

# Multi-Quality Characteristics Optimization of NPMEDM of Nimonic 90 by Using Data Envelopment Analysis based Ranking Technique

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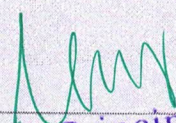
**Abstract** - In the manufacturing industry, to produce high-quality products at a reasonable cost, Optimization is a useful technique for determining the optimal production conditions. The focus of this research is to learn more about the influence of input parameters and determine the best settings for these variables to maximize MRR while decreasing SR and TWR while using Nimonic 90 NPEDM. The EDM characteristics of peak current, MWCNT powder, and nano Al powder were measured at three different levels using the L27 orthogonal array (OA). To improve the response parameters of material removal rate (MRR), surface roughness (SR), and tool wear rate, data envelopment analysis-based ranking method (DEAR) is widely used. The ideal values are achieved at MWCNT 0.5g/l, nano Al powder 2g/l, peak current 15 Amp, respectively, based on the findings of calculated Multi performance rank index (MRPI) values. MWCNT and peak current (Ip) discovered to be the most effective important parameters impacting quality attributes based on the results of the ANOVA.

**Keywords**- NPMEDM, Data envelopment analysis based ranking technique, MWCNT powder, nano Al powder and Nimonic 90.

## I. INTRODUCTION

EDM is used to manufacture product surfaces in a variety of industries, including mould production, die making, and small hole drilling. [1,2]. This technique can increase electrical conductivity regardless of the mechanical properties of the material. It hardens electrical energy to a work piece submerged in a dielectric, causing plasma to form and sparks to erupt between the work material and the tool, melting and evaporating both the electrode tool and the work piece [3]. In EDM, the positive terminal is generally

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## Research Article

# Experimental Investigation on Mechanical Properties of Carbon Nanotube-Reinforced Epoxy Composites for Automobile Application

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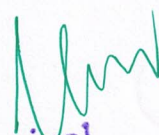
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Carbon nanotubes are established as a superior form of carbon. These have superior characteristics in terms of mechanical and chemical properties when compared to the other fibres available. High-strength fibres can be employed in a composite in a short form and mass-produced to fulfil high demands in composite applications. These composites can meet the strength requirements of nonstructural and structural components in a wide range of industries. Because of their light weight and excellent strength-to-weight ratio, these composites can be used in a wide range of applications. With Young's modulus as high as 1 TPa and tensile strength up to 63 GPa, they are among the stiffest and strongest fibres. There is currently a lot of interest in using carbon nanotubes in a matrix to take advantage of these features. There have been a variety of polymer matrices used, and nanotube/ceramic and nanotube/metal composites are gaining popularity. The study of these materials is an ongoing process, as researchers and design engineers have yet to realize their full potential. Carbon nanotubes (CNTs) are used in this study to create the composite with the resin. The percentage of CNT used as a filler material in the composite is varied from 1 to 4 percent, with the best percentage chosen for optimal mechanical properties.

## 1. Introduction

Carbon nanofibres (CNF) and carbon nanotubes (CNT) have had increasing potential in recent decades. Researchers from all around the world are attempting to apply the better qualities of these nanocomponents to a variety of applications [1]. The application range between biosensors and bat-

teries of the new age CNTs has outstanding mechanical properties due to the two-dimensional arrangement of carbon atoms in a graphene sheet [2]. Due to this, massive out-of-plane distortions will happen while the strength of carbon-carbon in-plane bonds keeps the graphene sheet extremely strong against any in-plane distortion or fracture [3]. CNTs have a high aspect ratio and excellent electrical

  
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# Parameter Study on Friction Surfacing of AISI316Ti Stainless Steel over EN8 Carbon Steel and Its Effect on Coating Dimensions and Bond Strength

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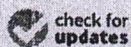
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**Abstract:** Friction surfacing is a solid-state coating process that uses plastic deformation to improve the efficiency of the core metallic pattern, resulting in fine-grained coatings with superior wear and corrosion properties. This article focuses on the development of inherently homogeneous, non-diluted coating of AISI316Ti stainless steel above EN8 and also encloses the empirical relationship for the prediction of bond strength ( $B_s$ ), coating thickness ( $C_t$ ), and coating width ( $C_w$ ). The key individualities for bonding geometry were believed to be the process parameters such as rotational speed (rpm), traverse speed (mm/s), and axial load (kN). The effect of input parameters on the bond's external dimensions and strength was investigated using a multi-objective optimization approach through experimentation. The bond's strength improved as the coating thickness was reduced and the coating width was increased. The grain-refined coatings superimposing martensitic microstructure with no deposition of carbide particles added value to the metallurgical study using the scanning electron microscope.

**Keywords:** friction surfacing; AISI316Ti stainless steel over EN8 carbon steel; response surface methodology; bond strength; depth of coating and coating width

## 1. Introduction

As a solid-state process for creating corrosion-resistant and hard-facing surfaces that increase the efficiency of primary metal patterns, friction surfacing has been essentially inevitable in recent periods. In modern days, friction surfacing has revived interest, consumed by the need for superior overcoat solutions. Increased results in friction processing have led to new concerns for researchers in the field. During the last few years, friction surfacing has received a lot of attention. In the recent past, as it relates to the reclamation of worn components, it has been shown to be effective in the rebuilding of worn-out shafts [1]. The heat produced yields a visco-elastic layer that results in a substrate-material bond. The processing of these surfaces without any dilution distinguishes this technique from other categories of surface modification processes [2]. Friction surfacing on varied substrates and

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**Congratulations!!!**

Article ID: DE21Sept0114

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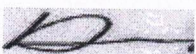
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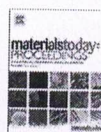


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# Cloud based Machine learning with advanced predictive Analytics using Google Colaboratory

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## ABSTRACT

With the exponential elevation in the velocity, variety and volume of the data the need of high performance applications and platforms are explored very frequently. To process the huge amount of data with the effective analysis patterns and predictions, the deep learning applications are used. Deep Learning enables to extract the feature points from the dataset automatically so that better predictions and knowledge discovery can be implemented with higher degree of accuracy and minimum error rate. Colab is an open, cloud-friendly notebook environment. It helps you and the members of your team to edit documents, and how you use Google Docs. Colab supports several common research libraries that can be loaded conveniently on your notebook. Colaboratory is a collaborative initiative developed by Google to encourage machine learning and research. The world of Jupyter's notebook doesn't need any configuration and runs in the cloud absolutely. This work is focusing on the integration of Google Colab for advanced applications of Machine Learning and Deep Learning on Cloud.

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Selection and peer-review under responsibility of the scientific committee of the Emerging Trends in Materials Science, Technology and Engineering.

## 1. Introduction

The integration of professional equipment that can handle databases more efficiently and reliably is important to work with high performance and super-computer systems related to Big Data and Deep Learning. The Graphics Processing Unit (GPU), which can execute parallel computations to provide full speed, must be integrated with the large data sets and massive features to run. There can be several main processors in the conventional central processing unit (CPU). GPU Computing involves using hundreds of GPU cores as co-processors so that engineering and science computing can be accelerated in the CPU. In 1999, Nvidia initially promoted the concept of GPU for device acceleration with the GeForce 256 as the first GPU Fig. 1 Fig. 2 Fig. 3 Fig. 4 Fig. 5 Fig. 6 Table 1.

The industry has now gained ground in NVIDIA GPU computing—and will pick up by 1,000X by 2025.

The global market size of GPU is quite high and escalating with speed. As per the report from GPU's business value as a provider was over USD 200 million in 2016 "Global Market Insights" The Compound Annual Growth Rate (CAGR) is forecasted to be above 30 percent by the year 2024, according to the study.

To conduct calculations for applications focused on big data and deep learning, the GPU must be incorporated with the system so that the speed of computations can be escalated to retrieve the results in minimum time span.

Traditionally, the installation of GPU with the system is a costly affair. In addition, the computer should be having the slot to place the GPU card. To solve the issues regarding the costly GPU systems, there are many cloud based services which provides the GPU on Cloud. Using these services, Without buying and downloading GPU on the local machine, a remote computer with GPU can be employed.

## 2. Prominent deep learning and massive data analytics cloud platforms

The following are some of the leading cloud platforms which can be used depending on usage to work with deep learning and Big Data-based implementations. Many of these providers of cloud services are built into the GPU such that scientific measurements of high accuracy can be made. The linked GPU for deep learning, machine learning and Big Data Analytics is supported on remote virtual servers for these services.

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ORIGINAL RESEARCH

# Improved localization with RSSI and DTN algorithms in wireless sensor networks

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**Abstract** We introduce a Triangulation (DTN) algorithm that uses a WSN along with GP algorithm to enhance the accuracy of different location algorithms. The GP is used for the prediction of direction of the RSSI. The experimental results show that GP can able to predict the RSSI tendency and reduces variations of RSSI signal as the mobile user is in motion. The proposed triangulation algorithm cooperates with GP gives the lowest mean-distance error in runtime. Triangulation method proves better localization algorithm compared with other methods. Anchor nodes measures the RSSI of nearest neighbour nodes, based on RSSI values DTN method approximates the nearest neighbour nodes and DT triangles are formed.

**Keywords** RSSI (received signal strength indicator) · Dynamic triangulation (DTN) · Gray prediction (GP) · Wireless sensor nodes

## 1 Introduction

Localization of the sensor node is almost unknown in the (WSN) wireless sensor network applications. Mobile users location estimation plays a vital role in wireless sensor network environment, for outdoor environments GPS are mostly used, but GPS systems are not appropriate for indoor applications due to lack of signal strength. WSN differentiate themselves

from other wired or wireless network through sensor and actuator based on communication with environments (Wang et al. 2003). The GP method uses miniature imperfect information to predict in a weak informations systems. It require less modeling informations, but can provide elevated prediction precision (Liu et al. 2004). In WSNs the location of sensor nodes is the critical element in the deployed area where especially mobile nodes, then it is very complicated to find the exact location of unknown node, and it's complicated to estimate how far unknown nodes away from the anchor nodes. Many algorithms were proposed to approximate the correct locations of sensors nodes but when the nodes are in motion, most of the algorithms failed to approximate the exact Location of Target nodes [1–5, 8, 10, 12].

We proposed triangulation method to estimate the correct Location of unidentified nodes, whose location is frequently changes with this scenario it is very difficult for the anchor nodes to estimate the exact location of targeted nodes, we addressed above problem to provide a optimal solution for Localization of WSNs to identify its neighbouring mobile nodes frequently and updates the status of mobile nodes time to time.

The proposed work we described in the following sections as: in Sect. 2 we discussed about RSSI model based on the literature survey on different wireless sensor networks nodes localization techniques, which are exploited in Sects. 2, 3 Grey prediction method, Sect. 4 describes DTN method, and in Sect. 5 Simulation Results.

## 2 Distance measurement based on RSSI model

The most widely used wireless network models are FSP model, Hata Model, LDPL model, TRGR model, Log-Normal Shadowing Model, etc. [2]. In [2, 6, 7, 9, 11] LNS

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# View article



Dr. Jonnala Sandhya

## one pot, four - component, and green synthesis of novel 2-(2-amino-7,7--dimethyl-5-oxo-phenyl-5,6,7,8,-tetrahydro 4H - chromene-3-carbonyl)-2,3-dihydrophthalazine-1,4-dione ...

Authors M. V Basaveswara rao M.V. sathyanarana, A.G.gopi J. Sandhya

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Journal Russian journal of general chemistry

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**Description** An efficient one pot, four-component and green synthesis of novel 2-(2-amino-7,7-dimethyl-5-oxo-4-phenyl-5,6,7,8-tetrahydro-4H-chromene-3-carbonyl)-2,3-dihydrophthalazine-1,4-dione derivatives has been developed by condensing dimethyl phthalate 1 with 2-cyanoacetohydrazide, benzaldehydes and 5,5-dimethylcyclohexane-1,3-dione using L-proline as a catalyst in ethanol. Pure products are obtained in high yields without column chromatography involved. The method is environmentally friendly, simple and proceeds under mild reaction conditions.

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## Enhancing The Privacy For Message Authentication Using Cryptographic Methods In Internet Of Things

**AITHA SANJANA, Dr. GULAB SINGH, Dr.CHANDRAMOULI NARSINGOJU,**

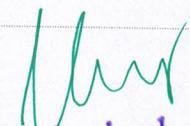
**Keywords:** Internet of Things, hop-by-hop authentication, integrity, source privacy.

### ABSTRACT

In recent years, the internet of things (IoT) has experienced an exponential and wide-ranging growth in popularity. IoT devices serve a variety of functions that are not directly related to improving people's lives. In order to make use of the huge volumes of data that are generated and captured by these devices, machine learning and big data analytics are employed. When dealing with cyber threats such as identity theft and hacking, it is critical to address security and privacy concerns such as impersonation and data pollution/poisoning. Despite this, because resources are limited and IoT devices have a high level of diversity, it is difficult to build lightweight and versatile IoT security solutions for the Internet of Things. This paper describes a solution for IoT communication authentication that is private, secure, and quick. As part of our efforts to increase efficiency and functionality, we developed a system that allows IoT devices to employ alternate cryptographic settings that may be computed both offline and online, so increasing the variety and usefulness of the system.

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# IoT Based Smart Agriculture Monitoring System

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**Abstract:** In every country agriculture is done from ages which are considered to be science and also art of cultivating plants. In day today life, technology is updating and it is also necessary to trend up agriculture too. IoT plays a key role in smart agriculture. Internets of Things (IoT) sensors are used to provide necessary information about agriculture fields. The main advantage of IoT is to monitor the agriculture by using the wireless sensor networks and collect the data from different sensors which are deployed at various no des and send by wireless protocol. By using IoT system the smart agriculture is powered by NodeMCU. It includes the humidity sensor, temperature sensor, moisture sensor and DC motor. This system starts to check the humidity and moisture level. The sensors are used to sense the level of water and if the level is below the range then the system automatically starts watering. According to the change in temperature level the sensor does its job. IoT also shows the information of humidity, moisture level by including date and time. The temperature level based on type of crops cultivated can also be adjusted.

