



An Earthquake Analysis of a Multi-Story Residential Building

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ABSTRACT:

In Zone-III and Zone-V, the top storey is more displaced based on the two evaluations. Compared to Zone-III, Zone-V has a greater value in terms of storey displacement.

The fifth-level EQX load case's time history approach exhibits the largest degree of storey drift.

When exposed to RSZ, Zone-6th III's and 7th floors show the most storey drift. The RSX building's fourth through ninth levels include it. In the 4th to 11th and 3rd to 12th levels for Zone-X and RSX, respectively, the maximum storey drift can be seen.

The ground receives the most shear whether employing the response spectrum or time history methods. When looking at this As a clear evidence, Zone-V outperforms Zone-III. Structural seismic analysis employs response spectrum analysis. Seismic research was performed on the G+15-story residential building situated in zone II. With the help of STAAD.PRO software, the whole structure was evaluated. we saw a decrease in the reaction time of instances of ordinary moment resistant frames and special moment resisting frames in both static and dynamic analyses. Seismic loads are well-resisted by the particular moment of the resisting frame construction.

Equivalent static analysis, response spectrum analysis, ordinary moment resisting frame, special moment resisting frame, STAAD.PRO V8i.

INTRODUCTION

People are now confronted with issues related to land shortage and rising land prices. It was unavoidable that multi-story structures would have to be built for both residential and commercial uses because of population growth and the industrial revolution. The lateral force resistance of the high elevated buildings is inadequate due to their faulty design. A structure's collapse might occur as a result of this. A number of considerations go into the construction of earthquake- The structure should be able to resist earthquakes equal to DBE without significant structural damage though some non-structural damage may occur. The structure should withstand an earthquake equal to MCE without collapse.

resistant buildings. These include the structure's inherent frequency, damping factor, kind of base, significance of the building, and the structure's ductility and flexure. Because of their improved moment distribution, ductile structures need less lateral load design. Response reduction factor R is used to address this issue for various types of structures. The building is built as an SMRF for maximum efficiency. It simply has to be built for forces smaller than those for which an OMRF would be required.

MOMENT RESISTING FRAME:

The frame whose member and joints resist the forces primarily caused by flexure is Moment resisting frame.

Ordinary Moment Resisting Frame: The moment resisting frame which are designed without any special attention towards ductile nature of the frame are called ordinary moment resisting frames.

Special Moment Resisting Frame: The moment resisting frame which are designed to have ductile nature are called as special moment resisting frames. The design is done according to the requirements specified in IS-13920.

The earthquake resistant designs of structures are considering the following magnitudes of a earthquake.

Design Basis Earthquake (DBE): The earthquake whose probability of occurrence is at least one during the structure design life is called design basis earthquake.

Maximum Considered Earthquake (MCE): The earthquake whose expected intensity is maximum that can occur in a particular area or region is called maximum considered earthquake. The maximum values are considered as per code.

The design approach recommended by IS: 1893-2002 is based on the following principles (clause 6.1).

METHODS OF ANALYSIS

Equivalent Static Analysis:

This method is only one of several that may be used



A REVIEW OF NANO MATERIALS IN CIVIL ENGINEERING WORKS

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ABSTRACT :

The performance of conventional concrete can be improved by applying nanotechnology materials in constructional industry. The properties of materials actually become affected due to particle size at the length scale of nanometer, i.e., 10⁻⁹ m, based on this view, researchers have been pursuing to evolve new or alternative materials towards a green and sustainable solution. The Nanotechnology deals at a scale smaller than 100 nm (1 nm = 10⁻⁹ m). Due to their reduced size, nanomaterials properties vary considerably from bulk and thus they present exceptional mechanical and physical properties. The engineering of complex structure of cement based materials at nano level will definitely result in new generation of concrete, stronger and more durable with whole range of newly introduced smart properties. The nanotechnology materials have many unique characteristics but their material cost is very expensive due to novelty technology.

INTRODUCTION

Nanotechnology, introduced almost half century ago and is one of the most active research areas with both novel science and useful applications that has gradually established itself in the past two decades. The evolution of technology and instrumentation as well as its related scientific areas such as physics and chemistry are making the research on nanotechnology aggressive and evolutionary. Not surprisingly, it is observed that expenditure on nanotechnology research is significant. The US National Nanotechnology Initiative (NNI) expenditure exceeds \$1 bn each year with president's 2008 budget for NNI at \$1.5 bn. The research is mainly moving forward motivated by immediate profitable return generated by high value commercial products. The nanotechnologies can be defined as the design, characterization, production and application of structures, devices and systems by controlling shape and size at the nanoscale. Nanotechnology requires advanced imaging techniques for studying and improving the material behavior and for designing and producing very fine powders, liquids or solids of materials with particle size between 1 and 100 nm, known as nanoparticles (Gogotsi, 2006). Nanoscience can be divided into three fields (i) Nanostructures; (ii) Nanofabrication; and (iii) nanocharacterization with typical application in nanoelectronics and life science and energy. The

usage of technology materials while being incorporated in constructional structures would not help in prolonging in their lifetime but would also help keep a check on the energy spent by them at the same time gauging their reaction and reacting to different agents like fire, corrosion, water penetration and cracks, etc. The purpose of reviews is to give clear image among the nanotechnology development areas where the construction process would immediately harness nanotechnology. By specifying clear recommendations. The information would be beneficial to both construction, engineering education and research.

BASICS OF NANOTECHNOLOGY

Nanotechnology is the creation of materials and devices by controlling of matter at the levels of atoms, molecules, and nanoscale structures (Roco et al., 1999). In other words, it is the use of very fine particles of materials to create new large scale materials (Mann, 2006). The key is the size of particles because the properties of materials are dramatically affected under a scale of the nanometer (nm), i.e., 10⁻⁹ meter (m). To better understand the difference among various scales, Table 1 shows the categories of scales and its related topics (Balaguru, 2005)



A Review of recent development in parametric based acoustic emission techniques applied to concrete structures

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Abstract

In this post, we'll take a look at some of the most recent advancements in parametric AE approaches for concrete buildings. AE testing of concrete buildings has made major advancements over the years, incorporating a variety of methodologies and models that have been established by earlier researchers. To provide a general overview of the distinctive aspects of parametric AE approaches for concrete buildings that have been used throughout time. Traditional parameter-based AE approaches for concrete buildings are emphasised. There has already been a substantial quantity of study published on the use of AE methods on concrete structures, and this research has received a great deal of attention. Recent research on concrete bridge beam damage, such as AE energy analysis and b-value analysis, have also been addressed. Concrete beam specimens were fractured and the AE energy emitted throughout the process were summarised. AE properties of concrete have been studied extensively during the last three decades. We hope that this overview of parametric AE techniques for concrete structures will assist researchers and engineers better understand concrete failure mechanisms and devise new methodologies for structural diagnostic inspection and concrete structure failure prediction/prevention.

