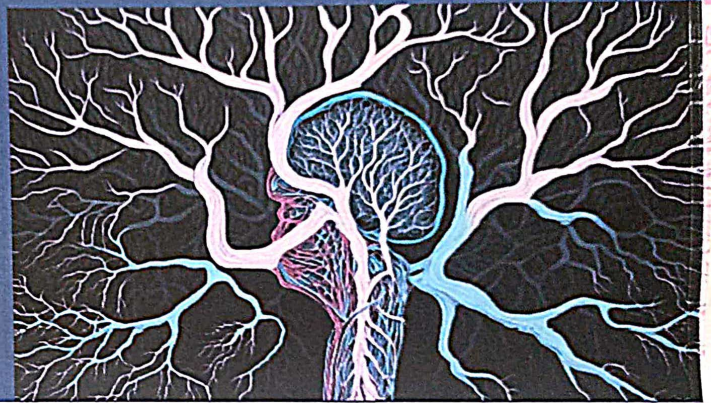


This book summarizes Facial expression recognition and identifies emotion from a face image. It is a manifestation of the activity and personality of a human. In the 20th century, the American psychologist Ekman and Friesen defined six basic emotions (anger, fear, disgust, sadness, surprise, and happiness), which are the same across cultures. Facial expression recognition has brought much attention in the past years due to its impact on clinical practice, social robotics, and education. According to diverse research, emotion plays an important role in education, we presented a Convolutional Neural Network model for students' facial expression recognition. The proposed model includes 4 convolutional layers, 4 max-pooling, and 2 fully connected layers. The system recognizes faces from students' input images using a Haar-like detector and classifies them into seven facial expressions: surprise, fear, disgust, sad, happy, anger, and neutral.



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M. Chitkalaiah
N.L. Tejaswini



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Facial Emotions Recognition using Convolutional Neural Network

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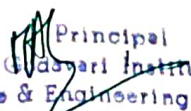
CHAPTER 1

1. INTRODUCTION

Facial expression recognition identifies emotion from face image, it is a manifestation of the activity and personality of a human. In the 20th century, the American psychologists Ekman and Friesen [2] defined six basic emotions (anger, fear, disgust, sadness, surprise and happiness), which are the same across cultures. Facial expression recognition has brought much attention in the past years due to its impact in clinical practice, social robotics and education. According to diverse research, emotion plays an important role in education. Currently, a teacher uses exams, questionnaires and observations as sources of feedback but these classical methods often come with low efficiency. Using facial expression of students the teacher can adjust their strategy and their instructional materials to help foster learning of students. The purpose of this article is to implement emotion recognition in expressions based on Convolutional Neural Network (CNN), which is a deep learning algorithm that are widely used in images classification. It consists of a multistage image processing to extract feature representations. Our system includes three phases: face detection, normalization and emotion recognition that should be one of these seven emotions: neutral, anger, fear, sadness, happiness, surprise and disgust.

1.1 MOTIVATION

Many researchers are interested in improving the learning environment with Facial Emotion Recognition Using Convolution Neural Networks proposed a system which is able to analyze students' facial expressions in order to evaluate classroom teaching effect. The system is composed of five phases: data acquisition, face detection, face recognition, facial expression recognition and post-processing. The approach uses K-nearest neighbor (KNN) for classification and Uniform Local Gabor Binary Pattern Histogram Sequence (ULGBPHS) for pattern analysis. Savva et al. [4] proposed a web application that performs an analysis of students' emotion who participating in active face-to-face classroom instruction. The application uses webcams that are installed in classrooms to collect live recordings, then they applied machine learning algorithms on its.


Principal
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Avapadu, Prakasaraopalem
W. G. Dt. (A. P.)

This book summarizes as an unmanned Aerial Vehicle (UAV) is a type of aircraft that has no pilot or passenger on board. UAVs include autonomously controlled (drones), and piloted vehicles (RPVs) controlled via a radio transmitter. Multirotor UAVs (unmanned aerial vehicles), namely quadcopters and hexacopters, have become increasingly popular in recent years. This book provides Over time, an increased understanding of the many factors that contribute to the risk of fire and has led to positive developments in the fire protection of commercial structures. Improvements in public fire protection systems and services, as well as increased use of private active or passive systems through fire protection and loss-control engineering, have meant an overall decrease in the cost of fire. The main focus of this system is its Automatic way of sowing the seeds. The seeds are been sowed in a proper sequence which results in the proper germination of seeds.



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FOR AUTHOR

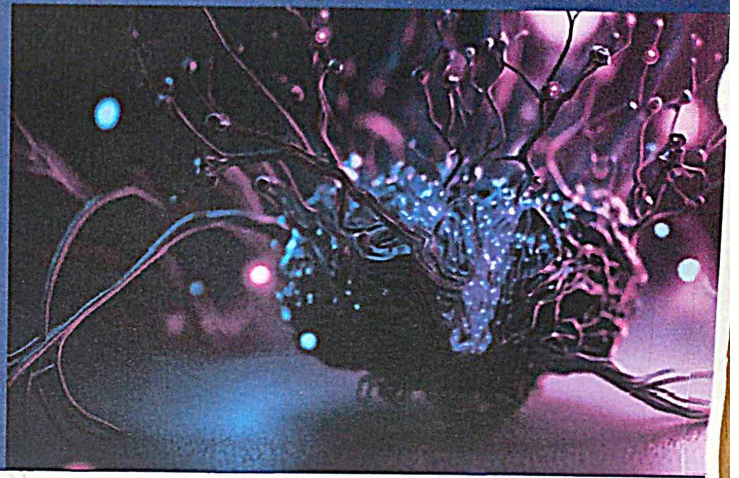
FIREFIGHTING AND AGRICULTURE SEED SPREADING DRONE

Principal
West Godavari Institute of
Science & Engineering (WISE)
Ayapadu, P. K. S. S. R. P.
W. G. (A. P.)

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This book summarizes that with the increasing number of vehicles in urban areas, many road networks are facing problems with the capacity drop of roads and the corresponding Level of Service. Many traffic-related issues occur because of traffic control systems at intersections that use fixed signal timers. In conclusion, the proposed system sets the green signal time adaptively according to the traffic density at the signal and ensures that the direction with more traffic is allotted a green signal for a longer duration of time as compared to the direction with lesser traffic. This will lower unwanted delays and reduce congestion and waiting time, which in turn will reduce fuel consumption and pollution.



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SMART CONTROL OF TRAFFIC LIGHT USING DEEP LEARNING

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Aparajitha, Prakasam
G. Dt. (A.P.)



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CHAPTER 1

INTRODUCTION

1.1 Motivation

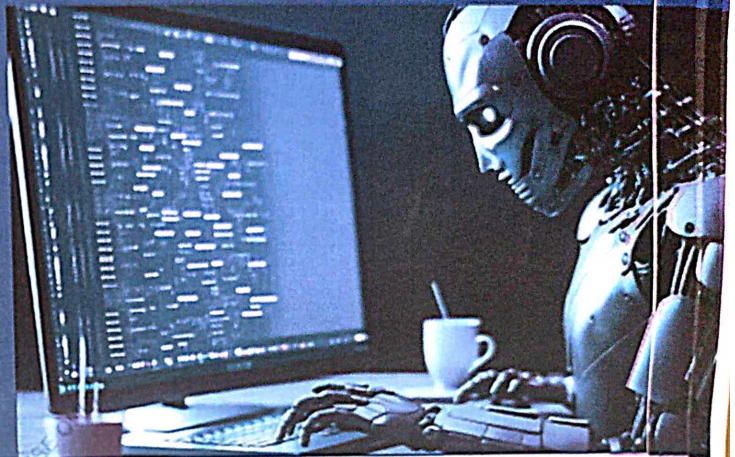
With the increasing number of vehicles in urban areas, many road networks are facing problems with the capacity drop of roads and the corresponding Level of Service. Many traffic-related issues occur because of traffic control systems on intersections that use fixed signal timers. They repeat the same phase sequence and its duration with no changes. Increased demand for road capacity also increases the need for new solutions for traffic control that can be found in the field of Intelligent Transport Systems. Let us take the case study of Mumbai and Bangalore. Traffic flow in Bangalore is the worst in the world while Mumbai is close behind in fourth position, according to a report detailing the traffic situation in 416 cities across 57 countries. In Bangalore, a journey during rush-hour takes 71% longer. In Mumbai, it is 65% longer [1]. There are three standard methods for traffic control that are being used currently: 1) Manual Controlling: As the name suggests, it requires manpower to control the traffic. The traffic police are allotted for a required area to control traffic. The traffic police carry signboard, sign light, and whistle to control the traffic. 2) Conventional traffic lights with static timers: These are controlled by fixed timers. A constant numerical value is loaded in the timer. The lights are automatically switching to red and green based on the timer value. 3) Electronic Sensors: Another advanced method is placing some loop detectors or proximity sensors on the road. This sensor gives data about the traffic on the road. According to the sensor data, the traffic signals are controlled. These conventional methods face certain drawbacks. The manual controlling system requires a large amount of manpower. As there is poor strength of traffic police, we cannot have them controlling traffic manually in all areas of a city or town. So a better system to control the traffic is needed. Static traffic controlling uses a traffic light with a timer for every phase, which is fixed and does not adapt according to the real-time traffic on that road. While using electronic sensors like proximity sensors or loop detectors, the accuracy and coverage are often in conflict because the collection of high-quality information is usually based on sophisticated and expensive technologies, and thus limited budget will reduce the number of facilities. Moreover, due to the limited effective range of most sensors, the total coverage on a network of facilities usually requires a lot of sensors.