**Keywords:** IoT, Soil, Moisture and Temperature sensors, Relay, Wi-Fi module ESP8266, ThingSpeak

## 1. Introduction

One of the largest livelihood providers in India is Agriculture. Agriculture plays an essential role in supporting human life. The rise in population is proportional to the increase in agriculture production. Basically, Agriculture production depends upon the seasonal situations which do not have enough water sources. To get beneficial results in agriculture and to overcome the problems, IoT based smart agriculture system is employed.

Global and regional scale agricultural monitoring systems aim to provide up-to-date information regarding food production. In IoT-based smart farming, a system is built for monitoring the crop field with the help of sensors like light, humidity, temperature, soil moisture, etc. The farmers can monitor the field conditions from anywhere. IoT-based smart farming is highly efficient when compared with the conventional approach. The proposed IoT based Irrigation System uses ESP8266 NodeMCU Module and DHT11 Sensor. It will not only automatically irrigate the water based on the moisture level in the soil but also send the Data to ThingSpeak Server to keep track of the land condition.

Due to the recent advances in sensors for the irrigation systems for agriculture and the evolution of WSN and IoT technologies, these can be applied in the development of automatic irrigation systems. The system will determine the parameters that are monitored in irrigation systems regarding water quantity and quality, soil characteristics, weather conditions, and fertilizer usage and provide an overview of the most utilized nodes and wireless technologies employed to implement WSN and IoT based smart irrigation systems.

## 2. Literature Survey

An IOT Based Crop-field monitoring an irrigation automation system describes how to monitor a crop field. A system is developed by using sensors and according to the decision from a server based on sensed data, the irrigation

system is automated. Through wireless transmission the sensed data is forwarded to web server database. If the irrigation is automated then the moisture and temperature fields are decreased below the potential range. The user can monitor and control the system remotely with the help of application which provides a web interface to user [1].

By smart Agriculture monitoring system and one of the oldest ways in agriculture is the manual method of checking the parameters. In this method farmers by themselves verify all the parameter and calculate the reading [2].

The system focuses on developing devices and tool to manage, display and alert the users using the advantages of a wireless sensor network system. It aims at making agriculture smart using automation and IoT technologies [3].

The cloud computing devices are used at the end of the system that can create a whole computing system from sensors to tools that observe data from agriculture field. It proposes a novel methodology for smart farming by including a smart sensing system and smart irrigator system through wireless communication technology [4]. This system is cheap at cost for installation. Here one can access and also control the agriculture system in laptop, cell phone or a computer [5].

## 3. Block diagram

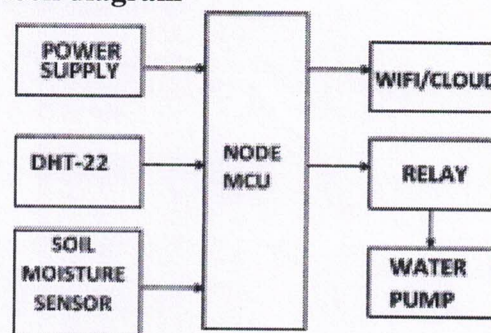


Figure 1: Block Diagram





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# Mechanical characterization of Al7050 metal matrix composite reinforced with B<sub>4</sub>C by electromagnetic stir casting method

J. Chandrashekar <sup>a</sup>, N.V.S. Raju <sup>b</sup>

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## Abstract

In the present study, an attempt has been made to synthesis Al7050/B<sub>4</sub>C Aluminium metal matrix composites using electromagnetic stir casting method under various mass percentage of reinforcement. Metal matrix composites were produced by reinforcing B<sub>4</sub>C particles with differing weight percent by 3, 6 and 9 using the stir casting process. The efficiency of the composites was contrasted with the alloy in order study the enhancement of the mechanical properties of the reinforcing particles to the composites. Increasing the weight percent of B<sub>4</sub>C particles in the aluminum matrix increases the hardness of the composites relative to the alloy due to the resilience of the reinforcement particles to plastic deformation. The tensile strength of the composites greatly increases up to 6 wt% of the reinforcement and after that th

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# DESIGN OF THREE PHASE PHOTOVOLTAIC INVERTER UNDER BALANCED GRID VOLTAGES USING PR CONTROLLER

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**ABSTRACT:** This paper proposed a technique to design a three phase photovoltaic inverter under balanced grid voltages using PR controller. PR controller is a high performance and critical device because it can be operated at same performance even at various frequency ranges (i.e.) above two phase or three phase. In order to maintain its performance and also to prevent any mishap due to its high voltage, we need a feedback system to control the voltage and current flowing. In general PR controller has inbuilt transfer function which can control the current injected in to the photovoltaic grid system. In this paper we are going to control and design three phase photovoltaic inverter using proportional resonant controller. Proportional resonant controller system uses the inbuilt positional functions for reducing noise in sine wave signal. Hence any error or noise captured by the PI controller will be controlled and it will make decision to attain balanced voltage for its precision overfrequency and current. The controller will always deals with sine waves hence we will using this PI controller to achieve infinite gain at zero frequency. Based on the output predicted by comparing the required gain and achieved gain, the controller will control the three phase inverter. Controller is the main component of the three phase inverter system which in turn take responsible to control, maintain, and prevent any nonlinear or inconsistent system.

**KEYWORDS:** Inverter, Three Phase, Controller, frequency, gain, photovoltaic.

## I. INTRODUCTION

Renewable energy resources have increased greater prevalence in power hardware field in view of their ecological benevolent nature, simple accessibility, less cost, high productivity, less contamination and so on. With the need of power, and the consumption of our current energy sources, for example, coal, charcoal, lamp oil and so on lead to utilize renewable energy sources. Various sorts of renewable energy sources are accessible. Among them the most famous are solar and wind energy. Solar energy is a decent methods since its accessible in bounty, eco-accommodating, doesn't brings on any climatic contamination and liberated from cost. In any case, it has a significant downside that is, its illumination level gets changes with variety in sun force and with the sudden shadows brought about by mists, winged creatures, trees and so forth. Wind energy can satisfy high burden need yet its essence is flighty. The discontinuous idea of these two sources makes them wasteful. Subsequently to follow most extreme force yield from these sources a greatest force point following calculation is presented. Various kinds of MPPT calculations are there, for example, annoy and watch strategy, steady conductance technique, dP/dV input control strategy, fluffy rationale, neural organization, and versatile control strategy and so on. In bother and watch technique it irritates the working point and watch the yield power.

  
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# Design Of Three Phase Photovoltaic Inverter Under Balanced Grid Voltages Using Pr Controller

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**Abstract:**

In this paper we are going to review how to design a three-phase inverter for photovoltaic array using PR (Proportional Resonant) controller system to control and stabilize the inverter system to utilize its performance at high gain at resonant frequency. Comprehensive assessment using the PR controller reveals the effective analyzes of inverter specifics from photo voltaic system by this review paper. The PR member functions are determined under balanced grid voltages for three phase inverter current of 400 to 440 voltage range. The PR controller process are included in functions using groups of under balance grid voltage. Each controlling parameter is distorted to match the grid voltage quantization of the regular power circuit. Abstract corresponding spots from the three-phase inverter and match them to the PR controller balanced grid voltage by using inbuilt functions. This review utilizes process of certain power circuits to analyze the comparative smoothness of three phase inverter outcome, and eliminates harmonic noise in resulting signals for better estimation of the PR controller and three phase inverters. This review concludes the anticipated three phase inverter for photovoltaic array using PR controller system.

**Keywords:** PR controller, Three Phase Inverter, Photovoltaic, Grid voltage.

## I. INTRODUCTION

The fundamental development of the solar half breed inverter market remembers expanded spending for solar force frameworks and valuable government plans and activities. These strategies are probably going to build up the business, as these plans and arrangements will expand the utilization of proficient solar gadgets just as half breed solar inverters. Additionally, a solar cross breed inverter is a half breed solar framework (UPS) with two inherent chargers called grid chargers and solar chargers and which gives quick force in case of a grid power blackout. The significant expense and high support of solar inverters are the principle constraints

that could hamper the development of the worldwide mixture solar inverter market. Crossover solar inverters, notwithstanding changing over direct current into exchanging current, can likewise store overabundance energy while working with batteries. These sorts of inverters tackle the issues related with the fluctuation of renewable energy and untrustworthy grid inverter structures. These inverters are additionally accessible in the 48V crossover solar inverter go. Solar battery-charged cross breed inverters and grid-associated mixture inverters are a portion of the serious inverters accessible around the world.

Crossover implies two distinct kinds of segments that play out a comparable capacity viably. The half and half



# REVIEW OF DYNAMIC RESOURCE DISTRIBUTION FOR PROFIT MAXIMIZATION IN CLOUD COMPUTING

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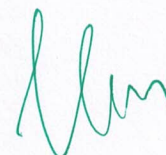
## ABSTRACT

Cloud computing, the investigation of financial matters of the cloud is basically significant. The amplification of benefit is done in this. For amplifying the benefit initially ought to comprehend the expense and income. Benefit augmentation must consider the client fulfillment likewise the expense of the cloud incorporates the leasing cost and force utilization cost. For amplifying, must lessen the expense. For this it will design the worker impeccably. For designing the worker, compute the normal holding up time and service charge is determined. Utilizing the optimizing technique, will upgrade the speed and the measure so get maximum benefit.

## INTRODUCTION

Cloud computing is initially evolved from distributed computing; it tends to be characterized as a sort of equal and distributed framework which has many interconnected PCs or workers. It is a promising innovation which pulls in specialists, academicians and computing enterprises in extraordinary degree as a result of its computing capacity to convey shared cloud questions progressively. Since the time its origination, cloud computing has been altering the way information storage and handling instruments are imagined and executed [1]. It empowered the on-request accessibility of services, for example, Software, Platform, Infrastructure (through SaaS, PaaS, IaaS separately) and in this way framed a monetary answer for fulfill the ever-fluctuating need for capacity and computational resources by developing organizations [2].

Cloud Computing Pricing Model: Cloud Computing Providers offer various online services dependent on SLA (Service Level Agreement) between the provider and the client. Anyway a significant job among providers and clients relationship has valuing model for which they should concur. Every provider has his plan for computing the cost (has services dependent on SLA (Service Level Agreement) between the provider and the client offered for customers. The provider will likely have a more noteworthy advantage, while every customer will probably have the maximum service for low cost. Along these lines, fulfilling the two players requires an ideal valuing technique. The cost charged is one of the most significant measurements that a service provider can control to energize the utilization of its services [3]. Cost is a significant factor for the organization which gives cloud services since it influences the customers legitimately and association benefit. The cost additionally has a significant effect in monetary perspective, where key ideas, for example, reasonableness and serious evaluating in a multi-provider commercial center influence the real estimating. Valuing for rivalry and reasonableness influences decisions in the structure of client applications and framework infrastructures. Actually evaluating reasonableness adjusts client cost and cloud service provider benefit. Evaluating model in Cloud Computing is more adaptable than customary models. Each cloud provider has its own valuing plan.



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## Consuming Big Data for Reporting Heavy Users in Top Video Apps

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**Abstract**— Approval of mobile devices and broadband internet has created novel trials for businesses for ISPs. More versatile skills; more volatile customer behaviour. Many businesses in the development of their marketing plans and products have adopted the strategy of utilising big data for this purpose. Using analysis, the study found Chunghwa Telecom online magazines' primary video users in Taiwan. Additional Chi-Square and ANOVA tests are used to detect statistically significant changes in heavy and non-heavy operators. Marketing plan can be developed using these profile results.

**Keywords**- User profiling; big data

### I. INTRODUCTION

Mobile devices and broadband Internet are more popular than ever, which means people are using them to do more things, which increases the amount of data being generated. From the service provider's perspective, the diversity of skills and customers behaviors has all become new competitive challenges. To meet the varied client needs, a better approach is needed.

Today, promotions have gone from promoting different product options to "target marketing" to target a specific group of customers. Customer data is required to identify the target customers. Due to the huge amount of data that is produced via the Internet, many businesses use big data to aid in their research into current and future customers. The study's goal is to find Chunghwa Telecom's potential customers by studying how customers use competing video applications. The

Results are used to develop marketing plans in the marketing department. The study's goal is Chunghwa Telecom's mobile and broadband customers. Using Chunghwa Telecom's connection logs, plus previously extracted data warehouse functions, the Big Data platform proposed by Chunghwa Telecom determined statistically significant characteristics between heavy and non-heavy users of the video application. Use these profile results to develop marketing plans to increase sales.

### II. BACKGROUND

More and more people now use the Internet as a video platform. As a result, telecommunications companies are rapidly developing the market for online video services. CHT Video is a public



# DESIGN AND DEVELOPMENT OF HADOOP DYNAMIC SLOT ALLOCATION TECHNIQUE USING MAPREDUCE IN HEALTH CARE

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**ABSTRACT:** In the present current world, healthcare likewise should be modernized. It implies that the healthcare data ought to be appropriately broke down so we can arrange it into gatherings of Gender, Disease, City, Symptoms and treatment. The enormous size of investigation will require huge calculation which should be possible with the assistance of circulated handling HADOOP. The systems use will give multipurpose gainful yields which incorporates getting the healthcare data examination into different structures. BIGDATA is utilized to anticipate pestilences, fix sickness, improve personal satisfaction and keep away from preventable passings. With the expanding populace of the world, and everybody living longer, models of treatment conveyance are quickly changing and a considerable lot of the choice behind those progressions are being driven by data. The drive presently is to comprehend however much as a patient as could be expected, as right off the bat in their life as could reasonably be expected, ideally getting cautioning indications of genuine ailment at early enough stage that treatment is far less complex and more affordable than if it had not been spotted until some other time. The proposed framework will gather the malady and their side effects data and investigate it to give combined data. After the investigation, calculation could be applied to the resultant and gathering can be made to show an away from of the examination. As the framework will show the data bunch shrewd, it is useful to get an away from about the sickness and their pace of spreading.

