EVALUATION AND DESIGN OF STRUCTURES SUBJECTED TO IMPULSE LOADING

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Abstract

In early years the structural Engineering structures are intended to oppose just for conventional burdens like dead loads, live loads, wind loads, quake loads. Be that as it may, presently a days because of fast advancement in science &technology particularly in material science. The fear monger assaults are expanded quickly. These assaults will indicate drastical consequences for human lives just as structural designing structure. On the off chance that we think again into history the primary realized touchy was dark powder (otherwise called explosive) which was a blend of charcoal, sulfur and saltpeter and consumed brutally.

By the around nineteenth century significant blasts will takes set far and wide. In these the remarkable fear based oppressor assaults are world exchange focus (W.T.C 9/11),Pentagon attack& Alfred P.Murrah building. These assaults will makes the real effect on auxiliary creators to take care about drive load thought while planning a structures. Significantly impact burden is thought about for extraordinary structures like research focuses, military weapon offices building& some significant open organization.

This proposition exhibits the properties of various materials utilized for explosives, figuring of drive load over the structure& dynamic examination of structure in manual strategy and simultaneously with programming too. The structure is intended for without motivation load, with impact load(calculated)& with impact load (chose).

Key words: Impulse load, Pentagon attack, 9/11 attack, Materials of explosive

1.Introduction

A bomb blast inside or around a structure can have cataclysmic effects, harming and obliterating interior or outside segments of the structure. It extinguishes enormous structure,

EXPERIMENTAL STUDY ON TUNED MASS DAMPER IN SEISMIC CONTROLLING VIBRATION OF FRAME STRUCTURES

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ABSTRACT:-Day by day, the numbers of taller and lighter structures are continuously increasing in the construction industries which are flexible and having a very low damping value. Those structures can easily fail under structural vibrations induced by earthquake and wind. Therefore several techniques are available today to minimize the vibration of the structure, out of which concept of using TMD is a newer one. There are large numbers of studies on theoretical investigation of behaviour of buildings with tuned mass dampers under various impacts. However, the experimental studies in this area are quite limited. In this thesis, a one-storey and a two-storey building frame models are developed for shake table experiment under sinusoidal excitation to observe the response of the structure with and without TMD. The TMD is tuned to the structural frequency of the structure keeping the stiffness and damping constant. Various parameters such as frequency ratio, mass ratio, tuning ratio etc. are considered to observe the effectiveness and robustness of the TMD in terms of percentage reduction in amplitude of the structure. Then the responses obtained are validated numerically using finite element method. From the study it is observed that, TMD can be effectively used for vibration control of structures.

I INTRODUCTION

Earthquake is a compartment of structural analysis which involves the computation of the response of a structure subjected to earthquake excitation. This is required for carrying out the structural design, structural assessment and retrofitting of the structures in the regions where earthquakes are prevalent.

Now a day number of tall buildings are going on increasing which are quite flexible and having very low damping value to minimize increasing space problems in urban areas. These structures should be designed to oppose dynamic forces through a combination of strength, flexibility and energy absorption such that it may deform beyond elastic limit when subjected to severe earthquake motion. To make these structures free from earthquake and

Best Keyword Cover Search

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ABSTRACT

Usually the items in a spatial database (e.g., diners/motels) are connected with keyword(s) to demonstrate their associations/organizations/features. A captivating issue known as Closest Keywords look is to request objects, called watchword cover, which together cover a course of action of inquiry catchphrases and have the base between things evacuate. Recently, we watch the extending availability and hugeness of watchword rating in dissent evaluation for the better essential authority. This impels us to investigate a nonexclusive type of Closest Keywords look for called Best Keyword Cover which considers between articles remove and additionally the catchphrase rating of items. The gauge calculation is enlivened by the techniques for Closest Keywords look whichdepends on thoroughly joining items from various inquiry watchwords to produce hopeful catchphrase covers. Right when the amount of request watchwords assembles, the execution of the benchmark figuring drops definitely in view of huge contender catchphrase covers delivered. To assault this disadvantage, this work proposes a substantially more adaptable calculation called catchphrase closest neighbor development (watchword NNE). Stood out from the standard computation, watchword NNE figuring on a very basic level abatements the amount of contender catchphrase covers delivered. The start to finish examination and wide examinations on certifiable informational indexes have defended the prevalence of our watchword NNE calculation.

1. INTRODUCTION

1.1 What is Data Mining?

EXPERIMENTAL STUDY ON BEHAVIOUR OF RUBBER CONCRETE ON PARTIAL REPLACEMENT OF COARSE AGGREGATE

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ABSTRACT:- It has been estimated that around one billion tires are withdrawn from use in the world every year. Waste tire rubber is not easily bio degradable even after a long period of landfill and results in a lot of environmental and health problems. Rubber finds its use in concrete because of its property of energy absorption. A lot of research is being done on the usage of waste rubber as replacement of aggregate and cement in concrete.

But the compressive, split tensile and flexural strengths of concrete have been observed to decrease with the increase of rubber quantity. To compensate this loss of strength, reinforcement is necessary. In tropical regions, natural fibres are abundantly available which when utilized will reduce cost of construction and improve performance. For this study, coconut fibers shall be used as they are freely available in large quantities at cheap costs. The use of coconut fibres will also lead to better management of these waste fibres.

The present experiment is carried out to investigate the fresh and hardened properties of binary blended concrete with 20% of Fly ash, by weight of cement, as partial replacement of cement and replacement of 0%, 5%, 10%, 15% and 20% of sand with Crumb rubber, by volume and addition of Coconut fibres at 0.1%, 0.2% and 0.3%, by weight of cement. Compressive strength of concrete is measured by testing standard cubes (150mm x 150mm x 150mm) at the age of 28 days, split tensile strength of concrete is measured by testing standard cylinders (150mm Ø, 300mm height) at the age of 28 days and impact resistance of concrete is measured by testing beams (100mm x 100mm x 500mm) at the age of 28 days. In maintain the ecological balance thus reducing the consumption of cement and river sand

The compressive strength and split tensile strength shall be evaluated and compared with coconut fiber reinforced concrete and normal concrete.

MODELLING AND SIMULATION OF STEERING GEAR SYSTEM

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Abstract

Rack and pinion steering systems are commonly used due to their simplicity in construction and compactness. The main purpose of this paper is to design and manufacture manual rack and manual pinion steering system according to the requirement of the vehicle for better manoeuvrability. Quantities like turning circle radius, steering ratio, steering effort, etc. are interdependent on each other and therefore there are different design consideration according to the type of vehicle. The comparison of result is shown using tables which will help to design an effective steering for the vehicle. A virtual rack and pinion assembly can be created using software's like CATIA V5 R20 and ANSYS.

1. INTRODUCTION

Steering is the term applied to the collection of components,linkages, etc. which will allow a vessel (ship or Boat) orvehicle to follow the desired course. An exception is the caseof rail transport by which rail tracks combined together withrailroad switches provide steering column, which maycontain universal joints, to allow it to deviate somewhatfrom a straight line.The most conventional steering arrangement is to turn thefront wheels using a hand–operated steering wheel which ispositioned in front of the driver.The steering system acts a significant role of making carconvenient to handle and enhance the vehicle stability. In thepast one hundred years, the development of steering systemhas experienced many stages, and the Steer-by-Wire system(SBW) is the newest technology of steering system forpassenger cars. But the Steer-by-Wire system has not yetaccepted by public consumers and permitted by stateregulations, in consideration of the reliability and safety ofthe system.

The steering system of a vehicle allows the driver to controlthe direction of the vehicle through a system of gears andlinkages that connects the steering wheel with the frontwheels. Steering Systems -

DESIGN AND ANALYSIS OF AN OVER-BRIDGE

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ABSTRACT

In many countries Composite bridges have become a popular solution as they have many advantages because of the steel girders, as they can carry the weight of the formwork and the wet concrete.Thecompetitiveness of composite bridges has been growing in recent years. Composite girders not only have less deflections and economical sections but also reduce the construction time, which is an added advantage for the constructor.

This project gives brief information aboutbridges highlighting composite bridges. Our work includes design of a road over bridge with composite welded steel girder-RCC deck slab for the requirements of atwo-laneheavy traffic road. A detailed design is presented for RCC deck slab, main girders, cross girders, stiffeners, bracings, bearings, connections along with partial analysis using STAAD.VI8. Codes referred were IRC- 22, IRC- 24, IRC- 21, IRC - 6, IRC- 83 and IS- 456 and steel tables for selection of steel sections. The design details and results obtained are included.

1.0 Introduction

A bridge may be a structure, engineered to span physical obstacleslikewater bodies, valleys, or roads to provide passage uponan obstacle.Thespecified passage could also be a road, a railway, pedestrian or a pipeline. Technically it's a structure carrying traffic or theothermovinghundredsoverassociate obstruction.

First bridgeeverseen may be a tree lying on thebanksofawatercourse impressed bythe power of nature, man has engineered bridges by mistreatmentstonew,logs, wood planks, employingstraightforward support and cross beam arrangement. Around 320 B.C, Alexander the good engineered floating bridges for the passage of his army. the amount between two hundred B.C and 260 A.D witnessed the widespread use of stone arches by Romans mistreatment large piers. Themedievalamount bridges were loaded with ornamental and defensive towers, chapels,statues, retailers and dwellings. The Arkadiko Bridge is one in

MODELLING AND SIMULATION OF PISTON

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Abstract:

Piston is the major part of an internal combustion engine which converts the chemical energy of the fuelinto the mechanical energy obtained at the crankshaft through the connecting rod. An internal combustion engineis acted upon by the pressure of the expanding combustion gases in the combustion chamber space at the top of thecylinder. This force then acts downwards through the connecting rod and onto the crankshaft. This paper showsthe use of different material from the existing one in the design and analyzed it for better results. A parametricmodel of piston is modeled using CATIA V5 R20 software and analysis is done by using CAE tools of ANSYS

The piston design is for 150cc 4-stroke petrol engine in which the various dimensions of piston is calculated byanalytical method considering maximum pressure condition and thematerialAluminium alloy 2024-T361 is used inthe design is based on the parameters like Vonmises stress, total deformation andfactor of safety and the weightreduction from the design.

1. INTRODUCTION

A piston is a component of engines. It is the moving component that is contained by a cylinder and is made gastight by piston rings. In an engine, its transfer force fromexpanding gas in the cylinder to the crankshaft via a pistonrod or connecting rod. As a main part in an engine, pistonendures the cyclic gas pressure and the inertial forces at work,and this real working condition may cause the fatigue damageof piston, such as piston skirt wear, piston head or crowncracks and so on. The investigations denote that the greateststress appears on the upper end of the piston and stressconcentration is one of the mainly reason for fatigue failure.

On the other hand, piston over heating-seizure can only occurwhen something burns or scrapes away the oil film that existsbetween the piston and the cylinder wall. Understanding this,it's not hard to visually why oils with exceptionally high

MODELLING AND SIMULATION OF SHOCK ABSORBERS

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Abstract

Shock absorber is a mechanical device designedto smooth out or damp shock impulse, and dissipate kineticenergy. In a vehicle, it reduces the effect of traveling overrough ground, leading to improved ride quality, andincrease in comfort due to substantially reduced amplitudeof disturbances. In this work suspension system is designedand a 3D model is created using CATIA V5 R20. The model isalso changed by changing the thickness of the spring.Structural analysis and modal analysis are done on theshock absorber by varying different spring materials. Springmaterials are Spring Steel, Phosphor bronze, BerylliumCopper and Titanium alloy. To validate the strength of themodel, the structural analysis on the helical spring wasdone. The analysis is done by considering loads, bike weight,and single, double riding. Modal analysis is done todetermine the displacements for different frequencies fornumber of modes. Finally, comparison is done for differentmaterials to verify best material for spring in Shockabsorber. Modelling is done in CATIA and analysis is done inANSYS.

1. INRODUCTION

A shock absorber or damper is a mechanical device designedto smooth out or damp shock impulse, and dissipate kineticenergy.

1.1 Description

Pneumatic and hydraulic shock absorbers commonly take theform of a cylinder with a sliding piston inside. The cylinder isfilled with a fluid (such as hydraulic fluid) or air. This fluid-filled piston/cylinder combination is a dashpot.

1.2 Explanation

The shock absorbers duty is to absorb or dissipate energy. Onedesign consideration, when designing or choosing a shockabsorber, is where that energy will go. In most dashpots, energy is converted to heat inside the viscous fluid. Inhydraulic cylinders, the hydraulic fluid will heat up, while in air cylinders, the hot air is usually exhausted to theatmosphere. In other types of dashpots, such aselectromagnetic ones,

A Review of MPPT Algorithms Employed in Wind Energy Conversion Systems

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Abstract

The depleting nature of fossil fuels and the environmental threats have resulted in the emergence of renewable energy sources (RESs) as alternative and accessible energy resources. Amongst various RESs, wind energy is one of the fastest growing distributed energy resources because of its zero-carbon emission and cost-efficient generation. Although wind energy is plentiful, it is of intermittent nature, i.e., the wind speed is not constant throughout. So, the strategy followed is to harness maximum output power from this variable wind as when it is available, and various algorithms for maximum power operating point tracking (MPPT) have been proposed and implemented successfully. However, choosing an exact MPPT algorithm for a particular application requires a high degree of skill as each algorithm has its pros and cons. This paper presents a review of various MPPT algorithms suggested in the literature.

1. Introduction

The present and future energy crisis and depleting nature of conventional sources have led to an increased interest in power generation through non-conventional sources of energy. Renewables are the fastest-growing source of energy for electricity generation, with an average increase of 2.9% per year from 2012 to 2040. Now, renewable resources have become vital elements for electrification, and some of the primary sources among renewables are the wind, solar, tidal, biomass, etc. Among all renewable sources, wind energy is gaining more support due to its zero-carbon emission and its cost effectiveness, and it is the most rapidly growing means of distributed power generation. According to Global Wind Energy Council report, 54 GW of wind power was added in 2016, bringing total global installed capacity to nearly 487 GW. China, the US, Germany, India and France are the leading users of wind energy.

AN EXPERIMENTAL STUDY ON GEOPOLYMER CONCRETE BY REPLACEMENT OF SAND WITH MANUFACTURED SAND AND ITS DURABILITY

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ABSTRACT:-

Concrete is the largely common material used for construction all over the world. The demand for concrete as a construction material leads to the raise of demand for Portland cement. Geo-polymer is an eco-friendly binding material alternative to ordinary Portland cement. Geo-polymer concrete is obtained by mixing the ingredients such as sodium hydroxide solution, sodium silicate solution (NaOH and Na2SiO3),or potassium hydroxide, potassium silicate solutions (KOH and K2Sio3)fly ash, grounded granulated blast furnace slag(GGBS) and, fine aggregate and coarse aggregate and cured suitably. The blend of sodium hydroxide solution and sodium silicate solution is termed as alkaline liquid. This study presents research deals with Geo-polymer concrete by replacing of fine aggregate material witch using the Msand. Complete 100% replacement of natural sand with Manufactured sand and compare the results witch GPC natural sand and GPC witch Msand and its durability. When exposed to sulphate, and acidic environment and assessment were made with normal Ordinary Portland Cement (OPC) concrete. In total four tests, were conducted to determine acid and sulphate resistance of geo- polymer concrete witch Msand. The tests involved concentration for a period of 30 to 60 days into 5% solution of sodium sulphate, 5% solution of magnesium sulphate, 5% solution of sulphuric acid and 5% solution of phosphoric acid. The progression of weight loss and compressive strength loss were studied. The most major degradation of compressive strength and weight were determined in 5% of acid solution. The minimum strength dissimilarity and weight loss were found in the 5% of sulphate solution. The Ordinary PC concrete deteriorated more in acid as well as in sulphate solution in compared with geo-polymer concrete, thus geo-polymer concrete is more durable than the OPC concrete.

Keywords: Binding material, GPC, Manufactured sand, degradation, deteriorated

STAMP Enabling Privacy-Preserving Location Proofs for Mobile User

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Abstract-

Location-based services are quickly becoming immensely popular. In addition to services based on users' current location, many potential services rely on users' location history, or their spatial-temporal provenance. Malicious users may lie about their spatial-temporal provenance without a carefully designed security system for users to prove their past locations. In this paper, we present the Spatial- Temporal provenance Assurance with Mutual Proofs (STAMP) scheme. STAMP is designed for ad-hoc mobile users generating location proofs for each other in a distributed setting.

Keywords— Stamp, enabling, privacy-preserving location proofs,

1. INTRODUCTION

1.1 GENERAL

The explosive growth of Internet-capable and location aware mobile devices and the surge in social network usage are fostering collaborative information generation and sharing on an unprecedented scale. In particular, IDC believes that total worldwide Smartphone shipments will Reach 659.8 million units in 2012 and will grow at a CAGR of 18.6 percent until 2016.1 almost all smart phones have cellular/ Wi-Fi Internet access and can always acquire their precise locations via pre-installed positioning software. Also owing to the growing popularity of social Networks, it is more and more convenient and motivating for mobile users to share with others their experience with all kinds of points of interests (POIs) such as bars, restaurants, grocery stores, coffee shops, and hotels. Meanwhile, it becomes commonplace for people to perform various spatial POI queries at online location based service providers (LBSPs) such as Google and Yelp.

1.2 OBJECTIVE.

This paper focuses on spatial top-k queries, and the term "spatial" will be omitted hereafter for brevity. We observe two essential drawbacks with current top-k query services. First, individual LBSPs often have very small data sets comprising POI reviews. This would largely affect the usefulness and eventually hinder themore prevalent use of spatial top-k query services

1.3 DESCRIPTION

The data sets at individual LBSPs maynot cover all the Italian restaurants within a

A Survey on Dynamic and Public Auditingwith Fair Arbitration for Cloud Data

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ABSTRACT:

Cloud clients no more extended physically have their information, so how to guarantee thetrustworthiness of their outsourced information turns into a testing assignment. As of late proposed plans, for example,"provable information ownership" and "verifications of retrievability" are intended to address this issue, however theyare intended to review static document information and thusly absence of information elements bolster. Besides, dangermodels in these plans more often than not accept a fair information proprietor and concentrate on recognizing anuntrustworthy cloud specialist organization in spite of the way that customers may likewise make trouble. This paperproposes an open evaluating plan with information progression support and decency mediation of potential debate.Specifically, we outline a list switcher to kill the constraint of list utilization in label calculation in current plots andaccomplish proficient treatment of information progression. To address the decency issue so that no gathering can getout of hand without being distinguished, we additionally amplify existing danger models and receive signature tradethought to configuration reasonable mediation conventions, so that any conceivable question can be genuinely settled.The security examination demonstrates our plan is provably secure, and the execution assessment exhibits the overheadof information elements and question discretion are sensible.

1. INTRODUCTION

Information outsourcing is a key use of distributed computing, which calms cloud clients of the substantial weightof information administration and framework support, and gives quick information get to autonomous of physicalareas. Be that as it may, outsourcing information to the cloud achieves numerous new security dangers. Firstly, in spiteof the intense machines what's more, solid security systems gave by cloud benefit suppliers (CSP), remote informationstill face organize assaults, equipment disappointments and managerial blunders. Besides, CSP may recover capacity ofinfrequently or never got to information, or even

Throughput Aanalysis of Spectrum Sensing in Optimal Cognitive Radio Networks for Primary Users

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ABSTRACT

On this paper, a totally particular prediction primarily based completely cooperative spectrum sensing scheme is investigated at the overall common performance of an electricity harvesting cognitive radio (CR) network. The spectrum sensing scheme is redesigned to defend the exquisite of employer (QoS) of number one purchaser (PU) and to decorate using spectrum holes. The selection approximately the PU spectrum recognition and electricity harvesting (RF and non-RF) of a CR node are based totally on prediction similarly to sensing at individual CR degree. We do not forget simultaneous spectrum sensing and electricity harvesting situation through the incorporation of an energy splitting tool. A CR harvests from non-RF assets if the choices (preference of prediction and preference of spectrum sensing) do no longer in shape or if each the alternatives in shape in favour of the absence of PU. On opposite, it harvests from RF property at the equal time as each the picks in form in favour of the presence of PU. A CR node transmits first-class if every optionendorses the absence of PU. A CR individual opportunistically uses the PU spectrum for its transmission reason underneath a collision constraint. The collision constraint gives a further safety to the QoS of PU on re-arrival of PU. Novel analytical expressions for detection usual performance, harvested power and network throughput are advanced. The effect of prediction and one in each of a kind network parameter alongside side quantity of detection frames, form of cooperative CR person, splitting parameter, collision threat on throughput ordinary common ordinary performance is investigated. Improvement in spectrum reuse and energy penalty at some stage in harvesting is indicated. Effect of noise power estimation at the sensing normal performance is likewise studied.

ENERGY STORAGE SYSTEMS FOR ADVANCED POWER APPLICATIONS

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ABSTRACT:

Electricity plays crucial role in the well-being of humans and is determining factor economic development country. Electricity issues have encouraged researchers to focus on improving power availability and quality along with reliability. This pursuit has increasingly raised intention to integrate renewable energy (RE) into power systems to curb the problem of energy deficiency. However, intermittency in the sources of RE supply coupled with fluctuating changes in demand with respect to time has induced high risk in maintaining system reliability in terms of providing adequate supply to consumers. Whilst an energy storage system (ESS) is not another source of electricity, it is proven to be effective and viable in solving aforementioned issues. Thus, this paper comprehensively reviews the development ESS technologies and discusses benefits and real-life applications these technologies. The concept of reliability in power systems is also explored to provide an improved understanding of this study. Lastly, notable studies that have addressed the reliability impact of ESSs on power systems are discussed. This review paper therefore is expected to provide a critical analysis of ESS developments, as well as recognize their research gaps in terms of reliability studies in modern RE-integrated power networks.

