mental health condition characterized by periods of manic and depressive episodes, interspersed with relatively normal states of mind. The unusual shifts in mood interfere with one's ability to carry out a normal daily life.

The aim is to identify the Seasonal Affective disorder and Bipolar Disorder based on Patients symptoms and test results by using the concepts of **Machine Learning**. This project creates the needed GUI (Graphical User Interfaces) by using **PyQt** tool. **PyUIC** tool is used for automated generation of the code. All the front end python code is automatically generated by this tool, by converting the user interface (.ui) files into .py files. Report lab is used to generate .pdf report containing the suggestions for the patients. This Report contains the results of diagnosis, based on symptoms and medical test results. This Project uses the **Support Vector Machine algorithm** for matching the symptoms and medical test results.

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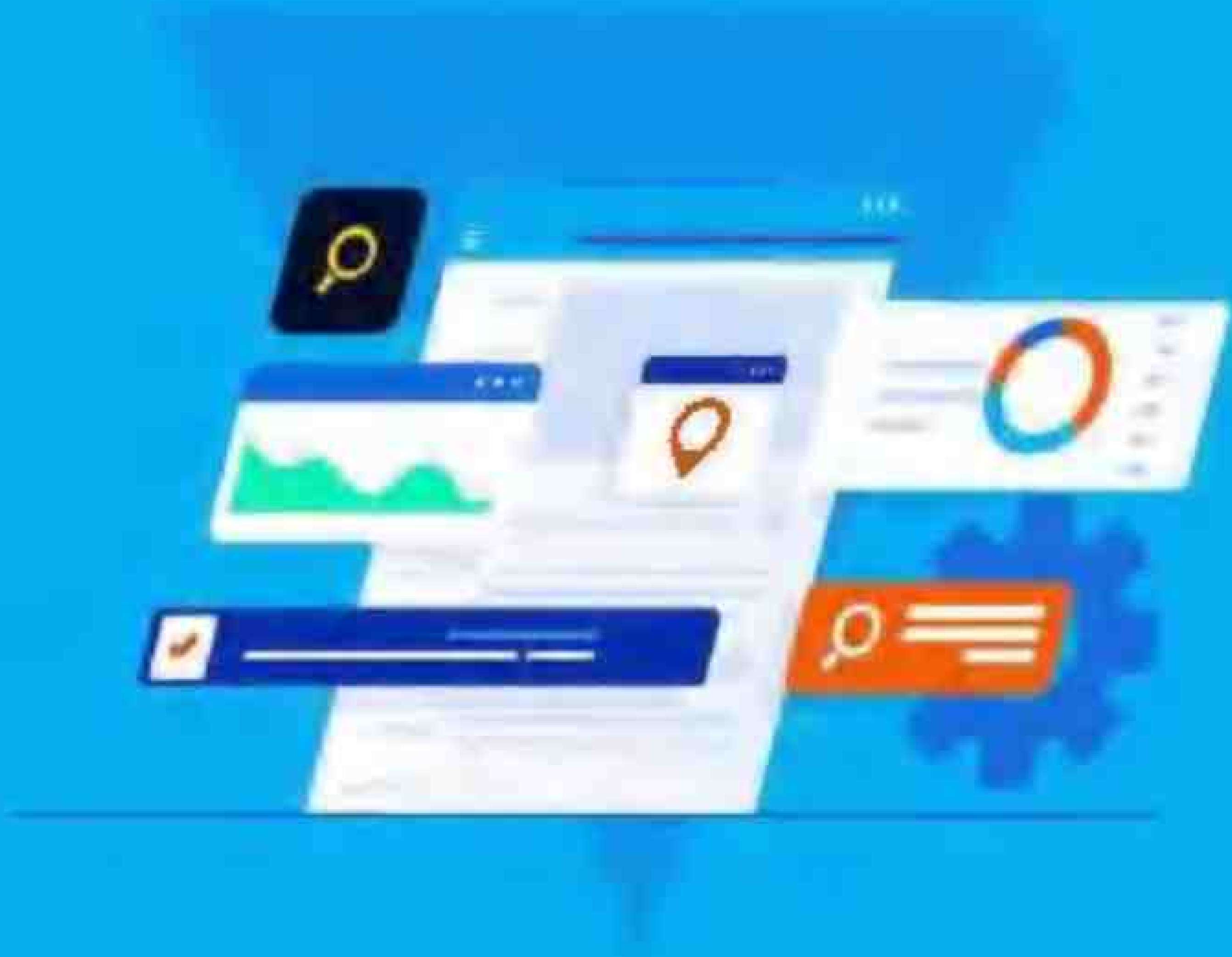