## I. INTRODUCTION

Big Data in healthcare is being utilized to foresee plagues, fix infection, improve personal satisfaction and evade preventable passings. With the total populace expanding and everybody living longer, models of treatment conveyance are quickly changing, and huge numbers of the choices behind those progressions are being driven by data. In customary hadoop framework, the ace allot equivalent assignment to all hub. This strategy get come up short in heterogeneous condition, where execution of every single hub consider in an unexpected way. To maintain a strategic distance from this situation we will consider advance hadoop big data system. The data blast for example creating huge measure of data. Also, it is hard to oversee, Retrieve and preparing by utilizing customary base framework. This healthcare association has made by keeping record, and administrative necessity. This potential will assist with improving personal satisfaction. Hadoop comprise of essentially two Factors,

- 1) Map Reduce
- 2) HDFS (hadoop distributed file system).

Hadoop is stage which are in circulated way and conveyed in clustering design. Furthermore, cluster ought to be homogeneous. This immense size of investigation will require enormous calculation which should be possible with assistance of appropriated handling, Hadoop. MapReduce, a mainstream registering worldview for huge scope data preparing in distributed computing. Sickness and their potential indications are bunch together and send it as contribution to framework which create aggregate data. After investigation done, on the off chance that we give side effects, at that point framework will produce name of illness. Calculation will make away from of yield in graphical configuration. Age, Gender, Disease, Region, Survival Status, Insurance are some gathering classes dependent on which investigation and gathering should be possible.

This will be accomplished with the assistance of Hadoop Framework with the assistance of which we can do an exceptionally quick examination for big data. It will be an awesome effect if the framework utilized by Govt. of India. This system comprise of two capacity to be specific map () and reduce (), each having various boundaries. Map work contain two boundaries for example key and worth. Of course this structure appoints esteem 1 to all



# SYSTEMATIC REVIEW OF DYNAMIC SLOT ALLOCATION TECHNIQUE USING MAPREDUCE IN HEALTH CARE

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## Abstract

### Abstract

Healthcare science has been reliably pushed forward by the appearance of big-data innovation. Healthcare logical applications ordinarily include streaming info data produced by an enormous number of appropriated sensors. Such data are additionally sent to the condition of-art big-data structures and stages to measure. For instance, the Body Area Network that is generally perceived as a medium to access, monitor, and assess the continuous health status of an individual, has for quite some time been infamous for its registering seriousness to handle Gigabytes of data progressively. Such data are gathered from very much arranged sensors to test the ongoing signs of internal heat level, blood pressure, respiratory and pulse, chest sound, and cardiovascular status, to give some examples among others.

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## Introduction

The present world is going into the wild west of Data Management huge amount of unstructured data is called Big Data. Enormous measure of data are simply produced over the most recent two years. All the data on the planet was generally created over the most recent two years, and this quickened pattern will proceed. This new data is originating from the advanced cells, informal organizations, exchanging stages, machines and from various source since the majority of this data is now entered and just used to settle on some choice among the data those data's are just utilized for that. Apache Software Founders Lab developed the Hadoop outline work in that Map Reduce

Programming models was use, it's a static map lessen. Big data is a rising processing and produces from enormous arrangement of datasets yet can't be examined with conventional registering method earth is developing expontially for some explanation first beginning retailer database, Logistics, conclude and health dataset there segment likewise catching more data and public web-based media as vision acknowledgment improves it furthermore beginning to become conceivable the total to extricate significant data from still pictures and recordings a little savvy objects go online big data is additionally being created a few territory in logical progression



## STRUCTURAL STUDY ON COMMERCIAL BUILDING DESIGNING AND IMPLEMENTATION USING E-TABS

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### ABSTRACT

Structural analysis is a discipline of engineering that focuses on figuring out how structures behave in order to forecast how various structural components will react to loads. Every structure will be susceptible to one or more of the groups of loads, which typically include dead load, live load, wind load (under IS875-1987), and earthquake load (IS1893-2016). Software called ETABS (Extended Three Dimensional Analysis of Building System) integrates all of the main analysis engines, including static, dynamic, linear, and non-linear. This computer software is used to evaluate and design buildings as well as to calculate forces, bending moments, stress, strain, and deformation or deflection for a complicated structural system. Our project "Structural study on commercial Building Designing and Implementation Using E-tabs" is an attempt to analyze and design a commercial building using ETABS. A G+5storey building is considered for this study. The Analysis is carried out by static method and design is done as per IS 456:2000 guidelines. Also, an attempt has been made to design the structural elements manually. Drawing is done using AUTOCAD. The primary objective of this project is to gain sufficient knowledge in planning, analysis and design of the building. Our project deals with the Analysis and design of a commercial building by TABS(2016). It is a reinforced concrete framed structure consisting of G+5. IS 456:2000 codes are the basic code for general construction in concrete structures, hence all the structural members are designed using limit state method in accordance with the IS 456:2000 code and design aids. The commercial building has proper ventilation; it is provided with sufficient Exits are also provided.

### INTRODUCTION

In civil engineering, a structure with several parts, such as a foundation, walls, columns, floors, roofs, doors, windows, ventilators, stair lifts, various types of surface coatings, etc., is referred to as a "building." A structure is created using structural analysis and design such that it can withstand all applied loads without failing for the duration of its planned life. RISA, STAADPRO, ETABS, STRUD, MIDAS, SAP, and RAM, among others, are some of the software programmers that are now on the market for evaluating and designing almost all sorts of structures. In general, the primary goal of our project is to become familiar with the many design elements, such as planning, analysis, and design. We have planned to design a Hostel Building structure consisting of G+5 Floors.

- 1) The elements of the building should be strong and capable to withstand the likely adversely effects of natural agency
- 2) Strength, stability, convenience, and comfort of the occupants should be the first consideration in planning.
- 3) Elevation should be simple but attractive. The number of doors and windows provided should be less for a commercial building.



# IDENTIFICATION AND CLASSIFICATION OF DIABETIC RETINOPATHY USING NEURAL NETWORK APPROACHES

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## ABSTRACT

Long-term diabetes can induce DR, an eye abnormality. As the disease worsens, it causes mutilation and blurred eyesight. It is a difficult and time-consuming task to analyze DR using a shaded funds picture since it takes skilled doctors to determine the existence of fundamental highlights. We suggest using CNN to analyze DR from computerized funds images. In our study, we adopted a different technique where the entire image was divided into portions, and only the areas of interest were taken for additional processing. The suggested framework clarifies DR and helps the client get in touch with a specific expert. This enables the client to determine their inquiry and receives an appropriate membership related to medical issues.

**Keywords**— CNN, Retinal Image, Matrix, Diabetic Retinopathy (DR);

## I. INTRODUCTION

Today, DR is identified with a dilated eye exam, in which doctors administer eye drops in the patient's eyes. After that, an image of the eye is taken using a range of medical tools. Since this procedure is manual, some diagnostic mistakes will always occur. Diabetes-related retinal damage (DR), often known as diabetic eye illness occurs when the retina is harmed. In the end, it can result in visual impairment. It is the outward manifestation of diabetes, a fundamental illness that affects up to 80% of all people who have had the disease for at least a decade. Despite these alarming revelations, research indicates that if proper and cautious treatment were provided, the number of these new cases might be reduced by about 90%. The more extended an individual has diabetes, the higher their possibilities creating DR.

DR is a consequence of diabetes that damages the eyes. DR is caused by damage to the blood vessels in the light-sensitive tissue of the retina. Diabetic retinopathy is one of the leading causes of blindness in working-age people. Diabetes mellitus affects around 420 million people globally. In the last 20 years, the prevalence of this condition has risen, particularly in Asia. DR, a chronic eye condition that can cause vision loss, is predicted to be identified in roughly one-third of the population. The importance of DR stage classification depending on the extremities for proper treatment and prevention of vision loss cannot be overstated.

DR can be categorized into five stages, according to the Study of Early Treatment Diabetic Retinopathy. [8]. The review for programmed recognition of DR turns out to be an ever increasing number of essential in the beyond couple of years. In our review we are zeroing in on irregularities in the retina as exudates and red injuries. Because of the comparative shading attributes of red sores with the retinal veins it is difficult to find these injuries utilizing typical picture handling procedures. DR is an infection of the retina in persons who have diabetes. It is started as a result of long-term retinal vascular damage induced by diabetes mellitus [13]. One of the most common causes of blindness is this disease [2]. As a result, detecting it at an early stage is crucial.



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# AUTOMATION OF LIVE VIDEO SURVEILLANCE WIRELESS ROBOT FOR HUMAN MONITORING

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## ABSTRACT

The software design for a four-wheeled surveillance robot employing an Arduino Uno microcontroller and an Android-powered smart phone is proposed in this work. The camera for this security robot is positioned over the robot and captures and feeds video to a mobile device. Using a camera and a microprocessor, a user can direct the movement of a robot. The user may monitor and keep track of things thanks to the live stream from the robot's camera. This layout could be especially useful for routinely monitoring private or academic organisations. As a result, this study suggests an automated monitoring system, which reduces the requirement for direct human monitoring.

**Keywords :** video surveillance, Arduino IDE software, NRF module, L298 motor drive, joystick shield

## 1. INTRODUCTION

Human surveillance is accomplished by stationing workers close to vulnerable regions to continuously check for changes. However, humans have limitations, making deployment in inhospitable locations not always feasible. Additional hazards include losing soldiers in the case of being discovered by the adversary. Robots can, however, be used in place of people to remotely monitor important regions. Research into various embedded based system solutions has been inspired by the need to incorporate new and advanced technology. Using an embedded platform and an ATmega328P microprocessor, the surveillance robot was created. It continuously monitors and secures a position among the threats that can be posed by surveillance robots with excellent accuracy. AV camera is used which continuously monitors the robot surroundings and sends the video information to the control station. In various areas there is a need of constant surveillance. The current surveillance system includes monitoring by using CCTV cameras and other monitoring system. Mostly these systems are stationary and they can cover a limited area. These systems are mostly control manually or through a computer. They cannot be used to cover a larger area as well as they cannot be controlled using any mobile device.

In this paper, we developed a sustainable surveillance robot that is cost effective using an Arduino microcontroller Together with a motor shield and an Android smart phone that runs the Operating System. The robot consists of a video camera and WiFi robot link. Smart phones come with superb hardware that satisfies the above needs. This can be leveraged upon through the use of APIs (Application Programming Interfaces) that is provided for the operating system. However, the building cost for the robot with a smartphone is greatly reduced. The robot can be remotely controlled using the wifi module and a microcontroller, smart phone interface embedded on the robot. The camera on the robot is used to capture and record real time video from the robot. The robot can be controlled based on visual feedback from the same smart phone. The four wheeled dc motors help to navigate the robot and ultrasonic sensor to avoid obstacles. The camera is attached to the wifi robot link which enables it to capture the environment or any object of concern. Experimental results with varied positions of obstacle show the flexibility of the robot to avoid it and have shown a decent performance and it is getting a communication range of nearly 50m, which is good enough for many surveillance applications. Surveillance is the process of monitoring a situation, an area or a person. This generally occurs in a military scenario where surveillance of borderlines and enemy territory is essential to a country's safety. However, building a small robot for testing and research purposes proves to be



## DNN AND DL ALGORITHM CONVERSION OF HUMAN VOICE DATA TO ENGLISH TEXT

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### ABSTRACT

Speech is the most acceptable form of communication amongst human races. Human-computer interface refers to the interaction between humans and computers. Speech recognition translates spoken words and phrases into a machine-readable format after recognizing them. Speech recognition is a technological advancement that identifies words and expressions on its own that most closely match the value of human speech. This development enables the development of a broad range of applications in which the output of speech recognition can either be the final product (such as letters) or a contribution to further preparation (e.g., providing orders to gadgets dependent on the identified words, semantic examination of discourse in a programmed exchange framework). The most natural use of Speech Recognition is converting our Speech to Text for various Purposes and also for using it as a tool to control our Computers

**Keyword:** Speech, Text, DNN, DL.

### 1. INTRODUCTION

Inside the path of recent years, cellular phones have emerged as an irreplaceable wellspring of correspondence for the cutting aspect society. We are able to come to a decision choices and instant messages from a supply to an objective without any trouble. Its miles realized that verbal correspondence is the most suitable modern of passing on and imagining the proper facts, avoiding misquotations. Speech reputation which is likewise known as automatic speech recognition (ASR) and voice recognition acknowledges the spoken phrases and phrases and converts them to gadget-readable layout via converting spoken audio into text, speech recognition technology permit customers to control virtual gadgets by way of talking in place of the use of conventional gear consisting of keystrokes, buttons, keyboards and many others. Controlling things using voice command has constantly been an obsession for humans. In recent times we see several voice operated appliances all around us. Those devices are capable of doing many things like controlling appliances. But, all of these structures are pre-configured and it's miles quite hard to do any modifications in them. Also, those services are on a dedicated tool or else a telephone. Those styles of device are not available on laptop computer systems and laptops. Here, our idea is to increase a python based totally open source speech to text engine that have a high degree of customizability and may be deployed without problems of several working systems. The gadget will allow person to carry out more than one obligations primarily based on voice controlling best.

