Criterion 3 Research, Innovations and Extension

Key Indicators (KIs) 3.3: Research Publications and Awards

3.3.2 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during last five year

S.No	Content	Page No.
1	Papers Published in Conferences/Book Chapters 2022	2 - 8
2	Papers Published in Conferences/Book Chapters 2021	9 - 27
3	Papers Published in Conferences/Book Chapters 2020	28 - 32
4	Papers Published in Conferences/Book Chapters 2019	33 - 35
5	Papers Published in Conferences/Book Chapters 2018	36 - 37

A Novel Approach for Identification of Healthy and Unhealthy Leaves Using Scale Invariant Feature Transform and Shading Histogram-PCA Techniques

K. S. Shashidhara, H. Girish, M. C. Parameshwara, B. Karunakara Rai, and Veerendra Dakulagi

1 Introduction

This because of varieties in climatic conditions, the cultivation crops and different pieces of the plants, for example, roots, stem, leaf, and seeds are assaulted by the infections [1]. Additionally, the agriculture crop sicknesses spread at a quicker rate contrasted with the other class of yields. This will bring about low harvest yield and cause budgetary misfortune to the ranchers. The plant's and the yield's wellbeing can be kept up by applying the fundamental medication on the plants, yet this in a roundabout way influences the soundness of the shoppers [2]. Further, the persistent increment in populace requests more harvests. Along these lines, vital advances must be taken to create more and solid yields.

The cultivation crops comprise of foods grown from the ground. As indicated by the Indian government, in the year 2015, around 500 million individuals have a place with white collar class and underneath neediness line [3]. For these classifications of the individuals, notwithstanding the food grains, vegetables are of higher need and

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Chapter

Power Consumption in CMOS Circuits

Len Luet Ng, Kim Ho Yeap, Magdalene Wan Ching Goh and Veerendra Dakulagi

Abstract

In this chapter, we explain the two types of power consumption found in a complementary metal-oxide-semiconductor (CMOS) circuit. In general, a CMOS circuit tends to dissipate power at all times—be it active or inactive. The power consumed by the circuit when it is performing computational tasks is known as dynamic power. On the contrary, the power lost due to current leakage during which the circuit is dormant is referred to as static power. By carefully and properly designing the circuit, current leakage can be suppressed to its minimum. Hence, dynamic power consumption is usually significantly higher than its static counterpart. Some of the techniques that could be adopted to save dynamic power consumption include reducing the supply voltage, clock frequency, clock power, and dynamic effective capacitance. By probing into the activity factors of the design modules, the techniques can be applied to those with high power consumption.

Keywords: dynamic power, static power, switching power, short-circuit power, leakage power, supply voltage, clock frequency, dynamic effective capacitance, switching activity

1. Introduction

More than half a century has elapsed since the three physicists from the AT&T Bell Laboratories—Brattain, Bardeen, and Shockley—invented the first solid-state transistor in December 1947 [1–3]. In comparison with the thermionic triode (which is colloquially known as the vacuum tube), the solid-state transistor is much smaller in size, consumes much lower power, operates at a relatively lower temperature, and exhibits significantly faster response time. Hence, the solid-state transistor swiftly replaced its predecessor as the predominant building block for electronic devices. The inexorable widespread application of solid-state transistors in electronic circuits has triggered a dramatic revolution in the electronic industries.

Today, microchips are built from the solid-state metal-oxide-semiconductor field-effect transistors (MOSFETs). A typical microchip consists of arrays of negative and positive MOSFETs, which are commonly denoted as the NMOS and PMOS transistors, respectively. **Figures 1** and 2 illustrate the symbols and cross-sections of the NMOS and PMOS transistors. As can be seen from the figures, the source and drain terminals

1

A Hexagonal Sierpinski Fractal Antenna for Multiband Wireless Applications

Mahesh Mathpati, Veerendra Dakulagi, K. S. Sheshidhara, Mohammed Bakhar, H. K. Bhaldar, A. A. Jadhav, and Dhanashree Yadav

1 Introduction

The concept of fractal was first developed by a scientist Benoit Mandelbrot in 1975. There are basically 2 types of fractal antenna viz. Sierpinski fractal and Koch fractal. As the days are passing the applications of antennas are increasing rapidly. The fractal structure uses self-similar concept in design which maximizes the effective length or increases the perimeter of antenna geometry. The key aspect of fractal lies on the iterations or the repetitions formed. Due to the iterations, fractal antennas can become compact, multiband and wideband and used in many wireless applications [1, 2]. Any patch antenna consists of 3 layers, the patch at top, middle substrate and at the bottom ground [3]. The antenna size of depends on the operating frequency. In this paper a hexagonal sierpinski fractal antenna is designed for UWB applications. The Coplanar Waveguide (CPW) fed technique used to response the high frequency [4]. A modified sierpinski fractal-based microstrip antenna for ultrahigh frequency (UHF) radio frequency identification (RFID) can be designed by combining the techniques of corner cutting with fractal shape [5]. Sierpinski Carpet Fractal Antenna is designed at 2.4 GHz frequency by introducing C shaped slot at rectangular patch which supports a multiband characteristics [6].

A sierpinski gasket fractal multiband antenna can be used for Wi-Fi and cognitive radio applications with modified structure. The novel Microstrip triangular fractal

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MAC Layer Intrusion Detection System by Cooperation of Cross Layer in MANET

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Abstract- **Cross layer convention configuration is one of the predominant approaches that have been recently presented in network administration research and lead to significant performance benefits. This paper presents the performance of cross layer interaction and investigates its effects with respect to security and information assurance of mobile ad hoc networks. In this paper cross layer based anomaly Intrusion Detection System (IDS) is utilized to recognize malicious nodes (attacks), IDS is utilized with conventional AODV Power and Delay optimized (PDOAODV) for finding fair load balancing path while selecting nodes .The simulated results like throughput, power consumption and packet drop proportion are contrasted among AODV, PDO AODV and IDS with respect to node mobility and simulation time. The outcomes demonstrate that the proposed IDS out performs for enhancing network performance.**

Key words- MAC Layer, MANET, Cross Layer and Intrusion Detection system

I . INTRODUCTION

A MANET is an accumulation of remote portable nodes that are equipped for speaking with each other without the utilization of system foundation or any brought together an organization. Notwithstanding the extensive variety of assaults that are the same as the one performed in wired systems, mobility limited transfer speed in addition, lacking battery life show open doors for pushing creative assault. Another class of assaults, cross layer assaults, rises up out of absence of collaboration amongst MAC and routing layers. These assaults engender from the MAC layer, where they are showed as Denial of Service (DoS) assaults, to the routing layer, causing genuine debasement of system execution as far as the accomplished throughput, latency and availability. An attacker can cause blockage in the system by either creating an excessive measure of traffic [3] or by creating particular traffic designs that prevent certain nodes from interfacing with different nodes.

The impacts of cross layer connection (Collaboration), or the absence of it was described[4], for the security and data confirmation of portable specially appointed remote systems (MANET).Natural connections between physical layer and MAC and in addition MAC and routing conventions, MANET can lead to a variety of attacks and interruptions. They are exceptionally hard to identify while at the same can have catastrophic impacts on the MANET functionality and operation. Cross layer collaboration can be mishandled malicious node to mount a DoS assault in the MAC layer and spread it to the routing layer. Dispute at the MAC layer causes a routing convention to answer by starting new route queries. The same holds on routing mishandle by route malfunctions in the MAC, DoS assaults are hard to prevent and secure. All attacks incorporate both malicious and misbehaving nodes. The number of assailants expected to cause genuine intrusion in the system, level of a violation of protocol parameters required for fruitful identification, detection handle, by methods for cross layer coordinated effort that may expand the speed of attack discovery, presence of stealthy assaults, and so forth. Previously IDS was introduced with on demand AODV protocol to detect intruders formally define attacks against the AODV routing process. Cross-layer intrusion detection model is used to detect malicious behavior of nodes using information from one layer to another layer and also to distinguish between normal and malicious behavior of nodes, in this way improves the detection accuracy [8].

Next Power and Delay Optimized AODV (PDO AODV), there is a core module called Routing Engine installed at every node of the MANET with handshaking mechanism between the data link layer and the network layer has been implemented by introducing a friendly packet between the two layers. To reduce the overhead of route finding in terms of delay and power consumption for finding the load balanced path, still unfair load balancing is there in finding efficient path[11].To overcome this unfair load balancing cross layer based anomaly IDS is introduced with PDOAODV which enhances the detection accuracy and improves the network performance. Power and Delay Optimized AODV with IDS is used to detect malicious nodes and to mitigate the attacks by selecting load balanced route while choosing a route. This efficient load balancing route will improve the network performance.