Keywords: structural damage evaluation using b-value analysis in conjunction with the use of methods for acoustic emission

Introduction

This novel, non-invasive and passive nondestructive testing (NDT) approach is called acoustic emission monitoring. Transient elastic waves (ultrasonic frequency range) are created by the fast release of energy from a localised source inside a material [1–9]. AE is classified as a phenomenon. Deformation processes like as crack development and plastic deformation are the primary causes of AE. As long as the elastic waves are of sufficient amplitude, they may be detected by transducers (sensors) connected to the specimen's surface [5,10]. Materials fracture may be monitored with great precision using the AE method. Localized strain energy is generated when fractures form in a material. Sensors are used to monitor the energy emitted by fractures as they expand. Actually, AE testing is a way for determining whether or not there is any activity associated with an electroencephalogram (EEG) (also known as electroencephalography, or EEG).

Monitoring the structural health of buildings and bridges is a common use for the AE approach [8,9,11–16]. Figure 1 illustrates the usual characteristics of an AE signal. The AE technique's benefits include the ability to pinpoint the exact location of growing cracks and the ability to test the whole structure at once without interfering with any of the structure's processes. Time differences between AE signals received by various AE sensors reveal the presence of AE. It is possible to determine the kind of fracture and its orientation using moment tensor components and AE's b-value analysis [9,17 – 22]. For the most part, researchers use two basic approaches to AE techniques: the classical or parameter-based method and the quantitative or signal-based approach [9,22]. Both methods are used by civil engineers working in the concrete constructions field. Using signal-based approaches to monitor huge buildings is currently not practicable [22]. It is possible to better identify the source of AE by measuring signal characteristics such as maximum amplitude, peak duration and frequency as well as by measuring signal phase and frequency spectra. It is necessary to analyse AE signal properties such as peak to peak and rise to decay times as well as energy and frequency content in this study. The AE event's origin may be determined using these signal characteristics [9,23].

Early AE studies of concrete

The first AE tests were performed in the middle of the 20th century [2,4]. Kishinouye [8,24–28] was the first to report on the AE experiment. A dissertation by Kaiser, published in 1953, was the first in Germany to present the AE phenomena known as the "Kaiser effect" [143]. Until the prior maximum applied load is surpassed, there is no observable AE in the Kaiser effect. A pioneering article on acoustic emission under applied stress was written by Schofield [29] in 1954, and he was the first to use the phrase "acoustic emission." An in-depth explanation of AE testing may be found in the ASNT's NDT handbook [5]. When Ohtsu (Grosse and Ohtsu 2008)



Behavior of Hot Rolled Steel Section Casings as Composite Column

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ABSTRACT

Larger bearing capacities and superior deformability of steel reinforced concrete (SRC) columns make them a popular choice for high-rise structures. At this time, there are no design codes that specifically cover this sort of structural structure. This study focuses on ISRC (isolated steel reinforced concrete) columns in an effort to better understand their special features. Based on a typical mega column in an ultra-high rise building, scaled ISRC columns were submitted to two-phase testing. In Phase 1, six 1/4-scaled ISRC columns with eccentricity ratios of 0, 10, and 15% are subjected to static stresses. During Phase 2 of the experiment, four 1/6-scale ISRC columns under quasi-static stresses were used for each specimen, which was subjected to simulated seismic loads of 10 percent and 15 percent, respectively. In addition to the physical testing, a FEA was carried out to get a better understanding of the behavior of "mega columns. To determine the specimens' carrying capacity, an enhanced Plastic Distribution Method has been developed. Simplicities comparable to those in EC4 [1] form the basis of the technique. This standard's scope is restricted to a single steel profile. Using modern finite element algorithms, the approach has been shown to be accurate in comparison to both experimental and numerical simulations.

Keywords: steel concrete composite mega column, separate steel sections, down-scaled experimental tests, Plastic Strain Distribution Method

1. INTRODUCTION

1.1 Research background and overview

Building systems for high-rise structures are always in need of optimization and reduction in the size of structural components. At all times, the challenge is to keep vertical structural components as small as possible while still maintaining the economic sustainability of projects and limiting their sizeable part of high-rise floor designs. Concrete and steel may be combined with higher-quality materials to create composite structural parts that can be used in a variety of ways. There are a number of common structural alternatives at this period, including concrete-filled tubes and continuous caissons formed by welding massive plates. For large plates, preheating and maintenance are required in addition to the high expense of the equipment.

"Composite mega columns are defined in this research as vertical structural systems made up of multiple hot-rolled steel sections embedded in concrete and subject to significant vertical loads and bending moments generated by seismic occurrences. In spite of the fact that codes and standards deal with composite structural components, they do not give explicit design guidance for composite sections having two or more enclosed steel sections (AISC 2016 Specifications for instance). Due to a lack of knowledge of axial, bending, and shear behavior of composite mega columns due to ambiguity in codes, it is essential to undertake experimental testing." These tests simplify the design process and aid in the development of numerical techniques for describing and validating the designs. CABR Laboratories and Tsinghua University's Laboratories, Beijing, hosted the experiment.

This information is utilized to determine the specimens' maximum capacity, displacement and stress distribution as well as their ductility and stiffness. To conclude, we provide simpler design approaches based on European, Chinese, and US regulations, and we then compare the resulting outcomes to numerical and experimental findings. For this purpose, we have included three examples of how the simplified approaches might be used to chosen mega column portions to demonstrate their usefulness.

2. EXPERIMENTAL CAMPAIGN

Sections of sample full-scale composite columns from Seattle's Magnusson Klemencic Associates, utilized in high-rise structures, were used to help design the specimens' general arrangement and geometry (MKA). To put it another way, the tower's lobby (the base) is 9 meters high, while the usual floor is 4.5 meters. The columns themselves are 1800 x 1800 millimeters in size. "During the experiment, there are six static tests and four quasi-static tests.

Phase 1-Static tests

There are six examples in Phase 1, all of which have the identical geometric arrangement, as seen in Figure 1. Specimens are put through its paces on a 200-ton servo system at Tsinghua University until they break. Experiment setup contains



Behaviourial Study of Expansive Soils and its Effect on Structures

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ABSTRACT:

There has been a lot of interest in expanding soil and its influence on buildings in the past, but little research has been done to understand its behaviour and how it affects structures. No thorough analysis of expansive soil has been published in the recent decade despite many publications on its features, behaviour, stability, and consequences on buildings. This work aims to provide an overview of the properties, behaviour, stability, and impacts on structures of expansive soil. It is a review. The physics and mechanics of it have been studied and various approaches have been attempted to stabilise it up to a point. Under addition to lime and fly ash, this soil is mostly stabilised with chemicals and performs well even in the most severe situations. Although its consequences and corrective procedures on buildings have been studied, little little has been done. Research in this subject will benefit from the study's technical overview and important information for future engineers and researchers.

Expansive soil, stability, fly ash, influence, structures, and features are some of the key terms in this paper.