### 2. RELATED WORK

Presently, existing are simplest available on devoted platforms and smartphones. Such offerings haven't been implemented on computer systems well. A person should do the whole thing using traditional method via Keyboard and Mouse. Proposed gadget is an open source very interactive voice-primarily based device with user pleasant response developed with the usage of Python Programming language. The machine will allow consumer to do more than one duties like open an software, typing and several other matters entirely based on voice instructions. The developed gadget can run easily on numerous working systems like windows, MacOS, Linux



# A SOLAR-BASED ENERGY GRID'S REACTIVE POWER RECOMPENSE USING REAL POWER AS A FUNCTION OF POWER FACTOR

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## ABSTRACT

One of the renewable energy sources that is most frequently used today is solar energy. As they only work at Unity Electricity Factor (UPF), solar inverters only inject active power into the grid or feed the load, depending on the needs of the load. By resulting in inadequate voltage regulation, the load's entire reactive power requirement is satisfied. Numerous techniques exist to balance out reactive power at the load side and control the flow of reactive power from the grid to the load, including the use of synchronous condensers, mechanically switched capacitors, and FACTS devices like STATCON, SSSC, and SVC, among others, which can limit the amount of reactive power drawn from the grid by the load and improve grid performance. But to get around some issues in these devices such as installation, maintenance, space requirements, overall life span, the cost of the equipment to be installed etc., a methodology is presented in this project the grid itself as the solar inverter do not contribute to reactive power requirement of the load. Due to this scenario at the grid side, the performance of the grid worsens because of poor power factor as a result of this the voltage profile of the grid will not be maintained properly, to control the reactive power flow from the grid side to load side by using a solar inverter which can provide reactive power along with the active power also. In this project, the solar inverter is programmed in simulation to provide reactive power injection in addition to active power generation. The methodologies for compensating the reactive power are developed using Matlab/ Simulink software and the results are presented.


**KEY WORDS:** Reactive power compensation, Solar Inverter, FACTS devices.

## 1. INTRODUCTION

The reactive power oscillates between the source and the load and is an oscillating power. When the voltage and current are out of phase, a network has reactive power. In the year 1930, a physicist by the name of Constant in Budeanu coined the term "VAR." Since reactive power causes a phase difference between voltage and current, the term power factor has also evolved as a result. Reactive power requirements decrease with decreasing power factor angles, and vice versa.

Power engineers started employing electronic devices for compensation after the development of power electronics, which have advantages over mechanical ones in terms of operating speed, minimal power loss, low maintenance costs, etc. Formerly, the reactive power compensation is of two types - series compensation and shunt compensation. In series compensation the capacitors are placed in series with the transmission line which improved the power transfer capability up to two times the original rating by decreasing the equivalent impedance of the line. The shunt compensation mainly focusses on the voltage profile of the line in which a capacitor is placed in shunt with the line improves the voltage regulation of the line. At the beginning, the thyristor family has been used for VAR compensation which is otherwise called as FACTS devices such as SSSC, SVC, SVS, STATCOM etc. These are having more advantages than the mechanically switched devices but the major disadvantages include the installation cost and allocation of the device.

To overcome the disadvantages of using FACTS devices, solar inverters are used as one of the solutions for compensating the reactive power as the inverter is also made of power electronic devices. Moreover, the solar inverter can be effectively used if reactive power provision is provided at lower solar insolation levels, thereby improving the utilization factor of the inverter also.

  
Principal



# Android App Malign Detection Using Machine Learning

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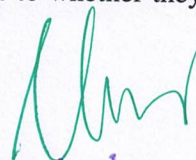
## ABSTRACT

The rapid growth of mobile devices has been increased in today world and made it remarkable for advance technologies, various operating systems have been developed from those, android is most popular and because of numerous applications it provides but cannot provide privacy and data integrity due to malicious Android application downloaded from third party markets. Mobile malware is the highest threat and our goal is to detect the malicious android application using genetic algorithm with the combination of support vector machine to build the training classifier which integrates android app permissions ahead itself to the developers and end –users. This will assist the developers in the safe use of APIS when developing applications. APIs are extracted from the packed app file we trained a classifier to identify whether an app is potentially malicious or not. Malware detection in android can be performed in two ways behavior-based detection and signature-based methods. The signature-based detection method is simple and detect already known malware. The behavior-based method uses the techniques from machine learning and data science such as decision trees and deep learning and three types of analysis techniques are identified as static, dynamic and hybrid analysis methods .static analysis used to perform by analyzing the byte code into source code. Dynamic analysis is used for detecting malware by analyzing the application. We compared static, dynamic and hybrid analysing the basis of data set feature extraction techniques, feature selection techniques, detection methods we identify the malicious android applications which assist the application developers.

**Keywords:** Bag of visual words, static analysis, dynamic analysis and hybrid analysis, malicious, support vector machine(SVM).

## 1. Introduction

In this technological era, usage of mobile applications rapidly increasing and android is one of the most popular operating system available due to convenience and efficiency in various applications. Android has become the most popular one because of the numerous mobile apps it provides. Unfortunately, smartphones running Android have been increasingly targeted by attackers and infected with malicious apps: according to the mobile threat report released by F-Secure over 95% of malicious apps were distributed on the Android platform. Google play is the official app store for android-based devices where many number are been published on it was in millions. Of these, the applications are classified into different category as regular apps, low-quality apps, high quality-apps which in turn consists of malicious applications which makes the targets for cyber criminals. And ML is the most prominent techniques used for detection of malicious android applications which helps in protection. And the data security is not maintained properly which lead to users steal data during the app installation. Android is built on top of linux Kernel. The Android architecture and its built-in security as well as they are threats and security issues for android applications. In addition, third-party markets, which are the primary providers of Android apps, contain a lot of cracked or modified apps with no indication as to whether they have been inspected for security threats or not.



Principal



## AN ANALYTICAL STUDY ON POWER FACTOR RECTIFICATION BY USING CUK CONVERTER-FED BLDC MOTOR

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### ABSTRACT

Because of its attributes of great efficiency, a broad speed range, and cheap maintenance, brushless dc motors (BLDC) are increasingly being used in low-power appliances. As a practical option for low power applications, this study discusses a power factor correction (PFC) based Cuk converter fed brushless DC motor or (BLDC) drive. By altering the DC bus voltage of the voltage source inverter (VSI), which uses low frequency switching of VSI (electronic commutation of BLDC motor) for reduced switching losses, the speed of the BLDC motor can be regulated. By electronically commutating the BLDC motor, fundamental frequency switching has been used to lower the switching losses in the VSI. Two BLDC motor drive control methods have been implemented, one of the control strategies is based on PFC-CUK converter fed BLDCM drive and another one is Hysteresis current controller converter fed BLDC motor drive. Comparison has been made between the two control strategies is PI and HCC in terms of minimize Torque ripple, Power factor for different operating speeds. The proposed work has been implemented under MATLAB/Simulink environment.

**Keywords:** BLDC motor, BLDCM drive, PFC-CUK converters, fed brushless DC motor, power factor correlation

### I. INTRODUCTION

A three-phase AC motor with electronic commutation and feedback on the rotor position is a BLDC motor. Typically, a three phase inverter with six switches is used to implement a BLDC motor. The data pertaining to rotor position is provided by the Hall Effect sensors. Due to the widespread use of BLDC motors and their inherent benefits, such as high efficiency, high flux density, and optimal cost, there are fewer switches and sensors [1]. For BLDC drive systems, a new architecture known as Six Switches, Three Phase Inverter (SSTPI) is being studied [2, 3]. This architecture lowers the need for power electronic switches, which lowers total costs and losses [4, 5]. PWM with uneven voltage makes it difficult to minimize conducting currents. The existing PWM schemes cannot be used for SSTPI.

Therefore, a new converter topology for three phase BLDC motor drive is to be developed. The Back EMF wave form of BLDC motor is trapezoidal in shape. And the stator current wave form is rectangular in shape. Hysteresis current control is employed to maintain the actual motor currents close to rectangular reference values [6, 7]. All through steady state analysis SSTPI fed BLDC motor is studied, the modeling, simulation and practical realization is to be explored. PI control is method of speed control of BLDC motor which reduces the steady state error to zero [8], PI controller does not respond to quick variation of speed and reaches the set point slowly. The PI controller can be easily implemented because simplicity and most common usage since long time [9]. In this paper, two control strategies for BLDC motor drive have been implemented. One of the control strategies is based on PFC-CUK converter fed BLDCM drive and another one is Hysteresis current controller converter fed BLDC motor drive and comparison is made between this two control strategies for different operating speeds. The performance of the BLDC motor with CUK converter for four switch VSI fed BLDCM motor is found to be quite effective due to improve power quality, less torque ripple and smooth control of speed of BLDC motor [10-11].



## WEB APPLICATION RECOGNITION AND ERADICATING VULNERABILITIES IN DATA MINING WITH STATISTICAL ANALYSIS

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### ABSTRACT

Although there has been significant research on online application security for more than ten years, the issue of web application security is still difficult to solve. Vulnerable source code, frequently written in dangerous languages like PHP, is a significant contributor to this issue. Code of origin Static analysis tools can help uncover vulnerabilities, but they frequently produce false positives and demand a lot of human work from programmers to patch the code. We investigate the usage of many techniques to find source code flaws with fewer false positives. In order to anticipate the existence of false positives, we integrate data mining with taint analysis, which identifies prospective vulnerabilities. This approach brings together two approaches that are apparently orthogonal: humans coding the knowledge about vulnerabilities (for taint analysis), joined with the seemingly orthogonal approach of automatically obtaining that knowledge (with machine learning, for data mining). Given this enhanced form of detection, we propose doing automatic code correction by inserting fixes in the source code. Our approach was implemented in the WAP tool, and an experimental evaluation was performed with a large set of PHP applications. Our tool found 388 vulnerabilities in 1.4 million lines of code. Its accuracy and precision were approximately 5% better than PhpMinerII's and 45% better than Pixy's.

**Key words:** CNN, RCNN, SSD, dataset, weapon detection.

### INTRODUCTION

Agriculture is India's main source of welfare. Rainfall is necessary for agriculture to succeed. Additionally, it benefits water resources. The country's economy grows as a result of farmers being able to better manage their crops thanks to historical rainfall data. Precipitation forecasting is useful for avoiding flooding, which protects lives and property. Forecasting rainfall is difficult for meteorological experts because of variations in the timing and volume of precipitation. To develop a predictive model for precise rainfall, forecasting is one of the most difficult tasks for academics from a number of domains, including meteorological data mining, environmental machine learning, functional hydrology, and numerical forecasting. In these problems, a common question is how to infer the past predictions and make use of future predictions. A variety of sub-processes are typically composed of the substantial process in rainfall. It is at times not promise to predict the precipitation correctly by on its global system. Climate forecasting stands out for all countries around the globe in all the benefits and services provided by the meteorological department. The job is very complicated because it needs specific numbers and all signals are intimated without any assurance. Accurate precipitation forecasting has been an important issue in hydrological science as early notice of stern weather can help avoid natural disaster injuries and damage if prompt and accurate forecasts are made. The theory of the modular model and the integration of different models has recently gained more interest in rainfall forecasting to address this challenge. A huge range of rainfall prediction methodologies is available in India. In India, there are two primary methods of forecasting rainfall. Regression, Artificial Neural Network (ANN), Decision Tree algorithm, Fuzzy logic and team process of data handling are the majority frequently used computational methods used for weather forecasting. The basic goal is to follow information rules and relationships while gaining intangible and potentially expensive knowledge. Artificial NN is a promising part of this wide field. Rainfall prediction remains a serious concern and has attracted the attention of governments, industries, risk management entities, as well as the scientific



# A RELIABLE RECHARGEABLE BATTERY FOR A WSN-BASED SOLAR ENERGY HARVESTING SYSTEM

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## ABSTRACT

The foundational elements of today's internet of things (IOT) infrastructure in smart buildings, smart parking lots, and smart cities are wireless sensor networks (WSNs). The WSN nodes are severely constrained by their low battery energy, which can only function for a few days depending on the duty cycle of operation. We suggest a fresh approach to this design quandary in this research by utilizing ambient solar photovoltaic energy. Here, we aim to develop a special and highly effective solar energy harvesting system for WSN nodes powered by rechargeable batteries. The optimized SEH-WSN nodes should run continuously in the background for an unbounded network lifespan (in years). In this study, we present a brand-new, very effective solar battery charging technology with maximum power point tracking (MPPT) for WSN nodes. The research focus is on to increase the overall harvesting system efficiency, which depends upon solar panel efficiency, MPPT control DC-DC converter efficiency and rechargeable battery efficiency. Several models for solar energy harvester system have been developed and iterative simulation