Keywords: energy storage system; power system reliability; renewable energy; smart grid.

1. INTRODUCTION

Sustainable development is currently a crucial issue globally. The most common and simplest definition of sustainable development is "development that meets the needs present without compromising the ability of future generations to meet their own needs". There are many factors that can contribute to achieving sustainable

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Improved Vector Control Strategy for Current Source Converters Connected to Very Weak Grids

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ABSTRACT—

This paper addresses an advanced vector current control for voltage source converter (VSC) connected to weak grid. The proposed control methodology permits high-performance regulation active power and voltage for feasible VSC range of operation. First, the steady state characteristics for power converter connected to very weak system with short circuit ratio (SCR) of 1 are discussed in order to identify the system limits. Then, the conventional vector control (inner loop) and the conventional power/voltage control (outer loop) stability and frequency responses are analyzed. From the analysis of the classic structure, an enhanced outer loop based on a decoupled and gain-scheduling controller is presented and its stability is analyzed. The proposed control is validated by means of dynamic simulations and it is compared with classic vector current control. Simulation results illustrate that the proposed control system could provide promising approach to tackle the challenging problem of VSC in connection with weak AC grids.

1. INTRODUCTION

High voltage direct current (HVDC) systems based on voltage source converters (VSCs) are emerging as main technology to connect remote renewable energy sources (RES), as offshore wind power plants, to existing power systems. VSC-based technology has been used in several HVDC point-to-point and back-to back projects in last 15 years. The connection point between VSC and AC system may be located remotely, leading to low or very low SCR. For HVDC systems based on line commuted converters (LCC) there is limitation minimum required SCR (it is suggested to be higher than 2 in order to avoid instabilities, but such theoretical limit does not exist for VSC based systems. This means that VSC-HVDC converter is capable to interface with any kind of electrical grid and can potentially create grid without synchronous generators (e.g., offshore wind power plants). There are several proposed control techniques in order to inject power to an AC system using VSC. One of the most widely used is the vector current control. The vector current control is based on the control of two independent current components, -axis and -axis in synchronous reference frame (SRF) while synchronization is provided by phase locked

EFFECT OF DIFFERENT DOSAGE OF SELF CURING COMPOUND ON M25 MIX CONCRETE

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ABSTRACT

Today concrete is most broadly utilized development material because of its great compressive quality and toughness. The point of this examination is to ponder the quality and solidness properties of solid utilizing water-dissolvable Polyethylene Glycol as self-curing operator. The capacity of self-curing specialist is to lessen the water dissipation from concrete, and consequently they increment the water maintenance limit of cement contrasted with the expectedly cured cement. The utilization of self-curing admixtures is vital from the perspective that sparing of water is a need regular (for each cubic meter of cement requires 3m3 of water in a development, the majority of which is utilized for curing). In this examination, compressive quality and split rigidity of cement containing self-curing operator is researched and contrasted and those of traditionally cured cement.

In this day and age, concrete is most prevalent and generally utilized material in development part because of its great compressive quality and strength. Contingent on its ease of use the blend extent (bond, fine total, coarse total and water) are set up to deliver plain concrete. Plain solid needs surrounding climate for curing for a base time of 28 days keeping in mind the end goal to accomplish fancied quality. Any laxity in curing will gravely influence the quality and toughness of cement. Self-curing concrete is one of the uncommon cements in relieving inadequate curing because of human carelessness, lack of water in bone-dry regions, detachment of structures in troublesome territories and in regions where the nearness of fluorides in water will severely influence the qualities of cement. The present investigation includes the utilization of shrinkage lessening admixtures like POLYETHYLENE GLYCOL (PEG 400) as interior curing compound and CUREFREE-C as outside curing compound. These curing mixes are utilized as a part of solid which helps in self - curing and aides in better hydration and subsequently great compressive quality. They trap the dampness inside the structure and keep it from dissipation (by making a thin film or by hinder the pores containing water) which typically happens because of the hydration procedure .In the present investigation, the impact of curing mixes on compressive quality and flexural quality is considered. From the past examinations by different specialists, we shift the rate of PEG by weight of bond from 0% to 2% as the measurements of interior curing compound and 0.25% of CUREFREE-C by weight of concrete was settled as the dose of outside curing exacerbate The test outcomes were contemplated both for M25 and M30 blends .The outcomes demonstrates that PEG 400 and CUREFREE-C could help in self- curing by giving strength on par with that of the conventional curing method.

Keywords: Self-curing concrete; Water retention; Relative humidity; Hydration; Poly ethylene glycol- 400

INTRODUCTION

Satisfactory curing is fundamental for cement to acquire basic and sturdiness properties and thusly is a standout amongst the most vital necessities for ideal cement execution. Curing of cement is the procedure of keeping up the correct dampness conditions to advance ideal concrete hydration instantly after arrangement. With inadequate water, the hydration won't continue and the coming about cement is basically influenced, coming up short to give a defensive obstruction against entrance of hurt ful operators. Legitimate curing of cement structures is critical to meet execution and toughness prerequisites. Enough water needs to be available in a solid for the hydration of concrete to occur. In any case, even blend contains enough water, any loss of dampness from the solid will lessen the underlying water bond proportion and result in fragmented hydration of concrete particularly with the blends having low water concrete proportion. This out comes in exceptionally poor nature of cement.

SELF-CURING CONCRETE

The self-curing admixture was given by creator, Dr. Wen-Chen Jau, for the test groups and chunks shrouded in this report. This SCA is secured by Patent No: US 8,016,939 B2. The Patent Publication connected in the Appendix for reference. This report does not assess the substance of the SCA admixture, just the execution when utilized as a part of elite cement. Dr. Wen-Chen was counseled through-out this venture on the measurement rates and utilization of the SCA item. Dosage rates and blend times depended on Dr. Jau's proposals. The SCA admixture is not a substitute or trade for water in the general blend, not at all like some different admixtures.

A few issues created in the preparatory HCC trial bunches. The

Auto Control of Street Light with Solar Tracker using Microcontroller

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Abstract

Energy has become the important factor in our day to day life, in order to save energy and use it wisely and in an efficient way we have come up with this project. In normal case turning on and off the street light would require manual operation which is time consuming, since time is a very important factor. On completion of this project manpower as well as time can be saved and it provides more accurate results than ordinary Street light. A solar tracker system provides solar charging to the battery which can be used when there is shortage of electric energy.

I. INTRODUCTION

Atmega8 is an Atmel AVR microcontroller family this has many features similar to atmega32. Since it has reduced features and capabilities as compare to atmeg32 but has an enough functions to work with it. The function which is not available in atmega8 is the JTAG (Joint Test Action Group) interface but rest functions are the same as atmega32. From the name itself it can be guessed that the atmega8 line has 8kb of flash memory. All the programming codes are stored in on- chip flash and have no offchip program memory [1]. This memory is nonvolatile flash memory the address data location contains input output registers, file registers and SRAM (Static Random Access Memory). The single chip consists of flash, EEPROM and SRAM, so we don't require an external memory in various applications. Atmega8 has 8 Kb of flash memory, 1 Kbyte of internal SRAM and EEPROM of 512 bytes with write or erase cycle with the power un interruption.

The operating voltage of atmega8 is 4.5v to 5.5v the speed grade is 0 to 16MHz, power consumption at 4MHz, 3v, 25°c in active mode is 3.6mA, in idle mode is 1.0mA and

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Highway project contingency planning using a construction threat rating model

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ABSTRACT

The relevance of risk assessment in construction projects has been underlined in previous research, and several methods for responding to possible hazards have been advocated for each phase of the project. The right distribution of contingency monies is one way to react to risk. The goal of this study is to determine the relative relevance of the risk factors mentioned in relation to the cost contingency amounts, as well as how much of an influence they are believed to have on costs and schedules. Survey answers from experts working on highway transportation projects were used to assess the pre-identified risk factors. Regression modeling was utilized to examine how preset cost contingency levels in these projects and the risk ratings given by project experts were related. According to the research, poor constructability evaluations had a large effect on calculating the owner's contingency amount, while adjustments by the owner's request had a substantial impact on a project timeline. Estimating risk-appropriate contingency percentages using these models and techniques might be useful throughout the planning phase of comparable highway building projects.

Author keywords: Risk; Planning; Contingency; Highway; Parametric modeling; Contracting."

1.Introduction and Problem Statement"

Creating contingency plans for specific project components or the entire project base cost is one way to accurately anticipate construction expenses in the future. Some estimates have found it difficult to designate the right amount of cost overrun and unused contingency to reduce project cost overruns at the project completion. If the predetermined distribution of contingency amounts is too low, it might lead to project cost overruns; on the other hand, if it is too high, it would tie up money that could be used for other purposes. Because of this, a more thorough evaluation of project risks is required in order to properly budget for contingencies.

Previous research has shown that transportation professionals are more concerned about the cost and time consequences of risk. Three-tier risk analysis and contingency estimates for highway projects have been developed via a large amount of research, which includes detecting risks, examining hazards qualitatively, identifying probable difficulties and then completing quantitative evaluations of risks. Active risk management is a component of this technique as well.. Risk and uncertainty methodologies used by Reilly and Brown (2004) are used to provide a project cost estimate that gives a range of probable expenditures. Estimated costs are being verified according to the name of this approach (CEVP). The Delphi approach, according to Olumide et al. (2010), was used to produce sliding-scale contingency graphs for three stages of highway construction. Road construction contingency costs may be predicted using a best-fit probability distribution function developed

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Colour Edge Detection Using Intensity and Chromatic Differences in Combination

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Abstract: The term "edge detection" refers to a collection of mathematical techniques for categorising spots in an image when the picture intensity changes abruptly or contains discontinuities. The work attempts to discover a method for identifying colour edges using the colour and intensity information of two new pictures, H-image and T-image, created through colour space transformation, which result in two derivates of H-image and T-image that are then merged to achieve the final edge.

Keywords: Digital Image, Colour Edge Detection

I. INTRODUCTION

There are three basic types of edge detection: one-to-one, neighbourhood, and many-to-one procedures, all of which use the pixel values to change the individual pixels in a picture. If the pixels in the input picture have the same values, a one-to-one procedure may be used to compare the images. A cluster of surrounding pixels around a pixel in the input picture is used to create a new image by use of the Neighborhood procedures.

For colour edge detection, low-level procedures including sharpening, filtering, smoothing, edge detection, and noise reduction are critical. Several image processing applications such as image analysis, segmentation, and identification rely heavily on colour edge detection, and it's time to focus more on processing coloured pictures.

Compared to colour less photos, multi-spectral images include a massive and comprehensive quantity of edge information. The edges frequently resemble the boundaries of an item, and the physical attributes, such as reflectance or light, also vary. Consequently, there will be no discernible border, which is why it is not suitable for certain image processing applications.

Object borders are defined by colour, according to psychological studies of the human visual system, It's important to figure out a way to identify colour edges using two fresh input photos that have been merged using colour and intensity information. In this article, we provide a technique for colour edge identification that makes use of inter-component difference information.

S-images are defined as the significant differences between everything about the two-shading modules in every multi-otherworldly picture F, and elective dim E-images are then produced by weighing S-images and dim power images H. Images of R and G are combined to eliminate the final remaining edges. Additional relationships are discovered by doing quantitative evaluations under various levels of Gaussian turmoil. In terms of adequacy and power, the results of several tests show that our approach outperforms more traditional shading spaces like RGB, YCbCr, and HSV.

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A Multi Level DVR Based on the ORNN Control Scheme for the Mitigation of Power Quality Issues

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Mr. N.Laxman

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Abstract—**India developments towards the Analysis Advancement as the Study leads to produce the nation developed today. In all the many Professions in Analysis Power Program displays the great embark in advancement. The DVR can be used for payment of Voltage practical complications like outstanding sag etc. This paper provides a brand-new manage approach for multilevel inverter-primarily based energetic Voltage Restorer (DVR) for the settlement of harmonics and reactive energy to illuminate the electricity fine (PQ) disruption of distribution software. inside the advised method, artificial bee colony (ABC) formula is sincerely utilized for enhancing the gaining knowledge of remedy of RNN (ORNN) for mitigating the PQ concern. The cautioned version is in reality likened with Fuzzy, ANFIS, RNN. The MATLAB simulation effects comes approximately show the predominance of the suggested technique.**

Keywords— Multilevel Inverter, DVR, PQ, distribution system, ORNN, Harmonic distortion;

I. INTRODUCTION

In latest years electric power systems are included with delicate loads, consequently the demand of voltage stability and high power qualitys supply has increased significantly. The practice of green energy assets such as blowing wind & solar energy power consisting of different power consumer electronics equipment's will bring in PQ inconvenience such as harmonics, voltage sag/outstanding, transients, insert unbalancing, distortion and their option confirmations very much interest in the distribution program [1].

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Cascade Refrigeration System Thermodynamics Using Carbon Dioxide and Ammonia

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ABSTRACT

A cascade refrigeration system's condensing temperature is estimated by analysing the thermodynamics of the system using R744-R717 and a few design parameters. This research examines the effects of ammonia (R717) in a high-temperature circuit and carbon dioxide cooling in a low-temperature circuit (R744). Analysis of the relationships between optimum COP and ideal condensing temperature was carried out using regression analysis. Refrigeration systems may benefit from a variety of optimization techniques.

INTRODUCTION

Since the required evaporation temperature ranges from -40°C to -55°C, a single stage vapour compression refrigeration system cannot be utilised for low temperature applications such as rapid freezing and the storage of frozen food. In cold weather, two-stage or cascade refrigeration systems are often used. Unlike the two-stage refrigeration system, a cascade refrigeration system uses distinct refrigerants for its high and low temperature circuits [1,2]. Two-stage or cascade refrigeration systems may help to meet environmental treaty responsibilities if natural refrigerants are used. In low-temperature, two-stage refrigeration systems, ammonia (R717) is often utilised as a natural refrigerant, despite its several disadvantages. Toxic and toxic smoke is released when it is burnt. Ammonia is a good illustration of this.

As evaporation temperatures fall below -35°C, ammonia systems experience both short-term inefficiency and long-term unreliability due to air seepage. As a result, in order to effectively evaporate the 35°C liquid, a non-toxic and flammable gas with a high positive evaporation pressure should be used.

It is possible to meet all of these requirements by using CO2 and NH3. When evaporating water at temperatures below -35°C, it's recommended to use a thick, ecologically friendly refrigerant gas that won't burn. In a cascade refrigeration system, CO2 and NH3 may be employed to meet these requirements. In a CO2/NH3 cascade refrigeration system, both CO2 and ammonia may be utilised as refrigerants. There are several advantages to using CO2 in large-scale refrigeration systems that operate at very low temperatures. In addition, it doesn't produce hazardous odours or vapours. At low temperatures, cascade systems use far less ammonia than two-stage ammonia refrigeration systems [3,5,7], making them more energy efficient. Cascade refrigeration systems using CO2/NH3 have become more common as a result.

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Hacksaw Machine Design and Construction Using Automation

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ABSTRACT

This project's purpose is to use a Microcontroller to automate a typical power hacksaw machine in order to boost workpiece productivity. To run the automated cutting machine, the user must enter the desired number of pieces to be cut, as well as the desired length for each piece. To be hacked with a knife. Information may be entered into the system through a keypad and LCD display. verify the facts he has given you. The operator does not need to measure the length of the work-piece or insert it into the machine in order to cut it. removing the cuttings from the chuck each time a fresh piece is cut. Upon receipt of the two inputs required, we're ready to proceed with the work-length indicated by the user. Chopping a component requires the use of a chuck. A lot of money has been slashed. The workpiece is fed into the machine through a conveyor. Feeding stops when the correct length has been reached thanks to an IR sensor and a DC motor. A cylinder holds the workpiece in position while it is being cut. An AC motor is used in this process. To cut workpieces, a reciprocating movement is required. A self-weight is attached to the reciprocating mechanism. Using a hacksaw blade penetration mechanism to provide the necessary downward force for the workpiece. The self-weight mechanism will engage an automated limit switch when one piece of material has been cut. Workpieces that have not been cut will be restarted by the microcontroller.

AUTOMATION; POWER HACKSAW; MICROCONTROLLER; RELAY; and LCD

INTRODUCTION

Cutting shafts and tubes out of metal and plastic is easy using power hacksaws. Solid shafts or rods with diameters of more than fifteen millimetre are difficult to cut using a hacksaw. Power hacksaw machines were invented in America in the 1920s to do this difficult and time-consuming task. Automatic machines, such as the one shown in Figure 1, are those that do not need the operator to do any manual labour. In order to cut the workpiece, you must give the reciprocating motion and the downward force. Workpiece lengthening has already been completed once an operator is on site, thus there is no need for further action. The artwork has been taken apart piece by piece.

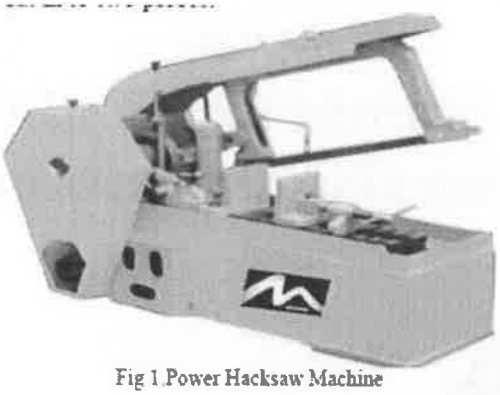

Fig 1 Power Hacksaw Machine

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A Bridgeless Buck-Boost Converter-Fed BLDC Motor Drive with Adjustable Speed

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Abstract—

This paper presents a power factor corrected (PFC)bridgeless (BL) buck–boost converter-fed brushless direct current (BLDC) motor drive as a cost-effective solution for low-power applications. An approach of speed control of the BLDC motor by controlling the dc link voltage of the voltage source inverter (VSI) is used with a single voltage sensor. This facilitates the operation of VSI at fundamental frequency switching by using the electronic commutation of the BLDC motor which offers reduced switching losses. A BL configuration of the buck–boost converter is proposed which offers the elimination of the diode bridge rectifier, thus reducing the conduction losses associated with it. A PFC BL buck–boost converter is designed to operate in discontinuous inductor current mode (DICM) to provide an inherent PFC at ac mains. The performance of the proposed drive is evaluated over a wide range of speed control and varying supply voltages (universal ac mains at 90–265 V) with improved power quality at ac mains. The obtained power quality indices are within the acceptable limits of international power quality standards such as the IEC 61000-3-2. The performance of the proposed drive is simulated in MATLAB/Simulink environment, and the obtained results are validated experimentally on a developed prototype of the drive.

Index Terms—Bridgeless (BL) buck–boost converter, brushless direct current (BLDC) motor, discontinuous inductor current mode (DICM), power factor corrected (PFC), power quality.

I. INTRODUCTION

EFFICIENCY and cost are the major concerns in the development of low-power motor drives targeting household applications such as fans, water pumps, blowers, mixers, etc. [1], [2]. The use of the brushless direct current (BLDC) motor in these applications is becoming very common due to features of high efficiency, high flux density per unit volume, low maintenance requirements, and low electromagnetic-interference problems [1].

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Based on the Radial Power System's Distributed Generation unit's maximum load capacity

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Abstract

Distributed generation (DG) has been rising in distribution networks as a result of technological advancement, energy market liberalisation, and environmental concerns. DNOs get a number of requests each year for the installation of additional generators in their current networks. The distribution networks are expected to undergo a radical change as a result of this circumstance. In order to keep the power system stable and operational at all times, energy and service must be included in the system's overall structure. As part of this article, it was examined how DSM regulations may assist the growth of distributed generation in a particular distribution system, as well as the economic gains that utilities can get by using both distributed resources in tandem. Real-world distribution networks have been used to conduct simulations that demonstrate the impact of DSM intervention on the expansion of distributed generation (DG) and the resulting technical and economic advantages.

Key Words : ***Distributed Generation Unit, Radial Networks, Maximum Cost and Penalty Factor. Energy Savings, Environmental Issues and Demand Side Management.***

Introduction

1.1 DistributedGeneration(DG)

When a client or independent energy producer instals a power production technology at the distribution level of the electric grid, it is known as distributed generation. All on-site generating, such as solar systems serving a home or a cogeneration facility serving an office, is included in this category (Hoff.T., 2007). The definition offered intentionally omits information about the subject matter.

• Power rating and technological advancements are included in this category.

• Effects on the environment

• The area in which the goods will be delivered.

• The method of action

For example, deep and shallow connection costs, as well as protection features, are comparable for all forms of distributed generation. This allows for a more generic examination of numerous aspects.

The most important advantage of a distributed generating system is the guarantee of obtaining electricity from the utility even if your system is not operational. Renewable energy sources like solar and wind, which provide intermittent electricity, and other technologies that may need to be shut down for maintenance, need this. Management of the Demands (DSM)

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Design and Analysis of Crown and Slotted Octagonal Fractal Antennas

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Abstract

The VNA-Network analyzer is used in this study to create a multiband fractal antenna design and simulation. Measurements like return loss are tracked by us. Impedance of the VSWR input in all circumstances. It turns out that the antenna's effective electrical length, space filling characteristic curve, and scaling factor all play an important role as iteration progresses from lower to higher, as well as the victual location, parasitic patch position, patch length and breadth (if multibanding is used).

INTRODUCTION

Fractal antennas have several levels and a space-filling curve. This is the setting in which we're doing our research.