II. MAC LAYER ATTACK DETECTION MECHANISM

IEEE 802.11 MAC has a limited outline issues that happen when the traffic level increases. Consequently, recognizing typical of strange behavior in conditions of expanded activity speaks to a significant issue. Since the objective is to limit the quantity of false alarms while expanding the probability of detection. The majority of MAC

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Antiphotography System for Photography Prohibited Areas

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Chapter 52
Analysis of Efficient Handover CAC Schemes for Handoff and New Calls in 3GPP LTE and LTEA Systems

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Abstract In this work, a novel CAC scheme is analyzed for handoff handling and new call blocking attempts. As traffic in mobile cellular network increases handoff will become an increasingly important issue and as cell size shrinks to meet the growing demand for services, better, more efficient handoff mechanisms must be implemented. In this paper, various handoff schemes are analyzed for multiple traffic system and simulate an ATM-based wireless personal communication network to implement the bandwidth level degradation along with dynamic guard channels scheme.

52.1 Introduction

The most significant aspect of a wireless cellular communication system is mobility, and in most cases, continuous service is necessary, which is accomplished by the process of handoff from one cell to another. Because of technological advances, user mobility is increasing in wireless cellular network and also demand for multimedia and voice is increasing.

Handoff is the process of changing the channel (frequency, timeslot, spreading code, or combination of them) associated with the current connection while a call is in progress. It is usually triggered by either crossing a cell boundary or a drop in signal quality on the current channel. Poorly constructed handoff schemes result in a significant increase in signaling traffic and as a result, a significant reduction in service quality (QoS). Handoffs will become increasingly critical as traffic in these mobile cellular networks grow. Newer, more efficient handoff techniques are required when cell sizes reduce to suit an increased demand for services. Handoff Management Operation: The handoff management operation allows a mobile.

Terminal (MT) to effortlessly switch from one access point to another while maintaining the active connection's quality of service (QoS). Handoff management is divided into three stages: 1. Initiation: This stage involves handoff decision-making,

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Bio- Derived Materials and Their Application in Water Purification

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Abstract— The scarcity of clean and safe drinking water is one of the major problems faced by humans nowadays. The study is focused on the filtration of domestic waste water. This filtration is done by preparing a different bed using different layers of powdered cactus, pine bark, sand and coarse aggregate. The use of pine bark enhances the purification by preventing microbial action and reducing turbidity. But the application of the pine bark increases the concentration of acidity. In order to reduce the acidity. Coarse aggregate is used as another layer. Finally, a sandy layer is provided as a supporting layer for powdered cactus. The thickness was fixed by the column study method. As per the column study, three different layers of filter bed were used in the current research. The maximum percentage reduction for turbidity, alkalinity, hardness, chloride, acidity, BOD_5 for f3 were obtained 56%, 13%, 43%, 85%, 58%, 84%. Respectively

Keywords:- Cactus, Pine Bark, Efficiency, Coarse Aggregate.

I. INTRODUCTION

The growth of the global population, the increasing need of water for agriculture and the increasing urbanization put great pressure on the existing resource of freshwater and the finding of new resource of fresh water become necessary. An alternative source of water can be reuse waste water. Grey water is all waste water from a household, with the exception of toilet water, which is called black water, water from dishwashing, from kitchen sinks and from laundry machines constitute grey water and it account for 80% of the household waste water. Grey water can be reused in areas that do not require portable water such as irrigation and toilet flushing. The reuse of grey water reduces the pressure on fresh water resources and thereby pressure the environment and decrease the cost of water. grey water in this scenario is resource of water rather than wastewater. Unfortunately, grey water origins contain chemicals, bacteria and viruses. The reuse of raw grey water without a pre-treatment can have negative impacts on the soil. Can pollute the ground water. The surface and contribute to the transmission of diseases.

The high cost and the insufficiency of centralized waste water treatment plants mainly in low-income countries justify the choice of the onsite filtration system with local and inexpensive filter materials in this study, pine bark, powdered cactus, coarse aggregate and sand were used as filter media in column filters, some physical and chemical parameters of

grey water that can have a negative environmental impact were measured before and after filtration with different materials and with different layer thickness.

The filtration efficiency depends on both the low rate of different filter material. Pine bark, cactus, coarse aggregate and sand were found to be better in reducing some of the chemical and biological parameters. The bark filters have an acidifying effect on the filtrated grey water. This study has contributed to the finding of methods to improve the quality of grey water for reuse. The study confirmed the possibility to improve the quality of grey water by filtration and showed that degree of the reduction depends on the filter material used and the characteristics of the microorganisms. Water purification using natural materials such as pine bark, cactus, sand and coarse aggregate can be affordable for all class people and it have some advantages over the most preferable water purifiers.

II. OBJECTIVES

- To investigate the treatment efficiency of cactus powder and pine bark.
- To evaluate the optimum dosage and effect in treating waste water.
- To improve the quality of municipal waste water by filtration.

III. MATERIALS AND METHODLGY

MATERIALS

- Pine bark
- Cactus powder
- Sand
- Corse aggregate

A. Pine bark

Pine bark the reduction of turbidity is done. The bark originated from undefined mixture of fine bark is air dried and is sieved through 4.75, 2.35 and 1mm screens. The bark retained on 2.36 and 1mm screens was mixed in 3:2 ratio by weight. As the first layer from top, the pine bark was filled in the filter pipe at a thickness of 5cm. Pine bark chips

Non Motorized Transport- A Case Study of Bidar City

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Abstract— Non-motorized transport is vital for sustainable living. The characteristics of sustainable transport are safe, comfortable and efficient in terms of economic and energy consumption and minimize environmental pollution. With changing urbanization pattern along with socio-economic growth, a transport demand in urban area of India is growing rapidly. A sustainable transport system must meet the mobility and accessibility needs of people by providing safe and environmentally friendly modes of transportation. Non-motorized transportation (NMT) meets these objectives of sustainability as it utilizes indigenously available human and animal energy which is non-polluting, safe, and affordable and user friendly and need only a small fraction of the capital required for motorized transport.

This study aims to suggest sustainable transport in terms of non-motor vehicle for a city that promises a better world for future generations. It provides options to change the choice of transport modes to road users of motor vehicles to non-motor vehicles through integration of non-motorized transport with existing public transport. By improving pedestrian path and cycling zone to increase non-motorized travel and reduce motor vehicles travel. The use of non motorized transportation such as cycling and walking is not only to reduce carbon footprint and reduce environmental impacts but also to promote healthy lifestyle.

Keywords—Non motorized transport, Sustainable transport, Cycling, Walking.

INTRODUCTION

Non- motorized transport includes walking, cycling and variations of small- wheeled human-powered transportation modes. With the exception of walking, these utilize non-motorized vehicles such as bicycles, skate-board ,push scooters, wheel chairs, and rickshaws .This entry focuses on the to primary non-motorized or active modes- walking and cycling for transport.

Non-motorized transport is vital for sustainable living the characteristics of sustainable transport are safe, comfortable and efficient in terms of economic and energy consumption and minimize environmental pollution. It provides basic mobility, affordable transport, access to motorized modes, physical fitness and enjoyment.

Due to lack of natural material such as oil reserves increase in number of deaths and injuries by motor vehicle accidents and traffic congestion, many countries across the globe have chosen NMT as a solution to the above problem. In medium size cites in Japan, Germany and the Netherland,40-60% of all the trips are made by walking and cycling.