In recent years, video monitoring and surveillance systems have been extensively used in traffic management for security, ramp metering, and providing information and updates to travelers in real-time. The traffic density estimation and vehicle classification can also be achieved using video monitoring systems, which can then be used to control the timers of the traffic signals so as to optimize traffic flow and minimize congestion. Our proposed system aims to design a traffic light controller based on Computer Vision that can adapt to the current traffic situation. It uses live

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Principal
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Avapadu, Prakasaraopalem
W. G. Dist. (A. P.)

This book summarizes the financial activities are carrying out in every second by many persons in which one most important asset of our country is Banknotes. Fake notes are introduced in the market to create discrepancies in the financial market, even they resemble to the original note. Now days, supervised machine learning (SML) approaches for classification problem is widely used. For medical disease its shows even promising result. Few authors have only applied SML algorithms on bank currency authentication. In this study, there are several things that can be from the results of machine learning using Error Level analysis and Convolutional Neural Network.



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Deep Learning and Image Processing-Based Currency Detection

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CHAPTER 1

INTRODUCTION

1.1 Motivation

Financial activities are carrying out in every second by many persons in which one most important asset of our country is Banknotes [3]. Fake notes are introduced in the market to create discrepancies in the financial market, even they resemble to the original note. Basically, they are illegally created to complete various task [12]. In 1990 forgery issue is not much of concern but as in late 19th century forgery has been increasing drastically [13].

In 20th century technology is increasing very vastly that will help the frauds to generate fake note whose resemblance is like genuine not and it is very difficult to discriminate them [1]. This will lead to financial market to its lowest level. To stop this and to conduct smooth transaction circulation forged bank currency must be conserved [16]. As a human being it is very difficult to identify between genuine and forged bank currency.


Government have designed banknote with some features by which we can identify genuine [9]. But frauds are creating fake note with almost same features with nice accuracy that make it very difficult to identify genuine note [5]. So, now a day it is required that bank or ATM machines must have some system that can identify the forged note from the genuine note [12]. To determine the legitimacy of the banknote artificial intelligence and Machine learning (ML) can play a vital role to design such a system that can identify forged note from the genuine bank currency [6,7,12].

Now days, supervised machine learning (SML) approaches for classification problem is widely used. For medical disease its shows even promising results [2]. Few authors have only applied SML algorithms on bank currency authentication [6-9, 12]. To identify weather a note is genuine or fake we have to develop an automation system. Initially, the input is an image of note and from different image processing techniques we can extract the features of note. Further these images are given as an input to the SML algorithms to predict whether note is original or fake. In review we can see that not much of work is done on this side

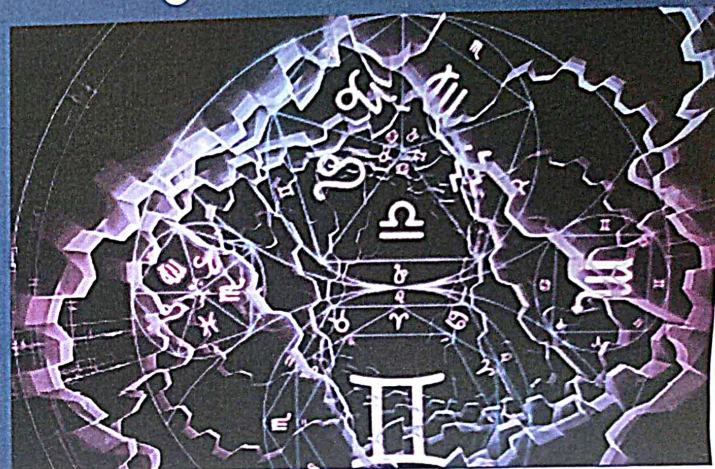
The steps are as follows,

- a. Pre-processing.
- b. Image Segmentation.
- c. Feature Extraction.
- d. Feature Matching or classifiers.

One by one identification performed by manual is only possible for confined quantity of notes. Therefore demand a machine learning centered alternative to


Principal
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Avapadu, Prakasaraopalem
W. G. Dt. (A. P.)

This book summarizes the electricity load forecasting has gained substantial importance nowadays in the modern electrical power management systems with elements of smart grid technology. Power big data has the characteristics of a large number, high dimension and time series. At the same time, there are many forms of missing electric power data, some are missing dispersedly, and some are missing in succession. Therefore, combinations of prediction methods are receiving increasing attention. We performed exploratory data analysis, pre-processing, and train-test split before training the model. We used various metrics to test the advantages of the proposed model: mean absolute error, mean squared error, and root mean squared error.

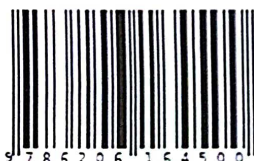


M Aravind Kumar
T. Durga Devi
G. Phani Madhuri



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Machine Learning Based Power Utilization Prediction



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CHAPTER 1

INTRODUCTION

1.1 Motivation

In 2018, share of energy from renewable resources in Estonia is 29%, which is above targeted value for 2020 and almost 10% more than the European Union countries average. As the share of variable renewable rises, so does operational complexity.

In order to reach the European Commission's targets for 2050, the integration of renewable Energies will require flexibility sources, independent of conventional generation, in order to provide standard security of supply. This trend is excellent in terms of environmental friendliness and sustainability but it creates challenges for the grid operator.


Machine Learning (ML) is one of the growing technical fields that merge between computer science and statistics. It tackles the issue of building computers that learn through experiences and hence provide more improved algorithms. ML keeps witnessing advances thanks to the new algorithms and the availability of online data, in addition to the accessibility of the computing power.

Electricity load forecasting has gained substantial importance nowadays in the modern electrical power management systems with elements of smart grid technology. Power big data has the characteristics of a large number, high dimension and time series. At the same time, there are many forms of missing electric power data, some are missing dispersedly and some are missing in succession.

The traditional method is not suitable for the cases where the missing data is large, because it will destroy the continuity, integrity and accuracy of the electric power data.

A reliable forecast of electrical power consumption represents a starting point in policy development and improvement of energy production and distribution. At the level of individual households, the ability to accurately predict consumption of electricity power significantly reduces prices by appropriate systems for energy storage.

Therefore the energy efficient power networks of the future will require entirely new ways of forecasting demand on the scale of individual households.


Principal
West Godavari Institute of
Science & Engineering (WISE)
Avapadu, Prakasaraopalem
W. G. Dt. (A. P.)

This book summarizes Undersea acoustic communications have drawn a lot of attention recently as their uses start to transition from military to commercial. The acoustic properties of the ocean are characterized by their tremendous complexity and dynamic nature. The parameters such as depth, temperature, salinity, location, time of day, and season of the underwater medium influences the acoustic signal propagation. However, these medium parameters are varying arbitrarily depending upon shallow and deep-water divisions of the ocean. In addition to the medium parameters, the characteristics of the acoustic channel (transmission loss, absorption and multi-path) are affected by variation in the acoustic signal speed in underwater. The influence of the aforementioned parameters alters the velocity of acoustic transmission, which affects network connectivity. Because research in the undersea environment is expanding rapidly, proficient channel modelling is required to demonstrate the effect of sound speed variations with respect to medium parameters.



M Aravind Kumar



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AN ACOUSTIC CHANNEL MODEL FOR DIRECT AND MULTIPATH MODELS IN DEEPWATER



9 786206 172855

MAK
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Avepedu, Polavaram
W. Godavari

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INTRODUCTION


1.1. Description of Wireless Sensor Networks

Wireless sensor networks (WSNs) have become an important field of research from past several years. WSNs usually comprise of large number of disseminated, self-directed, tiny, low cost, low power multifunctional sensor nodes that are deployed in a region of interest. Apart from sensing capability, sensor nodes are capable of processing data and communicating, as they are equipped with embedded microprocessors and radio transceivers. The contemporary developments in microelectronic mechanical systems (MEMS); wireless communication technologies; the smart sensors deployed in a physical area networked through wireless links *i.e.*, the internet provide unprecedented opportunities for a variety of civilian and military applications (environmental monitoring, battle field surveillance and industry process control etc.).

Sensor nodes offer a powerful combination of distributed sensing, computing and communication. The exceptional capabilities of these tiny sensor nodes enable the realization of WSNs based on the collaborative effort of the sensor nodes [1]. Wireless sensor networks incorporate knowledge and technologies from three different fields; wireless communications, networking and control theory. In order to realize the existing and potential applications for WSN; sophisticated and extremely efficient communication protocols are required.

In many real time applications, the sensor nodes are performing different tasks like neighbor node discovery [2,3], smart sensing [4], data storage [5,6], processing data aggregation [7], target tracking [8], control and monitoring node localization [9,10], synchronization and efficient routing between nodes and base stations [11]. Sensor networks may consist of many different types [12] of sensors such as seismic, low sampling rate magnetic, thermal, visual, inferred, acoustic, and radar, which are able to monitor a wide variety of ambient conditions (temperature, humidity, vehicular movement, lightning condition, pressure, soil makeup, noise levels, object tracking, mechanical stress on subjected object, current characteristics such as speed, direction, and size of an object). Unlike traditional wireless communication networks (cellular, mobile ad hoc networks (MANET)); the WSNs have unique characteristics such as denser level

2


Principal
West Godavari Institute of
Science & Engineering (WISE)
Avapadu, Prakasaraopalem
W. G. Dt. (A. P.)