**Keywords**— Smart cities, solar energy harvesting, DC-DC converter, MPPT, battery charging, wireless sensor nodes

## 1.INTRODUCTION

The most significant technological design challenge of the twenty-first century, caused by the acceleration of global warming and other environmental problems, is the development of renewable energy harvesting systems. ZigBee Green Power (GP), a new standard for energy-harvesting wireless sensor networks (EHWSNs), was just introduced by the ZigBee Alliance in the United States in August 2016[1]. The ZigBee Green Power (GP) standard for EHWSNs and the IEEE 802.15.4 communication standard protocol modifications for low data rate wireless networks make it easier for applications running on low power wireless microcontroller platforms to leverage the Green Power feature [2]. Today, businesses like Texas Instruments and ST Microelectronics and Linear Technology, USA, are offering wireless sensor network power management solutions based on renewable energy harvesting. The design of an efficient solar energy harvesting systems is necessary for the proper planning of solar energy harvesting wireless sensor networks (SEH-WSN). The harvester system extracts the solar Fig.1. Block diagram of Solar Energy Harvesting System using MPPT Control energy into the electrical form by using the Photovoltaic (PV) cells. Then, this electrical energy is used to charge the wireless sensor node battery. It reduces the human efforts to replace the battery of hundreds or thousands of sensor nodes by going out in the remote areas. Therefore, the design problem of limited energy availability of wireless sensor nodes is resolved and the human efforts to replace the battery periodically have been reduced. In the year 2008, Ref. [3] proposed Modelling and Optimization of a Solar Energy Harvester System for self-Powered Wireless Sensor Networks. In 2009, Ref. [4] proposed Design of a Solar-Harvesting Circuit for Battery less Embedded Systems. In this paper, the simulation results show that by using efficient solar energy harvester circuits the sensor network lifetime can be increased from few days to 20- 30 years and higher. Section 1 provides an overview of a basic Solar Energy Harvesting System. Section 2 presents the operation of SEH-WSN Node. Section 3 provides two types of solar energy harvester system most commonly used in practice i.e pulse width modulation (PWM)



## A DIGITAL SMART VOTING SYSTEM USING FINGERPRINT AUTHENTICATION AND FACIAL DETECTION ON CNN AND IMAGE PROCESSING

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### ABSTRACT

India is a democratic nation, yet it continues to use expensive, labor-intensive voting machines to conduct its elections. Voters can cast their ballots using the web-based method from anywhere in the world. For use in the online election, the Indian government created a restricted IP address. For the purpose of registering names and addresses, people should visit the website. The election commission will take fingerprints and a photo of each voter. The images will be kept on a server or in a database. Election Day voting is secure because to a database comparison performed when the pictures are obtained on that day. Similar to how mobile phones operate, faces and fingerprints are utilized to access the voting process. The existing system necessitates voter physical presence, which many voters find inconvenient. In addition, the procedure takes less time. The number of bogus voters can be minimized by detecting facial and fingerprint images. To make the system safer, the space between the eyes and the eyebrows remains consistent with age.

**Keywords:** Online website voting, face capture, Haar cascade face recognition, fingerprint, image pre-processing, Convolutional Neural Networks (CNN).

### INTRODUCTION

Elections are the cornerstone of any democracy, and when people elect their own government, democracy is truly alive. However, there are weaknesses and gaps in the way our country now conducts elections that candidates and political parties are taking advantage of. The current system has many faults, including the possibility of voting twice, manipulating Electronic Voting Machines (EVMs), and falsifying the results, all of which undermine democracy in its truest form. Elections are typically conducted using electronic machines, which is labor- and energy-intensive, and should be done at a designated area. The machine is expensive and takes more labor to move and maintain. The approach proposed here is a solution that covers all of the issues raised. People who do not live in the same area, the elderly, or those who cannot wait in huge lines for long periods of time will benefit from the Smart voting system, which uses facial and fingerprint identification. The voter can vote from anywhere, and the possibility of duplicate votes is reduced as a result. Using haar Cascade Algorithm, this online voting system employs image processing to detect voter faces[1].

To extract the lips, face, and eyes from a whole face and compare them to a database image of a face. The image of a fingerprint is matched using CNN Deep Learning. CNN reduce the computational time for processing the large size images[2]. The Artificial Neural Networks (ANN) training takes a long period. Future detection and picture classification are two steps of CNN. The features of face and fingerprint images are measured and compared to the database. When it's the same, the voter will be permitted to vote. In an election, voters can vote for any candidate. After that, the additional leader slots will be disabled. The votes are recorded on a server, and the counting is completed at the conclusion of the election. Client and server commission are critical to the system's success[3].

The Internet Protocol (IP) address is obtained from the election website of the government. After the crucial information is provided to the system to separate the eligible voters from the false ones, counting is very simple



## A POWERFUL, MANUALLY OPERATED, POWERLESS VACUUM CLEANER DESIGN FOR CLEANING VAST FLOORS

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### ABSTRACT

Cleaning the floors in colleges, hospitals, auditoriums, shopping centres, and workshops is the goal of this endeavour. This project's goal is to create and implement a cleaning procedure for floors with wet and dry surfaces. It is excellent for cleaning both dry and wet floors. The importance of interior design is growing in the modern world, but maintaining clean floors is still crucial for our health, and this floor cleaning equipment makes cleaning easier. As a result, this initiative is quite helpful in our daily lives. Anyone may use this machine easily because it is very simple to run and build. A damp cotton mop, swiping brushes, wipers, and vacuum cleaners are included in this floor cleaning apparatus for reducing the cleaning time. The overall cost of this machine is also cheap. Such type of machines is widely used for this purpose but they are working under different principles and the cost is very high. In recent years, floor cleaning machines are getting more popular for cleaning large floor area in minimum time. However in India, which is a developing country requires large type of such machines to satisfy the cleaning needs.

**KEY WORDS:** Floor Cleaning Machine, Vacuum Cleaner, Wiper

### 1: INTRODUCTION

Cleaning is a generational necessity. In general, there are more users in colleges, businesses, and hospitals, thus regular floor cleaning is necessary. The various surface types are cleaned using various methods. The reasons for cleaning floors are.

- 1) Accidental injuries could happen as a result of slipping on the floors.
- 2) To adorn the floor.
3. It is necessary to eliminate debris and impediments.
- 4) Dusts and allergens must be eliminated.
- 5) It is best to prevent surface wear.
- 6) To sanitise the environment (kitchens).
- 7) Maintaining the best possible traction is necessary to prevent slippage.

The front two brushes scrape any dust or wetness that may be on the floor. The vacuum cleaner collects this water and dust and the detergent water is sprayed on the floor the mope present in the middle section of the chassis perform rotary motion on the floor which cleans the dirt or dust. The remaining water on the floor is wipe by the wiper present in end of the cleaning machine.



# ANALYSIS ON IOT-ENABLED CYBER-PHYSICAL SYSTEMS RECOGNITION AND PROVENANCE OF CYBER-ATTACKS

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## Abstract

Cyber physical systems (CPS) that are Internet of Things (IoT) enabled can be difficult to secure since security measures designed for general information / operational technology (IT / OT) systems may not work as well in a CPS environment. Consequently, this research provides a two-level ensemble attack detection and attribution framework created for CPS, and more particularly in an industrial control system (ICS). For identifying assaults in unbalanced ICS environments, a decision tree integrated with an unique ensemble deep representation learning model is created at the first level. An ensemble deep neural network is created for assault attribution at the second level. Using real-world datasets from the gas pipeline and water treatment system, the suggested model is assessed. Findings show that the suggested model performs better than other competing methods with a similar level of computational complexity.

**Keywords:** Cyber-attacks, Deep representation learning, Cyber threat detection, Cyberthreat attribution

## INTRODUCTION

Cyber-physical systems (CPS) are becoming more and more integrated with Internet of Things (IoT) technology, including key infrastructure sectors like dams and utilities plants. IoT devices, also known as Industrial IoT or IIoT in these contexts, are frequently a component of an Industrial Control System (ICS), which is responsible for the safe operation of the infrastructure. ICS can be widely defined to include systems that use Mod bus protocols and programmable logic controllers (PLCs), distributed control systems (DCS), and supervisory control and data acquisition (SCADA) systems. However, by connecting ICS or IIoT-based systems to public networks, they expand their attack surfaces and vulnerability to cyber attacks. The Stuxnet campaign, which allegedly targeted Iranian centrifuges for nuclear enrichment in 2010, causing severe damage to the equipment [1], [2]. Another example is that of the incident targeting a pump that resulted in the failure of an Illinois water plant in 2011 [3]. BlackEnergy3 was another campaign that targeted Ukraine power grids in 2015, resulting in power outage that affected approximately 230,000 people [4]. In April 2018, there were also reports of successful cyber-attacks affecting three U.S. gas pipeline firms, and resulted in the shutdown of electronic customer communication systems for several days [1]. Although security solutions developed for information technology (IT) and operational technology (OT) systems are relatively mature, they may not be directly applicable to ICSs. For example, this could be the case due to the tight integration between the controlled physical environment and the cyber systems. Therefore, system-level security methods are necessary to analyze physical behavior and maintain system operation availability [1]. ICS security goals are prioritized in the order of availability, integrity, and confidentiality, unlike most IT/OT systems (generally prioritized in the order of confidentiality, integrity, and availability) [5]. Due to close coupling between variables of the feedback control loop and physical processes, (successful) cyber-attacks on ICS can result in severe and potentially fatal consequences for the society and our environment. This reinforces the importance of designing extremely robust safety and security measurements to detect and prevent intrusions targeting ICS.

## RELATED WORK

We develop a novel two-phase ensemble ICS attack detection method capable of detecting both previously



## ANALYSIS ON DETECTION AND PREVENTION OF CRIME PATTERNS USING MACHINE LEARNING ALGORITHMS

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### ABSTRACT

The development of policing strategies and the implementation of crime prevention and control depend greatly on crime prediction. The most popular prediction technique right now is machine learning. Few research, however, have rigorously contrasted various machine learning approaches for crime prediction. This study compares the predicting abilities of various machine learning algorithms using historical data on public property crime from a significant coastal city in southeast China from 2015 to 2018. The LSTM model appears to perform better than KNN, random forest, support vector machine, naive Bayes, and convolution neural networks, according to results based solely on historical crime data. Therefore, historical crime data and factors related to criminological ideas should both be used in future crime prediction. Not all machine learning algorithms are equally effective in crime prediction.

Keywords: naïve bayes, convolution neural networks, KNN and RNN algorithms, crime prediction

### I.INTRODUCTION

Public security-related spatiotemporal data have been expanding at an exponential rate in recent years. Not all data, nevertheless, have been successfully applied to solve problems in the actual world. Many academics have created crime prediction models to aid in crime prevention. The majority of them only calibrated their predictive models using past crime data. The two main areas of crime prediction study at the moment are the prediction of crime hotspots and crime risk. The crime risk area prediction, based on therelevant influencing factors of criminal activities, refers to the correlation between criminal activities and physical environment, which both derived from the “routine activity theory”. Traditional crime risk estimation methods usually detect crime hotspots from the historical distribution of crime cases, and assume that the pattern will persist in the following time periods. For example, considering the proximity of crime places and the aggregation of crime elements, the terrain risk model tends to use crime-related environmental factors and crime history data, and is relatively effective for long-term, stable crime hotspot prediction. Many studies have carried out empirical research on crime prediction in different time periods, combining demographic and economic statistics data, land use data, mobile phone data and crime history data. Crime hotspot prediction aims to predict the likely location of future crime events and hotspots where the future events would concentrate. A commonly used method is kernel density estimation. A model that considers temporal or spatial autocorrelations of past events performs better than those that fail to account for the autocorrelation. Recently machine learning algorithms have gained popularity. The most popular methods include K-Nearest Neighbor (KNN), random forest algorithm, support vector machine (SVM), neural network And Bayesian model etc..Some compared the linear methods of crime trend prediction, some compared Bayesian model and BP neural network and others compared the spatiotemporal kernel density method with the random forest method in different periods of crime prediction.

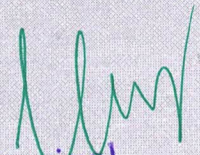


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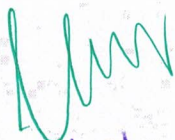
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# INDUSTRIAL ENGINEERING AND MANAGEMENT