1.1   NEED FOR STUDY:

The concept of sustainable transportation is vital to ensure clean environment, healthy and high quality. The concept also emphasis on the human life and the environment, to meet current and future needs. Today, the transportation systems in major cities have shown a bad image because of have traffic congestion, accidents, lack of access to public transport and carbon emissions to the atmosphere of space contributes to environmental pollution and imbalance in terms of quality of life in general mobility. Along with the promising concept of sustainable transport services to consumers and at the same time ensure the safety of road users and also help towards the welfare and the environment

Each individual can also play a role in supporting sustainable transport system, the easiest way is to use bicycles or walk to work. Walking and cycling is the ultimate 'zero carbon' and environmentally friendly solution to pollution by motor vehicles that have been used continuously for more than 20 years

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Manufacturing of Bricks using Laterite Soil (Tilla Soil)

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Abstract:- House is the third need of human in the world. While considering about India the population is increasing day by day which required Food, Cloths & shed / house for living. Affordable housing is needed in many countries of the world especially the developing ones. Building material makes up for 75%of the total cost of construction. The high demand for housing has increased the use of conventional building material which causes various environmental problems. To address these situations, attention has been focused on low-cost alternative building materials using industrial, agricultural, and natural wastes. Using the waste as substitute raw material in manufacturing of building products is an innovative way of waste utilization. In this paper we have given a thrust on the use of waste material such as fly ash, Rice husk with other raw materials to manufacture a masonry unit. And the results of experiments conducted for various percentages of laterite soil, cement and rice husk mixed with varying percentages of fly ash. Objective of this study is to obtain a best percentage of fly ash that can be added with soil and cement as stabilizing agent to manufacture bricks at a low cost which can fulfill the requirement of homeless people in the rural and urban parts of the country. Hence bricks in different percentages of fly ash, soil, cement and rice husk mix were added in this manufacturing process.

The laterite soil was collected from Dhumnsur Village Taluka Humnabad in the Bidar district. Bricks of 2.5% of cement and 3% of rice husk by weight of the soil & varying percentage of fly ash (2.5%, 5%, and 7.5%) with weight of the soil are used and different mix proportions of bricks were prepared and tested for compressive strength in the compressive testing machine (CTM) and water absorption test for 3days. After testing the bricks for 3 days we noticed that the best quality of brick with high compressive strength & The better degree of compactness of bricks by water absorption test were obtained for a mix proportion of Cement: 2.5% Rise husk: 3% Fly ash: 7.5% .

By this study we concluded that the addition of excess fly ash reduces the compressive strength of the brick and should be added in desired quantity. Addition of desired quantity of fly ash can result in better bonding of the raw materials and give a better-finished product with sharp and fine edges. Bricks have the compressive strength that satisfies IS code limits

Key Words: Laterite soil, cement, fly ash, rice husk, compressive strength.

1. INTRODUCTION

A house is one of the major amenities for the human being everywhere in the world. Different types of materials and method are adopted for constructing a house or a building. As far as country like India is concerned, low cost materials and its availability is the main factor controlling the selection of material and mode of construction. In olden days mud walled houses were used by poor people in rural areas.

Brick is one of the most important materials for the construction industry. The conventional method of bricks production has brought undeniable shortcomings. The consumption of earth-based materials as clay, shale and sand in brick production resulted in resource depletion, environmental degradation, and energy consumption. Virgin resources are mined from riverbeds and hillsides to service brick industry leaving mines areas un-reclaimed. Environmental degradation accompanies such mining activities with air pollution and remains after the mines cease operations, leaves scars on the landscape.

Objective: Production of laterite bricks with enhanced mechanical properties by using locally available laterite soil.

To determine the physical strength properties of bricks by partial replacement of cement with fly ash.

2. MATERIALS

Laterite Soil: The Laterite stone is good building material and people using laterite stone for the construction of buildings, but the waste laterite soil is available in the laterite quarries are used for filling purpose.Laterite soil is obtained from the well digging site which is used for the preparation of the bricks and the physical and mechanical properties of laterite soil are tested such as specific gravity, liquid limit, shrinkage limit, plastic limit, optimum moisture content, maximum dry density. These tests are conducted on the laterite soil.

Characteristics of laterite soil:

1. The laterite soil is slightly red in colour
2. These soils are coarse or rough in touch. They are porous as they allow water or air to pass through it.
3. Due to intensive leaching, laterite soils are not so fertile by themselves.
4. The significant features of the lateritic soils are their unique colour, poor fertility, and high clay content.
5. Lateritic soils have the advantages of good porous properties.
6. The behavior of laterite soil in an undisturbed as well as in laboratory conditions is essential since they are often used as foundation or base layers for road construction.

The laterite soil is taken from the village Dhumnsur near Humnbad which 56.5km away from Bidar.

Cement:

Cement used for the preparation of brick is Ordinary Portland Cement. The good quality of cement is required

Comparing the Standards of Coarse Aggregate in Bidar with Morth Specification

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ABSTRACT

The prime purpose of a pavement is to transmit loads to the base, sub base and underlying soil. The properties of aggregates used in pavement depends on gradation and type. In this study the information about the quarries available in the Bidar district are collected. Every quarry site was inspected and its locations are identified using GPS. The samples are collected from Humnabad, Bhalki, Aurad, Basavakalyan and Bidar district and tested for its material properties. The properties of coarse aggregates available in the district are compared with the standards of Dense Bituminous Macadam and Bituminous Concrete as per MORTH specifications. The mobile application is developed which fetches all the information about aggregates available and its location for the contractors, engineers and any other customers.

Keywords : Gradation, BC, DBM

I. INTRODUCTION

Bituminous mixes are used as base and wearing courses in a pavement structure to distribute stresses caused by loading and to protect underlying unbound layers from the effects of water. Designing a bituminous mixture to meet the needs of a particular paving project requires careful selection of the aggregate and bitumen to be used. A compatible aggregate source and gradation chosen must meet the needs of the project, because which will affect the overall performance of the bituminous mixture. Bituminous mixture is composed of approximately 95% by weight, or 80% by volume, mineral aggregate. Therefore it is important to see how aggregate gradation can affect the fundamental properties of bituminous mixture. The Bituminous Concrete mix is better than Dense Bituminous Macadam mix in term of indirect tensile strength(ITS), horizontal tensile strain(HTS), and the compressive strength, while Dense Bituminous Macadam mix is better in terms of shear strength and rut resistance.(Haider et.al 2012)

The aggregate comprising particles of various sizes should be such that the smaller particles fill the voids between the larger particles. Aggregate gradation determines the void content within the structure of aggregate. The optimization of aggregate gradation improves the rheological, mechanical and durability properties of concrete (Pawar et. al 2016). Hence it is necessary to know the quantity of coarse aggregates available and their quality standard as per requirements in a particular area is very important. Therefore the properties of coarse aggregates available

Spot Speed Study

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ABSTRACT

Approximately 48 percent of traffic accidents on urban roads in Bidar, city of india, were endorsed due to speedy. Over 4.8 lakh accidents were recorded, leading to 1.5 lakh average deaths in last five years in India due to speed. In this study, spot speed data were analyzed using data collected at 4 urban roadway sections in bidar. The stretches roadway sections are selected based on the number and fatality of accidents that happened in last 3 years (2016-2019) Bidar Traffic Police Station records. From the study, it is found that the condition of road, spot speed, traffic volume, carriageway conditions and negligence of the people are the main parameters causing the accidents. It was also seen that slow moving traffic were creating hazards for fast moving traffic as it always occupied the innermost lane of the roads.

Keywords : Urban Roadway Sections In Bidar City, Spot Speed, Speed Limit, Design Speed.

1. INTRODUCTION

Urban transport facilities in most of the Indian cities are inadequate and deteriorating over the years. The development of the public transport system has not kept pace with the traffic demand both in terms of quality and quantity. As a result, the use of undesirable modes such as personalized transport, mainly two-wheelers, and intermediate public transport, mainly three-wheelers, is growing at a rapid speed. Roads and footpaths today are heavily encroached by parked vehicles, hawkers, and roadside business forcing pedestrians to walk on the road. This results not only in restricting the traffic flow, but also putting the pedestrians' life at a great risk. Besides encroachment, it is found that road surface in most of the cities is substandard. Besides, lane markings and traffic signs are usually missing and the intersections often require geometric correction. Wholesale goods centers are usually located in the center of the city, which attracts substantial goods traffic on congested city roads. Congestion results in delays and time losses. An inevitable result of the growth of traffic has been the increase in road accidents, which take a great toll on human life every year. Each year nearly 1.3 lakh people die as a result of a road traffic collision, more than 3000 deaths each day and more than half of these people are not travelling by car. Over 4.8 lakh accidents were recorded, leading to 1.5 lakh deaths in the year 2016 which reduced to 1.46 lakh deaths from 4.5 lakh accidents in the year 2017, which shows the percentage reduction of about 3% in India. Which again in 2018 4.61 lakh road accidents leading to 1.49 lakh deaths. In road safety management, an accident

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Estimation and Influence of Decision Time Intervals on Wrong Decision Probabilities of Multi Handover Criteria

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Abstract— In this work, simulation results are presented for handover probabilities due to wrong decisions made on a five node network. The wrong decision can be a false positive or a false negative. False positives are unnecessary handovers and false negatives are missing handovers. The probabilities of unnecessary handover, missing handover and total of unnecessary and missing handovers are computed for different decision time durations from 1ms to 5ms. Various parameters like bandwidth, received signal strength, bit error rate and mobility of mobile devices are considered as handover criteria. The parameters are added one after the other starting with available bandwidth to demonstrate the effect of various parameters on the wrong decision probabilities. The effect of duration of decision time on the wrong decision probabilities is also demonstrated for all the parameter combinations used in this simulation.