This book summarizes The Electric Vehicle is preferred mainly because it is less expensive and environmental friendly. But it comes with the problem of battery overcharge and deep discharge. This problem affects battery life and performance over the years. To overcome this problem, the proposed system gives the prototype for Battery Monitoring System for Electric Vehicles (EV), in which different battery parameters such as voltage, current, power and the temperature are monitored by using various sensors. The measured battery parameters i.e., voltage, current, power and temperature data is sent to the Arduino UNO and the battery information is displayed on LCD and communicated to the user through Android smartphones. If the temperature exceeds the threshold value, then thermoelectric plates will automatically on and cool down the battery. The proposed system is also supported with a dual battery mechanism so that if one battery gets discharged then another battery will automatically connect. This mechanism helps in back up of the power when one battery is discharged.



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K.Bala Sindhuri

BATTERY MONITORING SYSTEM FOR ELECTRIC VEHICLES



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Avapadu, Prakasam
W. G. Dt., (A. P.)




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INTRODUCTION

Background

Electric vehicles do not emit polluting gases and are with the main aim of decarbonized future. This is reflected in the gradual increase in their sales: 6.6 million electric cars were sold worldwide in 2021, — this means that more than one in every 10 cars sold was a plug-in car. Of these, 71 % were battery-only electric vehicles (BEV) and the remaining 29 % were plug-in hybrid electric vehicles (PHEV), with Europe being the largest buyer of these vehicles.[1]

Below, bar graph shows the comparisons of global growth of the electric vehicle market in different countries like Europe, USA, China, Japan and other countries.[2]

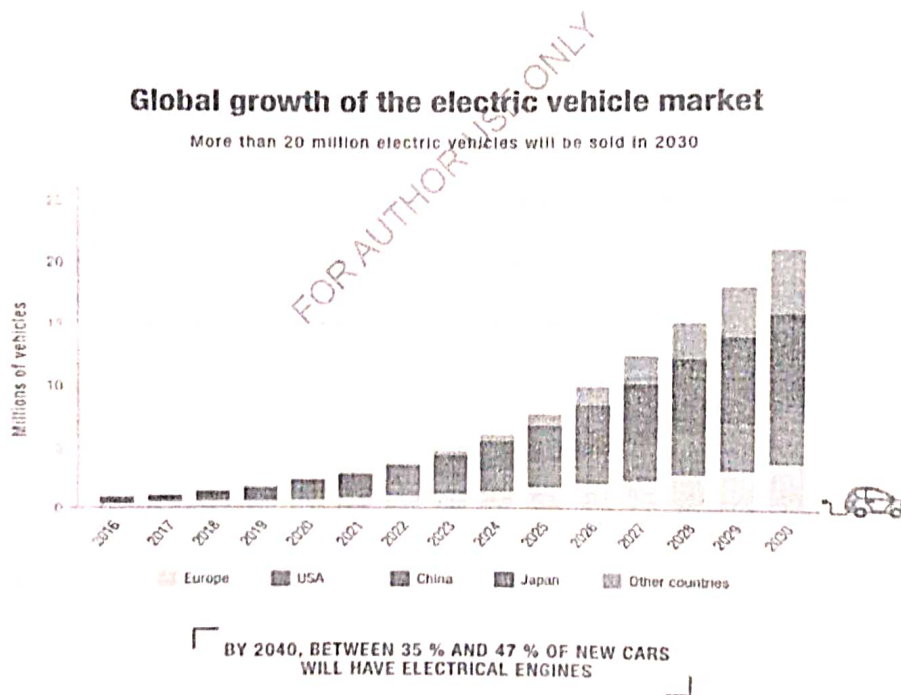

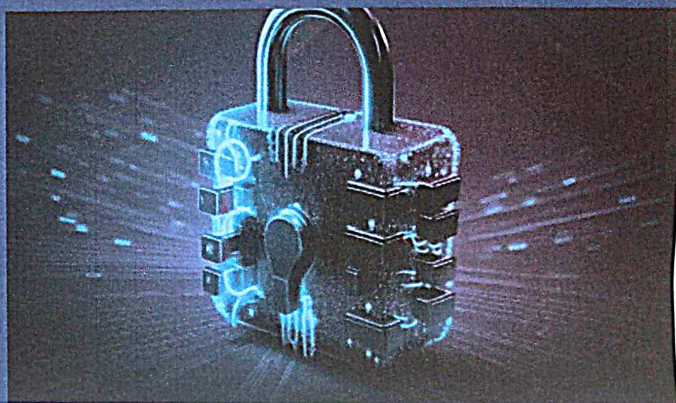


Fig.1. Global growth of the electric vehicle market [2]


Principal
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Science & Engineering (WISE)
Avapadu, Prakasaraopalem
W. G. Dt. (A. P.)

This book summarizes the Global cyber attacks are executed by highly organized criminal groups, and organized or national level crime groups have been behind many recent attacks. Typically, criminal groups buy and sell hacking tools and services on the cybercrime black market, wherein attackers share a range of hacking-related information. This online underground market is operated by groups of attackers, and it in turn supports the underground cybercrime economy.



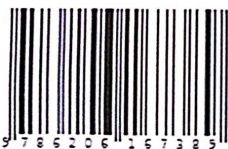
M. Aravind Kumar
P. Sheela



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Avapadu, Rajasaram
V. V. N. (A. E.)

A data analytics approach to the cybercrime underground economy



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CHAPTER 1

INTRODUCTION

1.1 Motivation

As the threat posed by massive cyberattacks (e.g., ransomware and distributed denial of Service attacks (DDoS)) and cybercrimes has grown, individuals, organizations, and governments have struggled to find ways to defend against them. In 2017, ransomware known as WannaCry was responsible for nearly 45,000 attacks in almost 100 countries [1]. The explosive impact of cybercrime has put governments under pressure to increase their cybersecurity budgets. United States President Barack Obama proposed spending over \$19 billion on cybersecurity as part of his fiscal year 2017 budget, an increase of more than 35% since 2016 [2].


Global cyberattacks (such as WannaCry and Petya) are executed by highly organized criminal groups, and organized or national-level crime groups have been behind many recent attacks. Typically, criminal groups buy and sell hacking tools and services on the cybercrime black market, wherein attackers share a range of hacking-related information. This online underground market is operated by groups of attackers, and it in turn supports the underground cybercrime economy [3]. The cybercrime underground has thus emerged as a new type of organization that both operates black markets and enables cybercrime conspiracies to flourish. Because organized cybercrime requires an online network to exist and to conduct its attacks, it is highly dependent on closed underground communities (e.g., Hack forums and Crackingzilla).

The anonymity these closed groups offer means that cybercrime networks are structured differently than traditional Mafia-style hierarchies [4], which are vertical, concentrated, rigid, and fixed. In contrast, cybercrime networks are lateral, diffuse, fluid, and evolving. Since cyberspace is a network of networks [5], the threat posed by the rise of highly professional network-based cybercrime business models, such as Crimeware-as-a-Service (CaaS), remains mostly invisible to governments, organizations, and individuals. Even though Information Systems (IS) researchers and practitioners are taking an increasing interest in cybercrime, due to the critical issues arising from the rapid increase in cyber threats, few have attempted to put this new interest on a solid foundation or develop suitable methodologies. Previous studies have not analyzed the underground economy behind cybercrime in depth.

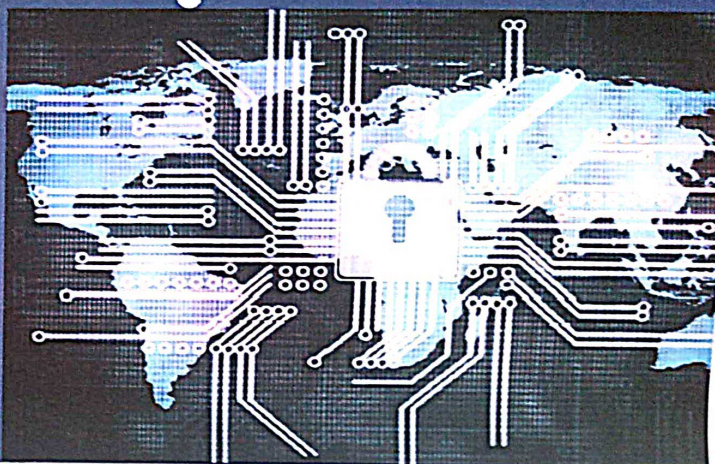
Furthermore, little is known about CaaS, one of the primary business models behind the cybercrime underground. There is an overall lack of understanding, both in research and practice, of the nature of this underground and the mechanisms underlying it. This research gap, and the practical problems faced by cybercriminals, motivates our study. We take a data analytics approach and investigate the cybercrime economy from a design science perspective. To achieve this goal, we

- (1) propose a data analysis framework for analyzing the cybercrime underground to guide researchers and practitioners;
- (2) define CaaS and crimeware to better reflect their features from both academic research and business practice perspectives;
- (3) use this to build a classification model for CaaS and crimeware; and
- (4) build an application to demonstrate how the proposed framework and classification model could be implemented in practice

1


Principal
West Godavari Institute of
Science & Engineering (WISE)
Avapedu, Prakasaraopalem
W. G. Dt. (A. P.)