INTRODUCTION

In the arid and semi-arid parts of the globe, expansive soils may be found. India's Deccan plateau, Western Madhya Pradesh, sections of Gujarat, Andhra Pradesh, Uttar Pradesh, Karanataka, and Maharashtra make up around 20% of the country's total land area. Black Cotton Soils are a frequent term for the expanding soils. These soils must be initially unsaturated at some water content for swelling to occur. Swelling occurs in the unsaturated soil as it absorbs water. If the water content drops, though, soil will contract. These soils have strong swell-shrink potentials due to the presence of montmorillonite clay. [38] [39] [7]

Located on a plateau in western Madhya Pradesh and south-eastern Rajasthan, the Malwa area is bordered on the west by Gujarat. A mountain range called the Vindhya Range runs south and east of it, while the Bundelkhand upland runs north. Deccan Traps, which were produced between 60 and 68 million years ago towards the end of the Cretaceous era, are a major source of the plateau's geological formation. Black, brown, and bhatari (stony) soil are the most

common types of soil in this area. Due to the basalt's high iron concentration, the black colour of the

volcanic, clay-like soil in this area is no accident. Both of the other soil types are lighter and include more sand than the other two. When moisture levels fluctuate in the Malwa area, expansive soils such as Black Cotton Soil are more likely to shrink and expand, which makes buildings and pavement that are not heavily laden more vulnerable to damage from differential movement. It is common for structures with traditional open foundations, floating raft bases, or the most recent under reamed pile foundations, to experience various forms of structural problems. Similar huge fissures appear in pavements when the expanding behaviour of subgrade is not taken into account.

LITERATURE REVIEW

Expansive soil causes problems for structures and national highways in the Malwa area of Madhya Pradesh in India because of the mineral Montmorillonite. An in-depth case study on the performance, issues, and solutions for structures built on expanding soil was provided by the authors. Structures are becoming exposed to the consequences of expansive soil's swelling.

Gypsum, crude oil, and a CNS (Cohesive Non-swelling) layer are all tested for their influence on expansive soil. Vibrational ground improvement may lessen the risk of liquefaction and ground deformation caused by lateral spreading in regions with low seismic activity. Swelling Pressure, Triaxial Compression Test, Optimum Moisture Content, Conducting Field Density, Liquid Limit, Plastic Limit, Shrinkage Limit, Specific Gravity, etc. are some of the tests conducted on the expansive soil. [46] [47]

Swelling and the resulting damage are investigated and explained experimentally in a local setting; based



BIOCATALYSIS IN NON-CONVENTIONAL MEDIA: MEDIUM ENGINEERING ASPECTS

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ABSTRACT

The basic knowledge of the processes governing biocatalysis in non-conventional media has progressed significantly during the last decade. Biological catalyst activity and stability are influenced by a variety of circumstances, including the presence of water and the necessity to maintain biocatalysts in their active state. In order to rationally design biocatalytic processes in the reaction medium, certain fundamental guidelines have been developed and described in this review. Biocatalysis in non-conventional media and engineering media for synthetic purposes might benefit from these laws.

INTRODUCTION

Synthetic chemistry is becoming more interested in including biotransformation processes (Laane et al., 1987a, Tramper et al., 1992). Biocatalysts are interesting because of their specificity and selectivity, which makes them ideal catalysts for chemical processes that are difficult or costly to perform. For a long time, the prevalent belief that biocatalysts (enzymes and entire cells) are only active in aqueous solutions and at mild circumstances has impeded the use of biotransformations in synthetic methods. Biocatalysts aren't as sensitive as previously thought, according to recent research. Even under severe circumstances like high salt concentrations or dramatic pH and temperature and pressure changes they can still perform their essential functions (Monsan and Combes, 1984). Organic solvents, aqueous two-phase systems, solid media, gases, and supercritical fluids are all non-conventional media in which they are active (Tramper et al., 1992). Biocatalysis is now much more useful in organic synthesis as a result of these discoveries. In this study, we'll examine the most recent developments in medium engineering and how they affect the biocatalyst's activity and stability. Immobilization of the biocatalyst or the addition of stabilisers is only one aspect of medium engineering, which also includes replacing aqueous reaction media with non-conventional media. In this review, organic solvents and supercritical fluids are discussed as non-conventional media. Other non-conventional media, such as aqueous two-phase systems and solid and gaseous media, will not be treated here. Water-

soluble polymers or a salt solution and a polymer solution may generate two-phase systems when they are combined together. There have been recent studies on the physical properties of these systems, as well as various biotechnological applications, by Andersson, Hahn-Hagerdal (1990), and King (1991). (1992). Recently, Robert et al. (1992) and Lamare and Legoy (1993) have explored the current developments in biocatalysis in gaseous and solid environments (1993).

POTENTIAL OF BIOCATALYSIS IN ORGANIC SOLVENTS

The use of organic solvents in synthetic processes has various potential benefits. The volumetric productivity of a process may be increased by using organic solvents, which improve the solubility of water-insoluble substrates. Changes in phase partitioning or reduction in water activity might change thermodynamic reaction equilibrium in favour of synthesis, rather than hydrolysis. A water-miscible organic solvent may be substituted for the water in the reaction mixture, or polymers, sugars, or salts can be added. Polymerization of oxidised phenols (Kazandjian and Klivanov, 1985) and hydrolysis during transesterification processes may be reduced by lowering the water activity or water concentration (Dordick et al., 1986). Increased product yields will also result from the reduction of inhibitory interactions between the enzyme and the substrate and/or product, either indirectly by keeping the inhibitor concentration low or directly by altering interactions between the inhibitor and the enzyme's active site (Schwartz and McCoy, 1977, Vermue and Tramper, 1990). (Zaks and Klivanov, 1988a). Recovery of the product and biocatalyst will be simplified by the use of low-boiling organic solvents. For example, filtering may be used to remove the biocatalyst from the reaction mixture, while evaporation of the solvent can be used to extract the product, provided there is a significant difference in



Blended Multi-Level And -Section Interleaved LLC Converter With More Advantageous Strength Processing Characteristics And Herbal Modern-Day Sharing

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Abstract- This paper introduces a new -segment interleaved flying-capacitor LLC converter topology with high output present day applications. as compared to a traditional -section LLC converter, the new converter provides a single capacitor that contributes to lower voltage stress at the number one facet's switches, mechanically balances the modern distribution between the phases and enhances the strength processing abilities. all the attractive features of LLC converters are preserved, which include zero-voltage switching on the number one facet's MOSFETs, 0-cutting-edge switching at the secondary side's power gadgets, slim switching frequency variety and easy layout. full principle of operation and analysis of the converter are defined, as well as the converter's primary characteristics and the impact of non-best components on the modern-day sharing conduct. A 600W, 400V-to-12V experimental prototype is used as a showcase of the appealing functions of the new converter, demonstrating superb current sharing, simple implementation and excessive performance of up to 97.3%.

Index terms –Multi-level converters, Resonant power conversion, current sharing, LLC Converters.