Fractal antenna engineering is a new development because antenna design necessitates a high degree of speed. Antenna field applications of Fractals are described in research papers. These multi-scale objects are called fractals. Natural geometrical characteristics of fractal geometries can be found in study.

Using regular expressions to detect odd activity is crucial in a wide range of commercial applications, including complex event processing, security, fraud detection, and RFID processing

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IOT-BASED ANDROID-CONTROLLED SURVEILLANCE ROBOT

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ABSTRACT

An enormous need exists for security services, notably in residential areas, places of employment, militaries, and on corporate boards of directors. The necessity for security measures to protect people, property, and the borders of nations has always been felt throughout history. Providing surveillance in particularly sensitive locations, terrorist hotspots and other high-risk areas without putting human lives in danger is the purpose of this initiative, which is still in its early stages. In this project, the Raspberry Pi is controlled by an Android Bluetooth application, and a 360-degree night vision camera is utilised for surveillance purposes to capture images. When you use the camera, you can watch a live stream of the film that it gathers, which can also be seen using an Android app, which is available for download. It also features a complete 360-degree rotation, which allows for more extensive monitoring, as well as the ability to store both video and audio from the camera's software. When the spy robot chassis, which is powered by a Raspberry Pi, is interfaced with an Android app, the direction controls are communicated to the chassis by a Bluetooth module, which is connected to the chassis over a Bluetooth connection.

KEY WORDS: Arduino,Raspberrypi,Camera,Surveillancerobot,Bluetooth

1. INTRODUCTION

Mechanical devices that can conduct physical tasks under the direction of a human or with the assistance of artificial intelligence are specified in the area of mechanics. Recent years have seen significant advancements in the production of processors and sensors, which has resulted in the creation of more intelligent robots.

It is undeniably true that one of the most essential uses for robots is the monitoring of people and objects. Every person, place, and object is always under surveillance, which is the process of tracking them down during the course of the day. This is often utilised in military applications where it is critical to keep track of the position of the adversary as well as the boundaries between the two sides of the battlefield. The overall security and stability of a country cannot be achieved without their participation. Human surveillance is a tactic that entails placing persons in or near sensitive areas in order to observe what is taking place. However, this kind of monitoring has its limitations since humans are unable to perform in unsafe or inaccessible environments, rendering the monitoring worthless.

These settings either put a person's life in danger or render him subject to capture by the adversary's soldiers,

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Assessment of Seismic Risk in Existing Concrete Buildings

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ABSTRACT:

Earthquakes have exposed the vulnerability of existing reinforced concrete structures in India. Multi-story buildings in Bhuj, Gujarat, were severely damaged by an earthquake that rocked the city in 2001. Because of this, many Indian RC constructions that rely on gravity loads are now in jeopardy. Seismic adequacy evaluations were required after a number of concrete structures were damaged and destroyed by earlier earthquakes. For an earthquake-prone country like India, a simplified assessment process is required. The capacity of structures to resist earthquakes is crucial for the preservation of life and the minimization of damage. Response Spectrum analysis is used to assess the current black reinforced concrete frame, infill, and soil effect. Response spectrum analysis (RSA) is used to assess this model's performance, a seismic evaluation approach. Depending on the format, it is computed and adapted accordingly. This study examines a novel way to retrofitting. In the evaluation of existing RC buildings for earthquakes, building infill plays a critical role.Upgrades and infill walls are the focus of the meeting

.INTRODUCTION

Among the many natural disasters, earthquakes may do significant damage to man-made buildings. Engineering techniques need to be honed in order to analyse earthquake structures since their forces are random and unexpected. Many of the world's largest earthquakes have occurred in India in the recent century. It is estimated that more than half of the country's land area is at risk of earthquakes. The whole Himalayan belt, including the north-east area, is vulnerable to significant earthquakes with magnitudes of higher than 8.0.

Fig 1: Area expose to seismic risk in Indian Classification

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The Characteristics Of Herbal Fiber Cement Boards For Building Partitions

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Abstract:

This paper uses bamboo fibers, coconut fibers, rice-husks and sugar cane-dregs, respectively, to make natural fiber cement boards for the building partition. Experimental consequences show that the unit weight of natural fiber cement boards are about 1430-1630 kgf/m3. The flexural power of herbal fiber cement forums is eighty% higher than that of normal building substances, except for rice-husks cement board. The duration change in the absorption check is inside the range of 0.09%-zero.16%, and the thermal conductivity with 0.201-0.296 kcal/m·oC·hr indicates a good heat-resistant capability. For B10, C10 and S10 materials after effect check, no cracks, the detachment, pinholes and the break up exist on effect surface, and the indentation diameters are beneath 26mm. besides, 3 cement boards containing 10% natural fibers fulfill the 2nd and 3rd rank of incombustibility standard.

1 INTRODUCTION

Many cement boards have been used as building partitions for over one century (Pamel & Schwarz 1979, Schwarz et al 1983, Schwarz & Simatupang 1984, MacVicar et al 1999). However, the unit weight of cement boards is still high, more than 2000 kgf/m3. In order to adapt the varieties of the functions and the space for high-rise structure, the partitions to separate building space demand to be lightweight, easy to construct fast and assembled simple.

In Taiwan, cement board, calcium silicate board and gypsum board are common used as the materials of building partition. Among them, moisture content for calcium silicate board and gypsum board gets up to 80% and 75%, respectively, due to the humid climate in Taiwan. High humidity made the partition deform and warp easily in use. One of the methods to improve the deformation of building partition affected by humidity is to add some fibers into the partition board. The useless agricultural products like rice-husks, sugar cane-dregs and coconut shell are always thrown away as the waste without any considerations in Taiwan. In fact, these agricultural wastes containing some natural fibers are valuable and can utilize to improve mechanical properties of the materials. This paper selects four natural fibers collected from bamboo, coconut shell, rice-husks and sugar cane-dregs, respectively, to produce natural fiber cement board considered as the building partition. We discuss material properties of natural fiber cement board including water absorption, bulk density, length change induced by absorption of water, impact endurance, fireproof capability and heatresistant capability. The experimental results can be used as a reference in building industry.

2 EXPERIMENTAL PROGRAM

2.1 *Materials*

Four natural fibers, bamboo fiber, coconut fiber, rice-husks and sugar cane-dregs, were added to the cement board, a kind of natural fiber cement board (NFCB). A comparison material is the cement board without adding natural fibers inside. NFCB consists
of cementitious matrix and natural fibers. The constituents of cementitious matrix include: (1) Type I Portland cement (ASTM C150); (2) slag with a specific gravity of 2.89 supplied by China Hi-Ment corporation (Taiwan); (3) river sand having a fineness modulus of 2.68, a specific gravity of 2.63, and an absorption of 2.0 %; and (4) fresh water. To prepare bamboo fibers, we first cut bamboo wood into the pieces with 40mm length, and then use the disintegrator to separate bamboo wood into the fibers, shown in Fig. 1. Sieve analysis for bamboo fibers is shown in Table 1, where dry specific gravity of 0.85, specific gravity of 0.93 with 10-12% moisture content in air and water absorption of 66% after 48 hours'absorption test. Bamboo fibers retaining in sieve 4 are shown in Fig. 2 with 13mm fiber length, passing through sieve 4 and retaining in sieve 8 are shown in Fig. 3 with 15mm fiber length, and retaining in sieve 50 with 5~15mm fiber length are shown in Fig. 4, respectively. Only the sizes of bamboo fiber between sieve 4 and sieve 50 were chosen to manufacture the fiber/cement board here.

Meanwhile, as we know bamboo fiber can retard the hydration of cement. Thereby, we need to overcome this retardant reaction in bamboo/cement boars by using following treatments. First, bamboo fibers were soaked in water, and then dried by heat. After that, bamboo fibers were also immersed in the solution with 20 to 1 of 1% organic titanium solution-tobamboo fiber ratio by weight. Finally, bamboo fibers are ready to use after drying.

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Enhancing Steel Trusses' Structural Performance

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Abstract-

Structure analysis and design software programmes that utilise finite element methods are becoming more popular because they make complex computations easier to understand by enabling users to enter data more easily. No attention is given to whether the idea is viable or whether it is feasible at all. To create skyscrapers, commercial and residential complexes as well as other huge structures, steel is a preferred option. Roof and ceiling joists may be constructed from structural steel for long-term durability. Steel-based constructions, which can handle higher weights as well as stronger winds, may give better protection. Steel may be used as a building material in any construction project. Because time is money, you may be able to save money on the project's budget. Your door will ring in the not-too-distant future to the sound of steel. You'll save time and effort after you've completed your measurements and cutting. There's no need to start again if anything goes wrong. A project's completion date may be pushed up because of the speed at which steel can be processed.

Structural efficiency, steel trusses, and optimization are used in this work. Starting point for discussion. Composite materials have been widely used in the construction of trusses because of their exceptional qualities and inexpensive cost. Because of its better strength and performance, composite trusses have been employed in civil engineering projects. Concrete and steel are the most often used materials in the construction of truss bridges..

Introduction

The design, manufacture, and assembly of structural components have all been carefully investigated. This kind of construction, which is distinct in terms of material properties (such as strength and stiffness), has been investigated since the 18th century [1-3]. Structural composite systems were shown to be affected by prestressed cables. Prestressed steel cables and concrete compression members have been examined in the construction of composite space trusses in a number of recent research. There is much research on the overall performance and characteristics of composites. To put it another way, both of these assertions may be true at once. Composite trusses with pretensioned cables need more investigation, despite the fact that several research have already been published. Background

Most useful is an open-ended time frame. As a result of the fact that certain elements of a structure are superior in quality, this is the case. Our "objectives" include things like the product's weight, feel, and stiffness. If a certain objective characteristic is selected, the quality of a structure may be evaluated in terms of its weight, value, or stiffness. If optimization is limited to a set of specified parameters, no solution will be identified. To begin, there are design restrictions, such as a limited geometrical extension or a shortage of readily available materials.

What constitutes the fundamental constituents? The boundaries of the structure's behaviour show how it reacts to a demanding environment. Limits of dynamic pressure and displacing reactivity, and tensions and tensions might be handled. Far kinematic equilibrium is required for all structures to avoid becoming mechanical devices. A good example is limiting someone's ability to do what they want to accomplish. Structures that fall inside the optimization problem's parameters are prime candidates for implementation. Motivation

For a broad variety of goals, optimization is possible. "Multiple goal optimization" is what I call it (also referred to as multi-criterion or vector optimization). To illustrate this notion, consider Galante's 1996 attempt to cut weight by using the smallest possible number of distinct profiles. Weighted components of objective functions may be combined in multi-goal optimization to create new goals. Exclusive Optima might be created by adjusting the weights. For multi-goal optimization, there are several methods to go about it. It is possible to increase the size, form or topology of a truss in one of three ways: (or arrangement). Before optimising the overall structure's shape, topology, and size, the ideal cross phase area for each structural component must be determined. The three variables may be improved via multi-degree optimization by first optimising the topology (additionally called layered optimization). It is not always feasible to get the greatest overall solution using this method in certain instances. Thus, all three parameters may be optimised concurrently using a genetic algorithm [9]. It's possible that the truss might be made better.

One example is a truss, which is a structure made out of triangles. Friction-free connections aren't often used to attach trusses. Real-world trusses, on the other hand, use welded or screwed bars to make their joints more or less rigid. If the centre of gravity axis has some stiffness in the connections, a friction-free model may still be utilised to explain the problem..

REVIEW OF LITERATURE

Research by Vaibhav B. Chavan et al (1990) During this study, researchers compared the Hollow and the Regular parts. Researchers conducted a study to see how much money might be saved by using Hollow Sections. Various combinations of height and material cross-section are used to compare profiles for a certain span or load. As well as being

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maximizing the pre-engineered building industry

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ABSTRACT:

The use of pre-engineered structures has increased significantly in recent years. The main benefits are speedy construction and high quality control. On the other hand, its economy is mostly unknown. The building's cost is affected by the gable's slope, spans, and bay spacing. Keeping these characteristics in mind while building gable frames for typical loads like those listed above is essential, since they are updated throughout time in this article. Once the amount is known, the most cost-effective option is shown in each case.
To avoid confusion, "pre-engineered building" refers to prefabricated structures that are assembled in a factory.

INTRODUCTION

It is possible to create a steel structure of exceptional quality and accuracy by manufacturing framing members and other components in a factory and then shipping them to the construction site for use as bolts and nuts in the final assembly process. The nut-bolt system eliminates the requirement for on-site welding in traditional steel fabrication. These constructions use hot rolled tapered sections and cold rolled sections (usually "Z" and "C" sections) as per the internal stress requirements, resulting in less steel waste and lighter foundations owing to the reduced weight and self-weight of the structure.. Standard standards for metal building manufacturers Association (MBMA) allow the use of built-up sections with a 3.5 mm thickness, rather than six millimetres required for typical steel sections. The use of high-strength steel (345MPa) and tapered profiles demonstrate that steel may be more effectively used for increased strength. Tapered section theory was established in America by use of the bending moment diagram. At larger bending moment values, resistance increases, while depths decrease. PEB's Moment of inertia (I) varies with depth, which makes it different from ordinary steel sections. When it comes to PEBs, expanding their depth has an exponential power of three, therefore it's a no-brainer to either lessen or boost their strength.

LITARATURE REVIEW

The usage of pre-engineered buildings in industrial construction has just lately started. Smallness and cheap cost contribute to the versatility of this method, which makes it suitable for a wide range of tasks. To supply as much as possible is one of the guiding principles. This design offers many advantages over a conventional steel construction (CSB). Research has shown that CSB constructions are more costly and time-consuming to build than PEB structures, according to findings. Since India is one of the world's fastest-growing economies, infrastructure development is essential. Prefabricated structures have a lot of space to grow in India because of the country's fast population growth. As a result, PEB in India is still a relatively new field. Only a tiny number of academic studies have looked at the use of IS 800 instead of AISC for creating PEBs. A higher level of safety is provided by tougher building requirements in India compared to other countries.

OBJECTIVE

Steel is minimised to the greatest extent possible in PEB buildings. The roof angle, bay spacing, and span length are only few of the aspects to keep in mind (S). Is 875, which provides typical load combinations, is used to evaluate this structure. The least quantity of steel is produced when certain conditions are observed and reported.

SALIENT FEATURES AND IMPORTANT DIMENSIONS

The 7.0m height pre-engineered rigid frame of tapered sections with bolted connections shown in fig

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The objective of several top-tier power waft versions for sending out strength machines

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ABSTRUCT

In-situ deep mixing has gained widespread acceptance as a method of increasing bearing capacity and preventing settlement in soft ground. Cemented soft clays with high water content were studied for their compressive and tensile strength, stiffness, and expansion. This research examines a wide range of factors in order to get a better understanding of the engineering behaviour of cement-stabilized soft clays. As a result, the geotechnical engineering behaviour of stabilised soft clays and the quantity of cementing agent that is required to achieve the appropriate strength development may be explained. The cementation binding strength increases as the wc/c ratio decreases. We discovered that for low wc/c ratios and longer curing durations, stress-strain curves of the treated samples climbed rapidly to peak values, then promptly declined. As wc/c ratio is reduced (or cement content is increased), both C and rise, according to this research, but C climbs and falls with increasing curing time. Increasing the quantity of cement and the curing time resulted in an increase in pre-consolidation pressure and a drop in the compression and swell indexes. In order to improve fine grained soil, the clay-water/cement ratio (wc/c) is the most significant element.
Keywords: It is important to know the properties of soft clays such as stress-strain, unconfined compressive strength, and compressibility.

INTRODUCTION

The low strength and extreme compressibility of Bangladesh's soft clays provide unique challenges to engineering design and construction in various locations of the country. For deep excavation operations in soft clays, proper ground improvement methods are required for suitability and deformation control. It is possible to increase the intrinsic shear strength and lessen the compression of such clay deposits by preloading them with vertical drains (e.g., PVD or sand drain) (Siddiquej et al., 2002). Admixtures such cementing agents may be used to increase the cementation bond level as an alternate method. In this cemented condition of clay, the resistance to compression and subsequent strength growth increases as curing time increases.An in-situ soft clay mix with a cementing agent is not feasible. DMMs have been created over the last three decades in order to create columnar inclusions in the soft ground and so alter the whole soft ground to composite grounds. The Port and Harbour Research Institute in Japan began researching and implementing this technology in 1975. (Nagaraj et al., 1998; Miura et al., 2001). (Hashizume et al., 1998) explored the behaviour of the enhanced ground of the group column type DMM (Probaha et al., 2000). Soil-cement columns were experimentally and statistically investigated to see whether the surrounding clay increased in strength over time (Nagaraj et al., 1998; Miura et al., 2001).Using cementing agents and high water content clays, researchers (Nagaraj et al., 1998) and (Miura et al., 2001) investigated the fundamental factors of strength development. Several studies have examined the laboratory strength and deformation properties of stabilised soft clays at certain clay-water contents (Hashizume et al., 1998) and (Kamaluddin et al, 2002). There are no works in Bangladesh that use the deep mixing approach to enhance the water content of soft clays by distributing cement additive using the wet method. As a result, it is impossible to understand the behaviour of the stabilised clay material under different circumstances by studying it at a certain water content. Engineers need to investigate Bangladeshi soft clays at high water content and utilise them to explain some of the observed engineering behaviour for the deep mixing approach in a well-controlled laboratory environment before applying it to the field.To mimic the conditions of deep mixing, this research examines the stress-strain-strength and compressibility properties of cement stabilised soft clays at high water contents. To better understand the engineering behaviour of cement-treated clays, efforts have been made to determine the essential parameters that influence the strength

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Heavy metal water contamination risks to human health

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Abstract:

Soil, surface, and mechanical assembly water all exhibit varying levels of toxicity due to the presence of a wide range of heavy metals, including lead, arsenic, cadmium, chromium, and mercury. There are several ways in which heavy metals are emitted into the atmosphere, some of which are harmful. With international connections like WHO (2008), USEPA, EUC, EPA, split and national, the centres selected were more than the most remarkable and interactive cutoff. Waste water from rapidly growing mechanical areas, mine tailings and high metal waste products and tainted gas may be counted on to contaminate the water supply. Critical metal destructiveness, which has been connected to a slew of new dangers, has emerged as a major concern. Despite the fact that these metals do not have patents, their detrimental effects on the human body and its proper functions endure..

Introduce

Consumers are frightened to the point of paralysis by the frequent degradations of the dangerous chemicals. Toxins brought in by industrialization, technological change, and the exploitation of common things, agricultural waste, and surrounding squanders are constantly contaminating the land and water-gifted planet. Large metal bags will be the most harmful if these new compounds are not biodegradable due to their predictable character, harmful tendency, and affinity to accumulate in living things. Because of their long-term stability in the environment and their documented potential for causing harm, toxic metals such as arsenic, arsenic, lead, cadmium, and mercury may represent a major concern. Control may be disrupted by metal embryos, gastrointestinal (GI) and cardiovascular (CV) processes, lungs, kidneys, liver, adrenal glands, and bones. The ability of the mind to maintain a clear distinction between reactivity and potentially dangerous metals is severely constrained. People, even those who are not exposed to professional threats, continue to express their metals in their body via a variety of sources, such as fuel or incentives. Dietary rules that let heavy metals stay in the body, such as those seen in the Mediterranean diet, may minimise the risk of metal damage trends (Rajeev Kumar et al., 2014). Another way to say it is: There is a risk that contaminated water and other food items will be burned through in an attempt to reach or bridge a bank of water resources.

The enormous metal invasion referred to in the text is only one of numerous instances from throughout the globe. There may be certain limitations or terminations due to the large number of sources collected via the game plan. Indonesian producers have attempted to cover the most ludicrous number of features, some of which are instantly split down as follows: a For two unique metals, Zn and Cu, there has been a significant drop in lead fixation patterns on creature size formation, with metal fixation patterns in urban surges eliminated.

Similar to fish that live in dirty fights, they have acquired a physiological resistance to metals falling together because to a massive amount of exposure. A frequent source of basic waste is large metals present in water, algae, fish, and other marine foods. Researchers/tension toxicologists are always thinking about the universe of massive metals and their clever affect on people when they come up with this theory. Primary metals have a high level of non-corruption due to their strong negative impacts. Compounds that build up over time are needed to safeguard these essential components from regular wear and strain. Large metals may have disastrous effects on the surrounding environment, even at low concentrations. Due to bioaccumulation, these risks may be mitigated (Widianarko et al., 2000; Ganagaiya et al., 2001). There seems to be a circulation of destructive metals in floods caused by mechanical and urban/regional systems.

Other living things, including humans, are in danger. To maximise the amount of follow-metals, particularly significant metals, in our streams, we must study urbanisation and industrialization that is extricated. (Seema). Compounds that pose a threat to human health may be found in soil and water (Abida et al., 2009).

Deep Metal Water Contamination WellspringSeasonal ingredients are the focus of this article.

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Heavy metal water contamination risks to human health

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Introduce

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Deep Metal Water Contamination WellspringSeasonal ingredients are the focus of this article.

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Design and Analysis of Crown and Slotted Octagonal Fractal Antennas

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Abstract

The VNA-Network analyzer is used in this study to create a multiband fractal antenna design and simulation. Measurements like return loss are tracked by us. Impedance of the VSWR input in all circumstances. It

INTRODUCTION

Fractal antennas have several levels and a space-filling curve. This is the setting in which we're doing our research.

Fractal antenna engineering is a new development because antenna design necessitates a high degree of speed. Antenna field applications of Fractals are described in research papers. These multi-scale objects are called fractals. Natural geometrical characteristics of fractal geometries can be found in study.