This book summarizes that information technology is significant in supporting computer applications to many users and establishments worldwide like information security, information hiding, and information retrieval. All users, who use multimedia such as images, audio, video, and text, may need to protect information from attacks while sending or receiving them through channels. The proposed algorithm gives good results by applying some statistical tests as well the proposed algorithm achieved encryption rates of about 0.134136 and 0.106204 for decryption rate. Finally, it is possible to encrypt partial images instead of full image encryption. Also, it can be applied as a block cipher instead of a stream cipher to get good results. As well as it can be developed by compression of the plain image with an image key to reducing the cost of data transition.



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FAST IMAGE ENCRYPTION BASED ON RANDOM IMAGE KEY



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FOR APPROVAL

MAR

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CHAPTER 1

INTRODUCTION

There is no doubt that information technology plays a significant role to support the computer applications to many users and establishments in the world like information security, information hiding and information retrieval. As a matter of fact, all users, who use multimedia such as image, audio, video and text, may need to protect information from attacks during sending or receiving them through channel.

There are two challenges for multimedia encryption; the first one is the size of data and the second is the cost of encryptions. In this paper, an image encryption method based on a new random key generated from the same image is going to be adopted. The previous related work takes into account to review the points of power in these studies and to see how researchers think in this field.

Image Cryptosystem can be classified into two main sections; one for encryption and the other for decryption. The block cipher and stream cipher are two types of cryptosystem, so private key and public key are two strategies to be used in an encryption. In this paper a new algorithm is proposed to encrypt color image using symmetric key which is generated from the same image or any image can be selected. Some tests are applied here to determine performance algorithm.

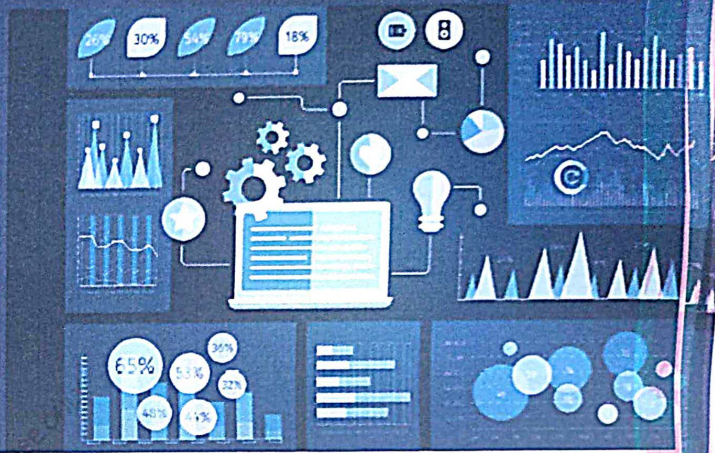
These are histogram, mean square error, peak signal to noise ratio, entropy, correlation coefficients, number of changing pixel rate and unified averaged changed intensity. The proposed algorithm was satisfied with good results where speed of running was good for encryption and decryption algorithm.

In electrical engineering and computer science, image processing is any form of signal processing for which the input is an image, such as a photography or video frame the output of image processing may be either an image or, a set of characteristics or parameters

1 

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Avapadu, Prakasaraopalem
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This book summarizes The primary concern of supervised hashing is to convert the original features into short binary codes that can maintain label similarity in the Hamming space. Due to their strong generalization capabilities, non-linear hash functions have shown to be superior than linear ones. Kernel functions are frequently utilized in the literature to create non-linear hashing, which results in encouraging retrieval performance but long evaluation and training times. Here, we suggest using boosted decision trees, which are quick to train and assess and are hence more suited for hashing with high dimensional data. As part of continuous improvement, we first suggest sub-modular formulations for the hashing binary code inference issue as well as an effective block search technique based on Graph Cut for large-scale inference. Then, we train boosted decision trees to suit the binary codes in order to learn hash functions. Experiments show that in terms of retrieval precision and training duration, our suggested strategy greatly surpasses the majority of state-of-the-art methods.



MARAVIND KUMAR



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OBJECT CLASSIFICATION USING FAST SUPERVISED HASHING FOR HIGH DIMENSIONAL DATA



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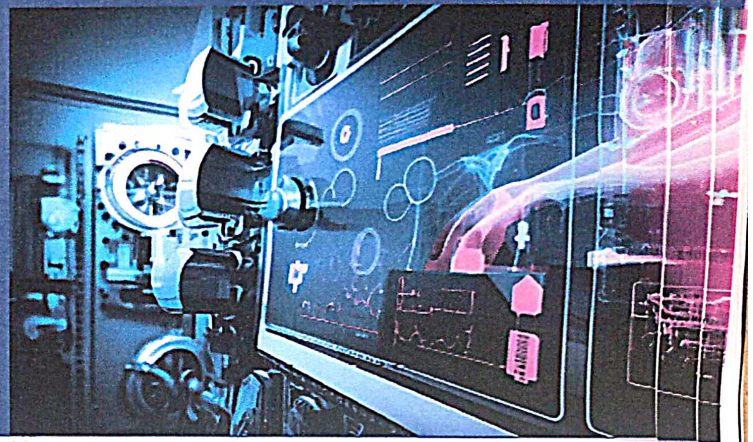
INTRODUCTION

Problem Statement and Motivation

Thanks to the rapid advancement of information technologies, the last decade has witnessed unprecedented growth in multimedia content generated by all kinds of digital electronic devices, such as digital cameras, mobile phones, and tablets etc. The ubiquitous multimedia big data presents a number of challenges and opportunities for research and development of efficient storage, indexing, and retrieval techniques. Hashing is recognized by many researchers as a promising solution to some of the aforementioned big data problems. Typically, hashing algorithms transform high-dimensional data representations into compact binary codes, and such a transformation enjoys several compelling benefits. Firstly, binary hash codes require significantly less storage compared with the high dimensional floating point representations. For instance, it only takes 8GB space to store 1 billion 64-bits hash codes, which can be easily loaded into the memory of a single PC; while if the data points are represented by 4096-dimensional CNN features, one would need 20TB memory to store the same amount of data. Secondly, the similarity between data points can be computed with Hamming distance through bit-wise "XOR" operation, which is the fastest atomic operations supported by modern computers. In fact, the Hamming distance computation is several orders of magnitude faster than that of the Euclidean distance between two vectors of the same dimension. Lastly, the binary hash codes can be naturally used as the index to build hash tables and support sub-linear or constant-time lookup, which offers even more aggressive speedup when one needs to search for similar items in massive-scale data repositories.

In light of these inherent speed and storage advantages, hashing, especially learning-based hashing, has attracted considerable research attentions during the past few years [42, 37, 58, 77, 10, 54]. Typically, learning-based hashing methods learn binary hash codes by preserving certain similarity structure among the training data items from a specific dataset. These hash codes can be optimized to be very compact and discriminative, thus achieving promising efficiency and accuracy for a number of similarity search tasks, including, but not limited to, image retrieval [58], video retrieval [101], and cross-media retrieval [10]. Moreover, hashing-based methods can not only be

This book summarizes Major operations are performed to remove or reconstruct the infected parts in the human body. These operations will lead to blood loss and pain. Therefore, it is necessary to arrest the pain and the blood loss. Anesthesia plays an important role in the part of painkilling. In which microcontroller is made use of to perform anesthesia injecting operation, where the quantity to be injected and the time at which the drug should be injected is provided. The Microcontroller displays the quantity to be injected and the time in the display device. Syringe infusion pump is mechanically connected to the motor.



M.Aravind Kumar
K.M.Unnisha Begum

IOT Based Anaesthesia Injector through Robot



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CHAPTER-1 INTRODUCTION

1.1 INTRODUCTION

Major operations are performed to remove or reconstruct the infected parts in the human body. These operations will lead to blood loss and pain. Therefore, it is necessary to arrest the pain and the blood loss. Anesthesia plays an important role in the part of painkilling. AAI can be defined as "Automatic administration of precise amounts of anaesthesia at a specific time suggested by the anesthetist." Anaesthesia is very essential in performing painless surgery and so an Automatic administration of Anesthesia is needed for a successful surgery.

An Embedded system is a combination of computer hardware, software and additional mechanical parts designed to perform a specific function. An example is the microwave oven. It is hardly realized that the oven actually consists of a processor and the software running inside. Another example is the TV remote control. Very few actually realize that there is a microcontroller inside that runs a set of programs especially for the TV.