I. INTRODUCTION

TODAY'S power converters are required to deliver more power and achieve high efficiency over a wide load range. The LLC resonant converter topology is able to address such challenges and is advantageous in front-end DC-DC conversion applications as a result of the zero-voltage switching (ZVS) for the primary side's MOSFETs and zero-current switching (ZCS) for the secondary side's power devices [1]-[5]. In addition, it features narrow switching frequency range to facilitate regulation, fast transient response

and relatively low cost mainly due to incorporation of the transformer's leakage inductance as the resonant inductor. In particular in its half-bridge implementation, the topology has been widely and successfully applied to flat panel TVs, 80+ ATX and small form factor PCs, where the requirements on efficiency and power density of their switching mode power supplies (SMPSs) are getting more and more stringent. In high power applications where the current stress in a converter becomes high, paralleling of two (or more) converters, namely multi-phase operation, is a good solution for distribution of the current stress and it has been broadly investigated for both PWM [6]-[10] and resonant converters [11]-[13]. It has been found that multi-phase operation of LLC converters introduces implementation

challenges that are typically related to the load current sharing between the converter's phases [11]-[24]. Current sharing is required to increase the power processing capability, maintain high efficiency and improve the reliability since the thermal stress is better distributed. Therefore, current sharing is considered mandatory in multi-phase LLC converters operation.

The main reason for an unbalanced load sharing between converter's phases lays in the difference between the components of the resonant networks. When interleaving phases, since the operation hinges on equivalent switching frequency of the different phases, mismatches in the resonant tank components impact the current distribution between the phases [13]. This is since only one phase operates at the frequency where the required voltage gain is achieved. Even small differences, within the resonant components values' tolerances, can have a severe effect on the current sharing and one phase will deliver most of the load current when other phases



Brick Manufacture using Waste Rocket Propellant: Characterization and Utility

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Abstract

Waste Rocket Propellant is used in manufacture of Fire-clay Brick to neutralize twin-problems of waste propellant disposal and scarcity of raw materials for Brick manufacture. Waste rocket propellants, containing Ammonium Perchlorate (AP), Aluminium powder (Al) and hydrocarbons, as major ingredients, is processed as granular powder of 300 micron and mixed up to 2.5% by weight in the green mix of brick, containing clay, silica and soil. Impregnated Brick is characterized by XRD and SEM. Water absorption, compressive strength and thermal conductivity are determined following suitable standards and equipments. XRD revealed presence of alumina in the propellant impregnated brick without formation of any secondary phase. SEM indicated higher porosity with hardened surface around pores. Compressive strength is comparable and water absorption is favorably improved on an average, from 29% to 20%. The thermal conductivity is found to reduce from 0.72 W/m.K to 0.68 W/m.K. Overall, the effect of pollution reduction, waste utilization and property enhancement can pave way for a sustainable and eco-friendly solution in construction domain

Keywords: Bricks; Waste propellants; Microstructure; Water absorption; Compressive strength; Additives; Rocket; Composite propellant

Introduction

Asian countries contribute to 87% of the total global demand of the bricks, out of annual global consumption of around 1500 billion bricks. To meet this exorbitant demand, the used raw materials are getting consumed very fast and attempts are regularly made to explore possibility of incorporating alternate available waste materials, leading to their utilization and disposal, simultaneously. Different types of raw materials including organic combustible waste materials like cigarette butts [1], Charcoal [2], sugarcane bagasse [3-7], husk [2,3,7], Paper [4,5], ground nutshell [6], orange peel [7], Plastics [8], dung [9], etc are used as additives. Combustible materials are consumed during baking of bricks and this result in increase in porosity of brick. Density reduction, high water absorption, and reduced compressive strength are contemplated for such additions. One more concern due to high porosity of combustible material impregnated fire clay brick is loss of structural integrity. So, the amount of

combustible materials addition in bricks is mostly restricted to around 10-15%. Similarly incombustible waste like granite [10], glass [11,12], sludge [13,14], radioactive waste, television tubes, computer waste, etc are also utilized as additives for their faster disposal, exposure mitigation and impregnated status. Many a time, incombustible materials lead to enhanced density, high strength due to fusion of additive with clay and ceramic nature of bricks. The major concern becomes low emission for such altered fire clay bricks. In light of these recent developments, it was conceived to incorporate waste high energy materials, to be more precise, waste rocket propellants as combustible additive for exploration of effect on behaviour of brick. The waste composite propellants are obtained from a propellant production center used to be disposed of by open burning. This was polluting atmosphere and at the same time, generating infertile burning grounds, due to contamination. The idea was converted into a patent and filed in 2019 [15]. The patented idea was implemented in actual fire clay brick manufacture and properties are evaluated to understand the efficacy of such exercise. The waste propellant used for the study has around 68% ammonium perchlorate, 18% aluminum powder and rest hydrocarbon binder and other additives.

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Propellant Impregnated Bricks

The soil used for the manufacture of bricks is taken from Brick Kiln, Nasik India. The Brick kiln is operational for last 20 years and has been regularly producing fire clay brick for construction in peripheral area [16]. Production of composite propellants for rocket has around 15-20% waste generation. Such process waste, which is otherwise generally burnt in open for disposal are granulated to 300 + 20-micron size. The waste propellant in powder form is added to the extent 2.5% by weight. A homogenous mix is obtained, and dough plasticity is maintained by addition of distilled water (20-25%



Building Information Modeling Application in Engineering Design Performance Prediction

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Abstract

Engineering design constitutes a critical factor in a construction project, and the process has fundamentally impacted the performance. Previous research on design performance has established the relationships between project attributes and performance measures. Recently, there is growing interest in measuring the benefits of BIM on project performance, but less attention on design performance. Evaluating design performance based on the relationships between the use of BIM inputs and outputs becomes essential. This paper presents a systematic analysis correlating BIM uses with engineering performance to better predict industrial construction projects. Applying project data collected through BIM application surveys and the statistical variable reduction techniques to develop multiple linear regression models of the engineering design performance evaluation, the best prediction was achieved and validated. The study results show that the correlation between BIM uses and engineering performance measures is significant, and the engineering design performance can be predicted from BIM uses attributes.

Index Terms—Building Information Modeling (BIM), engineering design performance, BIM Uses, performance measures

INTRODUCTION

Project performance attracts attention for industrial owners and researchers in various aspects of construction activities. With expectations of high performance, the measurement and prediction of performance constitute a successful execution and delivery of a project. The engineering design process is defined as a transformation of idea into reality from owner's expectation and requirement are considered as a significant driving force for a successful project overall performance [1]. As the fact that the engineering design process is a crucial factor impacting project life cycle, the engineering performance measurement and prediction is critical for the successful delivery of a project, and the ability to manage engineering design performance is essential. In recent years, the engineering design process has been significantly influenced the project execution workflows during the life cycle of a facility by applying Building Information Modeling (BIM) in the Architecture, Engineering, and Construction (AEC). Now, BIM application has gained a rapid interest in the AEC industry. The major challenge is allowing the stakeholders to automate project tasks in

design, analysis, coordination, fabrication, construction, commissioning, operation, and maintenance processes. A study of critical success factors for BIM implementation during the period 2005 to 2015 found the factors were collaboration in design, engineering, and construction stakeholders; earlier and accurate 3D visualization of design; coordination and planning of construction works; enhancing the exchange of information and knowledge management; and improved site layout planning and site safety [2]. Research on the significant findings of BIM benefits is mainly related to 3D modeling, coordination, collaboration, process improvement, cost management, time management, risk management, resource management, facility management, and sustainability applications [3]. Results of the research also showed that the priority rankings performed for the benefits of BIM in terms of time and cost [4]. The application of BIM has proven to reduce project schedules, avoid project cost growth, and improve the overall quality of facilities, and many facility owners and developers are requiring teams to embed BIM into their projects.