Using regular expressions to detect odd activity is crucial in a wide range of commercial applications, including complex event processing, security, fraud detection, and RFID processing where valid pathways for RFID tags are tracked. In the latter case, a pattern is used to determine the window

the available area of a fractal antenna. Due to antenna design's dependence on electrical turns out that the antenna's effective electrical length, space filling characteristic curve, and scaling factor all play an important role as iteration progresses from lower to higher, as well as the victual location, parasitic patch position, patch length and breadth (if multibanding is used).

size, and rows can be processed as usual[2]. Advanced data stream processing is used in complex event detection to identify patterns in the stream of events.

Benoit Mandelbrot devised fractal geometry as a technique to mathematically represent dimensions that aren't full.

In 1975, Benoit Mandelbrot classed this geometry and gave it the title fractal, which means fractured, from the Latin word fractus. Natural modeling, statistical analysis, computer graphics, compression, and Falconer et al. After fractal geometry research was publicly discussed by scientists. The physical processes and mathematical foundations of electromagnetic wave interaction with multilayer antennas or fractal antennas have been the subject of rudimentary research.

All the electrical features are packed into lengths, grouping electrically massive components tightly can be a useful method

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Reducing thermal bridging by using structural lightweight aggregates in construction

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ABSTRACT

An effort is underway in the EU member states to encourage energy efficiency improvements in buildings and fulfill the increasing demand for indoor comfort while also decreasing the energy consumption for space heating and cooling. NWC construction may be replaced with SLWAC construction to improve indoor air quality and reduce energy usage. A structure's energy efficiency may be improved through SLWAC in the end. Concrete mixtures made from SLWAC and NWC have their thermal characteristics examined. With the use of two-dimensional heat transfer software Term and a building energy modeling program Energy Plus, a case study was conducted to examine how SLWAC influences thermal bridge heat losses and energy consumption. It has been shown that SLWAC may enhance building energy efficiency, making it a viable option to NWC.

1.Introduction

Due to technical advancement and rising living standards, the quality of buildings has substantially increased in recent decades. In order to fulfill today's comfort standards, a building's design must take a number of factors into account.

In most cases, the only way to maintain a comfortable inside temperature is to use air conditioning, which accounts for a significant portion of the energy used by buildings.[ ].

40 percent of EU energy use was accounted for by buildings in 2010. (EU) [2,3] (about 30% in Portugal [4]), Residential constructions accounted for over two-thirds of all building energy usage, according to a new report. There was a wide variation in the amount of electricity utilized in EU residential buildings in 2009, mostly due to climatic variances.

Space heating accounts for 60–80 percent of total household energy use [5]. For the most part, these requirements are being met by repairing the country's deteriorating and poor construction. A similar situation should exist in other countries. It is critical to examine this problem from the standpoint of both new construction and historic preservation. Improving a building's thermal envelope and installing energy-efficient equipment are just a few of the methods to cut down on traditional energy use while also helping the environment. Another option is to integrate renewable energy sources.

"In recent years, EU member states have been pressed to adopt the EU Directives on the Energy Performance of Buildings (EPBD). It is a newer version of the original, like Directive 2002/91/EC [7] and the more recent Directive 2010/31/EU [3]." Buildings in the EU can be made more environmentally friendly, as both writers note, and they provide ideas on how to do so.

Buildings and building units must meet minimal requirements for energy efficiency, This must be defined by each member state [3]. That all heat transmission mechanisms and other factors (e.g., heating and air-conditioning systems) are thoroughly examined, passive heating and cooling components) be taken into consideration when assessing compliance with standards (such as shading control).

For the energy efficiency of a building, the envelope is one of the most critical components. As a result, a thorough investigation of conduction heat losses through the building envelope is necessary to identify probable causes of poor thermal behavior and to make the most appropriate design and construction choices.

Thermal bridges and other components of the building envelope are critical to the transfer of heat. Wall/floor/ceiling connections, for example, might introduce thermal bridges into the building envelope because

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ASSISTANCE FOR THE VISIBLY IMPAIRED USING TTS-BASED AI (TEXT TO SPEECH)

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ABSTRACT
Living alone in today's world is essential for every human being, but it becomes a challenge for those who have vision impairments. A person with a visual impairment is unable to detect or feel the outside environment. These people need certain resources in order to operate autonomously. With advancements in technology such as mobile connection and artificial intelligence, it became easier to maintain them in their daily lives. Our study involves using artificial intelligence, image recognition, and navigation to provide a workaround for individuals with visual disabilities. Our project is carried out by building a PI camera on a Raspberry Pi that guides them using TTS, a GPS module, and the use of a smartphone to traverse the site, as well as a sensor to identify obstructions. It can also analyze images and convert them into words, allowing them to communicate more effectively with the rest of the world.

1. INTRODUCTION

Visually impaired people describe a number of problems with existing technologies when it comes to connecting to printed text, including accuracy, mobility, and performance. We provide an intelligent technology that allows the vision impaired to correctly and efficiently read printed information. Citizens would utilize a camera-based help method for reading text documents in the planned experiment. The frame is equipped to estimate the distance of the item based on range in an embedded device developed on the Raspberry Pi board, a on board and an ultrasonic sensor.

DEFINITION OF THE PROBLEM AND A WORK PLAN

The next experiment necessitates the creation of a gadget that collects visual information from the pi monitor on the shoulder brace of a person with a vision impairment. The graphic data is transmitted to the Raspberry Pi microprocessor, which uses artificial intelligence to measure the visual text information in its audio format. Obstacles will be detected using an Ultra-Sonic sensor that works at shoulder height in a range of 8-10 cm. The ability to recognize dangers in close proximity enables the user to flee in their own path. While the API is running, a GPS device installed on the Raspberry Pi board transmits the user's location. When the maintainer sends a request letter, the Wi-Fi on-board transmits the location to the internet server.

3. APPLICATION OF THE METHODOLOGY:

The framework was divided into components, with each module reflecting the system's unique goals. This technique will be simple to incorporate into the device troubleshooting procedure as the company grows. Furthermore, in addition to device maintenance and stability, the components must be combined to form the whole operating system. Project definition, project simulation, material gathering, Python application development, program testing, device integration, and verification are all part of the process.

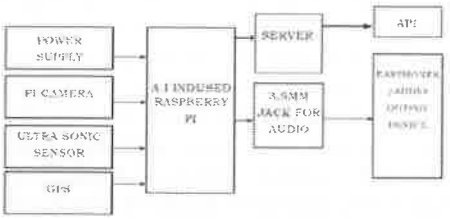

Figure 1: Block Diagram

1. EXPERIMENTAL SETUP

Figure 1 displays the machine block diagram. We also built an experimental setup utilizing different hardware modules. This setup tests the proximity and perception of the setting with A.I and produces an audio performance. We address briefly the hardware modules in the installation in the following segments.

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The prevalence of alcohol use among SA site-based construction workers and the psychometric properties of the Alcohol Use Disorders Identification Test (AUDIT)

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Abstract

Construction workers in SA are regarded a high-risk group in the context of HIV/AIDS. Excessive alcohol use is associated with risky lifestyles and lack of condom use, decreased uptake of HIV testing, and poor adherence to ARV treatment. Excessive alcohol consumption is also associated with depression and illicit drug use. Screening is widely employed in the detection of problematic alcohol consumption; the Alcohol Use Disorders Identification Test (AUDIT) being extensively used for this purpose. This study examines both the psychometric properties of the AUDIT (one-, two-, and three-factor models) and the prevalence of alcohol use among construction workers. A field-administered survey was used to gather data from 496 male workers drawn from 18 construction sites of 7 construction firms. Descriptive statistics, internal consistency, and confirmatory factor analyses were used to analyze the prevalence of alcohol use, as well as the dimensionality, reliability, and construct validity of the AUDIT. Nearly 50% of participants reported never consuming alcohol. Including abstainers, three quarters of participants were classed as low risk (score16-19); and 3.8% at very high risk (score 20+). Notably, of the 250 workers who reported using alcohol, 14.8% may be categorized as being at high-to-very high risk. In essence, 24.8% of construction participants were classed as engaging in hazardous or harmful drinking. Internal consistency of the AUDIT was very good. A 1-factor measurement model was indicated, the output indices presenting satisfactory model fit to the data. All factor loadings were significant. Concurrent validity was demonstrated. Further work is indicated in relation to items 9 and 10 of the AUDIT, as these particular items do not perform as well as the remaining items. The contribution of these two items needs to be examined using item response theory (IRT).

Keywords: Hazardous alcohol consumption; The AUDIT; Construction workers; South Africa

Introduction

Construction workers in South Africa are regarded as a highrisk group in the context of HIV/AIDS [1]. Use of alcohol, the most commonly used substance in South Africa [2], contributes to the rapid spread of HIV [3]. Excessive use of alcohol has been found to be associated with risky lifestyles and lack of condom use [4], decreased uptake of HIV testing [5], and poor adherence to ARV treatment [6]. Excessive alcohol consumption is also associated with depression [7] and illicit drug use [8]. Screening is a widely used method for the detection of problematic alcohol consumption [9]. The Alcohol Use Disorders Identification Test (AUDIT) [10] is extensively used for this purpose [11]. The AUDIT consists of 10 items, covering three domains of at-risk alcohol use, namely, hazardous alcohol use (items 1-3), dependencesymptoms (items 4-6), and harmful alcohol use (items 7-10). The AUDIT responses are each denoted a score in the AUDIT table (e.g., 'Never' = 0, 'less than monthly' = 1, '2-4 times a month' = 2, and so on). The total AUDIT score is determined by adding the scores of all of the responses. The maximum score is 40. Total AUDIT scores lower than 8 indicate low-risk alcohol use. Scores in the range 8-15 indicate medium risk and a hazardous drinking pattern, those in the range 16-19 indicate high-risk and a harmful drinking pattern, whilst those 20+ are indicative of very high risk and a dependent drinking pattern. An assessment of hazardous or harmful drinking is made if the score is 8 or more [12]. Although the AUDIT was initially developed as a one-dimensional measure, evidence relating to the factorial structure is equivocal. Whilst theone-dimensional factorial structure has been supported by some studies [13,14,15], numerous other studies have favored a multidimensional factorial structure [16,17]. For example, Bergman &Källmén [18], employing CFA to compare one-, two-, and threefactor solutions for a Swedish general population, reported the superiority of multiple factor models over a single-factor model. Tetrick [19] and Depaoli et al. [20] emphasize the pivotal role the measurement of occupational health psychology constructs plays in improving our understanding of occupational health and well-being, and its importance in the design, evaluation, and implementation of interventions in improving employees' and organizations' well-being. Given the behavioral associations between the use and abuse of alcohol, risky sexual behaviour, and HIV/AIDS, it is considered necessary to examine both the psychometric properties of the AUDIT as

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IC engine design and analysis on ANSYS

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ABSTRACT

The upper surface of the piston is being monitored with a wok for stresses and temperatures. Pistons in IC engines are very sophisticated and essential to a vehicle's flawless functioning. The most prevalent reasons of piston failure are mechanical and thermal stress. The uneven distribution of temperature and the pressure on the piston head are taken into consideration in the piston analysis. The top surface of the piston might be damaged or cracked as a result of operating temperature since damaged or broken components are so expensive to replace and frequently difficult to remove. An ANSYS TOOL was used to construct this model. Hyper Mesh is used to mesh and clean up the CAD model. The FEA uses RADIOSS. You may use Hyper Works module OptiStructure to assist organise the model.

I.C. Engine and Ansys software are also in the list of terms, along with stress concentrations and FEA.

INTRODUCTION

Temperature and pressure increase when the fuel's energy is released, which causes engines to expand. Pressure and temperature increase rapidly in a short period of time. Part of this energy is converted to mechanical work via a piston in the combustion chamber. Construction begins with a cylinder with the piston crown, pin boss, and skirt all attached. An engine's compression forces are delivered to the crankshaft through the piston pin, connecting rod, and the piston pin boss. There are four basic roles for the piston: power transfer from working gas, sealing and directing the connecting rod linearly, and dissipating heat from combustion.. [1] Pistons must be able to adapt to changing operating conditions, be smooth while running, have little bulk, and have the lowest pollutant emissions and friction losses in order to function properly.. In compliance with conventional machine design and data instructions, this piston was constructed. It was created using ANSYS 16.2's Geometric module, which was utilised to generate the solid model of the piston. The Response Surface Optimization tool was used to fine-tune the piston after it underwent thermal mechanical evaluation (containing both static structural analysis and thermal analysis). This piston is compatible with TVS sooty Pep+ four-stroke SI engines.
The Piston Design Modeling

According to the design manuals and data sheets of each machines, pistons are made using a specified technique and specification. Size is measured using the SI system of units. Piston head pressure, temperature, heat flow, stress and strain, length, diameter, and thickness of the piston and hole are all taken into consideration while constructing a piston. When designing an engine piston, the following aspects should be taken into account: It must be very durable in order to withstand the immense strain.

- In order for the cylinder to endure inertia forces, it must have lightweight and effective oil seals.
- It must have an adequate bearing area in order to avoid excessive wear.
- Distracting background noise shouldn't be a problem while travelling at high speeds.
- For this reason, thermal and mechanical distortions are uncommon.
- A few more things to keep in mind include making sure that the piston pin is supported properly.

Forces

The following forces act on the piston: There is a lot of inertia due to the piston's high-frequency reciprocating action. A certain amount of friction is created between the cylinder walls and the piston rings during the combustion process. When heated, gases expand.

Many types of engines

Otto and Diesel are two of the most used fuel cycles for internal combustion engines. The Otto cycle is named after Nikolaus Otto, the inventor of the four-stroke engine, who died in 1891. A spark is required to ignite the fuel and air combination in a SI engine before it can run. These engines are referred to as compression ignition because the gasoline is automatically ignited as it is pushed into the combustion chamber (CI). This may be

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An IoT-based botnet defence honeypot with machine learning-based detection framework

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Abstract*— With the huge increase of IoT botnet DDoS assaults in recent years, IoT security has now become one of the most worried subjects in the world of network security. A number of security measures have been offered in the field, however they still lack in terms of dealing with newly developing varieties of IoT malware, known as Zero-Day Attacks. In this research, we describe a honeypot-based strategy which leverages machine learning techniques for malware detection. The IoT honeypot produced data is utilized as a dataset for the effective and dynamic training of a machine learning model. The technique might be viewed as a fruitful beginning towards battling Zero-Day DDoS Attacks which now has arisen as an open difficulty in safeguarding IoT from DDoS Attacks.

***Keywords*— Zero-Day DDoS Attack; Machine Learning; IoT Honeypots; IoT Botnets**

INTRODUCTION

There's been an increase in DDoS attacks due to IoT, a network of networked devices without human involvement. [1] The security of Internet of Things (IoT) devices is more vulnerable than that of traditional desktop PCs. Because of this, IoT-based botnet assaults are becoming more common [7]. An IoT network has been infected with malware, resulting in the creation of a botnet, which is a collection of hacked IoT devices [2]. According to a recent study, there are more than 6 billion IoT devices on the earth, which means that fraudsters will not be able to escape undetected. Hundreds of thousands of pieces of malware have been discovered throughout the years, with the majority appearing in 2017 [5].

When a honeypot is used to lure in attackers for the purpose of gathering information about the attacking agent like malware for a DDoS assault, that's exactly what it is: a trap. By imitating a weakness that may be exploited by an attacker, this device can be used to compromise the main server. When it monitors the activity of an attacker and itself, it is able to gather information such as IP addresses, MAC addresses, ports, types of devices targeted, malware executables, and their instructions [27]. Honeypots have been shown to be a valuable tool in the fight against malware and its variations in recent years in the realm of computer security. The 'Deception Toolkit,' created by Fred Cohen in 1998 [28], originally appeared in the late 1990s and was made accessible to the general public and for commercial use in order to combat worms, which are self-replicating programmes.

Honeypots come in a variety of shapes and sizes, making them suitable for a wide range of uses. Depending on how much contact it permits with the attacker, it may be characterised as one of many types. This depends on the quantity of data that has to be gathered. As a result, it is divided into low- and high-interaction honeypots. Honeypots may also be categorised based on the goal they are trying to achieve, such as doing research to learn about potential threats and flaws in the system, or safeguarding the company's assets in real time to enhance overall security, known as Production Honeypots. Because they don't compromise IoT devices, honeypots are a good defence against Zero-Day DDoS Attacks [29].

Traditional honeypots and IoT honeypots are two distinct types of honeypots. As a result of the variety of IoT devices, traditional honeypot designs are homogeneous (mostly x86 and x86-84) whereas IoT honeypot architectures are diverse (mainly ARM).

Using a honeypot architecture, we have been able to capture a number of attempts to implant malware on the IoT device. We may utilise log files as input to the machine learning model we're employing for training purposes by analysing the data. It is possible to train the model by employing both known and undiscovered malware types by using honeypots instead of using a restricted number of datasets [13].

IoT device security risks are detected and predicted utilising relevant machine learning algorithms and methods in our solution. Unsupervised and supervised learning algorithms are the two most common types of algorithms. The assignment of classification labels during the training phase is required for supervised learning in order to predict the labels if the related characteristics are roughly the same. On the other hand, in unsupervised learning [6], labels aren't necessary; instead, classification is based on the similarity of the dataset's characteristics. Because an expert is required to develop the rules and assign the labels, we opted for an unsupervised learning algorithm in our approach to avoid

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To act as an adsorbent in nanomaterials, polymers, and environmentally friendly materials for use in water purification systems.

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abstract

Numerous contaminants have contributed to water pollution, making it one of the most pressing issues facing people all over the world. When it comes to wastewater treatment, there are a variety of methods and materials to choose from. For researchers to develop and assess novel adsorbent materials for wastewater treatment, methods and processes are needed. An important step in the development of systematic protocols and processes for the synthesis of nanomaterials, polymers and green materials as adsorbents utilised in water purification has been taken with the present review. Protocols and processes for the production of nanomaterials, waste-derived material materials and polymer adsorbents are discussed in this paper. A set of water treatment evaluation techniques is also supplied. Researchers and industry employees may use the disclosed processes and procedures as a reference for creating and testing novel water treatment products.

Introduction

When two hydrogen atoms are joined together by an oxygen atom, water is the most important substance in our bodies. Particulate matter, such as fertilisers, waste, pesticides and other human-made chemicals, natural elements and pollutants (such as arsenic and fluorides), and pathogens (such as bacteria, amoebas, viruses and eggs) can all contaminate it. It is also possible that it is contaminated by a variety of pollution sources. It is necessary to eliminate and lower the concentrations of water pollutants present in the water in order to make the water appropriate for its intended purpose. Water treatment is defined as the process of making water suitable for an end-use. The quality of the raw water, the number of requirements that must be met after treatment, and the intended use of the water all play a significant role in the water treatment process.