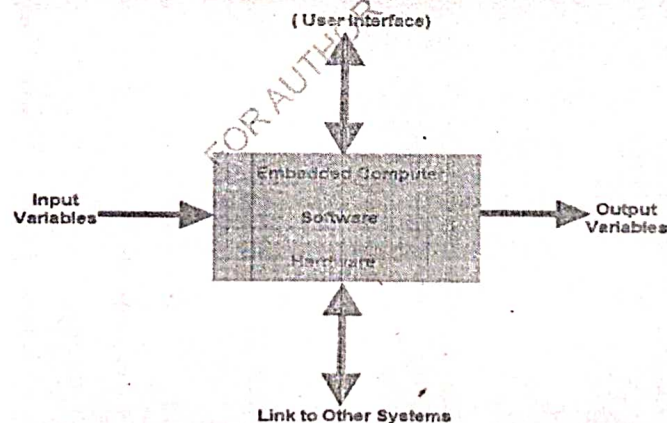


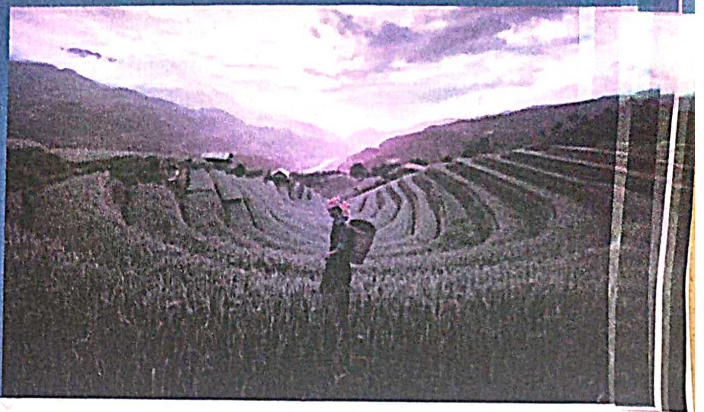
Fig 1.1: Embedded System

1.2 PROJECT OBJECTIVE

The main aim of the project is to aid an anaesthetist during a surgery to eliminate human errors in injecting precise amount of anaesthesia drug to the patient. Keypad is interfaced to set the level of anesthesia to be administered to the patient in terms of milliliters (1ml to 1000ml) and the time at which the drug should be injected. LCD is interfaced to display the quantity to be injected and the time at

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This book summarizes the exponential growth of the world population, according to the UN Food and Agriculture Organization, the world will need to produce 70% more food in 2050, shrinking agricultural lands, and depletion of finite natural resources, the need to enhance farm yield has become critical. Limited availability of natural resources such as fresh water and arable land along with slowing yield trends in several staple crops have further aggravated the problem. This testing phase of the project justifies that this book can be used in a real-time farming environment. Also, the project was developed after studying the market requirement which makes it extremely suitable in the context of present scenarios. The post-survey result provides that the system is useful in real-time scenarios and end users are interested in using this system.



M. Aravind Kumar



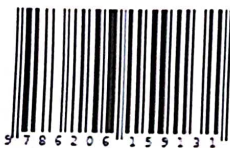
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IOT BASED SMART AGRICULTURE SYSTEM



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CHAPTER 1

INTRODUCTION

With the exponential growth of world population, according to the UN Food and Agriculture Organization, the world will need to produce 70% more food in 2050, shrinking agricultural lands, and depletion of finite natural resources, the need to enhance farm yield has become critical. Limited availability of natural resources such as fresh water and arable land along with slowing yield trends in several staple crops, have further aggravated the problem. Another impeding concern over the farming industry is the shifting structure of agricultural workforce. Moreover, agricultural labor in most of the countries has declined. As a result of the declining agricultural workforce, adoption of internet connectivity solutions in farming practices has been triggered, to reduce the need for manual labor.

IoT solutions are focused on helping farmers close the supply demand gap, by ensuring high yields, profitability, and protection of the environment. The approach of using IoT technology to ensure optimum application of resources to achieve high crop yields and reduce operational costs is called precision agriculture. IoT in agriculture technologies comprise specialized equipment, wireless connectivity, software and IT services. BI Intelligence survey expects that the adoption of IoT devices in the agriculture industry will reach 75 million in 2020, growing 20% annually. At the same time, the global smart agriculture market size is expected to triple by 2025, reaching \$15.3 billion (compared to being slightly over \$5 billion back in 2016).

This book summarizes the telepresence robot is a remote-controlled, wheeled device with a display to enable video streaming which allows the participants to view remote locations, as if they were there. The project consists of a smartphone in which a screen will appear to experience virtual reality and 4 wheeled robotic vehicle. The movement of the Robot can be controlled by using an android app. The motion of camera of the robot is controlled by the servo motor and data processed by the Arduino board. Video streamed is received by the smartphone using the link specified by the Arduino. This robot with a camera is placed in a remote location to capture the environment in visual form using Arduino. The captured visuals are displayed on the users mobile phone. An added feature allows the camera to move in the direction of the users phone movements. This gives the user a real-time experience as if he is present where the robot is located. The robot can also be moved in any direction through an app installed in the users smartphone. The cost is efficient for tele-presence robotic platform for complete and immersive remote operation, with Arduino and suggestive feedback and real time.



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K.Bala Sindhuri



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Implementation of Live Telecasting Robo



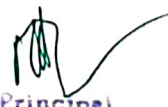
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Introduction

The advent of new high-speed technology and the growing computer Capacity provided realistic opportunity for new robot controls and realization of new methods of control theory. This technical improvement together with the need for high performance robots created faster, more accurate and more intelligent robots using new robots control devices, new drivers and advanced control algorithms. This project describes a new economical solution of robot control systems. In general, the robots are controlled through wired network. The programming of the robot takes time if there is any change in the project the reprogramming has to be done. Thus, they are not user friendly and worked along with the user preferences. To make a robot user-friendly and to get the multimedia tone in the control of the robot, they are designed to make user commanded work. The modern technology has to be implemented to do this. For implementing the modern technology, it should be known by all the users to make use of it. To reach and to full-fill all these needs we are using android mobile as a multimedia, user friendly device to control the robot. This idea is the motivation for this project and the main theme of the project. In this modern environment everybody uses smart phones which are a part of their day-to-day life. They use all their daily uses like newspaper reading, daily updates, social networking, and all the apps like home automation control, vehicle security, human body anatomy, health maintenance, etc. has been designed in the form of applications which can be easily installed in their handheld smart phones. This project approached a robotic movement control through the smart phones. Hence a dedicated application is created to control an embedded robotic hardware. The application controls the movement of the robot.

A telepresence robot is a remote-controlled, wheeled device that has wireless internet connectivity (Wi-Fi technology). Typically, the robot uses a smartphone to provide video streaming. Gives information about surroundings at where the robot is placed. Virtual presence can be considered as a special case of telepresence where the remote environment is artificially created. Camera is interfaced with Arduino which allows it to live stream and record the video. Also, Arduino plays the role of driving a robot through a motor driver. Robot is also controlled using a mobile application which allows us to send any direction command to the robot. However, operating and navigating these robots by individuals who have little knowledge and map of the remote environment is challenging. Typically, the robot uses a smartphone to provide video and gives information about surrounding. Virtual presence can be considered as a special case of



Communicating through hand gestures is one of the most common forms of non-verbal and visual communication adopted by speech impaired population all around the world. The problem existing at the moment is that most of the people are not able to comprehend hand gestures or convert them to the spoken language quick enough for the listener to understand. The main objective of this project is to give the better solution for the speech impaired people by making a glove, which will assist in removing or at least reducing the communication gap between the speech impaired and normal people.



Anusha Basamsetti




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A Theory on Hand Gesture Recognition For Vocal Impaired Community



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1. EMBEDDED SYSTEMS

INTRODUCTION TO EMBEDDED SYSTEMS

An embedded system is one kind of a computer system mainly designed to perform several tasks like to access, process, store and also control the data in various electronics-based systems. Embedded systems are a combination of hardware and software where software is usually known as firmware that is embedded into the hardware. One of its most important characteristics of these systems is, it gives the o/p within the time limits. Embedded systems support to make the work more perfect and convenient. So, we frequently use embedded systems in simple and complex devices too. The applications of embedded systems mainly involve in our real life for several devices like microwave, calculators, TV remote control, home security and neighbourhood traffic control systems, etc.,

DEFINITION OF EMBEDDED SYSTEMS

A combination of computer hardware and software, and perhaps additional mechanical or other parts, designed to perform a specified function. Most of the controlling systems, today, are embedded systems. The complexity of the systems may differ from to the other.

BRIEF HISTORY

The first recognizably modern embedded system was the Apollo Guidance Computer, developed by Charles Stark Draper at the MIT instrumentation Laboratory. The first mass-produced embedded system was the autozoetic D-17 guidance Computer for the Minuteman (missile), released in 1961. It was built from transistor logic and had a hard disk for main memory. Since these early applications in the 1960s, embedded systems have come down in price. There has also been an enormous rise in processing power and functionality.

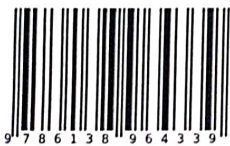
In 1978 National Engineering Manufacturers Association released the standard for a programmable microcontroller. The definition was an almost any Computer -based controller. They included single board Computers, numerical controllers and sequential controllers in order to perform event-based instructions. By the mid-1980s, many of the previously external system components had been integrated into the same chip as the

Design and Implementation of 4-BIT Shift Register Using 2PASCL Logic

Power dissipation is increasingly becoming a concern nowadays as the computing power is increased and the number of transistors switching has increased. With more power dissipated in the form of heat, different cooling techniques have to be adopted. The ever famous logic for implementing different functions is CMOS logic. CMOS is known for its low static power consumption. The problem with CMOS is it has very large switching power consumption, which directly depends upon the switching frequency.