Index Terms-False positives, false negatives in handovers, Mobility, bandwidth, received signal strength, bit error rate, wrong decision probabilities.

I.   INTRODUCTION

Mobile nodes are handed over from one network node to another network node when one or some of the criteria are met. The criteria are defined based on available bandwidth, received signal strength, bit error rate, mobility of the mobile node across the boundary of field of the network node, power consumed by the network node etc. The handover is initiated for the mobile nodes whenever the handover criteria are met to improve the quality of service. User of the mobile node is not subjected to any call drop or poor connectivity while he is on the move or even when at home or office. But there is always a problem in the handover due to wrong decisions. The wrong decisions can arise due to false positive and false negative cases. The true positive case is the one where the mobile node is handed over based on certain criteria and after it is handed over; the criteria are still valid. The false positive case is the one in which the mobile node is handed over based on certain criteria and after it is handed over, the criteria become invalid at the end of decision time interval due to change in conditions either at host network or target network. These types of handovers are also known as unnecessary handovers.

In case of true negatives, the mobile node is not handed over based on certain criteria and after it is retained without handover, the criteria are still valid at the end of decision time interval. The false negative case is the one in which the mobile node is not handed over based on certain criteria and after it is retained without handover, the criteria become invalid at the end of decision time interval due to change in conditions either at host network or target network. These types of handovers are known as missing handovers. Hence true positive and true negative cases are treated as successful and false positive and false negative cases are treated as unsuccessful due to wrong decisions. The probability of false positive is known as probability of unnecessary handover (UH) and probability of false negative is known as probability of missing handover (MH). The total probabilities of unnecessary and missing handovers due to wrong decisions are known as wrong decision probability (WDP). The probability definitions of UH, MH and WDP can be found in detail in Chi et al [1].

Chi et al [1] has the algorithm implemented for a criterion based on available bandwidth only for a two node network. The modeling was conducted with the help of markov chain model. Akhila et al [2] have extended the two node network model proposed by Chi et al [1] to a three network node model. In another work, Akhila et al. [3] simulated the three node network model for larger bandwidths. While the Akhila et al [2] focused on the handover probability computations based on the available band width alone, received signal strength was also considered in another work [4]. Shweta et al. [5] modeled various states of a mobile node that will reduce the missing and unnecessary handovers of a three node network. Mobile node can exist in any of the states like selfish state, malicious state, cooperative state and failed state and Shweta et al. [5] focused on the handover probabilities when mobile node is in any of these states.

Suresh et al [6] extended the three node network model based on available bandwidth to a five node network. Also the UH, MH and WDP have been compared for a two node, three node and five node networks [7]. This comparison was made only for one handover criterion, namely, available bandwidth. It has been concluded from this comparison that as the number of network node increases, the UH, MH and WDP decreases. Suresh et al. [8] added received signal strength to the handover criteria along with available bandwidth for a five node network model. Also, the Suresh et al. [9, 10] used the multistate model with states like selfish state, malicious state, cooperative state and failed state to a five node network model. Other approaches like mobility based handovers are also treated as one of the important methods to reduce the wrong decision probabilities [11]. With all these efforts by various researchers, it has been proved that the UH, MH and WDP can be improved by

1. By increasing the number of network nodes.
2. By increasing the number of parameters in the handover criteria.

Cross Layer Based MANET Frame work to minimize the energy Consumption and maximize the Network Life Time

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ABSTRACT
The versatile Ad hoc networks provide communication among wireless nodes which occur in the wireless medium. Energy effective routing in MANET is a demanding goal which should be made under consideration. Moreover, energy effective routing is deemed to be the most important design criteria for MANETs because mobile nodes will be powered by batteries with limited capacity. The architecture, of ad hoc network protocol generally based on a conventional layered approach has been found ineffective to deal with energy efficient routing and breakage of links in MANET. This paper proposes a Cross Layer based MANET framework to minimize the energy consumption and maximize the network lifetime.

Keywords
Cross layer, Lifetime, Energy consumption and Mobile ad hoc Network

1. INTRODUCTION
A mobile Ad hoc network (MANET) is a consistent, self-composing, infrastructure less network that is organized from claiming versatile apparatuses that need aid joined without wires. MANET [1] will be the contemporary developing engineering which empowers clients and will impart without any physical framework in any case for their geographic location. Due to this reason it is frequently allowed on concerning an illustration of infrastructure less system. Ad hoc networking permits the devices to deal with associations to maintain network connections and in addition to effectively including and excluding device to and from the network. Because of nodal transportability, the system topology might transform quickly furthermore change unpredictably over time. Therefore the mobile ad hoc network outline will be exceedingly challenging, but this technology need some way or another have figured out how to beat such limits on a percentage degree.

Previously, design offered by ad hoc network protocol has mostly been based on the layered approach. In layered architecture, the designer of the protocol algorithm focuses on a particular layer, without being required to consider the parameters of the rest of the stack. To overcome this, the cross-layer [2] approach has been found to address power consumption and network life time-related issues in wireless ad hoc networks

The cross-layer design [3] deviates from the traditional design approach of network in which each layer of the stack would be made to operate independently. The inter-layer communication metrics and the benefits of information exchange among the lower layers such as network layer and transport layer were also reported. The simulation of Cross Layer based MANET framework to minimize energy consumption [3] and maximize network life time with

comparison to Layered based MANET is proposed. A design approach switching from the traditional layered architecture that has been found inefficient to cope with receiving signal strength (RSS)-related and power control problems. This influences the physical layer, the network layer and the transport layer towards enhancing the cross-layer interaction among different layers. Hence evaluated [4] three ad hoc networks routing protocol such as EPAR, DSR and MTPR in different network parameter taking into consideration the power consumption. While achieving QoS metrics like PDR, Throughput, Jitter, end-to-end Delay etc. along with the optimization of energy consumption.

Therefore the surveyed papers show the different approaches of routing protocol that provides the stable path from source to destination will consume less energy and maximize the network life time.

2. PROPOSED CROSS LAYER APPROACH
Energy proficient routing over MANET [1] is a testing objective which has to be made under thought. In particular, power effective routing may be a chance to be the majority vital outline criteria to MANETs since mobile nodes will be powered by the batteries with limited capacity. Power failure of a mobile node not only influence the node itself as well as its ability of transmitting packets and as a result affecting the overall network life time [5].

Institutionalization of layered protocol stacks has enabled quick improvement of interoperable systems, but at the same time long haul restricted the execution of the general architecture, because of the absence of coordination among layers which has failed to provide the efficiency in minimization of overall energy consumption and therefore, maximizing the network lifetime. Cross-layer Framework is an escape from the layered architecture of the OSI communications model with virtually strict boundaries between layers.

The proposed Cross layer removes such strict boundaries which oppose the communication between the layers that is to let one layer to access the data of another layer so that the information exchange and interaction is enabled. This Cross Layer based MANET framework is simulated with the help of Network Simulator (NS2) to minimize the power consumption and maximize the network lifetime .The desired information is passed from the physical layer to the network layer so that it can take optimum decisions required in the routing protocols. A major advantage provided by this approach is to allow access of information between physical layer and top layers such as MAC and network layer. The illustration of the cross-layer interaction among the layers is shown in Fig. 1.

Fire Fighting Un-manned Air Vehicle for Remote Areas

N. Shashank Bhat, K. S. Shashidhara, and Veerendra Dakulagi

Abstract Fire accident results in catastrophic injuries and devastating damage. The death rate in India due to fire accidents was almost 2.5 times more than in other parts of the world. Fire fighting is a highly difficult and challenging task for human beings to access the remote target areas. By using unmanned aerial vehicle, quick response to the fire affected area can be achieved and also firefighters will get the visual information of the fire accident. This work focuses on the implementation of Un-manned Air Vehicles (UAV)s that can extinguish the fire. The proposed fire fighting UAV system consists of Hexacopter as a platform. Hexacopter is a UAV that works with six motors to achieve stable flight and better lift loading capability. The goal of this work is achieved with stable and robust hexacopter along with dropping mechanism which is used to drop the fire extinguishing ball on fire-affected area and camera interface for live video footage. The description of the proposed work is briefly described as well as determines the principle functionality.