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GFilter: A General Gram Filter for String Similarity Search

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APP RANKING AND CATEGORY DISCOVERY AND ENCRYPTED PESSIMISTIC PASSWORD AUTHENTICATION

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App Ranking and Category Discovery and Encrypted Pessimistic Password Authentication

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PREFACE

The classification of fraud in the mobile app market refers to fraudulent or deceptive activities aimed at increasing applications in the popularity list. In fact, it has become increasingly common for app developers to use confusing means, like inflating app sales or posting wrong app ratings, to commit tax fraud. While the importance of preventing fraud has been widely recognized, there is limited understanding and research in this area. To this end, in this document, we provide a comprehensive overview of classification fraud and suggest a classification fraud detection system for mobile applications. Specifically, we first suggest precisely locating classification fraud by extracting the active periods, i.e. the leading cycles, from mobile applications. These groundbreaking sessions can be used to reveal local anomalies rather than global anomalies of application ratings. Additionally, we investigated three types of evidence, namely classification-based evidence, classification-based evidence and review-based evidence, classification behavior modeling, classification and review of applications by testing statistical assumptions. Additionally, we suggest an optimization aggregation method to incorporate all evidence to detect fraud. Finally, we evaluated the proposed system with real-time application data collected from the iOS app store over a long period of time. In experiments, we verified the effectiveness of the proposed system and demonstrated the scalability of the detection algorithm, as well as some regularity in the classification of fraud activities.

Secure password storage is a vital aspect in systems based on password authentication, which is still the most widely used authentication technique, despite some security flaws. Here, we propose a password authentication framework that is designed for secure password storage and could be easily integrated into existing authentication systems. In this framework, first, the received plain password from a client is hashed through a cryptographic hash function (e.g., SHA-256). Then, the hashed password is converted into a negative password. Finally, the negative password is encrypted into an encrypted negative password (ENP) using a symmetric-key algorithm (e.g., AES), and multi-iteration encryption could be employed to further improve security. The cryptographic hash function and symmetric encryption make it difficult to crack passwords from ENPs.

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Dr. Supreethi KP

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LAND REGISTRY SYSTEMUSING BLOCKCHAIN AND AADHAR AUTHENTICATION

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PREFACE

Property Registry is one of the use cases that involve a lot of intermediaries to put trust in the system. In the existing system, tracking who owns which piece of land is challenging when you have thousands of property records to maintain and mostly all these records are not digitized or take a long time to get digitized.

Blockchain in the land registry is utilized for secure transfer of property. The transparent nature of blockchain makes it possible to track the transfer of ownership from one individual to another reliably. Blockchain's immutable, auditable, and traceable features are enticing governments around the world to implement the decentralized technology in the land registry process. In our project we try to make a system that is trustworthy and transparent in the dealings of property records. This is achieved by adding multiple layers of security including aadhar authentication. One-time-password based verification improves the overall personal security and prevents unauthorized access to the system. A systematic approach is used, right from the registration of theland inspector/buyer/seller to the registration of lands, making it available to sell, etc.

A solution of decentralized application or DAPP is proposed through this project, which will bea one stop platform for buying, selling, or registering land.