Thus, BIM is seen by changing the conventional project execution model and impact how the stakeholders evaluate and predict the project and engineering performance. Therefore, there is a significant requirement to measure and predict engineering performance through project life for improving the implementation of BIM uses. This paper proposes a systemic approach to measure and predict the effectiveness of using BIM on project engineering performance. First, previous studies in engineering performance assessment and data collection are conducted. Second, find the relationship among the BIM uses identified in National BIM Guide for Owner (NBGO) by the National Institute of Building Sciences [5], and the correlation between BIM uses and engineering design. The stepwise multiple regression modeling and the assessment of the prediction model are both developed. Third, the validation where the model will be validated and implemented through real data from projects. Finally, the findings will be concluded for future works will be suggested.



Cold-Formed Steel Z Purlins.

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Abstract:

Factory-made components are then assembled on-site at a PEB to the design's specifications. They were constructed of wood until recently. Five and six millimetre thick steel is offered. The design grew more difficult as a consequence. On these projects, keeping the cost of hot-rolled steel buildings under budget proved to be a serious obstacle. A common material for prefabricated construction components is cold-formed steel. In addition to reduced weight and tighter tolerances, cold-formed steel has a lower production cost as well. To save money, steel structures are used in their design. You can create pieces with optimised dimensions more easily using cold-formed steel. Purlins, a supplemental structural component, are used to transmit external loads to the primary frame of the vehicle. In the past, purlins were often constructed from angles, I-sections, and C-sections of hot-rolled steel. Cold rolled steel may take almost any shape. In recent years, interest in the C and Z portions of Purlins has risen. Buckling of the web and flange of purlin sections is a common issue. As soon as the flange is in place, the purlins may be hung perpendicular to the rafters. Z purlins are the most adaptable component in terms of torsional stability and ease of overlap and installation. Purlin design principles and cross-section design challenges are discussed here.

Cold formed steel (CFS) includes thin sections in addition to the galvanised ones (HDG).

INTRODUCTION

There have been many changes in all aspects of architecture, from building materials to techniques of construction. Today's economy necessitates the use of new construction methods. Metal construction technology have been credited with the rapid expansion of the metal building sector. Metal buildings are becoming increasingly popular due to their ease of construction, large spans, increased usable area, and ability to easily expand or move. Structural faults may be easily remedied... Maintenance and repair expenses are much lower for metal structures. Wood has been replaced by hot rolled metal in industrial building. In a growing number of production processes, cold formed steel is taking the place of hot rolled steel. Cold-formed steel and hot-formed steel may both be used to manufacture metal structures..

The CFS output is B

To make CFS, iron ore and carbon are the two most important ingredients. A phenomenon known as "hot bands" is produced when liquid steel is pressed against thin steel sheets. They become sheets when let to cool to ambient temperature. Cold rolled steel is the term used here. Coils" are the term used to describe the strips of material that make up this product. To begin the process of making "slit coils," you first need to cut the coil. Roll the slit coil to form the desired forms at room temperature. Rolling HRS needs a lot of heat. With each colour it undergoes, the steel takes shape. While driving, it is possible to install bolts and other hardware. Thus, the setup time has been greatly decreased as a consequence of this...

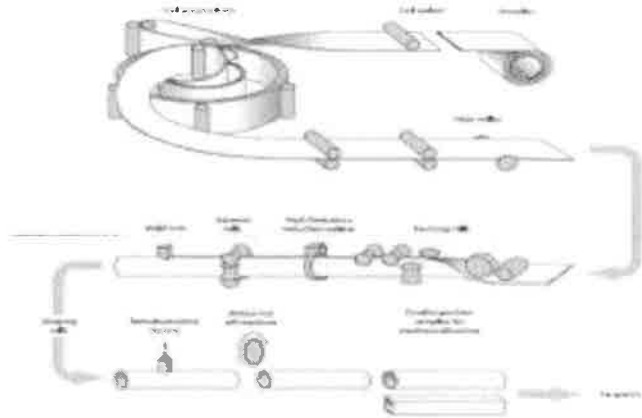


Fig - 1: Line diagram showing cold formed steel processing

Fig. 1 depicts the process of cold rolling. The thin metal sheet is made from hot rolled steel. To achieve the appropriate form, metal sheets are fed through a series of rollers of varied shapes and diameters. "Cold rolling" is the term used to describe this procedure Press brakes may also be used to provide the required sharp offsets in members.

Merits of CFS over HRS

		CFS	HRS
Design	Considerations	Local, distortional and global buckling considered	Only global buckling considered
	Span	Designed as continuous span	Designed as simply supported span
	Longer span	Purlins are nested into one another	Open web sections are fabricated
Flexibility of Shapes		Flexible and unique shapes also possible	Standard and limited shapes
	Connection	Simple (Standard bolted connections. Welding is avoided)	Complicated (Variable bolted and welded connections possible)
Galvanising		Pre - galvanising possible and	Post - galvanising possible

Economy	Cost	Low cost of manufacturing	High cost of manufacturing
	Span	Longer spans can be achieved by nesting members into one another.	

Table - 1: Merits of CFS over HRS

C. Classification of cross-section in HRS as per IS 800:2007

[5] In India, for the construction of steel structures, currently IS 800:2007 is being referred for HRS while IS 801:1975 is referred for CFS.

- 1) Class 1 (Plastic)
- 2) Class 2 (Compact)
- 3) Class 3 (Semi-Compact)
- 4) Class 4 (Slender)



Diabetes Prediction using Machine Learning Techniques

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Abstract:

Diabetes is a disease that develops as a result of a high glucose level in the bloodstream of a person. A person's diabetes should not be disregarded; if left untreated, diabetes may lead to serious health complications in the long run. Such as heart disease, renal disease, high blood pressure, and so on it may cause eye damage and can also have an impact on other organs in the human body. Diabetes may be managed if it is identified and treated early on. In order to accomplish this is the objective during this project's effort; we will look at early diabetes detection. In a human body or on a patient in order to gets more precision Different Machine Learning Techniques are being used. Machine gaining knowledge of methods by constructing models using data gathered from patients, it is possible to get better results for prediction. This is the case in this effort that we will put to use Classification and ensemble learning with machine learning Using statistical methods on a dataset, diabetes may be predicted. Which of the following are K-Nearest? KNN (Kindest Neighbour), Logistic Regression (LR), and Decision Tree (DT), Support Vector Machine (SVM), Gradient Boosting (GB), and Support Vector Machine (SVM) The Forest of Chance (RF). Every model has a different level of accuracy than the others. Whenever they are contrasted with other models. The project work provides the opportunity to the model's ability to forecast diabetes with high accuracy or greater accuracy demonstrates that the model is capable of doing so. As a result of our research, we have discovered that when compared to other methods, Random Forest produced greater accuracy. Techniques using machine learning.