Water treatment technologies

The general layout of a water treatment facility. Figure 1 depicts the overall layout of a water treatment facility. The first step in wastewater treatment is to collect it at the point of origin and settle it to remove any solids or fine sand. First, a screen separates suspended from floating particulates in the treatment unit. The raw water is then exposed to the elements through aerators, which remove gases from the water. A chemical coagulation and flocculation procedure is then carried out. Coagulants are then added to the water in a coagulant tank. To ensure appropriate mixing, a flash mixer is used. Coagulants, floccants, and pH adjusters are added to the water in high-speed mixing, and the water is stirred to form large flocs, which are then allowed to settle. The floc formed during flocculation is then allowed to settle and be separated from the water. Small particles may also be removed via sedimentation, which can be done with or without coagulants (e.g., ferric chloride or alum added to a secondary sedimentary tank), and by sand filtering, which removes the residual particles from the supernatant after secondary sedimentation. Secondary solids sink to the bottom of the tank and thicken as a result of this phenomenon. Phosphate may be removed from water by adding ferric chloride (FeCl3), alum (Al2(SO4)3•14H2O or lime (CaO or Ca(OH)2), or chemical precipitation (salts). Ammonia stripping (raising the pH to convert ammonium ions into ammonia and then purging ammonia from the wastewater in a process similar to aeration) and biological nitrification/de-nitrification are two methods for removing nitrogen from wastewater, which can be accomplished either chemically or biologically. Advanced treatment may include phosphate and nitrogen removal. The following methods can be used to remove organic compounds from water: I adsorption, in which organic compounds are adsorbed on materials (i.e., the surface of the adsorbent material), (ii) ozonation or chlorination, in which organic compounds are oxidised, and disinfection, e.g., using Cl2 to destroy microorganisms as well as organic impurities, such as pesticides, endocrine disruptors, and pharmaceuticals (Saleh et al., 2019; Tom, 2021). RO units may be added to the system depending on the wastewater. In RO water treatment, ions and undesirable ions and compounds are separated via partly permeable membranes. There are several sorts of pollutants that may be removed from a water supply with RO, such as dissolved and suspended chemicals as well as biological organisms that are dissolved or suspended in water (like bacteria). Water treatment and

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A Multi Level DVR Based on the ORNN Control Scheme for the Mitigation of Power Quality Issues

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***Abstract*—India developments towards the Analysis Advancement as the Study leads to produce the nation developed today. In all the many Professions in Analysis Power Program displays the great embark in advancement. The DVR can be used for payment of Voltage practical complications like outstanding sag etc. This paper provides a brand-new manage approach for multilevel inverter-primarily based energetic Voltage Restorer (DVR) for the settlement of harmonics and reactive energy to illuminate the electricity fine (PQ) disruption of distribution software. inside the advised method, artificial bee colony (ABC) formula is sincerely utilized for enhancing the gaining knowledge of remedy of RNN (ORNN) for mitigating the PQ concern. The cautioned version is in reality likened with Fuzzy, ANFIS, RNN. The MATLAB simulation effects comes approximately show the predominance of the suggested technique.**

Keywords— Multilevel Inverter, DVR, PQ, distribution system, ORNN, Harmonic distortion;

I. INTRODUCTION

In latest years electric power systems are included with delicate loads, consequently the demand of voltage stability and high power qualitys supply has increased significantly. The practice of green energy assets such as blowing wind & solar energy power consisting of different power consumer electronics equipment's will bring in PQ inconvenience such as harmonics, voltage sag/outstanding, transients, insert unbalancing, distortion and their option confirmations very much interest in the distribution program [1]. The voltage sag is definitely distinctive as diminution in voltage from 10% to 90% of source voltage for duration of 10mh to much less than 1 minute and voltage outstanding is definitely unique as intensification in voltage from 110% to 180% of source voltage for duration of 10mt to 1 minute. These PQ problems occur credited to turning actions in the grid mainly. A large inrush current takes place as a consequence to switching on devices or brief circuits in the charged power grid etc. Custom made power gadgets (CPD) provide alternative to reduce Electrical Quality complications. The Distribution Static Compensator (DSTATCOM) makes to make up the Electrical Quality problems of source current, Active Voltage Restorer (DVR) makes to make up the Electrical Quality problems of weight voltage, whereas Specific Power Quality Conditioner (UPQC)

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Exposure assessment of heavy metals in soil near a massive coal-fired cement industry in Nigeria

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ABSTRACT

Industrial and anthropogenic activity-induced mobilisation and dispersion of potentially toxic materials into the atmosphere and human environment have been linked to serious threats to human health. Inductively coupled plasma mass spectrometry was used to determine the concentrations of heavy metals (Cr, Pb, Ni, Cu, Zn, and Mn) in soil samples collected near a coal-fired cement factory in northeast Nigeria. For heavy metal concentrations, except for Cr, mean values were lower than the Canadian soil quality requirements (Cr = 76.44 > 64 mg kg–1, Pb = 19.32 – 70 mg kg – 1, Ni = 29.09 – 50 mg kg–1, Cu = 5.03 - 63 mg kg–1, Zn = 10.15 – 200 mg kg–1). For adults and children, a lifetime exposure risk assessment was made for ingestion, inhalation, and skin contact. The majority of metal pollution in the tested soils was due to human activity, according to statistical analysis. Adults and children are most likely to be exposed through ingestion, according to risk assessments. Children's hand-to-mouth eating practises may be to blame for their increased risk of illness. Non-carcinogenic health impacts were shown to exist in the subpopulations for all of the metals studied, with the exception of Cr, which had the highest potential for non-carcinogenic health effects.

Introduction

Anthropogenic activities have drawn great attention because of the indestructible and non-degradable nature of heavy metals and potentially toxic contaminants, along with their toxicity and effects on human health [1–4]. It has been shown that coal combustion and cement manufacture are major sources of heavy metals in the environment [5–9]. As the principal anthropogenic channels via which humans are exposed to greater levels of metal burdens than the typical background [10,11], they have become indispensable. Soil contamination and environmental pollution have long been related with coal combustion [8,12]. Human health concerns have also been linked to coal combustion [9,10]. Metals linked to coal that may be toxic are mobilised and released into the environment during the combustion process.

Combustion stack and combustion product leaking emissions to the atmosphere [12–17]. Toxic air pollutants in the form of cement dust have long been a problem in cement manufacturing, making it one of the least environmentally friendly processes [18,19]. A huge region is covered by wind and eventually soil deposits these metals after they have been released into the atmosphere. The human population is exposed to soil contaminants by direct ingestion, inhalation, and dermal contact via exposed skin [20–23]. Asthma and lung cancer may be caused by heavy metals that are confined to the tissues and circulatory system of the human body [24–26]. In other cases, they have been linked to organ failures or nervous/endocrine disorders [23,27]. Freedman et al. [28] connected heavy metal pollution to brain injury and nervous system dysfunction, whereas Okedeyi et al. [19] found a relationship between impaired reproduction and child development and heavy metal exposure breakdown. Children's hand-to-mouth eating practises may be a contributing factor to their higher risk of heavy metal exposure [22].

Cement manufacturing giant Ashaka Cement Factory Plc (AshakaCem) in northern Nigeria relies completely on coal to generate electricity. AshakaCem is a major environmental problem because of the combination of dust emissions from cement manufacture and coal burning. Even though the plant has emission control measures in place, the dust filters' collection effectiveness is insufficient to keep gaseous contaminants from seeping into the soil. While the plant employees and the public are constantly exposed to soil contamination, emissions from automobiles and trucks engaged in transportation operations surrounding AshakaCem contributed considerably. Long-term exposure to this substance may have mutagenic, teratogenic, or carcinogenic effects, all of which increase the chance of death [23,29]. Soil samples near AshakaCem have to be tested for the presence of these heavy metals and their potential health effects on humans. Ashaka Cement's metal pollution levels are unknown, despite the fact that several studies have been carried out in other parts of the globe to determine how dangerous these pollutants are to human health. For this purpose, the researchers conducted a pilot study to evaluate soil pollution caused by emissions from the coal-fired AshakaCem and to determine the level of exposure for both children and adults to each of the exposure routes. Results from this study will aid in the development of a quantitative estimate of the likelihood that any of the dangers associated with metal toxins will be realised in diverse populations. The outcomes of this study will aid factory

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EuAsFeO0.85F0.15 superconductivity and magnetic characteristics

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Abstract

EuAsFeO0.85F0.15 with a critical temperature Tc 11K was synthesised in a solid-state synthesis process. In magnetic fields ranging from 0.1 to 140000 Oe, its electric and magnetic characteristics have been studied. Magnetic penetration depths and coherence lengths have been determined by measuring critical magnetic fields Hc1 and Hc2. At low temperatures, the temperature dependency Hc2 (T) shows evident hyperbolic-like behaviour. It was found that compounds doped with rare-earth elements that have tiny atomic radii had higher than average concentrations of Tc and Hc2. The PACS score is 74.70. Ads * Please use the following address for any correspondence: dmitriev@ilt.kharkov.ua. Special properties of rare-earth metals, include superconductivity and magnetism

Introduction

It was first reported in 2008 that LaFeAsO1-xFx was superconducting at a temperature of 26K [1]. Ce [2] and Sm [3] replacements soon boosted the critical temperature Tc to 40-43 K, and even to Tc 52K with Nd and Pr [4,5] substitutions. Another interesting fact about the SmFeAsO1- xFx samples was that their superconducting transition temperature was Tc 55 K [6]. As a result, the new category of chemicals may be classified as high-Tc superconductors. The Tc rise seen in rare-earth REBaCuO systems is quite similar to this instance. Furthermore, band-structure predictions and observations show that the novel compounds have a complex mechanism of pairing (called pnictides). Accordingly, it is clear that the inclusion of Fe and Pr in superconducting compounds confirms this view. For example, the La2O2-xFx and Fe2As2 layers in the new superconductors [1] resemble HTSC topologies. Unlike the CuO2 layers in cuprates, which operate as carriers of electron states near the Fermi surface, the FeAs layers act as carriers of current. Charge carriers are provided by the LaOF layers. These compounds, which include rare-earths like Ce and Pr, have been synthesised recently by a variety of organisations.. It has been discovered that the maximum Tc may be achieved in fluorine-containing compounds (x = 0.1-0.2). Tc is also larger for rare-earth elements with lower atomic radii [3]. The study's purpose was to see whether a rare-earth element with a high atomic radius may reduce the REFeAsO1-xFx compound's critical temperature Tc. That the value and temperature dependency of the Hc2 upper critical magnetic field may be affected by this is also fascinating. A typical superconducting magnet may be used to extend the observation of Hc2 (T) behaviour to lower temperatures if Hc2 is much lower than the published data. The atomic radius of Eu is 0.2023 nm, hence we've picked it as our RE ion. To ensure high Tc, atoms of rare-earths have atomic radii in the range of 0.1755 to 0.1855 nm, with F content of 0.1-0.18, the ideal doping.

Experimental details

For 24 hours at T=11500 C, we synthesisedEuAs, EuF3, Fe and Fe2O3 compounds in an ampoule to produce polycrystalline EuAsFeO0.85F0.15. Additionally, the homogenization process was carried out for 30 hours at the same temperature. The electric resistance of the produced superconductors was studied using the four-probe technique in magnetic fields H up to 14 T on 5x1x1 mm samples cut from tablets. Accurate measurements of magnetic AC susceptibility and DC magnetization were made using a PPMS device.

Figure Captions

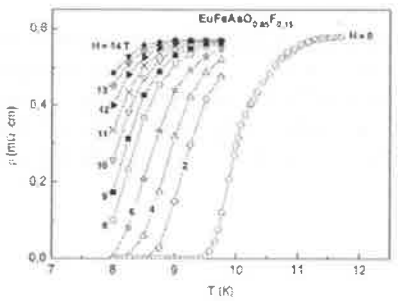

Fig.1. The temperature EuAsFeO0.85F0.15 superconducting resistivity under magnetic fields 0-

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A FLEXIBLE TECHNIQUE FOR IMAGE DOWNSAMPLING USING A GENETIC ALGORITHM AND A DIGITAL CURVELET TRANSFORM

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ABSTRACT

Propelled pictures are used everywhere and are definitely not hard to manage and change in view of the availability of various picture getting ready and adjusting programming. Repeat the image to a lesser extent and change the look of the image. This can be useful at times when the original version of the original will give you a slim version of the film. There are several methods of image downsampling. This sheet uses performance capabilities for a collage based on digital curve transfers and generic algorithms. Genetic Algorithm (GA) is attached by the Digital Curvelet Transform (DCT). Originally DCT The length of the map decreases by using. Using this reduced map, gateways and entry worth are coordinated by the utilization of hereditary estimation. From the appraisal of results, it will when all is said in done be picked that the proposed method is quick and exact.

Catchphrases: Image Downsampling, Genetic Algorithm (GA), Digital Curvelet Transform (DCT), Motion Filter, Soft Thresholding.

1. INTRODUCTION

is a method model to make the mechanized picture tinier by removing the pixels. [1] Usually, automated concealing pictures are addressed by each set by setting express characteristics for (YUVtype) allow accurate luminosity and chromosomes coordinate with the number of bits required for an image acceptable color illustration. This diminishing relies upon high affectability to the human eye of splendid changes than the discoloration changes. In some approaches, some pixels (sometimes called macro pixels) have to be assigned the same Color (chromosomes) for some groups while the thought behind this methodology is to set the individual estimation of the brightness components for each pixel. There are different sample forms depending on the process of underestimating the process and the base plan. Your optical resolution master scan is a accessible image that is a access image that is full of downsampling.

Only by having both professional and access records, the essential game-plan can sway, in any case at a near stature and width they are the actual Proxy. As we know, below-sample a digital image is small MOF changes the pixels by removing the statistical process. Instead, up-maples n pixel by adding the digital image to zoom into a statistical process. Generally, the pattern directly down-sampling and down sampling and divided. Live below-modeling the communication

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Distribution, Pharmacological Properties, and Action Mechanisms of Sesamin: A Systematic Review

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ABSTRACT

The sesamin found in sesame seeds (and other plants) is a kind of lignan that dissolves in fat. The wide range of its pharmacological effects has resulted in a growing amount of interest in it. Antioxidant, anti-inflammatory, anticancer, liver/kidney protective, diabetes/hypertension/atherosclerosis preventative, and other pharmacological properties of sesamin were comprehensively summarized in this work. Sesamin's potential to lower levels of reactive oxygen species (ROS) has been the subject of research into its anti-oxidant effects. And MDA to activate apoptosis and autophagy and prevent the production of pro-inflammatory cytokines (TNF-, IL-1, IL-6, etc.). NF-kB, JNK, p38 MAPK, PI3K/AKT, caspase-3, and p53 are only some of the signaling pathways that may be activated in cancer cells. By Sesamin not only reduces reactive oxygen species (ROS) but it also boosts nitric oxide (NO) biological activities in blood vessels and has positive effects on endothelial function.

Introduction

Sesamin is a naturally occurring lignan that was rst found in Sesamum indicum L. One of the oldest crops, sesamum indicum is nutrient-dense and has been cultivated for thousands of years. Been utilized as a nutritious supplement for a long history. It has liver and kidney replenishment, blood nourishment, and alleviates intestinal dryness. This has been established by prior research. Sesamin is the most vital component for achieving therapeutic in this plant's ejects [1]. Sesamin has been a popular ingredient in modern research hub, and reports of sesamin's pharmacological properties keep piling up. The effects of oxidative stress and inflammation are well-known. Result in several illnesses. It was, however, stated that sesamin anti-inflammatory and antioxidant properties. Potential for expansion antioxidant enzyme activity and decreasing ROS and MDA generation. At the same time, it may prevent the production of pro-inflammatories. Inflammatory cytokines in order to maintain the typical operation of organs such as the liver,

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A Local Metric for Defocus Blur Identification

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Abstract—The challenge of detecting defocus blur in computer vision and digital image is complex and time-consuming. Designing local sharpness metric maps has been a major focus of previous work on defocus blur detection. For defocus blur detection, this research provides a simple but successful solution that relies on the feature learning of several convolutional neural networks (ConvNets). In a supervised way, the ConvNets learn the most locally important aspects of the picture at the super-pixel level. We can automatically derive the local sharpness measure by altering the principal component vector by extracting convolution kernels from the trained neural network structures and using principal component analysis. It is also recommended to use the inherent properties of the hyperbolic tangent function to fine-tune the defocus blur detection result from coarse to fine. Our suggested strategy consistently outperformed earlier state-of-the-art methods in the experiments. Defocus blur, feature learning, local sharpness matrices, ConvNets, and PCA are all terms that may be found in the index.

INTRODUCTION

D The most prevalent cause of EFOCUS blur in digital photographs is an optical imaging system that is out of focus. Imaging systems all have a fixed depth of field (DOF). Distance of focus relates to how far the camera can see around the picture plane. During the picture generation process, when the camera focuses on the object plane, and the backdrop is beyond that plane or beyond the depth of field (DOF) distance, defocus blur develops. Defocus blur is a useful tool in digital photography for narrowing down the scope of a scene's details. In order to draw the viewer's attention and accentuate the primary topic, blurring the foreground and background is a useful technique. As a result, computational image processing and scene interpretation may be hindered by a blurred backdrop. In order to identify a somewhat blurry picture, blur algorithms are used. In computer vision and digital imaging, the automatic identification of blurred picture patches is an important and demanding topic. A blur kernel is often used to suit the original picture while deblurring modern images. Using local measures, the defocused picture may be precisely divided into blurred and clear areas. A lot of effort was spent into creating local sharpness measurements in previous efforts on defocus blur detection. Local metrics may be found using a variety of methods, including the gradient domain feature: Gradient

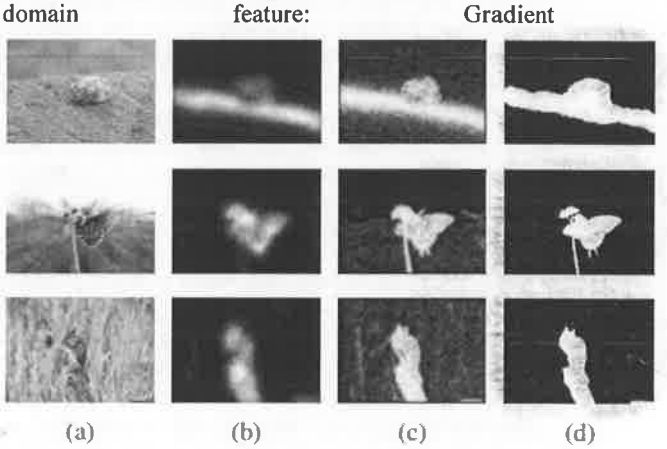

Figure 1 shows an example of the blur detection findings we've presented. (a) Images that have been sent in. For Alireza, the blur detection yields [37]. Images obtained by our suggested approach, with greater intensity values indicating sharper parts. Ground-truth binary maps, with white indicating sharpness and black indicating fuzziness, are shown here. As for the intensity and frequency domains, we have Histogram Span and Kurtosis, as well as Singular Value Decomposition, Linear Discriminant Analysis, and Sparsity. Lastly, we have Power Spectrum and Frequency Spectrum. The detection accuracy, detection time, and difficulty in designing blur detectors are only a few of the drawbacks of some of the suggested blur detection systems. Section II contains the most detailed information. If you don't know anything about computer vision, you can use deep learning to accomplish things like automatically identify shadows, find saliency, or partition a scene based on its semantics. Local metrics for defocus blur detection are easy, convenient, and effective. As a result, in order to identify defocus blur, we'll combine the benefits of ConvNets with a local measure. In this

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Design and Analysis of Crown and Slotted Octagonal Fractal Antennas

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Abstract

The VNA-Network analyzer is used in this study to create a multiband fractal antenna design and simulation. Measurements like return loss are tracked by us. Impedance of the VSWR input in all circumstances. It turns out that the antenna's effective electrical length, space filling characteristic curve, and scaling factor all play an important role as iteration progresses from lower to higher, as well as the victual location, parasitic patch position, patch length and breadth (if multibanding is used).

INTRODUCTION

Fractal antennas have several levels and a space-filling curve. This is the setting in which we're doing our research.

Fractal antenna engineering is a new development because antenna design necessitates a high degree of speed. Antenna field applications of Fractals are described in research papers. These multi-scale objects are called fractals. Natural geometrical characteristics of fractal geometries can be found in study.

Using regular expressions to detect odd activity is crucial in a wide range of commercial applications, including complex event processing, security, fraud detection, and RFID processing where valid pathways for RFID tags are tracked. In the latter case, a pattern is used to determine the window size, and rows can be processed as usual[2]. Advanced data stream processing is used in complex event detection to identify patterns in the stream of events.

Benoit Mandelbrot devised fractal geometry as a technique to mathematically represent dimensions that aren't full.

In 1975, Benoit Mandelbrot classed this geometry and gave it the title fractal, which means fractured, from the Latin word fractus. Natural modeling, statistical analysis, computer graphics, compression, and Falconer et al. After fractal geometry research was publicly discussed by scientists. The physical processes and mathematical foundations of electromagnetic wave interaction with multilayer antennas or fractal antennas have been the subject of rudimentary research.

All the electrical features are packed into the available area of a fractal antenna. Due to antenna design's dependence on electrical lengths, grouping electrically massive components tightly can be a useful method for reducing overall size. By Gianvittorio

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The HVDC Transmission System Review Paper states that

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Abstract

Power transmission could be disrupted more easily with AC (alternating current) than DC in early days of electrical delivery since transformers utilised it (direct current). For industrial and residential clients, high-voltage AC grids may connect previously isolated distribution networks and massive power plants. Many decades after the introduction of high-voltage direct current (HVDC) technology, the first commercially feasible high-voltage direct current link was not created. This study's focus is on India's existing and future high-voltage direct current (HVDC) transmission networks. The article discusses new developments in HVDC transmission and other technologies. This research compares the design, operation, construction, and maintenance of HVDC transmissions to HVAC. HVDC transmission over an AC framework is also analysed in the paper, which includes an economic assessment In this research, the HVDC transmission frameworks in India are examined in detail. Using HVDC frameworks is recommended in the present development of power frameworks, according to the text.

Bipolar transmission, HVDC linkages, and transmission are the focus of this section..

HVDC History:-

During the first year of the world's first HVDC transmission in Miesbach-Munich power transmission, just 1.5 KW of energy was transferred. It was built on the border of Germany between Miesbach and Munich [16,17]. Obviously, the AC system was instantly adopted for the generation, distribution, and so on of electricity. [13] Voltage conversion was simplified by the transformer in an alternating current system. Among a transformer's most distinguishing features are its low power loss and high electrical output. Synchronized three-phase generators are a great alternative to DC generators. As a result, transmission over an AC network is more straightforward than transmission over a DC network. The HVAC system may be used in a broad variety of settings when employing asynchronous grids and long-distance transmissions.

Table 1 below demonstrates the development of HVDC technology throughout time.

Table 1: HVDV Technology Development

He with's mercury-vapour rectifier, which showed up in 1901.

Experiments with thyratrons in America and mercury circular segment valves in Europe before 1940.

First business HVDC transmission, Gotland 1 in Sweden in 1954. • First robust state semiconductor valves in 1970.

First microcomputer-based control gear for HVDC in 1979.

Highest DC transmission voltage (+/- 600 kV) in Itaipú, Brazil, 1984.

First dynamic DC channels for back-best separating execution in 1994.

First Capacitor Commutated Converter (CCC) in Argentina-Brazil interconnection, 1998

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Data Stream Analytics in Real-Time Internet of Things (IoT) Applications: A Scalable Approach

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Abstract*: Analytical tools are being used in a variety of ways by the Internet of Things (IoT). Several applications strive to acquire data from various contexts, which may be homogeneous or heterogeneous, but the work of collecting, processing, storing, and analysing the data that is being collected from diverse environments is still difficult. Big data and untrusted networks make providing security for these things difficult. In the ever-expanding network, there may be various non-trivial problems with data gathering, data-efficient processing, analytics, and security. To achieve the aforementioned outcomes, large-scale sensor deployments are required in each of the examples provided. IoT devices may collect sensitive private information, which raises the problem of privacy exposure when sensors constantly transfer data to the cloud for real-time usage. A two-layer approach or paradigm for evaluating IoT data from numerous applications is proposed in this context. The initial layer serves mostly as a service-oriented interface for ingesting data from various settings. It is up to the second layer to ensure the safety of all the data it is in charge of. Open source components are used to implement the proposed solutions.