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Modeling and Simulation of Solar Energy Storage System for Electric Vehicle

Publisher: IEEE Cite This PDF

Gouthami Eragamreddy ; S.Gopiya Naik All Authors

Abstract

Document Sections

Abstract: In contrast to the conventional automobiles powered by internal combustion engines burning fossil fuels, electric vehicles have drawn increased attention. Future sustaina... **View more**

Metadata

Abstract:

In contrast to the conventional automobiles powered by internal combustion engines burning fossil fuels, electric vehicles have drawn increased attention. Future sustainable transportation is a goal for the auto industry. In an electric car, the electric motor is crucial. Most motors used in automotive applications include AC motors, DC motors, and reluctance motors. However, BLDC motors are best suited due to their high levels of dependability, power density, efficiency, affordability, lightness, and reduced maintenance need as a result of the lack of brushes. With in-wheel technology, each electric vehicle (EV) wheel is operated by a separate motor as opposed to a central drive system. In order to analyze power flow during motoring and regeneration. This work uses the MATLABSimulink platform to present a simulation model of a completely electric automobile. The drive train components include motor, battery, motor controller, BMS, and auxiliary loads. The range of an electrical vehicle is increased by using solar photovoltaic (PV) electricity to aid auxiliary loads, which is represented using their mathematical equations. Plots and discussions are made of all simulation outcomes. To calculate the energy flow and drive performance, the torque and speed circumstances during motoring and regeneration were used. The basis for future research and development will be this study.

Energy crisis is the major problem that the world faces today. The energy crisis can be reduced to certain extent by properly monitoring our energy consumption and avoiding energy wastage. Nowadays, people are facing issues related to power theft. Power theft is a major crime and it also affects our Indian economy. This book comes up with a solution to identify power theft using IoT. The IoT based electricity meter helps us in identifying the power theft.

Malla Reddy

IOT based Tampered Ene Meter Monitor

I am a Professor in Electrical and Electronics Engineering Department.

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LAP LAM Academic

Malla Reddy Nomula

IOT based Tampered Energy Meter Monitoring

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In today's generation the major problems are pollutants, cut of power etc. Thus, to overcome with this problem, we have come with a project on "Solar Grass Cutter" where we use solar energy for operating the machine instead of using electricity.

The power consumption becomes very essential for future. Solar grass cutter is a very useful device which is very simple in construction. It is fully automated grass cutting robotic vehicle powered by solar energy that also avoids obstacles. This system uses batteries to power the vehicle movement motor as well as the grass cutter motor. It uses a solar panel to charge the battery so that there is no need of charge externally.

Gopinath G

SMART ROBOT GR
CUTTER WITH LA
COVERTAGE BASED
SOLAR POW

Prof. G Gopinath's writing combines his academic background with a clear and accessible communication, making complex concepts understandable to a wide audience. Driven by a desire to inspire the next generation of scholars, he is also actively involved in mentoring graduate students and guiding their research endeavors.

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LAP LAMI
Academic

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This book presents an automatic recording and Water consumption by a consumer and also detection of the water level in the water distribution system. Hygienic Water is an important component of water. In addition to raising consumer awareness of their water use RFID is also an important way to identify water consumption. Water sensors are used to determine the level and quantity from water storage pipeline. The objective is to overcome the disadvantages of using current meter technology and make the billing and troubleshooting process faster along with reducing the wastage of water. RFID uses electromagnetic fields to transfer data over short distances. RFID is useful to identify people, to make transactions.

Ramana

SMART DIGITAL WA
MANAGEMENT SYST

I am an Assoc.Professor in the Electrical and Electronics Engineering Department.