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Anusha Basamsetti

Design and Implementation of 4-BIT Shift Register Using 2PASCL Logic

CHAPTER-1

INTRODUCTION

1.1 INTRODUCTION

Power dissipation is increasingly becoming a concern nowadays as the computing power is increased and the number of transistors switching has also increased. With more power dissipated in the form of heat, different cooling techniques have to be adopted. The ever famous logic for implementing different functions is CMOS logic. CMOS is known for its low static power consumption. The problem with CMOS is it has very large switching power consumption, which directly depends upon the switching frequency. The power dissipation in CMOS is given as

$$P_{\text{total}} = P_{\text{static}} + P_{\text{dynamic}}$$

$$P_{\text{dynamic}} = C_L V_{\text{dd}}^2 f_{\text{clk}}$$

P_{static} is the static power dissipation of CMOS which constitutes leakage power and short circuit power, which is very less compared to other logic circuits. P_{dynamic} is the dynamic power dissipation which depends on the switching rate f_{clk} , combined load capacitance C_L and proportional to square of supply voltage V_{dd} . The usual practices to reduce power dissipation in CMOS is to reduce V_{dd} , but it reduces the performance of the circuit. C_L is a technology parameter and it also depends on device intrinsic capacitances. In CMOS the total energy taken from the supply is given as $C_L V_{\text{dd}}^2$, in that half is dissipated in transistors and the other half is stored in capacitors. The lower bound of energy dissipation in CMOS is $C_L V_{\text{dd}}^2$.

The increasing demand for low-power very large scale integration (VLSI) can be addressed at different design levels, such as the architectural, circuit, layout, and the process technology level. At the circuit design level, considerable potential for power savings exists by means of proper choice of a logic style for implementing Combinational circuits. This is because all the important parameters governing power dissipation, switching capacitance, transition activity, and short-circuit currents are strongly influenced by the chosen logic style.

Depending on the application, the kind of circuit to be implemented, and the design technique used, different performance aspects become important, disallowing the formulation of universal rules for optimal logic styles. Previously, area, speed and

Face Recognition Using Raspberry Pi

This Book summarizes the experimental prototype of the embedded image-capturing system with Raspberry Pi system. The graphics capabilities of the Raspberry Pi are roughly equivalent to the level of performance of the Xbox of 2001. The Raspberry Pi chip, operating at 700 MHz by default, will not become hot enough to need a heat sink or special cooling. The SoC is stacked underneath the RAM chip, so only its edge is visible. Level 2 cache is 128 KB, used primarily by the GPU, not the CPU. This system is smaller, lighter and with lower power consumption, so it is more convenient than the PC-based face recognition system. Because of the open-source code, it is freer to do software development on Linux. Experimental results show that it's an effective method of using a Raspberry Pi board to actualize an embedded image-capturing system.



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Face Recognition Using Raspberry Pi

Chapter-I

INTRODUCTION

1.1 Introduction of Embedded System

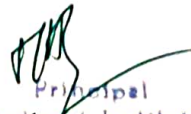
An Embedded System is a combination of computer hardware and software, and perhaps additional mechanical or other parts, designed to perform a specific function. A good example is the microwave oven. Almost every household has one, and tens of millions of them are used everyday, but very few people realize that a processor and software are involved in the preparation of their lunch or dinner.

This is in direct contrast to the personal computer in the family room. It too is comprised of computer hardware and software and mechanical components (disk drives, for example). However, a personal computer is not designed to perform a specific function rather; it is able to do many different things. Many people use the term general-purpose computer to make this distinction clear. As shipped, a general-purpose computer is a blank slate; the manufacturer does not know what the customer will do with it. One customer may use it for a network file server another may use it exclusively for playing games, and a third may use it to write the next great American novel.

Frequently, an embedded system is a component within some larger system. For example, modern cars and trucks contain many embedded systems. One embedded system controls the anti-lock brakes, other monitors and controls the vehicle's emissions, and a third displays information on the dashboard. In some cases, these embedded systems are connected by some sort of a communication network, but that is certainly not a requirement.

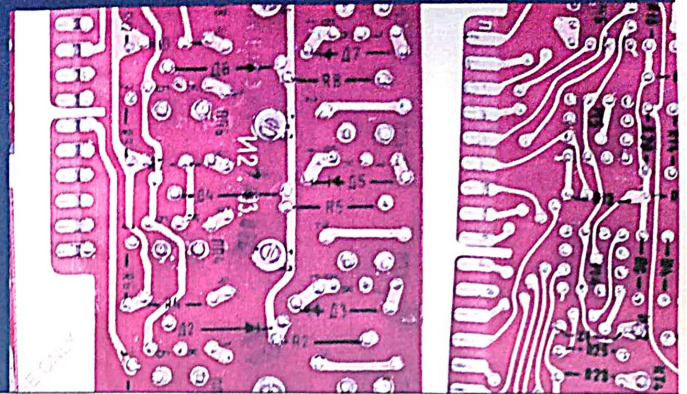
At the possible risk of confusing you, it is important to point out that a general-purpose computer is itself made up of numerous embedded systems. For example, my computer consists of a keyboard, mouse, video card, modem, hard drive, floppy drive, and sound card—each of which is an embedded system. Each of these devices contains a processor and software and is designed to perform a specific function. For example, the modem is designed to send and receive digital data over analog telephone line. That's it and all of the other devices can be summarized in a single sentence as well.

If an embedded system is designed well, the existence of the processor and software could be completely unnoticed by the user of the device. Such is the case for a microwave oven, VCR, or alarm clock. In some cases, it would even be possible to build an equivalent device that



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This book summarizes the entire prototype of the density based traffic management system has been implemented. Arduino MEGA 2560 has been made use as microcontroller and processing unit. Along with the microcontrollers we have employed ultrasonic sensors that are in turn connected to the Arduino MEGA 2560 that aided to achieve the density based traffic regulation. The information from the ultrasonic sensor is successfully received by the Arduino and a necessary decision according to the conditions provided has been taken. The LED lights indicating the traffic lights are also glowing according to the timings decided by the Arduino MEGA. Arduino MEGA drives the LED lights effectively as per the conditions. The emergency vehicles are prioritized on the roads to help them reach the destination as soon as possible. The lane that detects the emergency vehicle approaching the junction will be cleared as soon as possible till the vehicle crosses the junction. Finally, all the objectives were served effectively by the prototype that is implemented. The information of the traffic density has to be transmitted safely to the microcontrollers without being altered in between the communication.

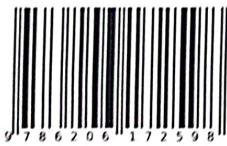


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Density Based Traffic Controlling System for Emergency Vehicles



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CHAPTER-1

INTRODUCTION

INTRODUCTION

Technology has been improved and implemented widely and in almost all the sectors. A comfortable life is what the people of this century are leading with the help of devices and machines such as television, air conditioners refrigerators, washing machines and much more. For commuting purpose people choose to have their own vehicles rather than waiting for the public transport in a crowd. This increases the number of vehicles on the road which further hurdles the smooth flow of the vehicles on the road. Thus giving rise to the issue of traffic congestion. Traffic congestion aids the road accidents due to the irritated drivers. Thus, controlling this issue becomes obligatory to avoid the unnecessary accidents.

Traffic Signaling Systems employed are still dependent on a trained policeman for the density based controlling. This is a tedious job for a person to perform as the traffic congestion is increasing day by day. To ease his job, we take the help of technology by using certain devices to understand the traffic condition and take necessary decisions to control the situation. The traffic density is detected by the help of sensors whose reading are fed to the microcontrollers that are programmed to take the necessary actions according to the condition of the traffic congestion.

The emergency vehicles are not prioritized on the road which leads to delay in serving the needy or the victim. There are hundreds and thousands of cases in which the victim or the patient dies on the way to the hospital due to the traffic congestion caused on the way to the hospital. Also, there are cases where the emergency vehicles are unable to reach the place on time where the accident has occurred because of the traffic congestion. Thus, to avoid this scenario, we need to prioritize the emergency vehicles on the roads so that they reach the needy at the right time to serve them better.

FRACTAL SEGMENTED LOTUS SHAPE PLANAR MONOPOLE ANTENNA

Fractal segmented lotus shape planar monopole antenna for multiband applications is proposed. The overall size of the proposed design is about 28mm x 35mm x 1.6mm. The proposed antenna has been designed on FR - 4 and the dielectric constant of 4.4, thickness of 1.6mm and loss of tangent is 0.02. Fractal techniques has imposed to increase the number of bands and wide bandwidth. The applications of the proposed antenna are satellite communications, defence tracking, air traffic control, weather monitoring. The proposed antenna is designed and simulated by using the HFSS software. Keywords – Rectangular Microstrip Antenna, Fractal, Leaf shape, Lotus structure, Multiband, FBW, HFS.