***Keywords:* Data, Data Stream, Spark, Analytics, IoT.**

I. INTRODUCTION

Advances in communication technology have made it possible for everyday objects to be equipped with software and hardware components such as microcontrollers and transceivers to provide digital communication between nodes of various networks with the users. This makes the Internet Of Things a part of our daily lives. This is a fast-evolving technology in the context of current wireless telecommunications, with the primary goal of connecting everything on the planet [1]. The Internet of Things (IoT) concept increased the allure and universality of the internet even more. As a result of the development of smart apps, as well as the simplicity with which these applications may be accessed, IoT can be a powerful communication technology. To deliver services to individuals, businesses, government agencies, and other entities, the IoT applications created may make use of large amounts of data and produce a wide range of data streams.

Indeed, the Internet of Things concept uncovers applications in several fields termed heterogeneous domains, such as industrial automation, health care automation, residential automation, and numerous others. [2]. Cloud computing is an advanced computing paradigm that allows users to use a shared resource pool of cloud resources, such as storage, access, processing, and applications, in an on-demand way. As an example, IoT Sensors first gather and transmit their information to gateways which then transmit it to the cloud for storage, processing, and analysis and it then transmits the data to the user on demand. This is an example of cloud computing's integration with IoT and its cloud computing capabilities, such as data retransmission. If data transmission fails at any point, it is retransmitted to the designated recipients until it is successfully delivered. In both academia and business, cloud computing is attracting a lot of interest. Smart initiatives may be enabled by connecting with big data and analytics, which is why many IoT apps may not only focus on controlling various things but also on mining the data acquired from IoT devices. Sensor-equipped conventional protocols like MQTT-Message Queue Telemetry Transport Protocol, XMPP, and others are often used by IoT devices to gather data. Internet of Things research shows that by 2020, the number of things or devices interconnected to IoT is expected to reach 50 billion, as shown in Fig. 1. With IoT, many opportunities have been created that can help increase revenue, reduce costs, generate a large amount of data, and all the other things besides. [4]

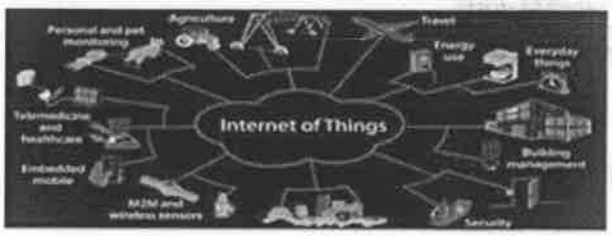

Fig. 1. Services of IoT

To reap the advantages of the Internet of Things, businesses must develop a platform that can be utilised to gather, manage, and analyse large amounts of data. The sensors

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An investigation towards efficient, lossless, multi-variance matrix-based cardiac data compression techniques

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***Abstract*—The Electrocardiogram (ECG) is a major source for the identification of cardiac diseases. The ECG signal has various components and features like P-QRS-T. The wave form with the PQRST components is used to identify the cardiac diseases and takes higher storage space. To reduce the space complexity, data compression techniques are recommended. Anumber of data compression techniques are available, and the efficiency of the compression approach is based on restoration efficiency. Moreover, the efficiency of compression algorithm depends on compression ratio achieved and restoration accuracy produced. This paper discusses about different methods of ECG data compression and performs a comparative study on various parameters. It alsopresents a lossless multi feature variance signal matrix approach to reduce the space complexity and improve the compression ratio.**

***Index Terms*— Electrocardiogram, Lossless compression, Wavelet Transform, Compression Ratio, Feature Variance Signal Matrix.**

I. INTRODUCTION

Human anatomy is more reactive to electric signals and each organ reacts to the electric signal. By passing electric signals to the human organs, the activity of the human organ can be traced. To monitor and read the activity of human heart the electro cardiogram is used. The ECG device has 12 electrodesplaced in different places of human body. A minimum electric signal is passed through the electrodes attached and the display unit attached to the device displays the waveform of heart function.

II. ECG SIGNAL

The ECG waveform produced by the device can be recorded and the recorded information takes higher storage space. The stored ECG waveform can be used to identify the presence of many cardiac diseases and could be used to compare with the others. Because of the space complexity of these recordings, the medical organizations require huge storage place. This also increases the storage cost of the waveforms. When the number of patients increases, the storage cost of them also hikes to different level. This increases the necessity of the waveform data to be compressed. Electrocardiography is a commonly used, non-invasive procedure for recording electrical changes in the heart. The records, which are called an electrocardiogram (ECG), show the series of waves that relate to the electrical impulses which occur during each beat of the heart. The results are printed on paper or displayed on a monitor. The waves in a normal record are named P, Q, R, S, and T and follow in alphabetical order.

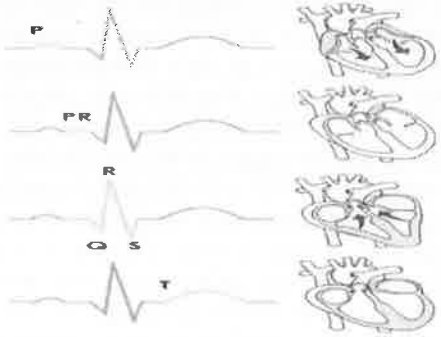

Fig. 1. ECG waveform

Fig 1 shows the snapshot of ECG waveform and the different components of ECG waveform. The number of waves may vary, and other waves could be present. The descriptions of P, Q, R, S, T wave are as follows :

P wave – it is important to remember that the P wave represents the sequential activation of the right and left atria, and it is common to see notched or biphasic Pwaves of right and left atrial activation,

PR interval – represents the time necessary to transferactivation from atria to ventricles.

QRS complex - the QRS complex is a structure on the ECG that corresponds to the depolarization of the ventricles. In addition, because the Purkinje system coordinates the depolarization of the ventricles, the QRS complex tends to look "spiked" rather than rounded, due to the increase in conduction velocity. A normal QRS complex is 0.06 to 0.10 sec (60 to 100 ms) in duration represented by three small squares or less.Any abnormality of conduction takes a longer time, and causes widened QRS complexes,

ST segment and T wave - in a sense, the term "ST segment" is a misnomer, because a discrete ST segment distinct from the T wave is usually absent. More often the ST-T wave is a smooth, continuous waveform beginning with the J-point (end of QRS), slowly rising to the peak of the T and followed by a rapid descent to the isoelectric baseline or the onset of the U wave. This gives rise to an asymmetrical T wave,

T wave - represents the repolarization (or recovery) of the

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INDIA: MODIFICATION OF THE PARADOX OF STREET VENDORS AND VENDOR ZONES

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ABSTRACT

The number of hawkers and street sellers in major urban areas is steadily rising every day. Unauthorized commerce is being conducted indirectly by sellers on sidewalks and in marketplaces, posing a threat to malls, superstores, and other legitimate retailers. The opposite side of the coin Globalization and healthy competition in the global market encourage manufacturers to provide high-quality products at competitive prices, and they invest in malls, super markets, big bazaar and other retail locations, as well as purchasing furniture and other amenities like seating arrangements, lighting, lifts, advertising and cleaning. But street vendors have posed a challenge to retail malls for the last forty years. The Street Sellers (Protection of Livelihood and Regulation of Street Vending) Bill, 2014, was enacted in the Rajya Sabha, ensuring the protection of street vendors' rights and social security. Creating a "conducive" climate for street sellers and designating specific locations for them to operate was the goal of the legislation enacted by the House. The purpose of this working paper is to gather information from many perspectives and to provide recommendations to municipal corporations, the government, and sidewalk vendors on how to regulate the footpath market. The findings of this study will be used to form a strategy for bringing ecological, administrative, and economic development marketplaces as an engine for economic growth in India.

Keywords: Hawkers, Street Vendors, Vendor Zones, Conducive.

PREAMBLE

Globalization, privatisation, and liberalism are all made possible by the LPG concept. The notion of a global market is introduced, and the market, marketing, customer service, and production system have all been altered as a result. Marketing research has a new method, and the market's mission has also altered. Product quality, cheap pricing, timely delivery, and suitable location are all priorities for manufacturers when it comes to reaching out to customers. To that end, shopping centres of different shapes and sizes have been established around the country. When it comes to finding a space to put a vendor on a public sidewalk, there is no shortage of options. Every city has a sidewalk market that springs up in a matter of days, and it's a booming industry. Vendors on the sidewalk use a variety of techniques to draw in customers. Ladies go to footpath for stylish items; men favour footpath because of cheap rates; and youngsters are drawn to footpath because of the trendiest and most appealing toys. As a result, the researcher is also attempting to find answers to the following questions via their study. What's the reason a consumer walks down the street? Footpath salespeople use a variety of techniques and expertise. How did sidewalk vendors arrange their wares on the sidewalk? What does it mean to say that the economy has suffered a loss? By creating designated zones for street vendors and hawkers that are far from the city's major market districts or even outside of it, the government aims to decrease street vendors' profits and redirect their economic potential in the name of removing undesirable encroachments from the city. However, the topic of whether street peddling / hawking is legal resurfaces. According to Article 19(1)(g), the citizen of India has the right to engage in any employment or business as a matter of right. This freedom is only restricted by the Indian Government's power to require professional or technical qualifications for particular crafts or professions. state's right and duty in the benefit of the general public to establish monopolies in specific trades, businesses, or industries It is impossible to deny a citizen's right to engage in a trade or profession of his choice. Self-employed persons in India include street sellers, craftsmen, masons, and construction workers. Because they operate in the informal or unorganised sector, they get little if any legal benefits. Organized industry, on the other hand, has a far easier time obtaining financing.

OVERVIEW OF LITERATURE

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Analysis and Design for the Mechanical Engineering Existence Cycle

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Abstract:

This is part two of a three-part series on mechanical engineering layout. The first part of this section focused on the use of laptops in the design process. Layout guide analysis, manufacturing layout, and language, representation, and setting are all included in this section. Each location's most recent research is used to determine the most recent full-size accomplishments in that area. The six major subjects are summarised below, along with some unanswered questions.

INTRODUCTION

In the journal Research in Engineering Design, this is the first of a two-part review of mechanical design research. The next exams will focus on engineering design sub-topics. The lectures are open to all engineers and are meant to keep them abreast of the most recent advancements in the field. Putting discoveries in context helps researchers prepare for the future. If you're looking for articles about engineering design, here is a good place to start. Evaluations like this must have a narrow focus. Although this review's objective is to provide an overview and point out further resources, if you have time, please read all of the articles. Despite our best efforts, we will be unable to include all potential applicants on our short list. If we misinterpret or don't understand anything, we might make a mistake. Please accept our heartfelt apologies for any trouble this has caused you, our valued customers. The scope is limited in certain areas. Mechanical engineering is all about designing goods, equipment, and structures. Geometric modelling, architectural design, manufacturing, and expert systems are only treated when they are directly relevant to mechanical system designs. Since commercial computer-aided design (CAD) systems are only now beginning to combine the wide range of study topics indicated here, we haven't even attempted to include them in our analysis. In this review study, the vast majority of the research is conducted in the United States. The practise of specifying work locations outside of the United States has not been prevalent. It isn't addressed unless mechanical design studies concentrate on highly specialised technical areas (such as mechanisms and heat exchangers) that are simple to apply elsewhere. This review of the topics breaks down design philosophy and practise into six categories. This list includes the following: The development of products and services may be described through models. The use of prescriptive design paradigms is becoming commonplace. Computer simulations are used to construct design process models. Working with a broad range of languages, representations, and settings is a challenge. Analyzing a situation may help you make better decisions. This section focuses on serviceability, scalability, and manufacturing. A study may fall under more than one of these headings in certain situations. That being said, we've done all possible to make our readers aware of the research's current position. Hope this helps. Of the six topics mentioned above, three were addressed in the first section. A look at recent developments in the subject is included in this section.

One must be concerned with words, images, and visual representations in the design context.

Two-way communication is critical in today's multilingual and multicultural society.

Formal representations in circuit design may be used to capture important characteristics of the object being generated.. The absence of adequate mechanical representations is a major problem in mechanical engineering design studies. Computer-based mechanical geometry models have undergone a great deal of effort over the last fifteen years to ensure their validity and reliability. Mechanical designs, other from the kinematic linkage design, lack a detailed description of their physical and functional properties. According to the following, mechanical design researchers are looking at this

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"Lightweight Total Cement: Properties and Microstructure With and Without Filaments"

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ABSTRACT

Lightweight aggregate concrete's mechanical properties were studied experimentally using a wide range of factors, including its dry apparent density, water to binding ratio, expanded shale aggregate characteristics, and fiber volume percent (LWAC).To find out how well LWAC holds up under compression, splitting tensile, and bending loads, we put it to the test. When it comes to the interfacial transition zone (ITZ), scanning electron microscopy has shown two distinct types (SEM). For dry apparent densities ranging from 1720–1940 kg/m3, more than 40 distinct LWAC combinations were developed and manufactured. These mixtures demonstrated 28-day compressive strengths ranging from 47 to 86 MPa. LWAC's water-to-binder ratio and lightweight aggregate qualities were shown to have significant influence on the outcomes of the tests. Aggregate with low absorption and thick shell was recommended. Only a little influence on compressive strength was made by adding fibre, which led in large increases in splitting and flexural strengths. At a volume percentage of carbon fibres of 0.9 percent, the highest improvement in strength was realised. In addition to revealing a minor wall effect, an ITZ microstructure investigation of lightweight aggregate revealed a thick shell and low water absorption.

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An examination of the difficulties faced by ESL instructors and students in the fields of engineering and technology

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ABSTRACT

It is an endeavour by Malaysian technical and engineering tertiary institutions to resuscitate the pedagogical approaches of ESL learning and communication skills at these universities. Examining the ESL practitioners' setting has shown that there is a crucial gap between the diverse needs of skills and solid pedagogical models to assess the quality of the practitioners' teaching. This research intends to analyse and investigate the problems experienced by practitioners in enabling the method in order to comprehend the need of the approach. 14 ESL specialists were interviewed in semi-structured interviews, and 42 ESL practitioners in technical and engineering domains were surveyed online. In order to get a better understanding of the obstacles and abilities needed to solve them, interview questions were devised for specialists. There were five-point Likert scales used to measure the significance of the competences in the method. The data was analysed using frequencies and percentages, as well as Braun and Clarke's (2006) six-stage thematic analysis technique. As a result of the findings of both investigations, it became clear that practitioners needed to have a deeper grasp of the strategy and specialised abilities to overcome the problems. The proficiency of practitioners was crucial because it may impact the desire of their students in acquiring the skills and comprehending the subject matter.

INTRODUCTION

English for Specific Academic Purposes, or ESEP (English for Specific Engineering Academic Purposes) as it is known in this research, involves helping students improve their language skills so that they may succeed in school. For fluency in everyday, casual contexts, both emphasise language in context rather than ESL grammar and procedures. Since the focus affects teaching methods, ESAP must be more practically diverse, taking into account elements of language and cognition as well as socio-cultural or psychological factors [1]. There are corresponding demands for educational techniques that are compatible with the advancements in mechanical engineering [2]. Accordingly, ESEP facilitation, despite its widespread diffusion, is centred on the peculiarity [3, 4] of technical and engineering educational environments. Due to stakeholders' demands, it is necessary for practitioners to have a solid grasp of the language. Engineering education has evolved at a breakneck speed during the last two decades [5], and practitioners must stay up. We need to make substantial changes in the current educational approach since it plays a big role in preparing students for the workplace and environment in which they will work in the future [6–7]. The practitioners need to be able to evaluate the requirements of students, build curricula, choose and use suitable resources for particular discipline topics and activities [8-10]. When it comes to deciding on curriculum, teachers have the issue of teaching foreign topics and engaging with subject experts, as Shatrova points out [11]. A practitioner's "subject knowledge issue" [12], coupled with their need to overcome a "inferiority complex," has resulted in their feeling conflict in their desire to prove themselves "intellectually competent" of dealing with the material. There is little mention of ESEP practitioners' problems at Malaysian focus institutions despite the increased demand on practitioners to facilitate English medium subject mastery. As a result of this research, it is necessary to investigate the instructional techniques of ESEP practitioners in the local technical and engineering universities. We want to know what experts think about the problems and competences that practitioners need in order to facilitate ESEP. We also want the practitioners' perspective on how they may overcome such challenges.

2. LITERATURE REVIEWS

2.1. The critical EAP theory

It is Henri Giroux's critique of practitioners' dissatisfaction with their existing status quo [15] that informs the Critical EAP theory proposed by Benesch [14]. Educators who are frustrated with the status quo and want to make a difference in the lives of their students are the target audience for this theory's "call to arms" [14]. A key component of the theory's argument is on the role that teaching plays in helping students create their own sense of self [16]. So that "various pedagogies develop diverse sorts of knowledge and learners' identities," this is to emphasise. As a result, it is crucial that ESEP

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Combinatorial Optimization Using (Integer) Linear Programming and Metaheuristics

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Abstract:

There are a number of different strategies available for dealing with difficult optimization problems. Two particularly successful methodologies for dealing with combinatorial challenges are mathematical programming techniques, which include (integer) linear programming-based methods and metaheuristic approaches. These two organisations were created by different communities that were more or less isolated from one another. Building hybrids of mathematical programming techniques and metaheuristics has just recently gained widespread attention from academics, who have recognised the many advantages and enormous possibilities of doing so. When it comes down to it, many issues may be dealt with significantly more successfully by using synergy between these different methodologies than by using "pure" classical algorithms. How mathematical programming methods and metaheuristics should be coupled to get these benefits is the central question. In the last several years, a slew of new procedures have been introduced. In this chapter, after providing a brief introduction to the basics of integer linear programming, we review well-known solutions for such combinations and divide them into ten different methodological groups.

1 Introduction

Combinatorial optimization problems (COPs) are frequent in a broad variety of highly important and practical disciplines, and their solution is notoriously difficult due to their computational complexity. Timetable creation, setting optimal schedules for operations that will be handled on a production line, developing efficient communication networks, and containerization are all examples of jobs that fall into this category.loading, determining the most cost-effective truck routes, and a multitude of other difficulties that emerge in the transportation industryComputational biology and artificial intelligence are only a few such examples. This includes setting values for discrete variables in such a manner that an optimal solution in terms of the constraints is produced.It is established whether or not a certain goal function exists under the limits of a specific job. Constraints.

The bulk of COPs are quite difficult to settle. For example, the fact that many such problems are NP-hard [38], which is captured in theoretical computer science, is an excellent illustration of this. NP-hard COPs are frequently referred to as "hard COPs" because of their inherent complexity as well as their enormous practical relevance.In the literature, there has been a plethora of solutions for addressing difficulties that are comparable to those that have been discussed.the last couple decades The techniques available for resolving COPs may be divided into the following categories:Algorithms are separated into two types: precise algorithms and heuristic algorithms. Precision algorithms are the most exact algorithms. Precise algorithms are guaranteed to discover the optimal solution while also demonstrating that it is in fact the best response.for each and every instance in which a COP occurs Running time increases dramatically as a problem instance grows in size; yet, only small or moderately-sized issues are often impacted by this phenomenon.Cases may be treated in a realistic manner in order to attain proven maximum efficiency. In the event of more serious circumstancesMost of the time, the only choice available is to use heuristic algorithms, which trade off optimality for speed, meaning that they are intended to provide outstanding results but not necessarily the best results.providing the best possible replies in a reasonable length of timeWhen it comes to exact approaches, the methods listed below have been shown to be successful.These approaches, including branch-and-bound algorithms, dynamic programming, constraint programming, and, in particular, the vast class of integer (linear) algorithms, have achieved significant success.The use of approaches such as linear programming and other relaxation-based methods is common in this field (ILP).Techniques such as branch-and-cut, cutting plane and column generating processes, and others are available.

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HSV-based and Deep Learning-based Object Detection Algorithms for Recognizing Pedestrian Traffic Light Signals: A Comparative Study

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Abstract*—Small object detection has been a challenge in many image analysis applications. One such application is the ability to detect the status of Pedestrian Traffic Light (PTL) signal to allow decisions to be made by an intelligent system. The challenge is becoming more complex due to the increased complexity of urban environment, where objects of close similarity would confuse the detection mechanism. In this research, a study is carried out to compare two methods for the detection of small objects within large-sized images. The first method is a classical color-based segmentation approach while the second uses an intricate Deep Learning (DL) object detection algorithm. In the classical approach, objects within the selected range of Hue, Saturation and Value (HSV) composition are identified and extracted from the large-sized images. For DL approach, a Mask R-CNN was used where traffic light-like objects are identified by object instance segmentation process. From this research, it is shown that a two-tier approach, a hybrid HSV-DL model can detect the PTL signal directly and accurately from large-sized images in real-time on smart devices at an accuracy of 92.75%.

Keywords-deep learning, mask R-CNN, image segmentation, object detection, object classification

INTRODUCTION

Deep Learning, a subset of Machine Learning, within the field of artificial intelligence has been developed at an unprecedented rate. Complex tasks such as recognition and detection of objects are now achievable to a large extent due to the revolution of deep learning: neural networks that rely on automatic feature extraction through convolutional layers. The applications of this field extend from classifying different types of animals [1, 2] to autonomous vehicles [3, 4] as well as diagnosing stages of cancer [5].