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LAP LAMB Academic P

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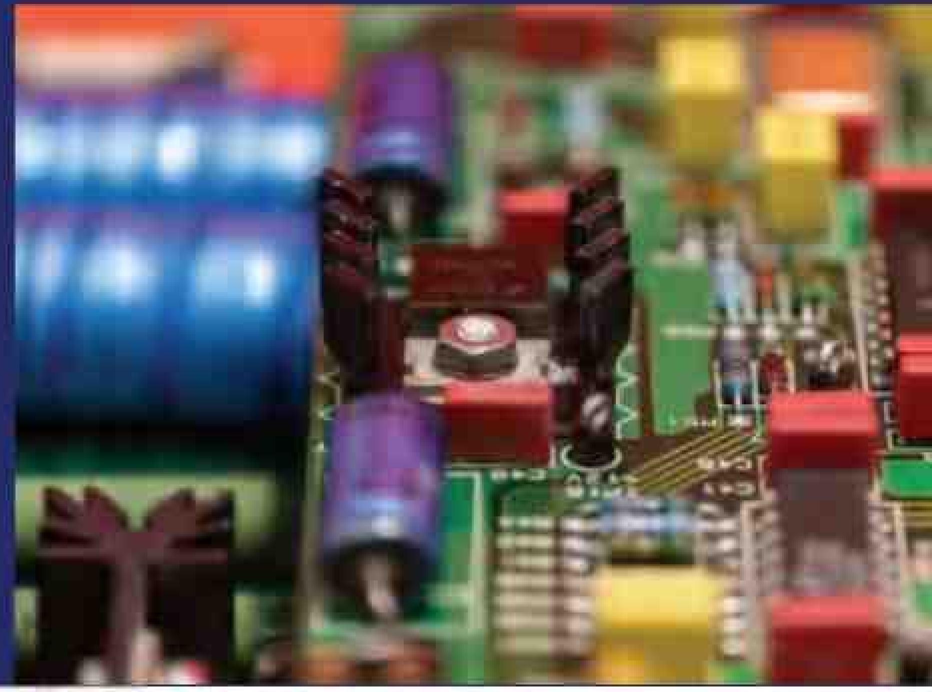
The main scope of the book is to show the working of controlling the speed of single-phase induction motors by using IR Remote. An IR receiver module is interfaced to the microcontroller. A standard TV Remote sends coded infrared data to the control board, which is then received by that IR receiver interfaced to the microcontroller. We can vary the speeds from 0 to 1250 rpm by discrete method of control by varying the firing angle of input voltage, we can vary the speed of induction motor.



I am an academician and an educator with a decade of experience in teaching and research.

Nageswar

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Nageswara Rao R

THYRISTOR POWER CONTROL

FOR SINGLE PHASE INDUCTION MOTOR BY IR REMOTE

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In this book will learn how to make our own IoT Based Electricity Energy Meter using ESP32 & Monitoring data. We enabled smart energy meter which is capable of two-way communication and can display various parameters through its in-built display as well as through an web based Head-end-System application software. The meter measures energy usage, current, voltage, power and provides the bill amount in real-time. This meter eliminates the need for manual checks for collecting meter data and generating electricity bills. The IoT enabled meter can transmit this data to multiple devices at once, allowing various entities such as consumers, linemen, and the electricity distributors to view the required meter data.

Ujwa
Gou

Ujwala Gajula, has received her B-Tech in Electrical & Electronics Engineering from JNTUH in the year 2008 and M.Tech in Power Electronics & Electric Drives from JNTUH in the year 2010. Presently she is Pursuing Part time PhD in Annamalai university, Chidambaram. She is member of IEEE, IEI and ISTE. Her areas of interest are Power Converters.

IOT BASED ENERGY ME
WITH BILLING SYSTEM A
LOAD PRIORITIZAT

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Academic P

Ujwala Gajula
Gouthami E.

IOT BASED ENERGY METER WITH BILLING SYSTEM AND LOAD PRIORITIZATION

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In today's world, Internal Combustion (IC) engine vehicles dominate our roads, relying on petrol, diesel, or natural gas as their primary sources of fuel. However, the harmful pollutants emitted and the diminishing reserves of these conventional fuels have triggered a pressing demand for alternative energy solutions for our vehicles. Among the available options, electricity stands out as the cleanest and most promising source of power, giving rise to Electric and Hybrid Electric Vehicles as the answer to our environmental concerns. One crucial challenge faced by these innovative vehicles is accurately predicting the energy consumption during their journeys along various road courses. Solving this enigma holds immense significance as it allows us to estimate the required motor and battery specifications accurately. Within the pages of this book, we delve into the heart of this issue by exploring various drive cycles and meticulously examining the vehicle's performance under each specific condition. The knowledge and insights gained from this project are destined to play a pivotal role in facilitating energy estimation, thereby propelling advancements in the EV.

Gouthami Erag
Ujw

ESTIMATION OF ENE REQUIREMENT BASED VEHICLE PERFORMA ANALYSIS US DIFFERENT DRIVE CYC

Mrs. Gouthami Eragamreddy, working as an Asst. Prof. at G. Narayanamma Institute of Technology and Science (for women), Hyderabad.
B.E in EEE, M.Tech in Embedded Systems from JNTUH. Pursuing Ph.D. in VTU. Research interests include EV, RES, Embedded systems, and IoT.