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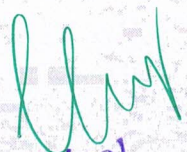
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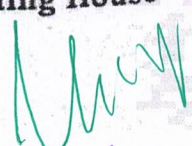
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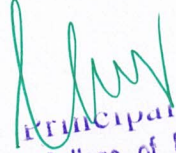
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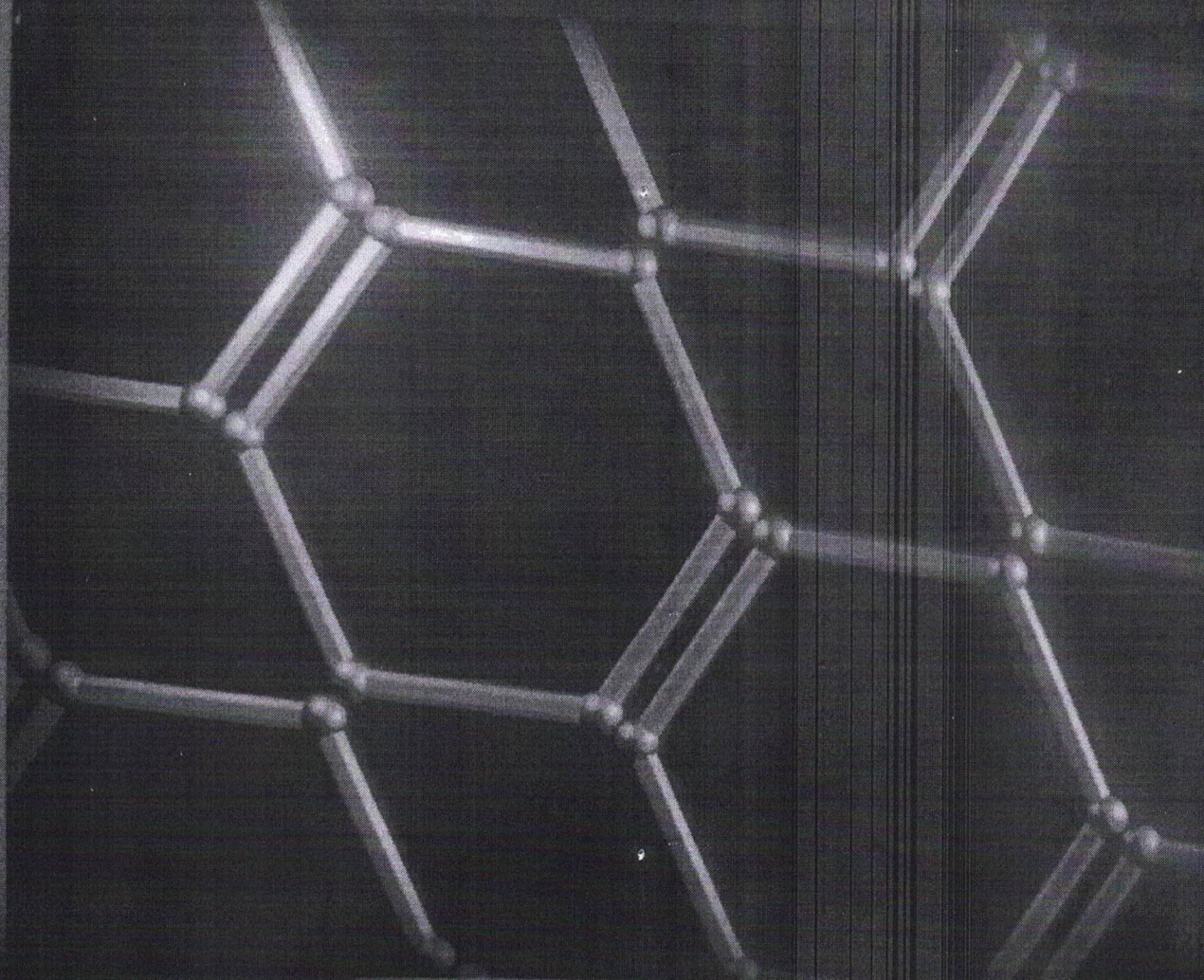
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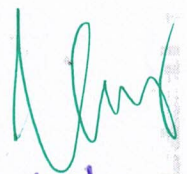
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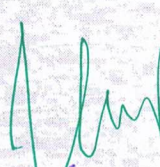
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# INTRODUCTION ARTIFICIAL INTELLIGENCE & DATA SCIENCE

FIRST EDITION

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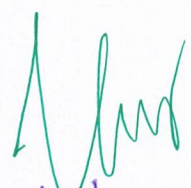
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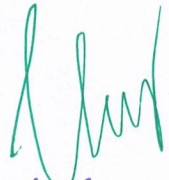


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# PROTECTION AND SWITCHGEAR

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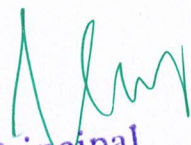
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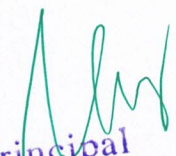
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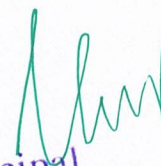
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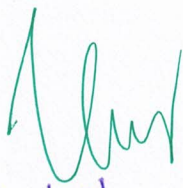


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# REAL-TIME CONCEPTS FOR EMBEDDED SYSTEMS

FIRST EDITION

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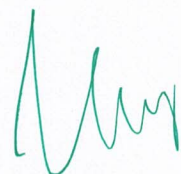
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# SYLLABUS

## UNIT I INTRODUCTION TO EMBEDDED SYSTEM DESIGN

Complex systems and microprocessors– Embedded system design process –Design example: Model train controller- Design methodologies- Design flows - Requirement Analysis – Specifications- System analysis and architecture design – Quality Assurance techniques - Designing with computing platforms – consumer electronics architecture – platform-level performance analysis.

## UNIT II ARM PROCESSOR AND PERIPHERALS

ARM Architecture Versions – ARM Architecture – Instruction Set – Stacks and Subroutines – Features of the LPC 214X Family – Peripherals – The Timer Unit – Pulse Width Modulation Unit – UART – Block Diagram of ARM9 and ARM Cortex M3 MCU.

## UNIT III EMBEDDED PROGRAMMING

Components for embedded programs- Models of programs- Assembly, linking and loading – compilation techniques- Program level performance analysis – Software performance optimization – Program level energy and power analysis and optimization – Analysis and optimization of program size- Program validation and testing.

## UNIT IV REAL TIME SYSTEMS

Structure of a Real Time System — Estimating program run times – Task Assignment and Scheduling – Fault Tolerance Techniques – Reliability, Evaluation – Clock Synchronization.

## UNIT V PROCESSES AND OPERATING SYSTEMS

Introduction – Multiple tasks and multiple processes – Multirate systems- Preemptive real-time operating systems- Priority based scheduling- Interprocess communication mechanisms – Evaluating operating system performance- power optimization strategies for processes – Example Real time operating systems-POSIX-Windows CE. Distributed embedded systems – MPSoCs and shared memory multiprocessors. – Design Example - Audio player, Engine control unit – Video accelerator.



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# TRANSPORTATION ENGINEERING

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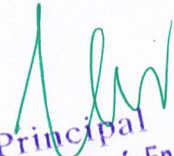
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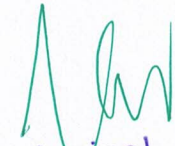
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# WEB DEVELOPMENTS

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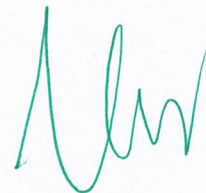


# Preface

Internet has become the number one source to information, and many of the traditional software applications have become Web Applications. The methods by which computers communicate with each other through the use of markup languages and multimedia packages is known as web technology. Web Applications have become more powerful and can fully replace desktop application in most situations. It involves communication across the web, and create, deliver or manage web content using hypertext markup language (HTML).

Web development refers to the building, creating, and maintaining of websites. It includes aspects such as web design, web publishing, web programming, and database management. It is the creation of an application that works over the internet i.e. websites. The part of a website that the user interacts directly is termed as front end. It is also referred to as the 'client side' of the application. Backend is the server side of a website. It is used to store and arrange data.

This book enables the readers to understand web essentials, basic internet protocols, HTML tags and attributes, layout elements, forms including features from the current specifications for HTML5, CSS3 including selectors and rules, classes. This book gives demonstration about the document object model and of how to complete basic page manipulation using JavaScript. This book covers various aspects of JSP, XML, AJAX and web Services



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# SYLLABUS

## UNIT I WEB SITE BASICS AND HTML

Web Essentials: Clients, Servers, and Communication. The Internet-Basic Internet Protocols -The World Wide Web-HTTP request message-response message-Web Clients Web Servers. Markup Languages: XHTML. An Introduction to HTML History-Versions-Basic XHTML Syntax and Semantics-Some Fundamental HTML Elements-Relative URLs-Lists-tables- Frames-Forms-HTML 5.0.

## UNIT II CSS AND CLIENT SIDE SCRIPTING

Style Sheets: CSS-Introduction to Cascading Style Sheets-Features-CoreSyntax-Style Sheets and HTML- Style Rule Cascading and Inheritance-TextProperties-Box Model Normal Flow Box Layout-Beyond the Normal Flow-CSS3.0. Client-Side Programming: The JavaScript Language-History andVersions Introduction JavaScript in Perspective-Syntax-Variables and DataTypes-Statements-Operators- Literals-Functions-Objects-Arrays-Built-in Objects-JavaScript Debuggers.

## UNIT III SERVER SIDE SCRIPTING

Host Objects: Browsers and the DOM-Introduction to the Document Object Model DOM History and Levels-Intrinsic Event Handling-Modifying Element Style-The Document Tree-DOM Event Handling-Accommodating Noncompliant Browsers Properties of window. Server-Side Programming: Java Servlets- Architecture - Overview-A Servlet-Generating Dynamic Content-Life Cycle- Parameter Data- Sessions-Cookies-URL Rewriting-Other Capabilities-Data Storage Servlets and Concurrency- Databases and Java Servlets.

## UNIT IV JSP AND XML

Separating Programming and Presentation: JSP Technology Introduction-JSP and Servlets-Running JSP Applications Basic JSP-JavaBeans Classes and JSP- Tag Libraries and Files-Support for the Model-View-Controller Paradigm- Databases and JSP. Representing Web Data: XML-Documents and Vocabularies-Versions and Declaration-Namespaces- DOM based XML processing Event-oriented Parsing: SAX-Transforming XML Documents- Selecting XML Data: XPATH-Template based Transformations: XSLT- Displaying XML Documents in Browsers.

## UNIT V AJAX AND WEB SERVICES

AJAX: Ajax Client Server Architecture-XML Http Request Object-Call Back Methods. Web Services: JAX-RPC-Concepts-Writing a Java Web Service- Writing a Java Web Service Client-Describing Web Services: WSDL- Representing Data Types: XML Schema-Communicating Object Data: SOAP Related Technologies- Software Installation-Storing Java Objects as Files.



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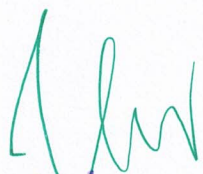


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# WIRELESS AND MOBILE COMMUNICATION

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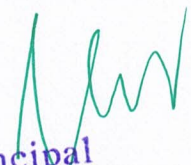
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## Preface

This textbook takes a unified view of the fundamentals of wireless communication and explains the web of concepts underpinning these advances at a level accessible to an audience with a basic background in probability and digital communication. Topics covered include MIMO (multiple input multiple output) communication, space-time coding, opportunistic communication, OFDM and CDMA. Particular emphasis is placed on the interplay between concepts and their implementation in systems.

The book begins with an overview of wireless systems and standards. The characteristics of the wireless channel are then described, including their fundamental capacity limits. Various modulation, coding, and signal processing schemes are then discussed in detail, including state-of-the-art adaptive modulation, multicarrier, spread spectrum, and multiple antenna techniques. An abundant supply of exercises and figures reinforce the material in the text. This book is intended for use on graduate courses in electrical and computer engineering and will also be of great interest to practicing engineers.

Wireless technology is a truly revolutionary paradigm shift, enabling multimedia communications between people and devices from any location. It also underpins exciting applications such as sensor networks, smart homes, telemedicine, and automated highways.

This book provides a comprehensive introduction to the underlying theory, design techniques and analytical tools of wireless communications, focusing primarily on the core principles of wireless system design.



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# SPECIAL ELECTRICAL MACHINES

FIRST EDITION

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## **SYLLABUS**

### **1. MANUFACTURING OF PLASTIC COMPONENTS**


Plastic Components: Types of plastics - Engineering plastics – thermosets – composite - structural foam, elastomers - polymer alloys and liquid crystal polymers. Factors Influencing the Selection of Plastics - Mechanical properties – degradation - wear resistance - frictional properties - special properties –processing – cost. Processing of Plastics: Extrusion-general features of single screw extrusion -twin screw extruders. Injection moulding types: Plunger type - Reciprocating screw injection - details of injection mould - structural foam injection mould - sandwich moulding - gas injection moulding - injection moulding of thermosetting materials - calendaring and rotational moulding. Design consideration for plastic components. Composite manufacturing: Introduction – characteristics of composite manufacturing - constituents – Glass fibers manufacturing process – hand laminating process – autoclave processing – filament winding – pultrusion process – liquid composite process – working principles by schematic diagram only – advantages – disadvantages.

### **2. RECIPROCATING MACHINES**

Planer: Introduction - description of double housing planer – specifications -principles of operation – drives - quick return mechanism - feed mechanism - work holding devices and special fixtures - types of tools - operations. Shaper: Introduction – specifications – principles of operations standard shaper – quick return mechanism - crank and slotted link – hydraulic shaper - feed mechanism - work holding devices – fixture - operations. Slotter: Introduction – specifications - method of operation - Whitworth quick return mechanism - feed mechanism - work holding devices - types of tools. Broaching: Types of broaching machine - horizontal, vertical and continuous broaching - principles of operation - types of broaches – classification - broach tool nomenclature - broaching operations.

### **3. MILLING MACHINES AND GEAR GENERATING PROCESSES**

Milling Machines: Types - column and knee type – plain - universal milling machine - vertical milling machine - principles of operation - specification of milling machines - work holding devices - tool holding devices - arbor - stub arbor - spring collet – adapter. Milling cutters: cylindrical milling cutter - slitting cutter -side milling cutter - angle milling cutter - T-

  
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slot milling cutter - woodruff milling cutter - fly cutter - nomenclature of cylindrical milling cutter.

Milling operations: straddle milling - gang milling - vertical milling attachment. Indexing plate – differential indexing - simple indexing – compound indexing – simple problems. Generating Process: gear shaper - gear hobbing - principle of operation only. Gear finishing processes: burnishing – shaving - grinding and lapping - gear materials.

#### **4. ABRASIVE PROCESS AND NON- CONVENTIONAL MACHINING PROCESSES**

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Non-Conventional Machining Processes: Construction, working and applications of Ultrasonic machining - chemical machining - electro chemical grinding - electrical discharge machining - plasma arc machining - LASER machining - Advantages – Disadvantages.

#### **5. CNC MACHINE AND ITS COMPONENTS**

CNC Machines: Numerical control – definition – working principle of a CNC system – Features of CNC machines - advantage of CNC machines – difference between NC and CNC – Construction and working principle of turning centre – Construction and working principle of machining centre – machine axes conventions turning centre and machining centre – Coordinate measuring machine – construction and working principle. Components of CNC machine: Slide ways – requirement – types – friction slide ways and antifriction slide ways - linear motion bearings – recirculation ball screw – ATC – tool magazine – feedback devices – linear and rotary transducers – Encoders - in process probing - tool material – tool inserts.