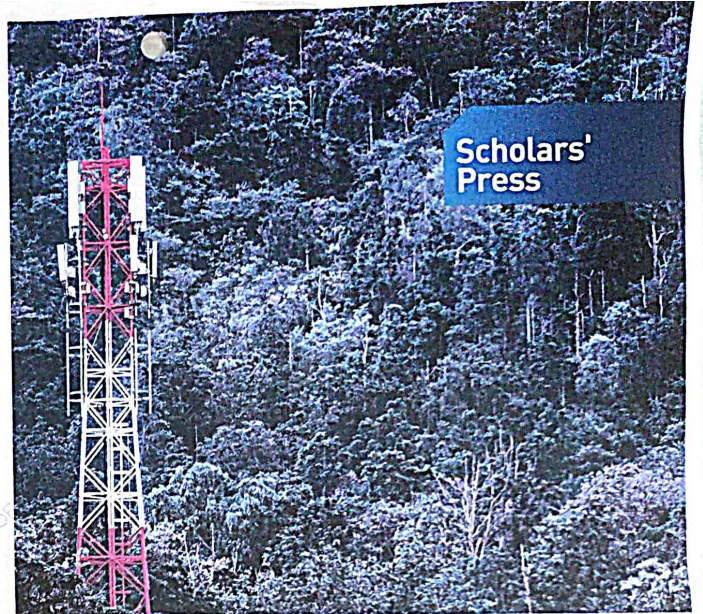


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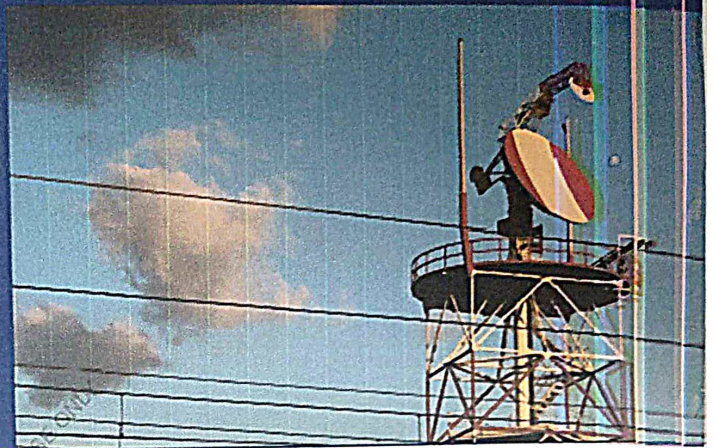
FRACTAL SEGMENTED LOTUS SHAPE PLANAR MONOPOLE ANTENNA

CHAPTER 1 INTRODUCTION

With the demand for wireless devices to provide increasing number of services, new challenges arise in design of low-profile antennas to facilitate increasing number of multi bands in a single module.

A single antenna can operate at multiple wireless standards have accoutered an importance substance to meet the difficulty of wireless device growth. By this impact, many various techniques and antenna structures have been predicted by researchers recognize multiple band applications with unique/different and compacted structures [1]. The Ultra-Wide Band (UWB) systems have succeeded in achieving importance in wireless communications due to its un licensed wide impedance band width. The technology of UWB has formed a basis for various wireless communication systems. For the design of UWB antenna with wide band width it should maintain higher gain and good radiation efficiency. [1-2]. The higher gain antennas with directive radiation features are important in various applications like high-speed moving target direction, coal mines, military etc. The assemblage of radiating elements in an electrical and geometrical configuration is defined as antenna array. antenna array gives high gain and directive radiation pattern rather increasing the size of the radiating element [2]. Antenna array is used to improve the overall gain, give diversity reception, negate interference from particular direction, regulates/determines the direction of arrival of signal and maximizes the SNIR (Signal to Interference Plus Noise Ratio). Array is most sensitive to appropriate direction [3]. The antenna array performance is improved by increasing number of elements in the array. Increase in the number of elements is in the form of cost, size and the complexity increase. This is one of the main drawbacks. To improve the performance of a communications engineering system an array of antennas is used in different ways [4]. A new technique based on the optimization of power transmission between two antennas has been suggested for the design of antenna arrays [5]. For attaining the improvement in band width, we can increase the thickness of the substrate. Antenna performance will be degraded with some limitation i.e. height of the substrate. for the improvement of band width impedance matching is a crucial role in the antenna performance. Antenna arrays are primarily used in the communication systems to transmit the signals with high gain

This book summarizes the research suggests a novel method that significantly enhances higher-order statistical algorithms for blind digital modulation identification (DMI) (HOS). In order to perform an offset on higher-order moments (HOM) and obtain an estimate of noise-free HOM, the suggested method makes use of noise power estimation. The suggested method will perform previous DMI algorithms that are based only on cumulants or do not take into account HOM denoising when tested for multiple antenna systems, even for a receiver with impairments. The improvement will be made while maintaining the same level of HOS-based DMI complexity in the same situation. Modulation identification is the step that succeeds energy detection and precedes signal demodulation. When both source signals and channel parameters are unknown, we are in a blind context that naturally requires a blind process of modulation recognition. Despite their high identification accuracy, maximum-likelihood-based techniques for modulation identification often suffer from the substantially high complexity. Feature-based algorithms of modulation identification give an alternative that provides a good performance.



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Identification of Blind Digital Modulation in Multiple-Antenna Systems



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Introduction

This dissertation addresses the problem of blind system identification (BSI). System in this case refers to one or multiple coexisting wireless communication links from the point of view of one of the receivers. Blind refers to the assumption that no specific information about the environment is known beforehand except for that at its core are independent signals that have been mixed together in a linear fashion to arrive at the received signal. Identification is the process of trying to estimate unaided (because of the blind assumption) the independent signals or some of their properties as well as to determine the mechanisms through which they contribute to the received signal. The linear process that describes the transfer of energy and information from the original source signals to the receiver will be referred to as the channel or transfer function. In a communication system, the independent signals that are present in the environment can be divided into three categories: desired, interferers, and noise. The desired signal carries information that the receiver is interested in which is in contrast to the interferers which are also information bearing signals but directed at other receivers. Both the desired and the interfering signals have cyclostationary (periodic statistics) statistics because of their information carrying properties associated with periodicities from their data rates and center frequencies of operation. Noise, on the other hand, does not carry any particular information or structure but is instead a result of a combination of random contributions of receiver noise, ambient noise, etc. and therefore can be modeled as a stationary signal. Both interferers and noise, as their names state, are nuisances which hamper the receiver's goal of correctly estimating the signal that has been originally sent by the desired source.

Under such circumstances the signal environment is not known to the receiver because any number of systems could be in use on the same frequency and time slots of the desired signal. These signals might vary in number, modulation, or amount of signal overlap (in time or in frequency), since any system is permitted to use this band at any given time subject to restrictions in power and bandwidth.

Present trends in communication links between devices have opted for wireless instead of wired solutions. As a consequence, unlicensed bands have seen a rise in the interference level as more and more devices are introduced into the market place that take advantage of these free bands for their communications needs. Under these conditions, the receiver's ability to recognize its environment unaided becomes increasingly important. In



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This book summarizes the In this project work, Design and Implementation Of High Speed and high Accuracy Novel Multiplier using PPA is implemented. Approximate circuits are becoming an effective solution to accurately operating circuits if energy efficiency is concerned, and the application is error tolerant. One of the primary features that help us determine the computational power of a processor is the speed of its arithmetic unit. PPA adder architecture therefore greatly enhances the speed of the overall process. This proposed system has less delay and requires less area, and its efficiency is compared with some of previous approximate and accurate multipliers in terms of power, area and delay. The corresponding architecture based on the proposed algorithm is then synthesized by Xilinx ISE and it is observed that the proposed structure has lower area-delay complexity than the best of existing designs.

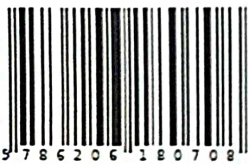


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DESIGN HIGH SPEED AND HIGH ACCURACY NOVEL MULTIPLIER



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1.1. INTRODUCTION


In the modern time, integrated circuit (chip) is widely applied in the electronic equipment. Almost every digital appliance, like computer, camera, music player or mobile phone, has one or several chips on its circuit board. Very Large Scale Integration (VLSI), in general, comprises over an excess of one million transistors, an incredible figure that could not have been imagined a decade ago. The Computer-Aided Design (CAD) has further aided the growth in the complexity and performance of integrated circuits in the VLSI technology. With such a phenomenal increase in complexity, it is more crucial than ever before to manage the design process, in order to maintain the reliability, quality, and extensibility of a given design. The process includes "definition, execution and control of design methodologies in a flexible and configurable way". Speed of development in high-performance computing, telecommunications and consumer electronics in a rapidly changing market, developmental costs, and cost involved in case of mistakes, play a critical role in a commercial environment. Hence, it requires designs that can be processed quickly, cheaply and mistakes brought to the forefront at the earliest, perhaps, before fabrication stage.

Nevertheless, a few disadvantages, such as long design and fabrication time and higher risk to project with complexity of millions of components leads to the anticipation of fast computation and layouts close to optimality generation. The research and development of circuit layout (Physical Design) automation tools could pave a way for future growth of VLSI systems. The accepted norm about the layout of integrated circuits on chips and boards is that it is a complex process. Consequently, any problem arising as a result of optimization problems requires to be solved during the circuit layout.

This refers to the fact that they are mostly Nondeterministic Polynomial (NP) - hard. The major implication of this recourse is that the optimal solutions cannot be achieved in polynomial time.

1.2. OBJECTIVE OF THE PROJECT

The aim of the project is to Design the Novel Multiplier Using Reversible Adder for High Speed Application.


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This book summarizes the India's agriculture sector is significant. It is necessary for the Indian economy's survival and expansion. India is a significant producer of many different agricultural goods. In the process of cultivating crops, soil is crucial. A non-renewable, dynamic natural resource required for life is soil. The selection of the right crop based on the needs of the soil is a common issue faced by young Indian farmers. They experience a significant decline in productivity as a result. Earlier crop cultivation used to be done by farmers with practical experience. Based on the qualities and properties of the soil, farmers are no longer able to select the ideal crop. Therefore, a recommendation system that uses a machine learning algorithm to suggest the crop that can be harvested in that specific soil has been developed. In the proposed system, we process the user-supplied image of the soil and classify it into one of four classifications of soil: Red, Alluvial, Black, and Clay. A MobileNetV2 Architecture model accomplishes this. Several crops that can be grown in that soil type are recommended when the soil type is forecasted.