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LAP LAM Academic

Gouthami Eragamreddy
Ujwala Gajula

ESTIMATION OF ENERGY REQUIREMENT BASED ON VEHICLE PERFORMANCE ANALYSIS USING DIFFERENT DRIVE CYCLES

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For the economic growth and social development of the country energy plays a vital role in every aspect. All the traditional energy production methods require non-renewable resources for the change of form of energy. But, if we continue to use non-renewable resources, once and for all they will become extinct for the future generations. Therefore, renewable energy has become an alternative solution for power generation in the day to day life. The energy from renewable sources is clean, eco friendly, efficient and reliable. Renewable energies have been initiated with the wind power and then followed by the solar power. Wind and solar energy are becoming popular owing to abundance, availability and ease of harnessing of the electrical power generation. This project aims to develop a grid connected hybrid power generation System using solar and wind energies on MATLAB/Simulink software. The model is designed based on the availability of solar irradiance, temperature, wind speed and direction.

K. Swarna Latha, Assistant
Professor, Dept of EEE, G. Narayanamma Institute of Technology and Science, Shaikpet, Hyderabad, Telangana.

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K. Swa

GRID CONNECTED SYST USING MULTI-LE INVER

LAP LAM Academic

K. Swarna Latha

GRID CONNECTED SYSTEMUSING MULTI-LEVEL INVERTER

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. Solar energy obtained from PV panel is in dc form and dc to dc converters are used to use the output of solar voltage to load, it can be either stepped up or stepped down according to requirement. For this, signal from load side is given to an Arduino control board used for the duty cycle control of the converter so that required load voltage can be obtained and Maximum Power Point is obtained using P&O technique. At this MPP, Battery as a load is charged and solar energy is stored in the battery. This stored energy can be used either directly in the dc form or converted to ac with the help of an inverter. Various Battery as a load is charged and solar energy is stored in the battery. This stored energy can be used either directly in the dc form or converted to ac with the help of an inverter. Various MPPT techniques are utilized for the tracking of MPPT but here we have we have P&O technique.

PRIYAMVADA KANCHUGANTALA

MPPT BASED BATTERY CHARGING

WITH SOLAR ENERGY

I am K.Priyamvada, presently working as Assistant.Professor at G.Narayanamma Institute of Technology & Science. I have 15 years of teaching experience.

LAP LAMBERT Academic Publishing

PRIYAMVADA KANCHUGANTALA

MPPT BASED BATTERY CHARGIHG

WITH SOLAR EHERGY

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CHAPTERS

The trend and need of shifting towards renewable energy sources for electricity generation, has attracted researchers towards photovoltaic (PV) systems for last fewdecades. Since PV generator has nonlinear behavior, and its output power is a function of solar irradiance and ambient temperature, therefore need of developing maximum power point tracking (MPPT) techniques remains the interest. This book mainly displays a similar investigation of two MPPT strategies i.e., Perturb and Observe and Incremental Conductance Method (ICM), in light of the fact that these calculations are broadly utilized because of minimal effort and simplicity of acknowledgment by utilizing MATLAB/SIMULINK, which is also used for performance evaluation. Some important parameters such as voltage, current and power output for each different combination has been traced for both the algorithms.

Buc

A COMPARITIVE STUDY
P&O A
INCREMENTALCONDUCTA
ALGORIT

for 1KW PV S

I am an solar PV based enthusisast working on many PV projects to find out efficient ways for harnessing maximum solar power.

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LAP LAMB Academic

Buchibabu P

A COMPARITIVE STUDY OF P&O AND INCREMENTALCONDUCTANCE ALGORITHM

for 1KW PV System

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The Nano satellite that respects the standard form CubeSat present various engineering challenges due to its small size and surface area. The challenge is to incorporate a large amount of technology in a cubic form no bigger than 10cm3 and consumes only 1W. This paper details the design of a photovoltaic-battery based power supply utilizing direct energy transfer for solar array regulation and battery charging. Also the simulation results for the management of the power system in the nanosatellite are displayed.