Keywords Fire fighting UAV · Hexacopter · Camera · Dropping mechanism · GPS · RF radio transceivers · Flight controllers

1 Introduction

The research on Unmanned Aerial Vehicles has always been an interest of engineers and hobbyists due to its wide range of applications such as rescue mission, mapping, aerial photography, border patrol, etc. These vehicles do not require any pilot on-board and can be easily controlled from the base station. These vehicles are equipped with GPS and hence they can autonomously fly to the desired location when a path is defined. Hexacopters are equipped with six motors to provide thrust to the vehicle. With the proper arrangement of these motors, stability can be obtained [1]. Depending

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A New Kaiser-Bessel Constant Modulus Technique for Smart Antenna Beamforming

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1 Introduction

Smart antennas have long been an attractive solution to a plethora of problems related to signal detection, estimation and beamforming [1]. The smart antenna system which consists of an array of antenna elements with signal processing capabilities can overcome the directivity and beamwidth limitations of a single antenna element, and when it combined with methods from statistical detection and estimation and control theory, a self- adjusting or adaptive system emerges [2, 3]. Mainly, two types of configurations are used in practice, namely the switched beam system and adaptive array system [4]. The features of the switched beam system are (1) forms

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Conference paper.

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Comparison of Segmentation Performance of Activated Sludge Flocs Using Bright-Field and Phase-Contrast Microscopy at Different Magnifications

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Abstract: Activated sludge (AS) is a type of process which is commonly used for the treatment of sewage and industrial wastewater. In this treatment process, the settling of the sludge flocs is important to ensure the normal functioning of the system, while sludge bulking has become a common and long-term problem that greatly affects floc settleability. Thus, methods based on image processing and analysis are introduced for monitoring AS wastewater treatment plants. However, the effectiveness of using image processing methods heavily depends on the performance of segmentation algorithms. The AS wastewater plant can be monitored through microscopic images of the flocs and filaments. Water samples are taken from the aeration tank of the wastewater plants and then observed using bright field and phase-contrast microscopy to compare the segmentation accuracy at different magnifications i.e., 4x, 10x, 20x, 40x. In this paper, three methods to segment and quantify the flocs in bright field and phase-contrast microscopy images have been analyzed. The first method is image segmentation using Bradley local thresholding method, the second method is texture segmentation using range filtering and Otsu's thresholding and the third method is Gaussian Mixture Method based segmentation. The experimental results show that Gaussian Mixture Model Method gives the best segmentation accuracy for bright-field microscopy and 10x magnification gives the best results.

Keywords: Wastewater, Activated Sludge, Image Segmentation, Image Analysis, Flocs

1. Introduction

The activated sludge (AS) process is commonly used in wastewater treatment. Whereas wastewater treatment is used to remove contaminants and pollutants from the hazardous wastewater so that this water can be returned to the water cycle. AS process is used to treat domestic sewerage water as well as industrial

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A study of 100kWp PV Plant Output Power Forecasting: A case study

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Abstract—Nowadays solar energy penetration in the local grids is increasing more; this may result in a reduction in reliability, so it requires the future power generation forecasts to improve the grid reliability and to make the grid smarter. This can be possible with Data Analysis: here large volume of time series data are analyzed in python using AI/ML techniques. Tis paper has implemented a DNN (Deep Neural Network) technique using LSTM networks for forecasting the PV Power Generation. For this, the previously recorded generation data of 100kWp Solar Power Plant for past two years (720 day wise data samples) are considered and also tested on 220 hourly data samples for predicting monthly and day ahead power generation. This time-series data processed through the LSTM Networks for forecasting monthly and hourly PV generation. These results are compared with the other forecasting models viz. ARIMA, SARIMA, RNN and fbProphet and observed that LSTM and Prophet are giving better forecasting results. Root Mean Square Error (RMSE) value and the plant's Capacity Utilization Factor (CUF) was calculated. This study shows that the LSTM networks are more accurate for forecasting the time series data.

Keywords— Solar Power Generation, Time series forecasting, Deep Neural Network, LSTM, RMSE, RNN, SARIMA, Prophet.

I. INTRODUCTION

The Govt. of India has taken initiatives to setup solar energy generation projects under Ministry of New and Renewable Energy (MNRE) to supply electricity at low cost and to reach remote areas and also to reduce dependency on conventional sources of energy[1]. Currently solar energy has an installed capacity in India reached 35 GW in June 2020 and targeted 100 GW by 2022. As a part of National Solar Mission, a 100kWp Roof –top grid Connected solar power plant is installed at GNDEC, Bidar Karnataka.

High penetration of PV power generation in the local grids yields power disturbances and causes reduction in reliability discussed in the paper "Solar Photovoltaic (PV) Grid Integration Issues".

"https://www.ijmtst.com/documents/105IJMTST020735.pdf"

Nonetheless PV power generation is not constant it changes rapidly with climate conditions results in grid integration issues to avoid this accurate irradiance information is required for power generation balance between utility and grid [2] [3]. Thus for optimal operation of PV based grids an accurate forecast model of day-ahead solar power is essential and discussed in [4][5]. Various PV power forecasting Methods are discussed in [6][7][8], recurrent approximated predictive neural networks discussed in the paper titled "Prominent smart grid measurements by RAP-NN to warrant the reliability of the PV system" to measure PV power output values is given in the link

"https://www.tandfonline.com/doi/full/10.1080/15567036.2019.1672836".

In this study we have chosen historical PV power generation data as inputs this, sequential time series data has processed through the Deep Recurrent Neural Networks for predicting the accurate PV power generation. Nowadays Deep learning approach is becoming popular due to its nonlinear representation and generalization capabilities on large data sets. The Deep Neural Networks possesses high training efficiency as large data can be handled using mini –batch gradient descent algorithm [9]. In[10], proposed deep learning based wavelet decomposition, convolutional neural networks (CNN) and LSTM network model for solar irradiance forecasting. In [11], LSTM (Long Short Term Memory) networks used for sequential data analysis. Deep learning technology is best suitable method for PV power forecasting. In this case study we implemented deep learning method using long short term memory (LSTM) networks for predicting PV power generation based on previously available time series data, collected from 100kWp PV Plant situated at GNDEC, Bidar and the test results, forecast values are validated and compared with the other forecasting models viz. ARIMA, SARIMA,RNN-LSTM and fbProphet.

A. Related Researches

Xw'egnon Ghislain Agoua et al. (2018) [4] presented a technique to forecast output power of a photovoltaic plant for a short duration up to 6 hours based on spatio temporal information. This method uses DG plants as sensors and makes the use of spatio temporal dependencies to improve forecasts.

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Chapter - 3

Apple Disease Identification and Classification Based on Deep Learning Model

Mukesh Kumar Tripathi and Dr. Dhananjay D. Maktedar

Abstract

Throughout the year's few work has been carry out for vision-based Apple disease framework. Mainly apple disease recognition includes two issues: one is infection identification and another is disease classification. Because of advancement of vision-based innovation we got better framework for this issue. The datasets are mainly grouped into four categories i.e. normal, rot, blotch, scab, the last three being the three major kind of defects found in apples. The aim is to distinguish these defected apples from the normal ones. In this chapter, we propose an Alex net and VGG-16 based deep learning model for classification of disease in all categories of apple. The performance of Alex-Net model 95.56 percentage where as VGG-16 produce 94 percentage accuracy rate. In both model highest classification accuracy has been produce for the rot disease apple category.

Keyword: apple, disease recognition, deep learning, training, transfer learning

1. Introduction

Apple is a common but nutritious food item, a doctor always advices that to a person to be healthy. It is majorly produced by Himachal Pradesh and Jammu & Kashmir for the country. With the high volume produced it gets obvious that some part of it is infected, some might be inconsumable maybe be because of the fertilizers used in cultivation or different types of worms found in the soil. If the farmer that grows it or the consumer buying it just wants to pick the uninfected ones, then it would get time taking due to the big quantity produced. Sometimes one might have a defected one in hand but is unable to recognize it, and it can be for any product just not apple.