Keywords: Diabetes, Machine, Learning, Prediction, Dataset, Ensemble

1) . INTRODUCTION

Diabetes is one of the most dangerous illnesses in the world. Diabetes is caused by obesity, excessive blood glucose levels, and other factors, among others. It has an effect on the insulin hormone, resulting in aberrant glucose levels. Crabs' metabolism is improved, as is the amount of sugar in their blood. Blood. Diabetes develops when the body does not produce enough insulin. Insulin. In accordance with the World Health Organization (WHO), Diabetes affects about 422 million people worldwide, with the majority of them living in low- or middle-income nations. And this may be the case. Up to the year 2030, the total amount of money will have risen to 490 billion. However Diabetes is reported to be prevalent in a number of different countries. Such as Canada, China, and India, among others. India has a population of 1.2 billion people. As the population of India has grown to more than 100 million, the real number of diabetics in the country is 40 million. Diabetes is a leading cause of mortality in the United States. Throughout the whole globe early detection of diseases such as diabetes may save lives. Maintain control while saving a person's life In order to achieve this, this research investigates diabetes prediction by examining a variety of variables. Diabetes-related characteristics are listed below. In order to do this, we using the Pima Indian Diabetes Dataset, we run a number of tests. Techniques for machine learning classification and ensemble learning to be able to anticipate diabetes Machine learning is a technique that is used to learn new things. This method is used to explicitly teach computers or machines. Various Machine Learning Techniques are effective in delivering results. Gather knowledge by creating different classifications and categorizations ensemble models derived from a dataset collection such information was gathered Diabetes may be predicted with the use of statistics. Various methods are used. Machine Learning is capable of making predictions; however this is not always the case. It's difficult to decide on the ideal method. As a result, for this reason On the basis of popular classification and ensemble techniques, we develop a dataset for the purpose of prediction

2) REVIEW OF THE LITERATURE

K.VijayaKumar et al. [11] presented a random Forest algorithm for the prediction of diabetes and developed a system that may be used to diagnose the disease. Can make an early diagnosis of diabetes in a patient who has a



Distributed representations of code: a tutorial

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INTRODUCTION

Using distributed representations of words, sentences, paragraphs, and documents (such as doc2vec) has been critical in unlocking the potential of neural networks for natural language processing (NLP) tasks. An object's low-dimensional vector representation, known as an embedding, may be learned using techniques for learning distributed representation. Because the meaning of an element is spread out over several vector components in these vectors, things with semantically comparable meanings are translated to nearby vectors.

```
String[] f(final String[] array) {
    final String[] newArray = new String[array.length];
    for (int index = 0; index < array.length; index++) {
        newArray[array.length - index - 1] = array[index];
    }
    return newArray;
}
```

Predictions

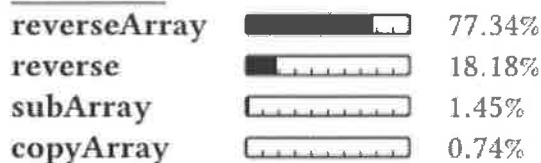


Fig. 1. A code snippet and its predicted labels as computed by our model.

Purpose: The goal of this study is to learn code embeddings, continuous vectors for expressing snippets of code. By learning code embeddings, our long-term objective is to allow the application of neural approaches to a broad variety of programming-language problems. In this study, we employ the motivating aim of semantic labelling of

code fragments. Motivating task: semantic labelling of code fragments. Consider the procedure in Figure 1. The procedure comprises just low-level assignments to arrays, yet a person reading the code may (correctly) describe it as doing the opposite action. Our objective is to forecast such labels automatically. The right-hand side of Figure 1 displays the labels predicted automatically using our technique. The most probable guess (77.34 percent) is reverseArray. Section 6 includes other instances. This challenge is complex since it needs learning a relationship between the complete content of a technique and a semantic label. That is, it involves aggregating maybe hundreds of phrases and assertions from the method body into a single, descriptive name. Our approach. We provide an unique approach for predicting programme attributes using neural networks. Our fundamental contribution is a neural network that learns code embeddings \mathbb{D} continuous distributed vector representations for code. The code embeddings provide us a natural and efficient way to represent relationships between code snippets and labels. Because of the organised nature of source code, our neural network design can learn to combine several syntactic pathways into a single vector. As in NLP, word embeddings are important to the use of deep learning for NLP tasks, and this capacity is crucial to the application of deep learning in programming languages. It is necessary to provide the model with an appropriate tag, caption or name for the code snippet. Using this label, we specify the semantic attribute we want the network to represent, for example, a tag applied to the snippet, or the name of the method, class or project from whence the sample was extracted. The code fragment is C, and the label or tag is L. It is our primary assumption that the distribution of labels may be derived from C's syntactic routes. That is why the label distribution $P(L|C)$ is part of our model's learning process. For the goal of guessing the name of a technique based on its body, we show the usefulness of our methodology. This is an essential issue since clear method names



Emerging Databases for Next Generation Big Data Applications

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ABSTRACT:

The rising quality of large-scale period analytics applications (real-time inventory/pricing, mobile apps that offer you suggestions, fraud detection, risk analysis, etc.) emphasizes the requirement for distributed knowledge management systems which will handle quick transactions and analytics simultaneously. Efficient process of transactional and analytical requests, however, need completely different optimizations and branch of knowledge selections in a system. This paper presents the wildfire system that targets Hybrid Transactional and Analytical process (HTAP). wildfire leverages the Spark system to modify large-scale processing with differing types of complicated analytical requests, and columnar processing to modify quick transactions and analytics simultaneously.

I. INTRODUCTION

Due to the approach they evolved, relative DBMSs have always that been strongest playing transactions that make sure the classical ACID properties. the first literature outlined the way to accomplish strict serializability and isolation of concurrent transactions, and therefore the Two-Phase Commit protocol for achieving consistent commits of distributed transactions. Indexes on any column, not simply a primary key, facilitate accessing individual rows within the purpose queries typical of transactions. however ancient DBMSs additionally developed necessary technologies for additional complicated analytics queries, notably the declarative Structured search language (SQL) and sturdy improvement of it, and multi-node correspondence for rushing long running queries. additional recently, DBMSs have considerably accelerated analytics queries with a sophisticated exploitation of multi-threaded correspondence, compression, giant main reminiscences, and particularly column stores [22, 26, 30, 33].

Nonetheless, DBMSs have their weak spots, too. A software package could be a closed system that solely owns its knowledge, that should be loaded into its proprietary format and slows retrieval for data-hungry applications like Machine Learning.

These weaknesses mostly intended the recent develop- ment of huge knowledge Platforms like Hadoop [5]and currently Spark [11], that were designed virtually completely for performing advanced and long-running analytics, like Machine Learning, cost-effectively on extraordinarily massive and diverse knowledge sets.

These systems promote a way a lot of open surroundings, each of functions and de facto customary knowledge formats like Parquet, permitting any operate to pronto access any knowledge while not having to travel through a centralized gate-keeper. By habitually replicating knowledge by default, typically asynchronously (e.g., with ultimate consistency semantics), these systems in-built high convenience, scale-out, and physical property from their beginning.