However, despite the high success rate of the abovementioned applications as well as the progress of the deep learning field, the detection of small objects within a largesized image ranging from 4,096×3,072 pixels to 7,680×4,320 pixels in ultra-high-definition frame remains a challenge. One such example is the accurate detection and classification of pedestrian traffic light (PTL) signals. A typical 2D colored image consists of three channels – Red, Green and Blue (RGB), made up of pixels that range from 0 to 255 within each channel. These pixels make up the input layer of deep learning neural networks where with each progressing layer, it goes through feature extractions and non-linearity functions. The images are usually normalized and resized to a smaller dimension such as 300x300 pixels [SSD model] or 1,024x1,024 pixels [Faster R-CNN or R-FCN]. In the case of pedestrian traffic light signals which are relatively small objects, it may become unrecognizable if the source image is overly compressed, making the detection of PTL signal a near impossible task. In addition, the existence of objects similar to the shape or form and colors of PTL further complicate the detection process.

RELATED WORK

The commonly used approach is the classical color-based segmentation method, such as those shared in references [6, 7]. Reference [6] proposed a Traffic-Light Recognizer to support the visually impaired person using contour and color-based approach in order to identify potential Active Output Unit candidatures. Reference [7] proposed similar approach, the extraction algorithm is based on color segmentation and geometrical properties analysis while the recognition algorithm is based on SVM classification. These approaches yield fantastic results. However, different designs and forms of pedestrian traffic lights adopted in different countries may have impact on the robustness and accuracy of the detectors, making the deployment of such systems a challenge. Traffic lights that are partially occluded could also contribute to confusion in the detection process.

Currently there are machine learning and deep learning approaches deployed, such as the HSV-based analytic image processing and learning-based processing by [8] and Faster R-CNN-like models by [9]. Reference [9] addressed the challenge using a novel attention model based on a Faster RCNN algorithm. The locator and recognizer then uses another Faster R-CNN-like model. This has motivated us to explore the state-of-the-art deep learning approaches to provide a more robust solution that can be generalized for wider applications.

PROPOSED CONCEPT FOR PEDESTRIAN TRAFFIC LIGHT DETECTION

In this paper, we propose a novel method in addressing this problem, with the aim of addressing the issues raised in the previous section and in making the detection more robust and efficient, as summarized in Fig. 1.

We suggest two different methods of segmentation with the objective of identifying regions of interest (ROI) of traffic light from a large-size image. The first method uses a classical Hue, Saturation and Value (HSV) based segmentation method, while the second uses Mask R-CNN instance segmentation. Both methods consist of two stages: the first stage analyses and identify ROI where there is potential presence of traffic light while the second stage uses a deep learning image classification network to classify the type of signals found in these ROIs, which may contain various traffic lights as well as background objects.

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PYTHON KERAS, BIG DATA, AND DEEP LEARNING TO PREDICT PATIENT DIABETES AND EMPLOYEE'S WAGES PER HOUR

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***Abstract:** Big Data Analytics and Deep Learning are not supposed to be two entirely different concepts. Big Data means extremely huge large data sets that can be analyzed to find patterns, trends. One technique that can be used for data analysis so that able to help us find abstract patterns in Big Data is Deep Learning. If we apply Deep Learning to Big Data, we can find unknown and useful patterns that were impossible so far. These techniques are currently a much active area of research in medical science. With increasing size and complexity of medical data like X-rays, deep learning gained huge success in prediction of many diseases like pneumonia, diabetes. In this paper, we proposed two deep learning models using Keras and also we will build a regression model to predict an employee's wage per hour, and we will build a classification model to predict whether or not a patient has diabetes.*

***Index terms:** Deep Learning, Bigdata.*

I. INTRODUCTION

In simple word, the term of Big Data means collecting, processing and presenting the results of huge amounts of data that comes at high speed in a variety of formats. Traditional Machine Learning tools have shortcoming when they face with Big Data and want to solve Big Data area problems.

Big Data and deep learning are two important words in data science now days. Big Data Analytics and Deep Learning are two high-focus of data science. The large volumes of data collected by organizations are utilized for various purposes such as for solving problems in marketing, technology, medical science, national intelligence, fraud detection etc. Traditional data processing systems are not adequate to handle, analyze and process as the collected data are unlabelled, uncategorized and very complex.

Deep learning is an increasingly popular subset of machine learning. Deep learning models are built using neural networks. A neural network takes in inputs, which are then processed in hidden layers using weights that are adjusted during training. Then the model spits out a prediction. The weights are adjusted to find patterns in order to make better predictions. The user does not need to specify what patterns to look for — the neural network learns on its own. Deep learning is appropriate for exploiting large volumes of data and for analyzing raw data from multiple sources and in different styles.

II. REVIEW OF LITERATURE

A. BIGDATA:

While the term "big data" is relatively new, the act of gathering and storing large amounts of information for eventual analysis is ages old. The concept gained momentum in the early 2000s when industry analyst Doug Laney articulated the now-mainstream definition of big data as the three Vs.

B. DEEP LEARNING:

Deep learning is an aspect of artificial intelligence (AI) that is concerned with emulating the learning approach that human beings use to gain certain types of knowledge. At its simplest, deep learning can be thought of as a way to automate predictive analytics Share .Deep Learning is a subfield of machine learning concerned with algorithms inspired by the structure and function of the brain called artificial neural networks. Yoshua Bengio is another leader in deep learning although began with a strong interest in the automatic feature learning that large neural networks are capable of achieving. He describes deep learning in terms of the algorithms ability to discover and learn good representations using feature learning."Deep learning algorithms seek to exploit the unknown structure in the input distribution in order to discover good representations, often at multiple levels, with higher-level learned features defined in terms of lower-level features".

C. KERAS:

Keras is a powerful and easy-to-use free open source Python library for developing and evaluating deep learning models. It wraps the efficient numerical computation libraries Theano and Tensor Flow and allows you to define and train neural network models in just a few lines of code. Use Keras if you need a deep learning library that: 1.Allows for easy and fast prototyping (through user friendliness, modularity, and extensibility) 2.Supports convolution networks and recurrent networks, as well as combinations of the two. 3. Runs seamlessly on CPU and GPU. It runs on Python 2.7 or 3.5 and can seamlessly execute on GPUs and CPUs given the underlying frameworks.

Build Deep Learning Models with Keras:

The focus of Keras is the idea of a model. The main type of model is called a Sequence which is a linear stack of layers. we create a sequence and add layers to it in the order that you

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Healthcare Chabot Artificial Intelligence

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Abstract:

Through chat bots one can communicate with text or voice interface and get reply through artificial intelligence. Typically, a chat bot will communicate with a real person. Chat bots are used in applications such as ecommerce customer service, call centers and Internet gaming. Chatbots are programs built to automatically engage with received messages. Chatbots can be programmed to respond the same way each time, to respond differently to messages containing certain keywords and even to use machine learning to adapt their responses to fit the situation. A developing number of hospitals, nursing homes, and even private centers, presently utilize online Chatbots for human services on their sites. These bots connect with potential patients visiting the site, helping them discover specialists, booking their appointments, and getting them access to the correct treatment. In any case, the utilization of artificial intelligence in an industry where individuals' lives could be in question, still starts misgivings in individuals. It brings up issues about whether the task mentioned above ought to be assigned to human staff. This healthcare chatbot system will help hospitals to provide healthcare support online 24 x 7, it answers deep as well as general questions. It also helps to generate leads and automatically delivers the information of leads to sales. By asking the questions in series it helps patients by guiding what exactly he/she is looking for.

Keywords: Artificial Intelligence, Prediction, Pattern matching, Disease, Query processing

Introduction:

Artificial Intelligence, also referred to as Machine Intelligence, is an intricate innovation smoothly gearing up to revolutionize our lives forever. The stimulation of human intelligence using contemporary computers that imitates cognitive functions is changing the ways of problem-solving. And with cutting-edge disciplines such as AI and Chat bots, researchers are leading the way to a great transformation. Apart from all other ways of demonstrating an impact, the role of AI in health. To lead a good life healthcare is very much important. But it is very difficult to obtain the consultation with the doctor in case of any health issues. The proposed idea is to create a medical chatbot using Artificial Intelligence that can diagnose the disease and provide basic details about the disease before consulting a doctor .To reduce the healthcare costs and improve accessibility to medical knowledge the medical chatbot is built. Certain chat bots acts as a medical reference books, which helps the patient know more about their disease and helps to improve their health. The user can achieve the real benefit of a chatbot only when it can diagnose all kind of disease and provide necessary information. A text-to-text diagnosis bot engages patients in conversation about their medical issues and provides a personalized diagnosis based on their symptoms. Hence, people will have an idea about their health and have the right protection. are industry is particularly ground-breaking.

CHATBOTS:

Are automated systems which replicate user's behavior on one side of the chatting communication. They are mimic systems which imitate the conversations between two individuals. They provide a simulating platform for effective and smart communications with the user on the other end. They copy marketers, sales person, counsellors and other mediators and work to provide services that the above-mentioned people provide. There are wide ranges of chat bots catering in many domains some of them are as follows: business, market, stock, customer care, healthcare, counseling, recommendation systems, support system, entertainment, brokering, journalism, online food and accessory shopping, travel chat bots, banking chat bots, recipe guides, etc.The most famous chat bots like Alexa or Google assistant are the best examples that can be given for smart communicating chat bots. These are general purpose chat bots that provide services for all domains and are not restricted to a specific domain. There are also domain-specific chat bots which provide functionalities to the above-mentioned domains. Artificial Intelligence:

Is based on how any device perceives its Environment and takes actions based on the perceived data to achieve the result successfully. It is the study of intelligent agents. The term "artificial intelligence" is applied when a machine mimics

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An Approach to Bot Detection Using Graph-Based Machine Learning

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Abstract—**Bot detection using machine learning (ML), withnetwork flow-level features, has been extensively studied in the lit-erature. However, existing flow-based approaches typically incura high computational overhead and do not completely capture thenetwork communication patterns, which can expose additionalaspects of malicious hosts. Recently, bot detection systems whichleverage communication graph analysis using ML have gainedattention to overcome these limitations. A graph-based approachis rather intuitive, as graphs are true representations of networkcommunications. In this paper, we propose a two-phased, graph-based bot detection system which leverages both unsupervisedand supervised ML. The first phase prunes presumable benignhosts, while the second phase achieves bot detection with highprecision. Our system detects multiple types of bots and is robustto zero-day attacks. It also accommodates different networktopologies and is suitable for large-scale data.**

I. INTRODUCTION

Undoubtedly, organizations are constantly under securitythreats, which not only cost billions of dollars in damageand recovery, but also detrimentally affect their reputation.A botnet-assisted attack is a widely known threat to theseorganizations. According to the U.S. Federal Bureau of In-vestigation, "Botnets caused over $9 billion in losses to U.S.victims and over $110 billion globally." The most infamousattack, Rustock, infected 1 million machines, sending up to30 billion spam emails a day [1]. More recently, WannaCryresulted in data breach from over 230,000 computers in 150countries [2]. Undeniably, in the face of a cyber arms race,attackers constantly find clever ways to sabotage networksusing botnets, most importantly via zero-day attacks [3].A botnet is a collection of bots, agents in compromisedhosts, controlled by botmasters via command and control (C2)channels. A malevolent adversary controls the bots throughbotmaster, which could be distributed across several agentsthat reside within or outside the network. Hence, bots canbe used for tasks ranging from distributed denial-of-service(DDoS), to massive-scale spamming, to fraud and identitytheft. While bots thrive for different sinister purposes, theyexhibit a similar behavioral pattern when studied up-close. Theintrusion kill-chain [4] dictates the general phases a maliciousagent goes through in-order to reach and infest its target.Detection of bots can be largely achieved via intrusiondetection systems (IDSs), which can be broadly classifiedinto signature-based and anomaly-based [5]. Signature-basedmethods use pre-computed hashes of existing malware bina-ries. They scale well and efficiently detect known threats.However, they require frequent database updates and can besubverted by unknown or modified attacks, such as zero-dayattacks and polymorphism [5], [6]. This undermines their suit-ability for bot detection. Anomaly-based methods overcomethese limitations [3], [7]. They establish a baseline of normalbehavior for the protected system, and model a decision enginethat alerts on any divergence or statistical deviations fromthe norm. Machine learning (ML) is an ideal technique toautomatically capture the normal behavior of a system. Its usehas boosted the scalability and accuracy of IDSs [3], [7].An important step prior to learning, or training a ML model,is feature extraction. These features act as discriminatorsfor learning and inference, reduce data dimensionality, andincrease the accuracy of ML models. The most commonlyemployed features in bot detection are flow-based (e.g., sourceand destination IPs, protocol, number of packets sent and/orreceived, etc.). However, these features do not completelycapture the communication patterns that can expose additionalaspects of malicious hosts. In addition, flow-level models canincur a high computational overhead, and can also be evadedby tweaking behavioral characteristics e.g., by changing packetstructure [8].Graph-based features, derived from flow-level informationto reflect the true behaviour of hosts, are an alternate thatovercome these limitations. We show that incorporating graph-based features into ML yields robustness against complexcommunication patterns and unknown attacks. Moreover, itallows for cross-network ML model training and inference.The major contributions of this paper are as follows:• We propose an anomaly-based approach for bot detectionthat is protocol agnostic, robust to zero-day attacks, andsuitable for large datasets.• We show the limitations of stand-alone supervised learning.Therefore, we employ a two-phased ML approach thatleverages both supervised and

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The HVDC Transmission System Review Paper states that

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Abstract

Power transmission could be disrupted more easily with AC (alternating current) than DC in early days of electrical delivery since transformers utilised it (direct current). For industrial and residential clients, high-voltage AC grids may connect previously isolated distribution networks and massive power plants. Many decades after the introduction of high-voltage direct current (HVDC) technology, the first commercially feasible high-voltage direct current link was not created. This study's focus is on India's existing and future high-voltage direct current (HVDC) transmission networks. The article discusses new developments in HVDC transmission and other technologies. This research compares the design, operation, construction, and maintenance of HVDC transmissions to HVAC. HVDC transmission over an AC framework is also analysed in the paper, which includes an economic assessment In this research, the HVDC transmission frameworks in India are examined in detail. Using HVDC frameworks is recommended in the present development of power frameworks, according to the text.

Bipolar transmission, HVDC linkages, and transmission are the focus of this section..

HVDC History:-

During the first year of the world's first HVDC transmission in Miesbach-Munich power transmission, just 1.5 KW of energy was transferred. It was built on the border of Germany between Miesbach and Munich [16,17]. Obviously, the AC system was instantly adopted for the generation, distribution, and so on of electricity. [13] Voltage conversion was simplified by the transformer in an alternating current system. Among a transformer's most distinguishing features are its low power loss and high electrical output. Synchronized three-phase generators are a great alternative to DC generators. As a result, transmission over an AC network is more straightforward than transmission over a DC network. The HVAC system may be used in a broad variety of settings when employing asynchronous grids and long-distance transmissions.

Table 1 below demonstrates the development of HVDC technology throughout time.

[1]

Table 1: HVDV Technology Development

Hewitt's mercury-vapour rectifier, which showed up in 1903.

Experiments with thyratrons in America and mercury circular segment valves in Europe before 1940.

First business HVDC transmission, Gotland I in Sweden in 1954. • First robust state semiconductor valves in 1970.

First microcomputer-based control gear for HVDC in 1979.

Highest DC transmission voltage (+/- 600 kV) in Itaipú, Brazil, 1984.

First dynamic DC channels for excellent separating execution in 1994.

First Capacitor Commutated Converter (CCC) in Argentina-Brazil interconnection, 1998

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A Bridgeless Buck-Boost Converter-Fed BLDC Motor Drive with Adjustable Speed

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Abstract—

This paper presents a power factor corrected (PFC)bridgeless (BL) buck–boost converter-fed brushless direct current (BLDC) motor drive as a cost-effective solution for low-power applications. An approach of speed control of the BLDC motor by controlling the dc link voltage of the voltage source inverter (VSI) is used with a single voltage sensor. This facilitates the operation of VSI at fundamental frequency switching by using the electronic commutation of the BLDC motor which offers reduced switching losses. A BL configuration of the buck–boost converter is proposed which offers the elimination of the diode bridge rectifier, thus reducing the conduction losses associated with it. A PFC BL buck–boost converter is designed to operate in discontinuous inductor current mode (DICM) to provide an inherent PFC at ac mains. The performance of the proposed drive is evaluated over a wide range of speed control and varying supply voltages (universal ac mains at 90–265 V) with improved power quality at ac mains. The obtained power quality indices are within the acceptable limits of international power quality standards such as the IEC 61000-3-2. The performance of the proposed drive is simulated in MATLAB/Simulink environment, and the obtained results are validated experimentally on a developed prototype of the drive.

Index Terms—Bridgeless (BL) buck–boost converter, brushless direct current (BLDC) motor, discontinuous inductor current mode (DICM), power factor corrected (PFC), power quality.

I. INTRODUCTION

EFFICIENCY and cost are the major concerns in the development of low-power motor drives targeting household applications such as fans, water pumps, blowers, mixers, etc. [1], [2]. The use of the brushless direct current (BLDC) motor in these applications is becoming very common due to features of high efficiency, high flux density per unit volume, low maintenance requirements, and low electromagnetic-interference problems [1]. These BLDC motors are not limited to householdapplications, but these are suitable for other applications suchas medical

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An investigation towards efficient, lossless, multi-variance matrix-based cardiac data compression techniques

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***Abstract*—The Electrocardiogram (ECG) is a major source for the identification of cardiac diseases. The ECG signal has various components and features like P-QRS-T. The wave form with the PQRST components is used to identify the cardiac diseases and takes higher storage space. To reduce the space complexity, data compression techniques are recommended. Anumber of data compression techniques are available, and the efficiency of the compression approach is based on restoration efficiency. Moreover, the efficiency of compression algorithm depends on compression ratio achieved and restoration accuracy produced. This paper discusses about different methods of ECG data compression and performs a comparative study on various parameters. It alsopresents a lossless multi feature variance signal matrix approach to reduce the space complexity and improve the compression ratio.**

***Index Terms*— Electrocardiogram, Lossless compression, Wavelet Transform, Compression Ratio, Feature Variance Signal Matrix.**

I.INTRODUCTION

Human anatomy is more reactive to electric signals and each organ reacts to the electric signal. By passing electric signals to the human organs, the activity of the human organ can be traced. To monitor and read the activity of human heart the electro cardiogram is used. The ECG device has 12 electrodesplaced in different places of human body. A minimum electric signal is passed through the electrodes attached and the display unit attached to the device displays the waveform of heart function.

II.ECG SIGNAL

The ECG waveform produced by the device can be recorded and the recorded information takes higher storage space. The stored ECG waveform can be used to identify the presence of many cardiac diseases and could be used to compare with the others. Because of the space complexity of these recordings, the medical organizations require huge storage place. This also increases the storage cost of the waveforms. When the number of patients increases, the storage cost of them also hikes to different level. This increases the necessity of the waveform data to be compressed. Electrocardiography is a

commonly used, non-invasive procedure for recording
electrical changes in the heart. The records, which are called an electrocardiogram (ECG), show the series of waves that relate to the electrical impulses which occur during each beat of the heart. The results are printed on paper or displayed on a monitor. The waves in a normal record are named P, Q, R, S, and T and follow in alphabetical order.

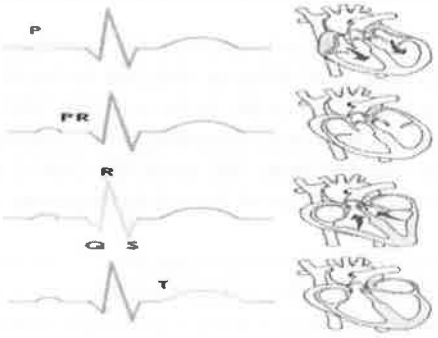

Fig. 1. ECG waveform

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The Recommendation of Social-Contextual Images Using a Hierarchical Attention Model

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Abstract—*Image based social networks are among the most popular social networking services in recent years. With tremendous images uploaded everyday, understanding users' preferences on user-generated images and making recommendations have become an urgent need. In fact, many hybrid models have been proposed to fuse various kinds of side information (e.g., image visual representation, social network) and user-item historical behavior for enhancing recommendation performance. However, due to the unique characteristics of the user generated images in social image platforms, the previous studies failed to capture the complex aspects that influence users' preferences in a unified framework. Moreover, most of these hybrid models relied on predefined weights in combining different kinds of information, which usually resulted in sub-optimal recommendation performance. To this end, in this paper, we develop a hierarchical attention model for social contextual image recommendation. In addition to basic latent user interest modeling in the popular matrix factorization based recommendation, we identify three key aspects (i.e., upload history, social influence, and owner admiration) that affect each user's latent preferences, where each aspect summarizes a contextual factor from the complex relationships between users and images. After that, we design a hierarchical attention network that naturally mirrors the hierarchical relationship (elements in each aspects level, and the aspect level) of users' latent interests with the identified key aspects. Specifically, by taking embeddings from state-of-the-art deep learning models that are tailored for each kind of data, the hierarchical attention network could learn to attend differently to more or less content. Finally, extensive experimental results on real-world datasets clearly show the superiority of our proposed model.*

1 INTRODUCTION

There is an old saying "a picture is worth a thousand words". When it comes to social media, it turns out that visual images are growing much more popularity to attract users [14]. Especially with the increasing adoption of smartphones, users could easily take qualified images and upload them to various social image platforms to share these visually appealing pictures with others. Many image-based social sharing services have emerged, such as *Instagram*[1], *Pinterest*[2], and *Flickr*[3]. With hundreds of millions of images uploaded everyday, image recommendation has become an urgent need to deal with the image overload problem. By providing personalized image suggestions to each active user in image recommender system, users gain more satisfaction for platform prosperity. E.g., as reported by *Pinterest*, image recommendation powers over 40% of user engagement of this social platform [30].