Classification framework is as yet a significant field in the computer vision to accomplish near human degrees of acknowledgment. It is basic to screen the organic product's wellbeing and to distinguish the sicknesses

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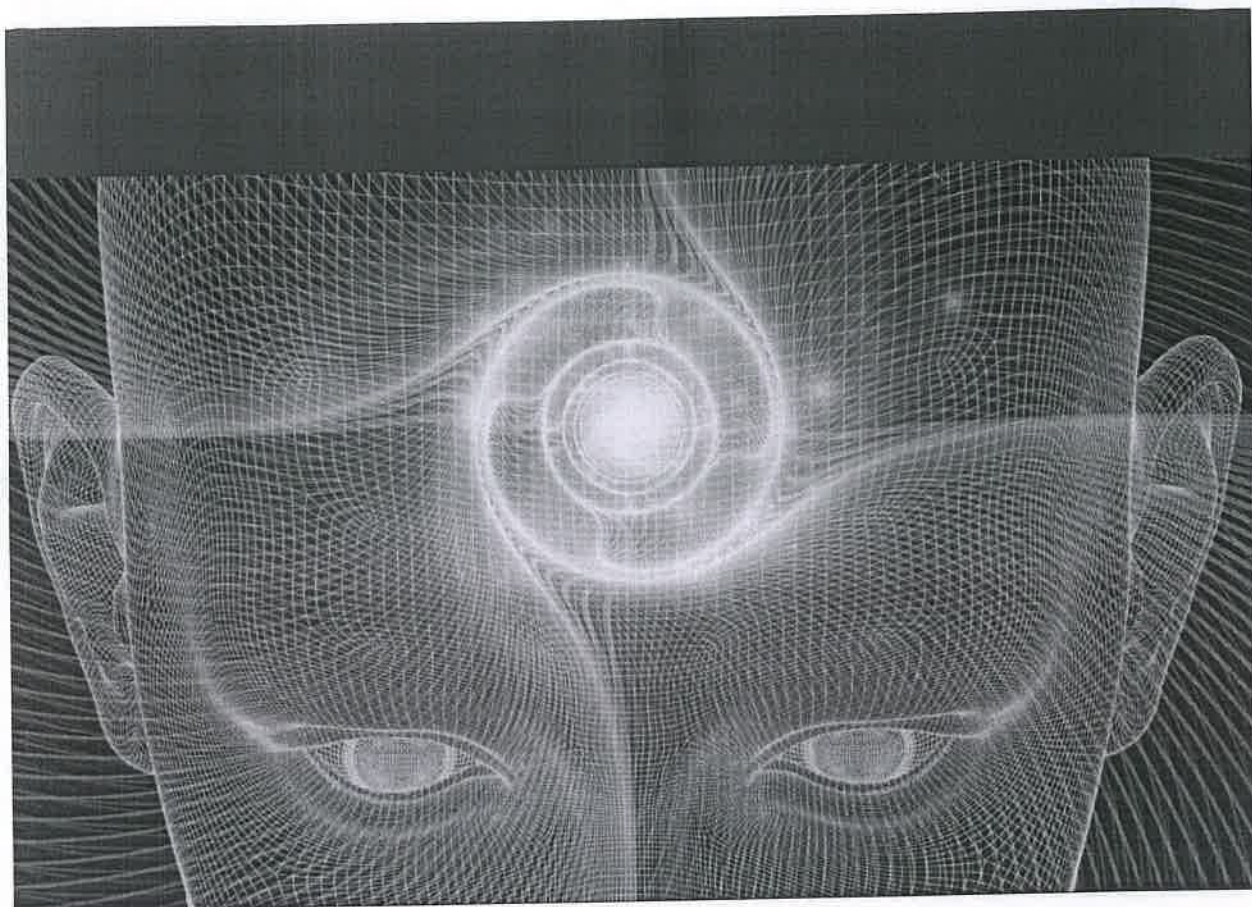
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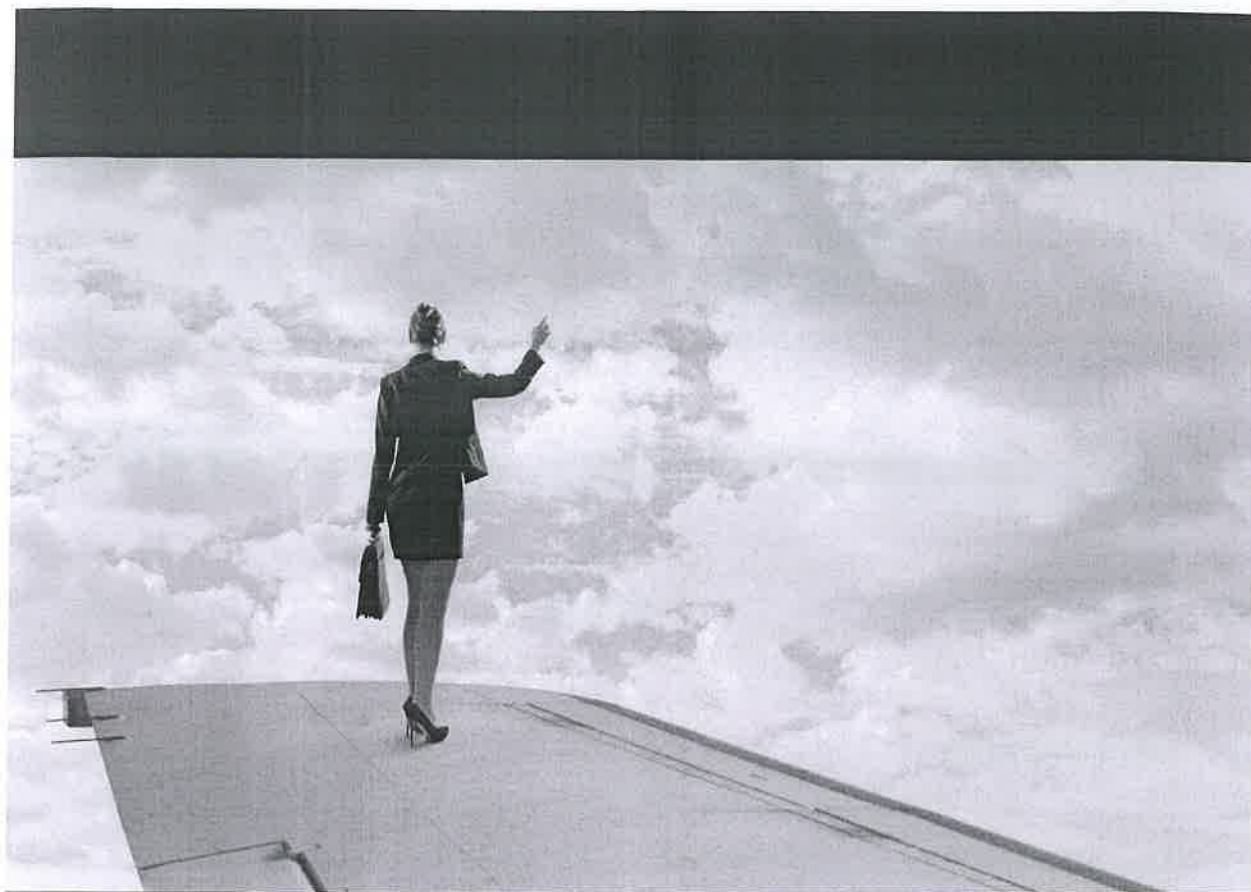
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MR Image Edge Detection Using Morphological Algorithm

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Effect of electrode materials on the degradation of palm oil mill effluent by electro-oxidation process

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Abstract. In the recent decades, Malaysia has been known as the one of the palm oil producers and exporters. The increasing of the production and demand of palm oil tends to increase the Palm Oil Mill Effluent (POME). Undeniably, the conventional biological treatment has been implemented to reduce the organic matters but insufficient to satisfy the discharge standard by the local authority. Consequently, the biological treated POME has to be treated further to meet the stringent discharge standard. Hence, an advanced oxidation processes (AOPs), electro-oxidation process (EOP) has been applied to treat further the biologically treated POME. There are two stages in this study, EOP carried on with catalyst and electrode (Al and Fe). Therefore, the performance of EOP is evaluated by investigating the removal efficiency on the organic parameters like COD, colour, suspended solid and NH_3-N. The operational parameters are the pH adjustment (pH 3, 5, 7 and 9), contact time ranging from 0 to 60 min and the dosage of catalyst (H_2O_2 and TiO_2). The highest degradation of the parameters was obtained under the most acidic solution pH 3, with addition of TiO_2 by using Al electrode. The percentages of removal are 96.58 % of colour, 98.74 % of SS and 84.85 % of COD.