However, massive knowledge platforms have their own shortcomings. Transactions (especially update-in-place) and purpose queries are mostly unheeded in Spark, thereby deputation in gest of knowledge to less complicated key-value stores like Cassandra [4]and Aero spike [1]. a number of these stores could give the high ingest rates needed to capture knowledge from new Inter- internet of Things (IoT) applications, however to realize this, have relaxed isolation levels and have embraced weaker ultimate consistency of copies on freelance nodes. They additionally in- dex solely a primary key, limiting purpose queries to people who specify that key. Lastly, they need restricted or no SQL functionality, that is commonly other as virtually Associate in Nursing afterthought (e.g., Hive [34]), with weak question optimizers.

This paper argues that the large knowledge world wants trans- actions. we tend to gift conflagration, a style and initial example to bring ACID transactions, albeit with a weaker variety of pick isolation, to the open analytics world of Spark. conflagration exploits Spark for performing arts analytics by: (1) utilizing a non-proprietary storage format (Parquet), hospitable any reader, for all knowledge; (2) victimization and lengthening Spark Apis and also the Catalyst optimizer for SQL queries; and (3) automatically replicating data for top



Emotion Recognition And Drowsiness Detection Using Python

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Abstract:

The natural expressions of human emotions are those that individuals enjoy making without exerting any conscious effort, and which are followed by the reflexing of face muscles rather than any deliberate effort on the part of the individual. Among the most basic feelings that a human face might express depending on the scenario in which one finds himself or herself are: happiness, grief, surprise and wrath, to mention a few examples: stability, joy, and stability, among others (normality). As part of this work, we present software that detects and recognises faces, as well as providing a wealth of additional information about that individual. This information can be used to solicit feedback from customers, or to determine whether a person requires an incentive to engage in certain behaviours. The ultimate goal of the project is to build a product that is both cost-effective and efficient in terms of operation and maintenance. AI and DIP technologies were employed in the development of the system, which was written in Python and implemented using Artificial Intelligence. When it comes to avoiding an accident or tragedy, the ability to recognise eye blinking is vital in a variety of situations, such as driving or in security vigilance scenarios. The fact that the system also recognises the identification card makes this a fundamental function. As a result of the training provided, the camera that has been installed initially focuses on the card and recognises its form and colour before going on to the next item.

1. INTRODUCTION

A growing number of people are becoming involved in the fields of artificial intelligence (AI) and digital image processing (DIP) all over the globe. The usage of deep learning-based artificial intelligence (AI) methods and

applications is increasing across a broad variety of industries, with many of them relying on deep learning as their foundation. The project might be performed for marketing and improvement purposes, as well as with the objective of creating a completely new item from the ground up. Please let us know if you have any product development projects that we should be aware of that you would want to share with us. Because of this, it is able to offer an accurate and detailed assessment of the implications. While the features of artificial intelligence technologies are simple to implement and understand in the most common systems, they can also be installed in a cost-effective and efficient manner in schools, colleges, and any other area where surveillance is required; however, a lack of funding is the most significant factor causing difficulties in the development of artificial intelligence technologies. Monitoring might be included into the project, which would aid in the maintenance of a regular health check, identification of a person's mental state while at work, and other tasks. This statement may also be used to criticise employees who have made significant contributions to the growth of the organisation in which they work, even after they have been recognised for their



EMPIRICAL ANALYSIS OF FINGER PRINT BANK ALGORITHM BASED FINGERPRINT MATCHING SCHEME

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Abstract: It is now necessary to safeguard your data/information safely without allowing attackers or intruders the option to steal it. Authentication is deemed the most critical function for this situation, which requires anyone to show their authentication to the system independently and once it is right to encourage them to enter the system features otherwise ignore or block them to progress further. In the information technology and defense sectors, there are several authentication mechanisms available, such as Biometric Scheme, IRIS Matching Scheme, Facial Recognition, Password Protection Scheme, etc. The most common, well-known and one of the best classical schemes is called the Biometric Finger Print Matching Scheme, which enables the user to register the finger print for training purposes in the system and further collects the current (testing) finger print from the user at each time of accessing the features in the system and matches it with the already registered finger print until it matches the already registered finger print The suggested Finger Print Bank Algorithm uses the concepts of effective finger print matching to compare the right finger print correctly and provides the user a Boolean answer to notify the user whether to continue forward or not. Effective filtering schemes are used by the Finger Print Bank Algorithm to filter the finger print to extract the internal and global core information of it and extract the raw code from it and equate it with the finger print already recorded. The optimal outcome and consistency of outcomes was ensured for the whole proposed method.

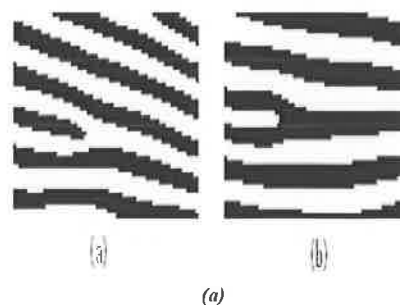
Keywords: Fingerprint, Biometric System, Finger Code, Filter Schemes, Finger Print Bank Algorithm.

1.INTRODUCTION

The Biometric-Matching Scheme is the study of a fascinating perception of persons with at least one physical or social feature inherent. Of all biometrics, finger prints are the most widely used parameter for person ID. In legal research, Specific Finger-Print ID is commonly used to assist forensic examinations and so on. An exceptional illustration of edges-and-valleys on the surface of a person's finger is a special finger-print. An edge is defined as

a bent solitary portion, as the space between two contiguous edges is a valley. The neighborhood boundary discontinuities are Minutiae-Points, which are of two kinds: edge-endings-and-bifurcations '. There are about '40-100' Minutiae-points [1][2] for a decent quality shot. It is these minutiae-points that are used to assess the identity of a single fingerprint. It is necessary to define Mechanized Finger-Print acknowledgment and self-validation systems [2][5] as check or ID frameworks.

By organizing against an existing Finger-Print database, the check protocol either recognizes or denies the client's character. Using Finger Prints, the character of the client is set up to discern facts. The meaning of the Finger-Print image is of essential importance, as precise alignment of Finger Prints depends to a large degree on edge structures. In any event, owing to elements of commotion that degenerate the lucidity of the edge systems, a particular Finger-Print image can not necessarily be quite defined by and by.





End-to-End Image Super-Resolution via Deep and Shallow Convolutional Networks

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ABSTRACT

A novel picture super-resolution (SR) technique based on a Convolution Neural Network (CNN) is being developed as part of this project's research. When learning the feature extraction, upsampling, and high-resolution (HR) reconstruction modules at the same time, a deep convolutional neural network (CNN) is created that can be used to rebuild pictures from any source and is completely trainable. If, on the other hand, you want to train a deep network in a straight line from start to end, this is time-consuming and may provide sub-optimal results since it takes a longer time to converge than other strategies. According to our results, an ensemble of deep and shallow networks should be trained at the same time in order to overcome this difficulty. Its stronger representation power, rather than a lower learning capacity, allows the deep network to capture the high-frequency information contained within visual images, rather than the other way around. When utilised in combination with joint training, the shallow network reduces the complexity of deep network optimization by a factor of two, in part because the shallow network is considerably simpler to optimise than the deep network. High frequency characteristics are rebuilt in a multi-scale manner to further improve the accuracy of HR reconstruction. This allows for the simultaneous integration of both short- and long-range contextual information to be included in the reconstruction, which further improves the accuracy of HR reconstruction. The suggested technique has been carefully examined on a variety of commonly used data sets, and when compared to current best practises, it beats them by a significant margin. Large-scale ablation experiments are carried out to establish the contributions of various network topologies to image SR, which results in the finding of new insights that may be used to future study.