Sai Niranjan

DESIGN AND SIMULAT OF NANO SATELLITE ELECTRICAL POWER SYST

Mr.P.Sai Niranjan Kumar is an esteemed assistant professor in the field of Electric and Hybrid vehicles at GNITS. With a deep passion for research and a commitment to academic quality enhancement. Mr.P.Sai Niranjan Kumar's work focuses on Power Electronic Drives and Electric Vehicles, exploring its implications and advancing knowledge in the field.

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LAP LAMI Academic

Sai Niranjan Kumar P

DESIGN AND SIMULATION OF NANO SATELLITE FOR ELECTRICAL POWER SYSTEM

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Load flow analysis helps in the computation of voltages at each node and currents at each branch but the load flow methods used in a power transmission network may not work efficiently in distribution networks due to the high resistance to reactance ratio. In this project, Improved load flow method is proposed for a Radial Distribution System. This method is derived from the concept of the conventional Backward/Forward Sweep method based on Kirchhoff's laws. The proposed load flow method is easy to implement and doesn't require the use of complex renumbering of branches and nodes. The effectiveness of the proposed method will be tested on IEEE 15 Bus system using MATLAB/SIMULINK.

Pandu

Radial Distribution Syst
Load Flow Analy

Mr.K.Pandu Kumar is an assistant professor of Electrical Engineering, and a great knowledge developer in his field. With a thirst for knowledge delivery and a dedication to advancing engineering education, he has made significant contributions through his research, teaching, and writing.

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LAP LAMB Academic

CONTENT:

All industrial drives need a controlled output, and it can be achieved by controlling the input supply. In this regard, the inverter circuit plays an important role in the applications of industrial drives. The industrial drives are operated at high rated power and the conventional inverters cannot be applicable for high power demands because of the large dV/dt (rate of change of voltage) and more switching losses. Therefore, multilevel inverters are introduced for high power-medium voltage applications. For all AC drives the MLIs are reliable in operation. This MLI topology also reduces the harmonics and bearings stress of a motor with low dV/dt. In most applications multilevel inverters are used because we can get a greater number of voltage levels. To increase the number of voltage levels, circuit needs to have more switches. But we have to optimize the switch count and switching operations. The power level of the inverter is limited due to high currents and stress. In this paper, we proposed a new circuit topology which enables the switches to be active at different voltage levels, causes reduction of the switching losses and also increases the efficiency of the inverter.

PR

A Novel Three Ph
Multilevel Inverter w
Single DC Link for Induc
Motor Drive Applicati

Y.Priyanka is working as Assistant professor in G.Narayanamma Institute of Technology and Science.

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LAP LAM
Academic

PRIYANKA Y

A Novel Three Phase Multilevel Inverter with Single DC Link for Induction Motor Drive Applications

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Today traffic management has been a global issue as there is a growth in vehicular usage through the years. The proposed idea is based on IoT which enables automation of signaling. It takes the data of the vehicular density by continuously monitoring and this information is used for efficient control of traffic. In this model, the signal timings are optimized and signaling is dependent on the density of vehicles on the roadside. It is supported by a prioritized signaling scheme that uses RFID technology that allows special vehicles like ambulances; fire brigades a freeways letting them reach their destination on time. The signaling can also be overridden manually from the control rooms itself over the internet in case of any emergencies or requirements. It reduces the waiting time of drivers on the roads solving congestion issues. It doesn't require any human intervention in regular thus making the system smart. It updates and stores the real-time traffic
and this can be used to analyze the peak times when there is more traffic thereby improving mobility. As the data of traffic flow can be displayed the drivers can take a decision to optimize their drive.