1. Introduction

Palm oil is the largest produced and traded vegetable oil in the global oil market. Malaysia produced 27 % out of 72.08 million tonnes of the total palm oil in year 2018. On the other hand, it will tend to increase of the Palm Oil Mill Effluent (POME). POME is an incurable non-toxic wastewater which a concentrate dark brownish slurry. It consists of 95 % water, 4 % oil and 30-70 % solid material [1]. The temperature of the POME discharge normally around 80 to 90 ^{0}C, which mixed with water, oil and suspended solid composition [2]. Also, POME contains residual oil so that it cannot be easily separated using conventional gravity-based treatment.

Wastewater like POME is needed to be treated before discharge to the environment which conform the standard limit of Department of Environmental (DOE) Malaysia. Normally, conventional biological treatments were applied to treat the POME in Malaysia such as oxidation pond with aerobic and anaerobic. However, it was insufficient to reach the standard limit due to the remaining of the non-biodegradable organics which are metabolized and degraded slowly.

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Optimization of Anthraquinone Dye Wastewater Treatment using Ozone in the Presence of Persulfate Ion in a Semi-batch Reactor

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Abstract. The degradation of anthraquinone dye Reactive Blue 19 by using O_3 and $O_3 / S_2O_8^{2-}$ in the advanced oxidation processes is studied to investigate the performance of these two systems. The response surface method with a Box-behnken Design was successfully applied to identify the relationship between operating variables such as initial concentration, $S_2O_8^{2-}$ dosage and contact time in order to determine the optimum operating condition. The quadratic model for the percentage COD removal (response) proved to be significant for the degradation of the dye. The COD removal efficiency under Box-behnken Design and experimental test were found to be 96.2% and 83.9% under the optimum conditions. Furthermore, the result obtained showed that the $O_3 / S_2O_8^{2-}$ system is more effective than the O_3 only in treating the Reactive Blue 19.

1. Introduction

In recent year, due to the development in many industries such as light and heavy industries, it brings the higher potential effect to the environment. Even though, these industries can give the benefits to the economy around the world, but the creation of the pollutant from these industries will produce the large amount of waste that harmful to human and environment. Industrial wastewater such as textile industries will bring the higher potential to the water pollution due to their development in industries. It is because the dyes use in industrial wastewater is very extensive and these industrial become the largest contributor to the industrial effluent. More than 11% of dyes lost in effluent during manufacturing and application processes from the 450,000 tons of organic dyes that annually produced by the worldwide [1]. Anthraquinone dye is one of the examples of dyes that have been used widely especially in the textile industry. As the decolorization anthraquinone dye is one of the serious problems that give a big effect to the environment, this issue has gotten much attention due to their recalcitrant nature [2]. Due to longer time needed of removing dye residue from the textile wastewater by conventional wastewater treatment methods such as carbon adsorptions, coagulation, advanced oxidation processes (AOPs) become the most suitable procedures to treat textile wastewater containing

Chapter 43
Optimization of Serviceability of Mobile Communication Towers Under Capital Constraints

Pankaj Preet Singh Dhaliwal, Mahendra Kumar, and Veerendra Dakulagi

Abstract Mobile communication towers are important component of mobile communication system for civil and military applications. The major part of technical equipment of mobile communication system is concentrated on these towers. These towers have geographical separation and they are normally unmanned. In remote areas especially away from towns the alternate routes for communication in the system may not be available. Therefore high degree of serviceability of these towers is very essential. This can be ensured by having inbuilt reliability of equipment, easy fault finding, availability of repair facility, spares required for repairs and technical competence. All these factors require capital which is always a constraint. Total system is required to be optimized for desired serviceability of towers with capital constraints.

43.1 Introduction

Mobile communication in an area is provided to customers through mobile communication grid. A typical grid is shown in Fig. 43.1. The mobile communication towers are provided at various sites. Towers may be of various types [1–4].

Basic Towers: These towers are basically meant for providing communication to customers around within a specified distance. The equipment on these towers will be transmitter, receiver, antennas and power supply units (PSU). Transmitter and receiver have multi-channel facilities [5].

Control Towers: Control towers are more versatile and in addition to transmitting and receiving, they have got facility for routing and providing connectivity to many towers. They are equipped with additional controlling and rerouting circuits.

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7 Investigation of the Efficacy of Acupuncture Using Electromyographic Signals

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CONTENTS

7.1 INTRODUCTION

Acupuncture is an ancient therapeutic modality which has been practiced in China since thousands of years ago. According to traditional Chinese medicine (TCM), a form of interior bodily energy, which has been vaguely interpreted as *qi* in the literature, is generated in the internal organs and systems [1–3]. The *qi* is carried by the breath or air and circulates throughout the entire body, forming intricate interwoven paths known as the meridian system or *ching-lo* [1]. Physically, the meridians are perceived to be made up of groups of orderly arranged electrically polarized water molecules, which form water clusters with permanent electric dipole moment [2]. Acupuncture treatment is merely one of the possible therapies which manipulate the *qi* as it circulates the meridians to achieve curative effects [1]. The other examples

Use of Camel Model: Comparative Analysis of Financial Performance of Selected District Cooperative Central Banks in Karnataka State

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ABSTRACT

Cooperative Banking sector is one of the fastest growing sectors in India. Evaluating Indian Cooperative banking sector is challenging task. There are so many factors, which need to be taken care while differentiating good banks from bad ones.

An evaluation financial performance of the Cooperative banks is essential to fight through the difficulties and inefficiencies faced by the Cooperative banking sector.

In this study, an effort has been made to evaluate the financial performance of the two major banks operating in Karnataka. This evaluation has been done by using CAMEL Parameters, the latest model of financial analysis. The present study analyses the performance of selected District central cooperative banks in Karnataka State. With the study period of 2014-15 to 2018-19 the performance of two District Central Cooperative Banks, Bidar District cooperative central bank and Raichur District cooperative central bank are analyzed based on capital adequacy, assets quality, management efficiency, earning capacity and liquidity management of banks.

KEYWORDS: CAMEL Rating Model, Capital adequacy, Asset quality, Management, Earning and Liquidity and Sensitivity, Etc,.

Introduction

CAMEL model of rating was first developed in the 1970s by the three federal banking supervisors of the U.S (the Federal Reserve, the FDIC and the OCC) as part of the regulators' "Uniform Financial Institutions Rating System", to provide a convenient summary of bank condition at the time of its on-site examination. The banks were judged on five different components under the acronym C-A-M-E-L:

C – Capital Adequacy

A – Asset Quality

M – Management Soundness

E – Earnings Capacity and

L – Liquidity

The banks received a score of '1' through '5' for each component of CAMEL and a final CAMEL rating representing the composite total of the component CAMEL scores as a measure of the bank's overall condition.

CAMEL FRAMEWORK and MAJOR RATIOS

CAMELS: Basically a ratio-based model for evaluating the performance of banks.

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Removal of Acid Violet 49 and Acid Red 88 dyes from Aqueous Solutions using Advanced Oxidation Process

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Abstract

Dyes used in various industries are stable, difficult to degrade and carcinogenic in nature. Discharge of effluents containing unexhausted dyes affect aquatic and human chain. Treatment of effluents hence gains utmost priority before its disposal into water streams. In the present study, removal of two acid dyes: Acid Violet 49 (AV49) and Acid Red 88 (AR88) from aqueous solutions using Fenton's process are conducted. Factors influencing dyes removal efficiency were investigated. It was observed that maximum AV49 dye removal efficiency of 98.35% was achieved when solution pH, H_2O_2, and Fe^{2+} were 3, 0.005 mol, and 0.0005 mol, respectively for 100 mg/L dye solution. Whereas for 200 mg/L AV49 dye, the maximum dye removal efficiency of 97.25% was obtained with solution pH, H_2O_2, and Fe^{2+} were 3, 0.01 mol, and 0.001 mol, respectively. The optimum conditions for 100 mg/L AR88 dye were: solution pH = 3, H_2O_2 = 0.006 mol, Fe^{2+} = 0.0005 mol, and dye removal efficiency, 97.30%. Similarly, for 200 mg/L, the dye removal efficiency of 96.50% was achieved with solution pH = 3, H_2O_2 = 0.012 mol, and Fe^{2+} = 0.001 mol. This study showed high removal efficiency of AV49 and AR88 from aqueous solutions using Fenton's reagents.
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Keywords: Fenton; effluent; Acid Violet; Acid Red

1. Introduction

The manufacturing sector like leather, cosmetic, textile, rubber, food treatment, pharmaceutical, paper industry, printing etc. use variety of dyes [1]. Large quantities of freshwater get contaminated with unexhausted dyes and other toxic components. Discharging of effluents containing unexhausted dyes into water bodies affect the aquatic and human life [2-5]. Dyes used in process industries are difficult to treat because of their complex aromatic

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Modeling and Analysis of Energy Efficient Media Access Control Protocols for Wireless Sensor Networks Using OMNET++

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Abstract. There are relatively few Media Access control (MAC) to display the sorted out and available remote sensor show usages, which remain close-by IEEE 802.15.4 models. This Scenario contains two Steps. To a restricted degree 1, the 3 sensor framework MAC shows with three model preoccupations of a remote sensor architecture. Somewhat, we look at the three models that utilizes the estimation systems. The simulation is performed by using the simulator OMNET++, The experimentations are also done for Wireless Sensor Networks. Then the results show the expected improvements in our approach when compared to the standard IEEE 802.15.4 in the MAC layer.