  
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# Reinforcement Learning and Heuristic Algorithms for Efficient Routing Protocols in Mobile Ad-Hoc Networks: An Advanced Approach

D. Srinivas Reddy<sup>1</sup>, V. Bapuji<sup>1\*</sup> and A. Govardhan<sup>2</sup>

DOI: 10.9734/bpi/ramrcs/v3/5275F

## Abstract

In mobile ad-hoc networks nodes are freely move and communicate with each other in its frequency range wirelessly. Due to dynamic topology the routes are not stable. Hence transmitting data packets among nodes is one of the major challenge. The algorithms compatible with the changes created in the network due to the nodes' movements are of high significance. For reducing data packet transmission time among nodes, route shortness and also route stability should be taken into consideration. More than a decade ago, that our approach to Artificial Intelligence has been widely accepted as a new development in the field of routing protocols [1,2]. In order to select the robust routing process, the reinforcement learning was used to make the best choice among the neighbor nodes at any moment to transmit data packets from source to destination. It predicts the behavior pattern of the nodes in relation to the target node through using reinforcement learning. The proposed method adopts Q-learning algorithm which has more homogeneity to estimate the value of actions [3].

*Keywords:* MANETs; DSR; QoS; RLTA; Q-learning; ACO; MP-DSR; EMP-DSR.

## 1 Introduction

A freely moving autonomous nodes communicating with each other without any underlying infrastructure, are termed as MANETs. Due to mobile in nature and depending on the local conditions, the transfer of data packets in MANETs is not stable. For transmission of data packets, the establishment of a route from source to destination is a major task. Due to the un-stability of the nodes, the change of routing path and establishing a new path not only increases the packet delivery time, but also consumes more energy resources as well as creates traffic overhead [4].

These distinguished features like, low bandwidth of channel transmission rate, limited features of nodes, dynamic topology and limited battery power makes MANETs distinguished from other networks. Hence, these highlighted features are to be addressed with new methods in designing and operations of routing protocols [5-8].

## 2 Data Forwarding Methods

The forwarding of data packets is done by two methods.

### 2.1 Source routing

In source routing or proactive routing protocol, the header of the packet contains the complete routing information from origin to the destination. Hosts are free and they need not maintain any routing information. All the routing information is maintained by the source host in.

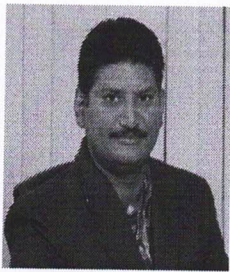
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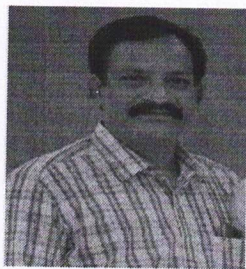
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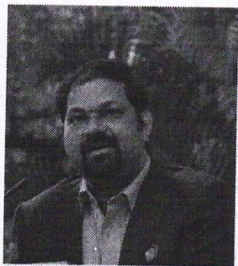
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# Application of Artificial Intelligence Control of HVDC Transmission System

M. Ramesh<sup>1\*</sup> and A. Jaya Laxmi<sup>2</sup>

DOI: 10.9734/bpi/ramrcs/v3/5276F

## Abstract

To handle bulk of power, the AC power transmission is not economical over long distance. High-voltage direct current (HVDC) transmission system is selected as the alternative not only in economic aspects but also in stability point of view. But the operation and control of HVDC links pose a challenge for the designers to choose the proper control strategy under various operating conditions. Traditionally, PI controllers are used for the rectifier current control of the HVDC system, but due to fixed proportional (P) and integral (I) gains, these controllers can perform well only over a limited operating range. However, in controlling a nonlinear plant such as the firing angle of the rectifier side in HVDC system, the model controls such as fuzzy logic controllers show better performance to the dynamic disturbances than traditional PI controllers. The CIGRÉ model as one of the conventional methods has been studied and improves the stability HVDC system.

**Keywords:** HVDC transmission; CIGRÉ benchmark model; Faults in HVDC system; Proportional integral (PI) controller; Fuzzy logic controller (FLC).

## 1 Introduction

The latest development in control of HVDC transmission system is the introduction of AI techniques of fuzzy, neural, genetic and expert system. These have exhibited inherent superiority over conventional control system. Conventionally PI controller is the one which is widely used for the HVDC system. Parameter variations in real time plant operation are well suited for PI controller but optimization in difficult, components such as transformers, converters and filters which make the HVDC systems highly nonlinear and complex in nature [1-5]. Harmonics generated by converters which can interfere with the controller, AC/DC filters are used for harmonic elimination. An alternative method of performance enhancement is the tuning of PI controller in all operating conditions and also during faults and disturbances occur.

Superiority of mathematical based models is blemished by the highly complex nature and nonlinear nature of the system causing inaccurate mathematical representation. To overcome this difficulty AI methods have proved to be a game changer, providing high quality at low cost. Design is simplified by just defining the qualitative parameters [6-10]. The expert knowledge, the ability to utilize the output of FLC for DC control, short term overloads can result, when the overload rating of converter is a result of control effectiveness the control simulation of AI based methods like FL, ANN and ANFIS have proved to be better than PI controller [11].

The application of an effective and intelligent current controller designed using AI techniques like FL, NN and NFL improves the gain of a HVDC transmission system [12]. The block diagram of HVDC system with AI controller is shown in Fig. 1.

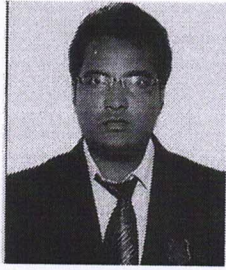
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# LEADERSHIP

*.....For Organizational Excellence*

PROF. ANAND PAWAR





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**ABSTRACT**

Leadership has a direct cause and effect relationship upon organizations and their success. Generally it is believed that the Leaders determine the organizational performance by adhering certain values, creating work culture, cultivating the habit of change management with at most tolerance and employee morale. They shape institutional strategies including their execution and effectiveness. Leaders can appear at any level of an organization and are not exclusive to management. Successful leaders do, however, have one thing in common. They influence those around them in order to reap maximum benefit from the organization's resources, including its most vital and expensive: its people.

In this backdrop, this study aims at to investigate the effect of leadership style on representative execution and leading to employee performance. The investigation embraced a blended technique approach and utilizes an exploratory study. A survey was utilized to elicit the information from the sample respondents from the select few IT & ITES Companies in Hyderabad. The study revealed that 132 of the respondents out of total 200 target sample opined as strongly agree with the Transactional leadership style which plays an important role in identifying and improving the employees' performance, followed by 33 of them agreed with the Laissez-faire leadership, there are 18 of respondents have agreed with Autocratic Leadership style and there are another 22 of them have agreed with Democratic leadership and therefore it is concluded that the two leadership styles were identified as most effective in enhancing the performance of employees according to this study.

**Keywords:** Autocratic Leadership, Democratic Leadership, Transactional Leadership, Laissez-faire Leadership, Employee Performance, Leadership Styles.






**BANKING**

# INDIAN BANKING

Insights and Perspectives

**Prof. Anand Pawar**

  
Principal

 **Rharti**



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**Title:** Indian Banking: Insights and Perspectives

**Editor:** Prof. Anand Pawar

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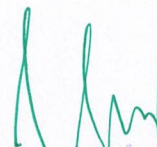
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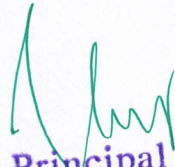
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**ABSTRACT**

*Since the inception, Regional Rural Banks (RRBs) play a significant role in the development of rural areas in India by providing needed financial assistance to agriculture, trade, commerce, industry and other productive activities in the rural areas. Credit and other financial facilities are extended particularly to small and marginal farmers, agricultural laborers, artisans, and small entrepreneurs with a view to strengthening these activities in rural areas. The RRBS have more reached to the rural area of India, through their huge branch network. Now, RRBs become key financial institutions at the rural level which shoulders responsibility of fulfilling the rural needs of different types of agriculture credit in rural areas. Telangana Grameena Bank (TGB) is one of the rural banks in Telangana state showing good performance in respect of deposits and advances, profitability and non-performing assets (NPAs) in backward district of the state. The present study examines the performance of the RRB (TGB) by analyzing the key performance indicators such as number of banks branches, deposits, advances, priority sector lending, profitability of the bank and NPAs during the period of 10 years from 2011 – 2020.*

**Keywords:** RRBs, Deposits, Advances, Profitability, Priority Sector and NPAs.

**INTRODUCTION**

*"Rural India is Real India and Rural Development is the Real Development of India" opined Gandhiji. India is purely a rural populated country; nearly 65.53 per cent (89.53 crores) of the India's population dwells in rural areas. So, the economic development of the country depends on the development of the rural economy. The Indian Government well recognized this fact and instigated many*



# Reinforcement Learning and Heuristic Algorithms for Efficient Routing Protocols in Mobile Ad-Hoc Networks: An Advanced Approach

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## 1 Introduction

A freely moving autonomous nodes communicating with each other without any underlying infrastructure, are termed as MANETs. Due to mobile in nature and depending on the local conditions, the transfer of data packets in MANETs is not stable. For transmission of data packets, the establishment of a route from source to destination is a major task. Due to the un-stability of the nodes, the change of routing path and establishing a new path not only increases the packet delivery time, but also consumes more energy resources as well as creates traffic overhead [4].

These distinguished features like, low bandwidth of channel transmission rate, limited features of nodes, dynamic topology and limited battery power makes MANETs distinguished from other networks. Hence, these highlighted features are to be addressed with new methods in designing and operations of routing protocols [5-8].

## 2 Data Forwarding Methods

The forwarding of data packets is done by two methods.

### 2.1 Source routing

In source routing or proactive routing protocol, the header of the packet contains the complete routing information from origin to the destination. Hosts are free and they need not maintain any routing information. All the routing information is maintained by the source host in.

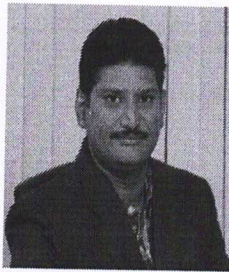
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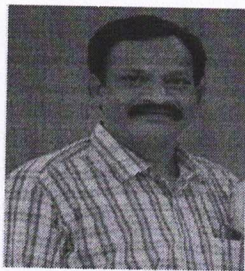
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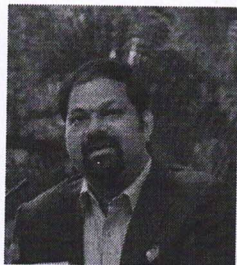
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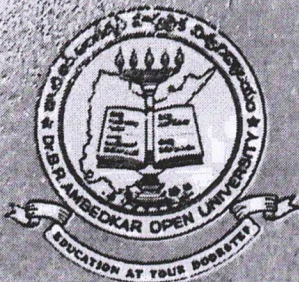
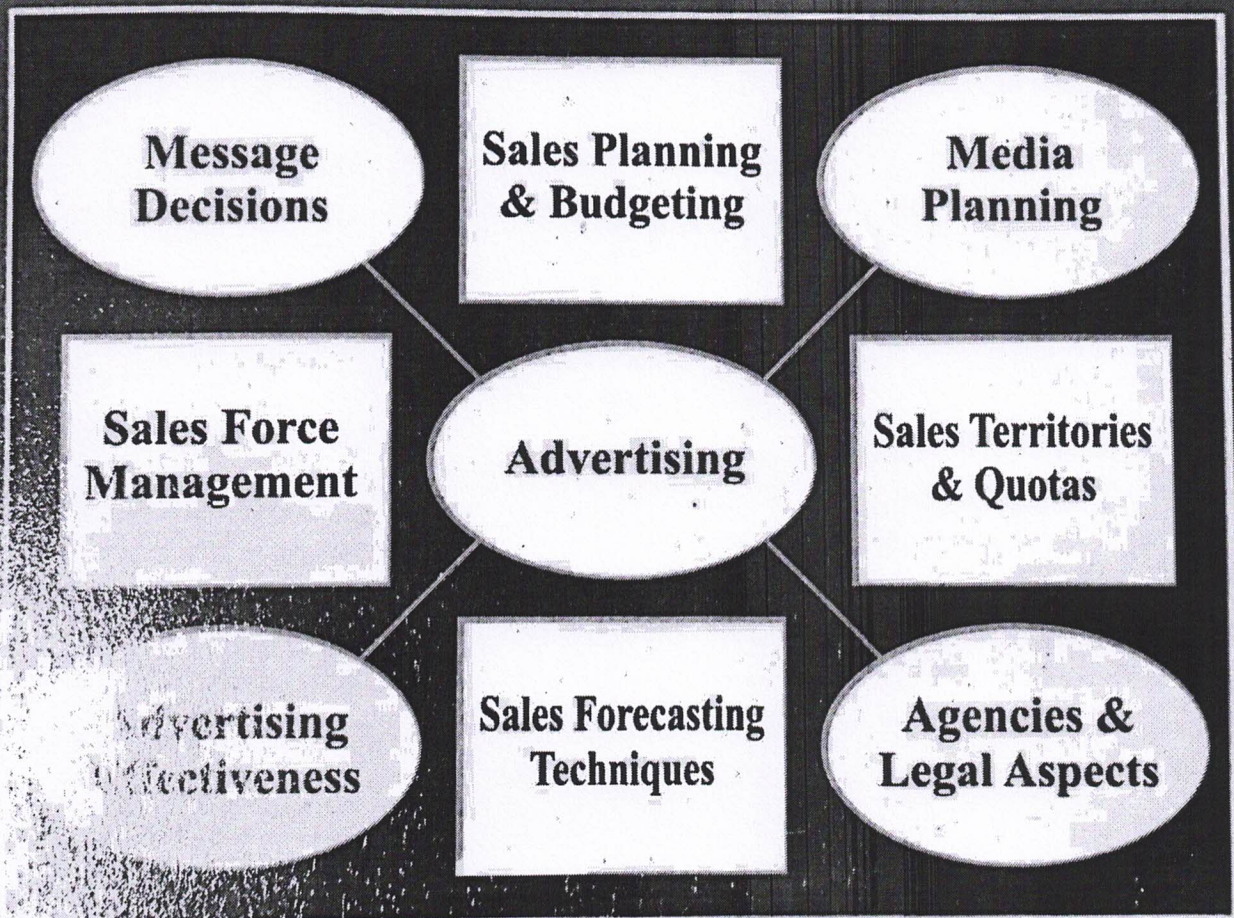


**MBA40122ASM**

**MASTER OF BUSINESS ADMINISTRATION  
(MBA)**

**SECOND YEAR SEMESTER - IV**

**ADVERTISING AND SALES MANAGEMENT**



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*Principal Engineering*



# UNIT - 13 : SALES PLANNING, BUDGETING AND CONTROL

## Objectives

After studying this unit, you should be able to:

- understand the importance of sales planning;
- identify the types of sales planning;
- explain the process of sales planning;
- discuss the essentials of good sales forecasting, and
- examine the sales budgets and control.