Naturally, the standard recommendation algorithms provide a direct solution for the image recommendation task [2]. For example, many classical latent factor based Collaborative Filtering (CF) algorithms in recommender systems could be applied to deal with user-image interaction matrix [26], [40], [26]. Successful as they are, the extreme data sparsity of the user-image interaction behavior limits the recommendation performance [2], [26]. On one hand

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some recent works proposed to enhance recommendation performance with visual contents learned from a (pre-trained) deep neural network [18], [49], [5]. On the other hand, as users perform image preferences in social platforms, some social based recommendation algorithms utilized the social influence among users to alleviate data sparsity for better recommendation [33], [24], [3]. In summary, these studies partially solved the data sparsity issue of social-based image recommendation. Nevertheless, the problem of how to better exploit the unique characteristics of the social image platforms in a holistical way to enhance recommendation performance is still under explored.

In this paper, we study the problem of understanding users' preferences for images and recommending images in social image based platforms. Fig. 1 shows an example of a typical social image application. Each image is associated with visual information. Besides showing likeness to images, users are also creators of these images with the upload behavior. In addition, users connect with others to form a social network to share their image preferences. The rich heterogeneous contextual data provides valuable clues to infer users' preferences to images. Given rich heterogeneous contextual data, the problem of how to summarize the heterogeneous *social contextual aspects* that influence users' preferences to these highly subjective content is still unclear. What's more, in the preference decision process, different users care about different social contextual aspects for their personalized image preference. E.g. *Lily* likes images that are similar to her uploaded images, while *Bob* is easily swayed by social neighbors to present similar preference as her

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A Financial Risk Management Approach for the Internet of Things Using Big Data Mining and PSO-Based BP Neural Networks

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ABSTRACT

In recent years, the technology about IoT (Internet of Things) has been applied into finance domain, and the generated data, such as the real-time data of chattel mortgage supervision with GPS, sensors, network cameras, mobile devices, etc., has been used to improve the capability of financial credit risk management of bank loans. Financial credit risk is by far one of the most significant risks that commercial banks have to face, however, when confronting to the massively growing financial data from multiple sources including Internet, mobile networks or IoT, traditional statistical models and neural network models might not operate fairly or accurately enough for credit risk assessment with those diverse data. Hence, there is a practical need to establish more powerful risk prediction models with artificial intelligence based on big data analytics to predict default behaviors with better accuracy and capacity. In this article, a big data mining approach of Particle Swarm Optimization (PSO) based Backpropagation (BP) neural network is proposed for financial risk management in commercial banks with IoT deployment, which constructs a nonlinear parallel optimizationmodelwithApacheSparkandHadoopHDFStechniquesonthedatasetofon-balancesheetitem and off-balance sheet item. The experiment results indicate that this parallel risk management model has fast convergence rate and powerful predictive capacity, and performs efficiently in screening default behaviors. In the meanwhile, the distributed implementation on big data clusters largely reduces the processing time of model training and testing.

INDEX TERMS
Big data, artificial intelligence, financial risk management, Internet of Things, particle swarm optimization,BPneural network.

INTRODUCTION

With the growing utilization of Internet of Things technology, many IoT-based applications have been developed and deployed in a broad range of fields, such as finance, healthcare, resource management, industry, etc [1]–[3]. For banks and financial organizations, IoT solutions can help them to gain real-time data on their own and their clients' assets, which would lead to more effective evaluation algorithmThe associate editor coordinating the review of this manuscript and approving it for publication was Tie Qiu.

of financial risk management [4], [5]. For example, chattel mortgage loans based on traditional financial data and real-time data from IoT equipments like GPS, sensors, network cameras, mobile devices, etc., and relative financial risk evaluation services, have been developed into management standards in many countries like China and South Korea.

When confronting to the massively growing financial data with mixing-structured or unstructured formats from multiple sources including Internet, mobile networks or IoT, the risk management and prevention has become more important on research and operation in commercial banks [6]. Before the 1990s, commercial banks mainly evaluate the credit risk of enterprises applying loans based on financial indicator ratios. Commonly used analytical methods are Z-score model, Lgit model, Probit model, etc. In these methods, analytical models are constructed based on various key financial ratios to find out the mapping relationship between financial ration data and credit risk, then the critical value of the financial ratios is obtained according to the occurrences of credit risk so as to decide whether a loan has risks. After the 1990s, many commercial banks use mathematical methods and financial theory to construct statistical models for quantitative analysis of credit risk. The mainstream models include KMV method, Credit Metrics, Credit Risk+, etc. Nevertheless, due to the shortcomings of these statistical models like strict financial assumptions, and that credit risk analysis of bank loan itself is a nonlinear problem, many researchers consider applying nonlinear models such as neural network to conduct the classification and prediction. These neural network models are usually running on a single machine and successfully applied to the management of relatively small sample dataset without strict financial assumptions.

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MACHINE LEARNING WITH DATA ANALYSIS FOR BIG MART SALES

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ABSTRACT

Machine Learning is a category of algorithms that allows software applications to become more accurate in predicting outcomes without being explicitly programmed. The basic premise of machine learning is to build models and employ algorithms that can receive input data and use statistical analysis to predict an output while updating outputs as new data becomes available. These models can be applied in different areas and trained to match the expectations of management so that accurate steps can be taken to achieve the organization's target. In this paper, the case of Big Mart, a one-stop-shopping-center, has been discussed to predict the sales of different types of items and for understanding the effects of different factors on the items' sales. Taking various aspects of a dataset collected for Big art, and the methodology followed for building a predictive model, results with high levels of accuracy are generated, and these observations can be employed to take decisions to improve sales.

Big Mart is online one stop marketplace where you can buy or sell or advertise your merchandise at low cost. The goal is to make Big Mart the shopping paradise for buyers and the marketing solutions for the sellers. The ultimate goal is to prosper with customers. The project "BIGMART SALES DATASET" aims to build a predictive model and find out the sales of each product at a particular store.

1.1 INTRODUCTION

With the rapid development of global malls and stores chains and the increase in the number of electronic payment customers, the competition among the rival organizations is becoming more serious day by day. Each organization is trying to attract more customers using personalized and short-time offers which makes the prediction of future volume of sales of every item an important asset in the planning and inventory management of every organization, transport service, etc. Due to the cheap availability of computing and storage, it has become possible to use sophisticated machine learning algorithms for this purpose. In this paper, we are providing forecast for the sales data of big mart in a number of big mart stores across various location types which is based on the historical data of sales volume. According to the characteristics of the data, we can use the method of multiple linear regression analysis and random forest to forecast the sales volume.

1.1.1 INTRODUCTION TO MACHINE LEARNING

Machine learning (ML)

Machine learning is the scientific study rather than defining the field in cognitive terms. This follows Alan Turing's proposal in his paper Computing Machinery and I of algorithms and statistical models that computer systems use to perform a specific task without using explicit instructions, relying on patterns and inference instead. It is seen as a subset of artificial intelligence. Machine learning algorithms build a mathematical model based on sample data, known as "training data", in order to make predictions or decisions without being explicitly programmed to perform the task. Machine learning algorithms are used in a wide variety of applications, such as email filtering and computer vision, where it is difficult or infeasible to develop a conventional algorithm for effectively performing the task.

Machine learning is closely related to computational statistics, which focuses on making predictions using computers. The study of mathematical optimization delivers methods, theory and application domains to the field of machine learning. Data mining is a field of study within machine learning, and focuses on exploratory data analysis through unsupervised learning. In its application across business problems, machine learning is also referred to as predictive analytics.

The name machine learning was coined in 1959 by Arthur Samuel. Tom M. Mitchell provided a widely quoted, more formal definition of the algorithms studied in the machine learning field: "A computer program is said to learn from experience E with respect to some class of tasks T and performance measure P if its performance at tasks in T, as measured by P, improves with experience E. This definition of the tasks in which machine learning is concerned offers a fundamentally operational definitionntelligence, in which the question Can machines think?" is replaced with the question "Can machines do what we (as thinking entities) can do In Turing's proposal the various characteristics that could be possessed by a thinking machine and the various implications in constructing one are exposed.

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A Conceptual Framework Using Spark and Machine Learning to Predict Bus Arrivals

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Abstract— **As of recently, Chiang Mai's public transit options have expanded to include a new kind of transportation: buses. Because they are not confidence in the accuracy of the bus timetable, individuals are reluctant to board the bus. Data pre-processing in real-time, the number of data inputs, and the degree of forecast accuracy all contribute to the difficulty of solving this challenge. Statistical and machine-learning techniques have been used in previous bus arrival time prediction research. However, earlier machine-learning prediction algorithms seldom take the time series issue into account. In addition, some models only examine tiny quantities of data, resulting in poor accuracy and slow forecast speed. This report looked at the last five years of research on bus arrival time prediction. Bus arrival time prediction is discussed in depth in this work, which identifies current research needs as well as real-world applications. The foundation for the study, as well as probable future trends and difficulties, were discussed.**

Predictive modelling, machine learning, and software engineering are all terms associated with intelligent public transportation.

I. INTRODUCTION

More and more individuals are able to afford their own cars as a result of rising economic levels. From 2005 to 2015, the number of registered motor vehicles in Thailand grew each year [1]. [1] [2] Traffic congestion, pollution, and even car accidents may have a detrimental influence on people's life as the number of cars increases.

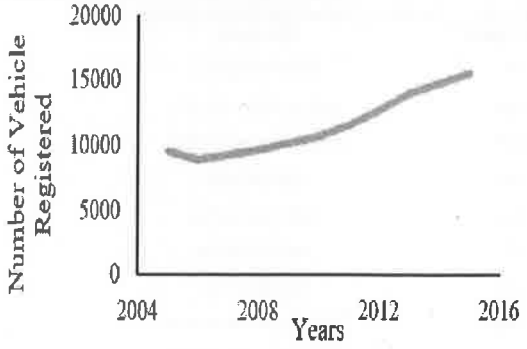

Fig. 1.Thailand's motor vehicle registered from 2005 to 2015

Carbon dioxide is one of the crucial emissions of automobile exhaust. In Fig. 2, we can see that Thailand's carbon dioxide emissions have increased year by year from 1960 to 2014 [3].

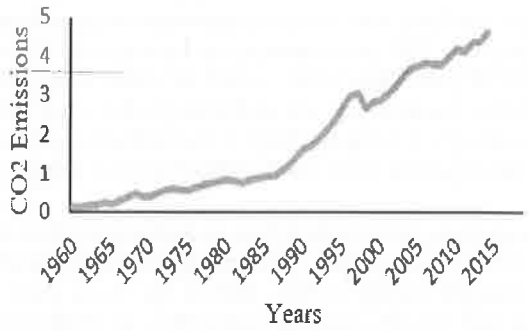

Fig. 2.CO2 emissions in Thailand (metric tons per capita)

Fig. 3 shows the percentage of the population from 2010 to 2017 who were exposed to ambient concentrations of PM2.5 that exceed the required value of the World Health Organization (WHO) [4]. As seen from the Fig. 3, 100% of the Thailand population were exposed to levels of PM2.5 that exceeded the allowable amounts set by WHO, which is very harmful to people's health.

Country Name	2010	2011	2012	2013	2014	2015	2016	2017
Thailand	100	100	100	100	100	100	100	100
Andorra	99.95664	100	99.956	97.68596	16.59898	90.84806	17.41956	17.82446
Australia	32.97097	36.32342	30.65454	28.27406	27.10551	26.04667	24.90421	24.89358
Austria	98.45154	99.25717	97.41014	95.76836	93.78567	91.47447	85.01593	85.05154
Brazil	90.93812	91.92837	86.82923	85.33471	77.11647	74.92775	67.95256	68.13503
Canada	13.66722	18.72082	8.338184	6.630327	2.023392	0.725554	0	0
Switzerland	93.0007	94.78524	91.82091	86.9105	78.49919	72.31111	49.33945	49.30014
Germany	99.59944	99.44803	98.29507	97.84632	95.7253	95.9526	89.15466	89.17436
Denmark	96.09901	98.95868	85.47423	78.75029	82.83431	75.18744	57.09176	56.91446
Algeria	100	100	100	100	100	100	100	100
Euro area	91.43221	92.65376	89.29121	87.65739	82.7704	84.39633	77.25749	77.36932
Eritrea	100	100	100	100	100	100	100	100
Spain	72.15111	78.72739	68.4927	60.68315	47.71915	55.15272	40.72439	41.11555

Fig. 3.The population who were exposed to ambient concentrations of PM2.5 that exceed the required value of the WHO (% of total)

There are several benefits to using public transit, such as reducing the issues we've discussed. In my opinion, it's the best method to go about. People in China are eager to travel by bus since it is easy and inexpensive.

Despite this, the bus is seldom used in Chiang Mai. The majority of individuals choose to drive oneself or to use red cabs while travelling. A rise in the number of cars on the

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Evaluation of Enterprise Group Financial Company Efficiency in China by use of quantitative analysis

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Abstract

When you think about it, financial institutions have a ***big influence on both financial markets and the actual world. Consequently, more research into the banking sector's efficiency is of critical importance. Essentially, China's financial corporation serves as a "internal bank" for its parent company. As a result, this article relates to the quantitative analysis and assessment approach of the banking industry, which is integrated with data characteristics of the financial company's sector. For the period from 2011 to 2016, the DEA model and the Malmquist index were used to analyse and evaluate the efficiency of 79 Chinese business group financing organisations. Here are the results: According to the DEA model, the overall efficiency of Chinese financial institutions is low, and the effect of scale efficiency is less pronounced than the effect of pure technical efficiency. However, oil processing, steel, and nonferrous metal financial institutions perform better than their counterparts in the rest of the industry. There has been a slight improvement in overall financial company efficiency from 2011 to 2016, based on the Malquist index model, and the efficiency is easily influenced by the change of scale efficiency; from industry category, military financial companies have seen a faster change in overall financial company effectiveness; and the technical progress in auto financial companies has been optimal.***

Keywords: financial institution, efficiency, DEA model, and the Malmquist index model

Introduction

General Bank Finance was established in 1716 as the world's first financial institution, while the US Financial Finance Company was established in 1878 as the world's first non-bank financial institution. For international financial firms, there are two types: enterprises and non-enterprises that are associated with a financial institution. There are a variety of non-bank financial organisations that specialise in consumer lending, corporate finance and financial counselling, but they all fall into one of two categories: those that concentrate on the sale of products and those that don't. Financial businesses have grown in size and breadth as economic globalisation has progressed and financial reforms have been implemented in many nations.. More essential in the global financial market, this new mix of business and finance is becoming increasingly common. Financial businesses are an essential aspect of China's financial sector since they are the non-bank financial entity that is most closely linked to the actual economy. The number of Chinese business group finance firms has grown steadily over the last several decades as the market economy has grown and the appropriate legal structure has been improved. The industry is progressively expanding as a result of the company's constant innovation. Financial enterprises in the Chinese enterprise group total 244 at the end of the third quarter of 2017, whereas service companies total 79,000 or more. Nearly 80 trillion yuan in consolidated assets, and 77.5 trillion yuan in total internal and foreign assets. A whopping 73.548 trillion yuan has been made, and things are looking well for the company. It has an average non-performing asset ratio of 0.03 percent, which is much lower than the industry average. The average capital adequacy ratio in the industry is 22.27, and asset quality has a decent outlook. In recent years, there have been a wide variety of performance metrics for financial institutions. As a result, academics studying financial institution performance assessment are increasingly turning their attention to the efficiency index. Non-bank financial institutions that provide financial management services to enterprise group member units in order to strengthen the centralised management of enterprise group funds and to improve the use efficiency of enterprise group funds are defined in China Banking Regulatory Commission's "Management Methods for Enterprise Group Financial Companies" promulgated on July 27, 2004. As can be observed, the growth of business conglomerates is dependent on the effectiveness of financial institutions. Financial firms' ability to allocate resources, employ resources efficiently, etc., is measured and evaluated in terms of efficiency. It may be seen in the ratio of financial organisations' inputs to outputs in their business operations. Decision-making units that use the DEA technique are more efficient at allocating resources when they input the lowest or maximum number of components under a specific output combination. This represents the efficiency of the decision-making unit's resource allocation. Financial businesses' technological efficiency may be studied by using the DEA approach in this research. These two factors distinguish this paper from previous studies: (1) it uses data from 79 Chinese enterprise group financial companies from 2011 to 2016 as its

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Rocks' Electromagnetic Properties

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1. INTRODUCTION

It is possible to use electrical properties of rocks in mineral exploration by using methods such as induction polarisation and resistivity, as well as electromagnetic methods (Keller and Frischknecht in 1966), crustal sounding (Hermance in 1973), lunar and planetairl sounding (Banks in 1969; Brown in 1972; Dyal and Parkin in 1973; Simmons et al. in 1972), glacier sounding (Rossiter and coworkers in 1973), and many more. Other factors like oxygen fugacity and water content have been taken into account while analysing the electrical properties of rocks in laboratory settings (Keller, 1966; Ward and Fraser, 1967; Parkhomenko, 1967; Brace and Orange, 1968; Fuller and Ward, 1970; Alvarez, 1973b; Dvorak, 1973; Hansen et al., 1973; Katsube et al., 1973; WatT, 1973; Gold et al., 1973; Schwerer et al., 1973; Marshall et al., 1973; Olhoeft et al., 1974b; Duba et al., 1974; Hoekstra and Delaney, 1974; and others). An overview of the electrical characteristics of rocks, focusing mostly on frequency, temperature and water content in relation to possible processes will be presented here. In geological materials, the best procedure usually involves a combination of techniques involving the observation of electrical properties as functions of applied field (to test for voltage-current non-linearity) and frequency (Collett and Katsube, 1973). There are many experimental techniques available and a discussion of them will not be attempted here (see von Hippel, 1954; Collett, 1959; ASTM, 1970; Hill et al., 1969; Suggett, 1972); (temperature, water content, etc.).

2. ELECTRICAL PROPERTIES

Maxwell's equations are used to determine electrical characteristics. Standard textbooks (such as Stratton, 1941) provide a propagation constant for an electro magnetic wave.

FREQUENCY DEPENDENCE

The complex permittivity or complex resistivity is used to characterise all frequency-dependent electrical characteristics here (see discussions in Fuller and Ward, 1970, or Collett and Katsube, 1973). Only the value at zero frequency is taken into account for calculating conductivity, and this value is regarded independent of any other frequency. Keep in mind that except for the limit of w -.0 or when 0" we, conductivity is not the reciprocal of resistivity. The complex dielectric constant is the ratio of the material's permittivity to the open space's permittivity. The free space permittivity, 8.854 x 10-12 F 1m, is equal to K' - jK" in this equation. Diameter of a real dielectric

$$\rho' - j\rho'' = \frac{1}{\omega\varepsilon_0 K'} \frac{(D - j)}{(1 + D^2)}$$

waveguide An imaginary dielectric constant known as "K"

where D is the loss tangent

$$D = \tan\delta = \frac{K''}{K'} + \frac{\sigma}{\omega\varepsilon_0 K'} = \frac{\rho'}{\rho''}$$

It is used to indicate an electromagnetic wave phase shift (Olhoeft&Strangway, 1974b) as well as an energy dissipation measurement. Figure 1 (explained below) shows the basic behaviour of electrical characteristics as a function of frequency and may be simulated by a circuit like Figure 2. The DC conductivity channel is represented by the conductance G, the low frequency limit of the dielectric constant is determined by the capacitance CL and the resistor-capacitor pair RCL, and the high frequency limit of the dielectric constant is determined by the capacitance CH. There is a single time constant in this circuit, but in general, there is a distribution of time constants (see Ghausi and Kelly, 1968; Shuey and Johnston, 1973; and others). Dielectric constants that are distributed in time may be

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School Drug Testing: A Review of the Research

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Abstract:

At this research, we investigate whether or not drug testing in schools is a useful strategy for addressing the issue of substance addiction among adolescents. Studies culled from the Internet and the most prominent academic databases are examined. The examination reveals a number of key points, including: Few studies have been conducted in this field, especially across Chinese settings; the quality of the studies that have been conducted is often poor; and the results of studies that have examined the efficacy of drug testing in schools are contradictory. Quantitative and qualitative assessment studies of the efficacy of school drug testing are also reviewed, along with the methodological challenges that arise from them.

KEYWORDS: drug testing; adolescent substance abuse; abuse detection; adolescents.

INTRODUCTION

Researching the websites of various international organizations (such as the United Nations Office on Drugs and Crime, the International Narcotics Control Board, the United States National Institute on Drug Abuse, and the European Monitoring Center on Drugs and Drug Addiction) reveals that drug abuse is a complex global issue that needs to be addressed. Substance addiction among young people has also emerged as a major issue throughout the world[1,2]. This is likely attributable to the impact of youth subculture and popular culture. Teenage drug addiction is a concern for policy makers and health professionals, as shown by the results published in key databases on adolescent development such Monitoring the Future, Youth Risk Behavior Surveillance (YRBS), and the National Household Survey on Drug Abuse (NHSDA)[3]. 9.3 percent of 12 to 17-year-olds in the United States are active illegal drug users, according to data from the 2008 National Survey on Drug Use and Health[4]. School drug testing has been used in certain Western nations to combat the rising epidemic of teenage drug misuse. The US Supreme Court ruled in favor of mandatory drug testing for high school sports in 1995.

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