G. Sujatha, Assistant Professor, Department of EEE,
G. Narayanamma Institute of Technology and Science.

SUJ

SMART TRAFFIC SIGNALL
SYST

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LAP LAMB
Academic P

SUJATHA G

SMART TRAFFIC SIGNALLING SYSTEM

LAP LAMBERT Academic Publishing

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Conventional vehicles utilize petroleum derived fuels to provide good performance and long-range. But conventional vehicles have certain disadvantages such as high fuel cost and exhaust gas emission causing environmental pollution. So, to overcome these disadvantages, electric vehicle technology is useful. An electric vehicle is modeled using matlab tools. The model mainly consists of a vehicle body, motor, motor controller unit and a battery block. The motor control unit regulates the speed of the motor which in turn controls the speed of the vehicle so that the actual speed matches with the reference speed given to the longitudinal driver block. The longitudinal driver block provides the PI control and ensures the closed loop operation. It is is divided into two parts, in the first one, vehicle body dynamics are examined for wind & terrain constants, brakes changes and gear shifts with ideal sources and PWM controlled DC motor. In the second part, 4 wheeler and 2 wheeler are designed for which reference and actual speeds are compared in the scope and battery SOC, distance traveled are tabulated.

Mamta P.

Design and Performance Analysis of an Electric Vehicle Using Matlab

Assistant Professor, EEE, G. Narayanamma Institute of Technology and Science. I completed M.Tech and B.Tech in Electrical and Electronics Engineering.

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CONTENTS **PAGE NO.**

In this day and age of rapid technological development it is necessary to to stay updated with all the new advancements. One such application of technology is using IOT interfaced to our energy meters making them smart energy meters. This project focuses on the integration of IOT with the energy meters and also recording, calculating the bill for the energy consumed. This smart meter replaces the bi-channel communication of meter to consumer and meter to utilities to a single channel communication between the meter and cloud. This facilitates the data access to the energy utilities and the consumers anywhere at any time of the day. The additional element is the load management algorithm that detects fault and separates the load thereby, protecting the consumer from any transients like over voltage, over current simultaneously sending an alert to the mobile whenever such abnormal conditions exist. This enables the customer to keep a track of their energy consumption and monitor all the parameters.

Sowmya KV is an Assistant Professor at GNITS, Hyderabad.

K. V.

SMART IOT BASED ENE METER WITH LO MANAGEMENT ALGORIT

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LAP LAM Academic

K. V. Sowmya

SMART IOT BASED ENERGY METER WITH LOAD MANAGEMENT ALGORITHM

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CONTENTS **PAGE NO.**

Solar Energy is expected to contribute to the power blend in a big degree. Most commonly, we look into charge controllers if we are trying to install an off-grid solar system, from rooftop systems to smaller setups on boats. Solar charge controllers are one of the important components of a solar power system, and help extensively in maintaining the efficiency, performance and reliability of the solar battery.

BadriRamaKr

SMART SOLAR CHA
CONTROLLER US
SYNCHRONOUS BU
CONVERT

FOR LITHIUM-ION BA

I am a research scholar working in the field of Electric Vehicles.

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LAP LAMI
Academic

BadriRamaKrishnan V

SMART SOLAR CHARGE CONTROLLER USING SYNCHRONOUS BUCK CONVERTER

FOR LITHIUM-ION BATTERY

LAP LAMBERT Academic Publishing

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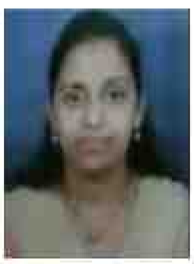
Multilevel inverters are playing a major role in PV based systems because of numerous advantages like low dv/dt, better harmonic profile so on. But, conventional multilevel inverters consist of some drawbacks like capacitor voltage balancing issues in neutral point clamped multilevel inverter and flying capacitor multilevel inverters. Moreover flying capacitor multilevel inverters requires more number of capacitor banks and neutral point clamped multilevel inverters require more number of clamping diodes. If any one switch of conventional multilevel inverter (NPC or flying capacitor) fails, the entire configuration has to be shutdown. To address these issues, a novel multi-level inverter has been proposed in this project which can be operated during the failure of any power electronic switching device / isolated dc source.

K. V. Dhanalakshmi

A Novel Fault Tolerant Twenty-one Level Inverter with Induction Drive



K.V. Dhanalakshmi works as Assistant Professor in G. Narayanamma Institute of Technology and Science. She has 16 years teaching experience. She is currently pursuing PhD in GIET University.

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