## Structure

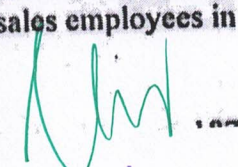
- 13.1 Introduction
- 13.2 Meaning of Sales Planning
- 13.3 Importance of Sales Planning
- 13.4 Types of Sales Planning
- 13.5 Factors Affecting Sales Planning
- 13.6 Stages in Sales Planning
- 13.7 Essentials of Sales Planning
- 13.8 Selling Strategies
- 13.9 Execution of Sales Plans
- 13.10 Challenges to Sales Planning
- 13.11 Sales Budgets and Control
- 13.12 Summary
- 13.13 Keywords
- 13.14 Model Examination Questions
- 13.15 Suggested Readings

## 13.1 INTRODUCTION

Progress and prosperity of any organization, either business or non-business, directly depends on its planning activities. In sales management, sale planning is the primary activity and it has its own importance. Based on sales planning other activities of business are planned. In other words, it gives kick start to remaining functions like sales organization, selection, training and development of sales employees, allocation of resources, sales control, etc. In view of importance of the sales planning, it is proposed to study various concepts of sales planning in this chapter.

## 13.2 MEANING OF SALES PLANNING

Planning means decide the future course of action in advance. This means deciding what we are going to in the future, i.e., tomorrow, how and when we are going to do it. A sales plan is an evaluation of present sales of a product in particular market region. It includes sales objectives, strategies that are required to achieve the predetermined sales objectives and allocation of required resources. A sales plan of a firm also includes assignment of sales targets to sales employees in





# UNIT 14.1 MANAGING SALES TERRITORIES AND QUOTAS

## Objectives

After studying this unit, you should be able to:

- understand the meaning of sales territories and identify the procedure for developing sales territories;
- explain the process of managing sales territories;
- discuss the sales quota and targets, and
- examine the sales monitoring sales targets.

## Structure

- 14.1 Introduction
- 14.2 Meaning of Sales Territories
- 14.3 Scope of Sales Territory Management
- 14.4 Procedure for Developing Sales Territories
- 14.5 Managing Sales Territories
- 14.6 Sales Quotas and Targets
- 14.7 Monitoring Sales Targets and Revision
- 14.8 Summary
- 14.9 Keywords
- 14.10 Model Examination Questions
- 14.11 Suggested Readings

## 14.1 INTRODUCTION

Sales territory is the technique used by the sales manager to manage and control the sales force efficiently and effectively. It is very difficult to the sales manager to monitor huge market and selling activities by one. Hence, he (sales manager) divides as per territories to manage and control the sales force. A territory can be defined based on the geographical area, sales potential, history, or a combination of all these factors. It is the geographical area or areas assigned to sales person/persons to marketing the products of a company. Companies attempt to balance their territories because this can reduce selling and marketing costs and increase sales and revenue. In General, a firm splits the total market into some specific geographical areas and assigns each salesman a specific zone in which he has to carry out his selling operations. The geographical area assigned to a salesman becomes his sales territory. Each of the territory is served by one or more salesmen.

## 14.2 MEANING AND DEFINITION

A territory may or may not consist of geographical boundaries. It consists of present and potential customers of the product. Normally, a sales person is assigned to a geographic area of existing and potential customers. This territory is assigned to sales persons as their operating territory. They cannot go beyond this territory in ideal scenario. For example, a sales team is asked to look after Delhi customers. This sales team is responsible for the sales of Delhi city. The



# **UNIT - 15 : SALES FORECASTING TECHNIQUES**

## **Objectives**

After studying this unit, you should be able to:

- explain the importance of sales forecasting;
- identify the types of sales forecasting;
- discuss the methods of sales forecasting, and
- explain the essentials of good sales forecasting.

## **Structure**

- 15.1 Introduction
- 15.2 Meaning and Definition of Sales Forecasting
- 15.3 Importance of Sales Forecasting
- 15.4 Types of Sales Forecasting
- 15.5 Factors Affecting Sales Forecasting
- 15.6 Methods of Sales Forecasting
- 15.7 Characteristics of Good Sales Forecasting
- 15.8 Summary
- 15.9 Keywords
- 15.10 Model Examination Questions
- 15.11 Suggested Readings

## **15.1 INTRODUCTION**

Sales are the primary source of revenue and increases cost of production of the firm. Since total production is to be sold out and practically nothing can be produced overnight. Hence estimation of future sales is needed to decide quantity of production for a given period. Production of goods requires combination of various resources (money, men, machines, methods and materials) which have to be employed properly. Thus, sales forecast is the most significant for future business plan. Sales forecast helps the firm to know the expected level of sales for its products and plan its production activities accordingly. Sales forecast plays an indicative role in the organization to all planning activities. Assuming indefinite continuation of status quo and expect no changes in future days seems impossible and unrealistic. So the firm has no chance to forecast or not to forecast. The only one choice is that the way the forecast is made, when it does, who does it and what resources are to be adopted for it. Accurate sales fore cast is essential because plans of all functional areas depend on such forecast.

## **15.2 MEANING AND DEFINITION OF SALES FORECASTING**

The term 'forecast' refers to prediction or estimation of future happening based on the present situation. For example weather forecast. Sales forecasting is not a mere speculative exercise. It is judgment of future probable changes in the market considering scientific principles. Sales forecasting is an estimation future sales. It cannot be cent percent correct because future is uncertain. It is an activity, trying to estimate the future sales quantity of the firm. All individuals and organization engage in this activity, albeit at different levels of methodological complexity.



## Objectives

After studying this unit, you should be able to:

- understand the meaning of strategic sales plans;
- identify the stages in human needs;
- discuss the strategies in product life cycle;
- discuss the portfolio managements of a business firm, and
- explain the role of sales manager in the twenty first century.

## Structure

- 16.1 Introduction
- 16.2 Maslow's Hierarchy of Needs
- 16.3 Brand Functions
- 16.4 Product Related Analysis
- 16.5 Competitive Analysis
- 16.6 Strategic Marketing Process
- 16.7 Customers Analysis
- 16.8 Market Share Strategy
- 16.9 Product Life Cycle
- 16.10 Portfolio Management Analysis
- 16.11 Sales Manager for 21<sup>st</sup> Century
- 16.12 Critical Path to Continuous Success
- 16.13 Summary
- 16.14 Keywords
- 16.15 Model Examination Questions
- 16.16 Suggested Readings

## 16.1 INTRODUCTION

With the dynamic environment of the market, it is necessary to sales managers of a company to opt best choice from two. Managers either chose react to the situation or proactive, on which they should take initiative steps for planning and implementing their plans to maintain their sales and their market share and brand equity in the market. The present market is too dynamic to excuse the delay decisions of managers. The following reasons make the obligatory to the managers to prepare strategic plans for the organization:

1. Demand for timely decision due to constant changes in business environment.
2. To face real issues in the market.
3. To achieve long term targets of the organization.
4. Proper allocation of resources to avoid unfruitful results.
5. To establish appropriate communication and control system in the organization.

Strategic plans are required to launch new products, product variants at right time. Timing of the introduction is of strategic importance as wrong timing could meet the disastrous product

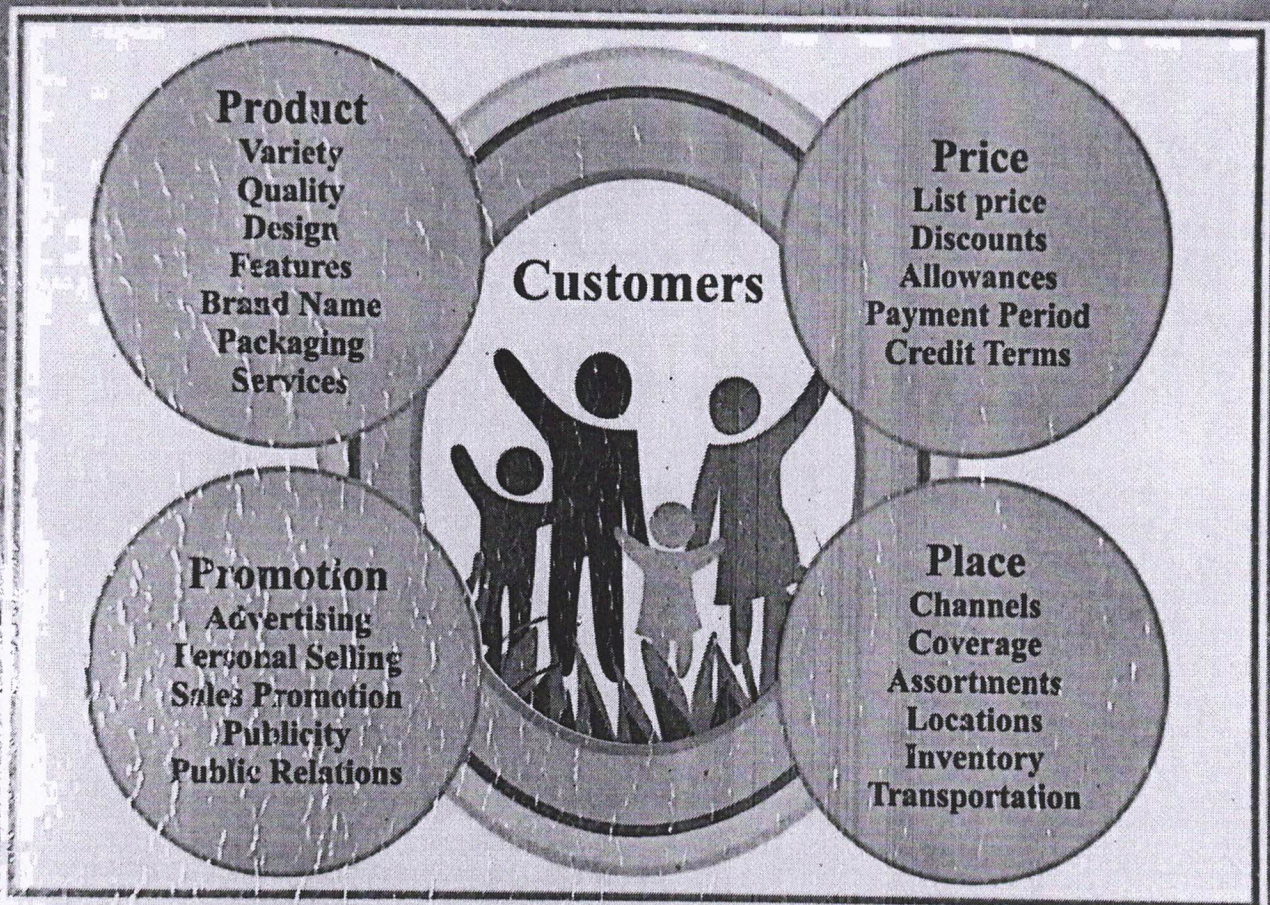


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## PRINCIPLES OF MARKETING



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## Multi-Quality Characteristics Optimization of NPMEDM of Nimonic 90 by Using Data Envelopment Analysis based Ranking Technique

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**Abstract** - In the manufacturing industry, to produce high-quality products at a reasonable cost, Optimization is a useful technique for determining the optimal production conditions. The focus of this research is to learn more about the influence of input parameters and determine the best settings for these variables to maximize MRR while decreasing SR and TWR while using Nimonic 90 NPMEDM. The EDM characteristics of peak current, MWCNT powder, and nano Al powder were measured at three different levels using the L27 orthogonal array (OA). To improve the response parameters of material removal rate (MRR), surface roughness (SR), and tool wear rate, data envelopment analysis-based ranking method (DEAR) is widely used. The ideal values are achieved at MWCNT 0.5g/l, nano Al powder 2g/l, peak current 15 Amp, respectively, based on the findings of calculated Multi performance rank index (MRPI) values. MWCNT and peak current (Ip) discovered to be the most effective important parameters impacting quality attributes based on the results of the ANOVA.

**Keywords-** NPMEDM, Data envelopment analysis based ranking technique, MWCNT powder, nano Al powder and Nimonic 90.

### 1. INTRODUCTION

EDM is used to manufacture product surfaces in a variety of industries, including mould production, die making, and small hole drilling. [1,2]. This technique can increase electrical conductivity regardless of the mechanical properties of the material. It hardens electrical energy to a work piece submerged in a dielectric, causing plasma to form and sparks to erupt between the work material and the tool, melting and evaporating both the electrode tool and the work piece [3]. In EDM, the positive terminal is generally