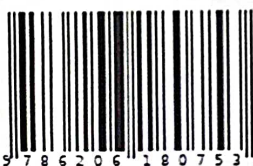


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SOIL ANALYSIS AND CROP RECOMMENDATION USING MACHINE LEARNING



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Motivation:

Agriculture is the important factor of economy in India. In recent years due to industrialization; excessive use of pesticides the strength of soil is getting affected. Many of the methods followed by agriculture are not sufficient to increase the productivity. The common difficulty present among the Indian farmers is they do not have any information regarding the right crop based on their soil requirements so it affects the productivity.

Indian farmers face a lot of challenges in making decisions about which farming technique to opt for and which crop should be selected for which climate. The common problem existing among Indian farmers that they do not choose proper crops to obtain max yield which are based on topographic features and financial aspects. In agriculture sector, achieving max crop yield at min cost is goal of production.

Introduction:

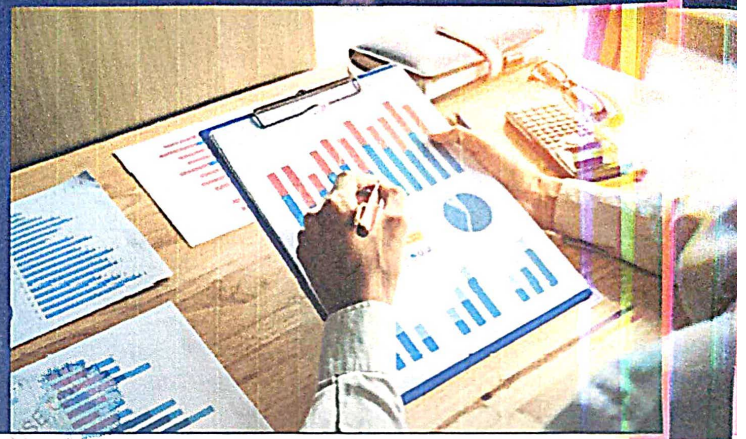
India is the land of agriculture and is among the top three global producers of many crops. The Indian farmer lies at the heart of the agricultural sector yet most Indian farmers remain at the bottom of the social strata. In addition, farmers find it difficult to decide which crop is best suitable and profitable for their soil, in spite of the few technological solutions that exist today, due to the variation in soil types across geographical regions. Small farms are prevalent in India. More than 75% of the country's total land capital is smaller than 5 acres. Because the majority of the land is irrigated, most crops are rain-fed. According to some estimates, agriculture employs around 55 percent of India's overall population. By using our project based on the parameters, we can anticipate which crop is ideal for farming. Machine learning is a useful decision-making tool for predicting crop yields, as well as for deciding what crops to plant and what to do during the crop's growth season. Several machine learning techniques have been used to aid crop yield prediction studies. Machine learning is utilised in pre harvesting to record soil, seed quality, fertiliser treatment, pruning, and genetic characteristics. India's agriculture has advanced significantly in recent years. Precision agriculture relies on location cultivation.

2



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This book summarizes the A relay network is a wide class of network configuration which is often used in wireless networks, where the source node and destination node cannot communicate directly and are interlinked with the help of some nodes. The different methods by which the relay networks are implemented in the system are known as relaying techniques. In this paper, we have presented the spectral efficiency and BER performance analysis of the MIMO-OFDM wireless system with different relaying techniques in Rayleigh fading channel. The simulated results for different modulation schemes are presented. The obtained results have shown that the hybrid relaying technique provides better spectral efficiency and bit error rate (BER) performance as compared to the other relaying techniques.



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PERFORMANCE ANALYSIS OF MIMO-OFDM SYSTEM WITH RELAYING TECHNIQUES




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INTRODUCTION

Antenna Theory

Radio antennas are a key element of any radio communications broadcast or wireless system. An antenna is required to radiate and receive the signals and therefore their performance is key to the operation of the overall radio system.

If the radio antenna performance is poor, then it will limit the performance of the overall radio communications system, or whatever wireless system is using it. As such, maximizing the performance of the antenna is very important. An understanding of basic radio antenna theory will help the maximum be gained from any aerial system.

In depth antenna theory can become quite complicated, but a qualitative and simplified theoretical explanation help in understanding what is happening, how the radio antennas work, and how they can be optimized. This can be key when setting up a radio communications system or link.

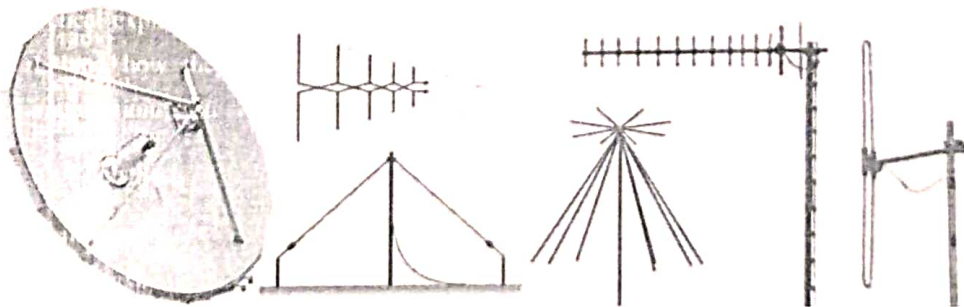
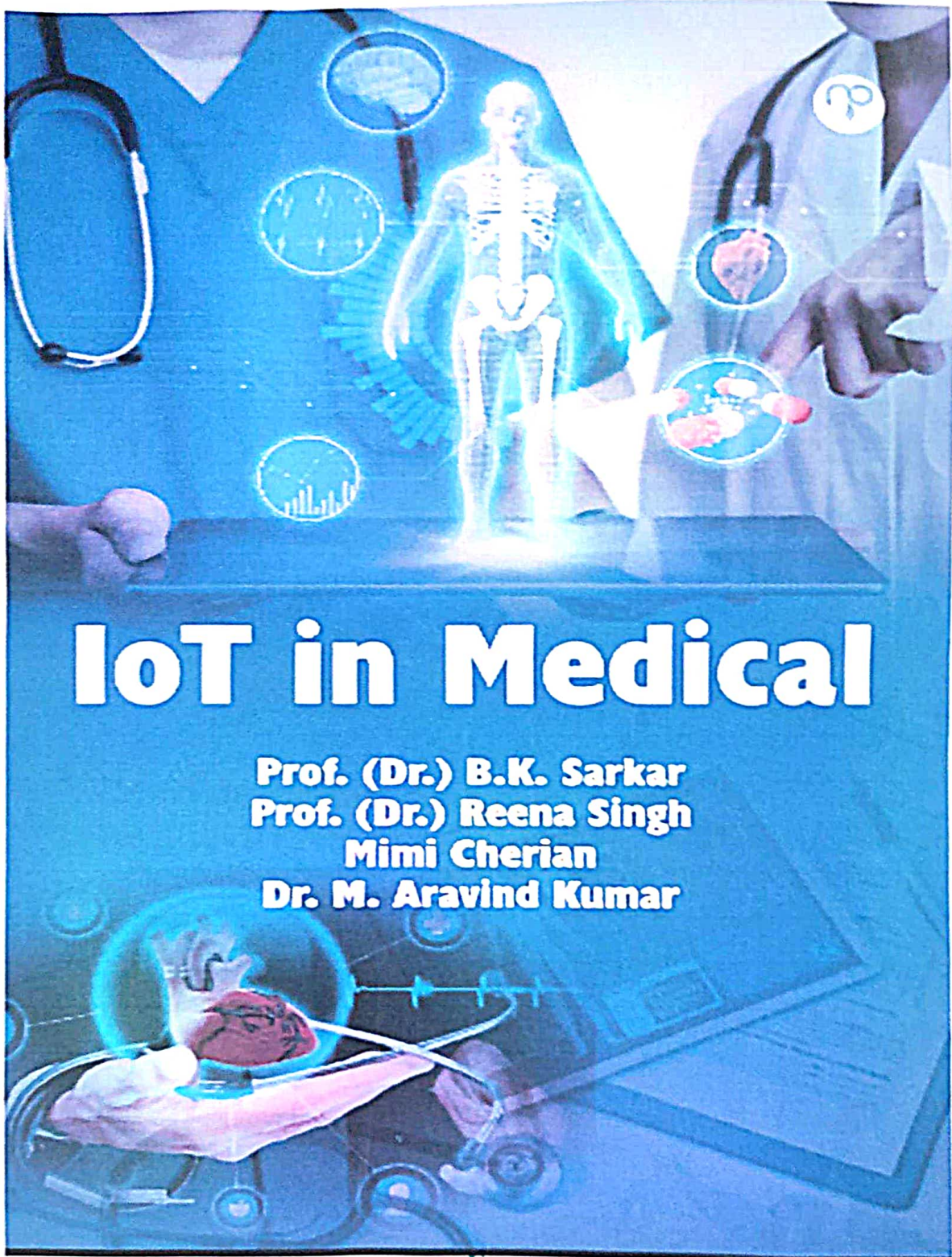


Figure 1.1 Radio Antennas



IoT in Medical

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Prof. (Dr.) Reena Singh
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