Keywords: INET · XMAC · LMAC · BMAC · NED · SMAC

1 Introduction

1.1 Representation of the MAC Protocols

There are two principal classes of MAC shows for WSNs, according to how the MAC supervises when certain centers can confer on the channel: Time-division various passageway (TDMA) based: These shows distribute particular timetable opening to center points. Center points can send messages just in their accessibility, as such clearing out clash. Occurrences of these sorts of MAC shows fuse LMAC, TRAMA, etc. Carrier sense different access (CSMA) based: These shows use transporter recognizing and back offs to avoid impacts, correspondingly to IEEE 802.11. Points of reference join B-MAC, SMAC, TMAC, X-MAC [1]. This element demonstrates the WSN MAC shows available in INET: B-MAC, LMAC and X-MAC. The going with portions details these shows rapidly.

1.1.1 B-MAC

B-MAC (short for Berkeley MAC) [3] is an extensively used WSN MAC show; it is a bit of TinyOS. It uses low-control tuning in (LPL) to confine control use on account of latent tuning in. Center points have a rest period, after which they wake up and sense the vehicle for presentations (clear channel assessment - CCA.) If none is perceived, the centers come back to rest. If there is a preamble, the center points stay alert and get the data packet after the introduction. If a center point needs to transmit something

Modified Adaptive Beamforming Algorithms for 4G-LTE Smart-Phones

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Abstract Recently, a huge demand for wireless communication, especially for cellular communication, has raised increased expectations. Current and future cellular communications demand wide coverage, high date transmission, very high quality, and spectrum utilization. These expectations will continue to increase because from the last few years use of mobile phones has reached more than one billion worldwide. Hence, effective spectrum utilization is indeed required to meet all these expectations. One of the most promising technologies for future mobile communication is the 'adaptive antenna.' The adaptive antenna is also known as 'smart antenna.' Smart antenna uses adaptive beamforming algorithms to detect and track the mobile user. One of the most commonly used beamforming algorithms is least mean square algorithm. This LMS algorithm is well known for its low complexity, fast tracking, and less prone to numerical errors. It requires only $O(L)$ flops to calculate array weights, where 'L' is the number of antenna elements used. The use of LMS algorithm in wireless communication is widespread. It is used in many fields including cellular communication and surveillances. Standard LMS algorithm requires at least 90 iterations for the satisfactory performance. But this corresponds to almost half cycle of signal of interest (SOI). Due to this, LMS algorithm is not suitable for many wireless communication applications, particularly for 4G LTE, 5G, and beyond. This paper proposes two computationally efficient modified LMS algorithms, namely sign data LMS (SDLMS) and sign error LMS (SELMS). These SDLMS and SELMS

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Chapter 8
Emerging Contaminants in Landfill Leachate and Their Treatment Methods

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ABSTRACT

This chapter presents an overview of emerging contaminants in landfill leachate and their treatment methods. In addition to introducing the conventional contaminants present in the leachate, the chapter also details emerging contaminants such as poly-aromatic hydrocarbons (PAHs) and phthalate acid esters (PAEs) and their concentrations in various environmental matrices. PAHs and PAEs are highly carcinogenic, mutagenic, and teratogenic substances which is why they have attracted a lot of concern in the studies of water, air, and soil pollution. They affect the endocrinal activities in animals and humans, therefore they are known as endocrine disrupting compounds. Drawing on the treatment methods of leachate, the chapter explains physico-chemical, biological, and advanced oxidation processes. The chapter also advances the discussion on their importance and efficiency in the leachate treatment.

Treatment of hazardous waste landfill leachate using Fenton oxidation process

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Abstract. The efficiency of Fenton's oxidation was assessed in this study for hazardous waste landfill leachate treatment. The two major reagents, which are generally employed in Fenton's process are H_2O_2 as oxidizing agent and Fe^{2+} as catalyst. Batch experiments were conducted to determine the effect of experimental conditions viz., reaction time, molar ratio, and Fenton reagent dosages, which are significant parameters that influence the degradation efficiencies of Fenton process were examined. It was found that under the favorable experimental conditions, maximum COD removal was 56.49%. The optimum experimental conditions were pH=3, H_2O_2/Fe^{2+} molar ratio = 3 and reaction time = 150 minutes. The optimal amount of hydrogen peroxide and iron were 0.12 mol/L and 0.04 mol/L respectively. High dosages of H_2O_2 and iron resulted in scavenging effects on OH• radicals and lowered degradation efficiency of organic compounds in the hazardous waste landfill leachate.

1 Introduction

Globally, engineered landfill is practiced as the easiest and most economical method of disposing municipal and hazardous solid waste. Generation of leachate has been encountered as a significant issue in landfilling, which contaminates surface and subsurface water leading to the mortality of aquatic flora and fauna. Leachate is a concentrated wastewater generated by passage of rainwater through various layers of landfill. The various factors on which leachate characteristics depends include site hydrology, landfill age, temperature, landfill depth, refuse composition and moisture content [1].

Reverse osmosis, Biological treatment, chemical oxidation, chemical precipitation, activated carbon adsorption, electrochemical oxidation and ion exchange are the various treatment techniques which have been employed for the removal of recalcitrant organic compounds from landfill leachate [2]. Many researchers have reported the chemical treatment techniques, which uses the oxidizing agents viz; Fenton's process, photo-Fenton, UV-Visible light or ozone for leachate treatment. These treatment methods are collectively known as advanced oxidation processes (AOPs), which employ hydroxyl radicals as a strong oxidation agent. Fenton and associated reactions involve reactions of iron with

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Mineralization of Hazardous Waste Landfill Leachate using Photo-Fenton Process

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Abstract. This study was conducted to evaluate the COD removal efficiency of Photo-Fenton oxidation process. The reagents used in the Photo-Fenton process are catalyst Fe^{2+} and H_2O_2 as oxidizing agent. A 16W UV lamp was used to carry out the experiments. All the experiments were performed in batch mode to investigate the influence of operating conditions viz., Fenton reagents dosage, molar ratio and reaction time. The maximum COD removal observed was 68% under optimum operating conditions. The operating conditions H_2O_2/Fe^{2+} molar ratio = 3 and reaction time = 90 minutes were found to optimum. The dosages of Fenton reagents i.e. hydrogen peroxide and Fe^{2+} were optimum at 0.09 mol/L and 0.03 mol/L respectively.

1 Introduction

There is enormous generation of by-products due to the economic development and change in lifestyle. It's high time to address the problems related to generation of solid waste which ultimately ends up in landfills. Landfilling is the widely adopted waste disposal method around the world [1]. This method of waste disposal gives rise to highly toxic wastewater known as leachate, which is a result of degradation of organic matter mixing with rainwater [2]. The COD to BOD ratio is usually higher in leachate with low biodegradability mostly due to the presence of huge amount of recalcitrant aromatic compounds [3].

The characteristics of leachate vary with the landfill age, site hydrology, landfill depth, temperature, moisture content and composition of refuse. Leachate characteristics and the type and the quantity of chemical reagents used in the treatment method are the major factors affecting the performance of the treatment method. Many researchers have reported the hazardous potential of leachate. Hence, an efficient leachate treatment method is quite essential. Biological treatment methods are effective in the treatment of young leachate with a higher BOD/COD ratio. However they are not efficient in the treatment of mature leachate with high concentrations of recalcitrant compounds [4]. Nevertheless the hydroxyl ions generated by AOPs can oxidize the recalcitrant compound present in the landfill leachate [5]. Primo et al. [6] conducted experiments to investigate the effectiveness of

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