1. Introduction

A low resolution (LR) observation is used to attempt to recover a high resolution (HR) picture with a large number of high-frequency characteristics from a low resolution (LR) observation. Single image super-resolution (SR) attempts to recover a high resolution (HR) picture with a large number of high-frequency characteristics from a low resolution (LR). However, SR is fundamentally ill-posed since there is a lack of appropriate information about the situation, which is particularly true when considering that numerous HR images may be down-sampled into a single lower-resolution image. According to the most recent study, learning-based strategies have been gaining more and more attention, and they have shown to be more effective in image SR than their predecessors. It is the fundamental premise of learning the mapping function from the LR picture to its HR counterpart via the examination of auxiliary data obtained throughout the method that is being discussed. In order to estimate the residual between the HR picture and the bicubic-interpolated LR image, machine

Active Queue Management Techniques for Congestion Control in TCP Communication Networks: New Prospective

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Abstract: the computer network area has grown very fast from previous years, as a result of which the control of traffic load in the network is at a higher priority. in network, congestion occurs if numbers of coming packets exceed, like bandwidth allocation along with buffer space. this might be due to poor network performance in terms of throughput, packet loss rate, and average packet queuing delay. for enhancing the overall performance when this network will become congested, numerous exclusive aqm (active queue management) techniques were proposed and few are discussed in this research paper. particularly, aqm strategies are analyzed in detail as well as their obstacles along with strengths are emphasized. there are several algorithms which are under the aqm like ared, fred, choke, red (random early detection), blue, stochastic fair blue (sfb), random exponential marking (rem), svb, raq, etc.

Keywords: Congestion Control, AQM, RED (Random early detection), ARED, SFB (Stochastic Fair Blue), CHOKe..

I. INTRODUCTION

When the number of incoming packets is high contending for restricted shared resources, including outgoing bandwidth and queue buffer, congestion might additionally evident in the data communication. Throughout, congestion several packets revel in postpone or be dropped because of queue overloaded. Results of Congestion degrades the overall throughput as well as high loss rate of packets. Congestion also reduces reliability along with efficiency of the complete network, moreover, performance will also collapse at high traffic, and therefore no packets are delivered. At the internet traffic tends to range. Ideally, a router queue control set of rules must allow transient bursty traffic along with penalizing flows which consistently overuse bandwidth. Additionally, set of rules must save you excessive put off via restricting the queue duration, keep away from underutilization by using allocating temporary queueing, along giving sources pretty in one of a kind styles of site visitors [1].

Practically, most of the routers are arranged that used basic Drop Tail algorithm [2] as it is simple and easy to use having minimum computation overhead, however, gives unsatisfactory overall performance. In order to solve this specific hassle, several various queue management algorithms are there for example CHOKe (CHOose and Kill for

unresponsive flows, CHOose and Keep for responsive flows, SFB (Stochastic Fair BLUE), BLUE, FRED (Flow Random Early Drop), RED (Random Early Drop) [3, 4, 5, 6]. Several algorithms state that they are able to offer truthful sharing amongst extraordinary flows without imposing an excessive amount of deployment complexity.

Mostly, these proposed algorithms just focus on one phase of an issue (either it is computational overhead, deployment complexity, or fairness), remove the limitations of lastly used algorithms as well as their simulations setting are distinct from one another. Therefore, all these make very difficult for evaluating as well as choosing one to utilize under specific traffic load.

II. ACTIVE QUEUE MANAGEMENT

In IP networks the important goal of AQM “Active Queue Management” was to balance the work of end-system protocols like in congestion control, TCP (Transmission Control Protocol) thus maximizing the utilization of network and decreasing the loss and packets delay. [2] AQM is a user that equally dividends bandwidth and manages congestion over the routers/internet. The subject on the congestion, metric effective queue management has listed load-based, queue-based length, load-based, and length-based.

A. Queue length based AQM Algorithms:

A QMs congestion based on Queue is measured through queue size as well as this movement is taken via keeping fixed of queues by means of Internet routers, one in line with interface, which keeps packets scheduled to begin extinct on the interface. In case the length of queue is shorter as compared to its higher restriction length, a packet is set on the queue and in any other case it will drop. It has one main limitation that packets’ backlog is required inherently through the control mechanism when the congestion is discovered in queue.

a. RED (Random Early Drop)

“Sally Floyd and Van Jacobson [2] proposed a mechanism called Random Early Detection (RED) that aims at avoiding congestion”. The work is inspired via an impartial of maintaining small average sizes of a queue in routers. This might be achieved by means of labeling or dropping certain

ANALYSIS AND DESIGN OF CIRCULAR MICROSTRIP PATCH ANTENNA WITH WI-MAX APPLICATION

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ABSTRACT

The micro strip antennae have become pretty famous within the fields of cell and cell communications, further to RFID programs with the appearance of diverse simulation equipment, inexperienced designs of MSA's in considered one of a kind patch configurations are being practiced, thinking about exceptional substrate or high-quality strate mixtures at recognized microwave frequencies of interest. In this dissertation, investigations are carried on the overall performance trends of round patch micro strip published antenna at 3.5 GHz that's suitable for Wi MAX packages.

Keywords: Antenna, Micro strip, mobile etc.

INTRODUCTION

The antenna acts a transducer via the use of converting electric powered currents to em-waves in transmission, by using converting em-waves to electric currents in case of reception of sign. Antennas play a critical characteristic inside the task of communications. A number of the antenna kinds are parabolic reflector, patch antenna, slot antenna and folded dipole antenna and so on. Each form of antenna is good in its residences and utilization. There are masses of diverse forms of antennas in use these days spherical micro strip patch antenna: CMP A consists of round shape radiating detail on one component of the substrate having the floor aircraft on awesome facet, CMPA has been fed with the useful resource of methods, which might be element feeding and coaxial probe feeding. CMPA has been designed the usage of substrates Rogers RT/duroid5880 ($\epsilon_r=2.2$, $h=1.588$ mm), Rogers RT/duroid5880 ($\epsilon_r=2.2$, $h=2.87$ mm) and FR4 epoxy ($\epsilon_r=4.4$, $h=2.87$ mm) separately for each feeding techniques. Cavity model evaluation of round patch antenna is given in text books [1-4], is given through Anders G. Derneryd [2]. Manoj singh et al [6] has mentioned a format of micro strip line feed (place feed) spherical patch antenna the usage of substrate material with relative permittivity (ϵ_r) of three.2 and thickness (h) of 0.762 mm at 10 GHz. The designed antenna has cross again lack of -24 dB (measured) at 10 GHz. A CMPA has been designed and simulated with the aid of way of HFSS with equal dimensions said in literature [6], the antenna has

given a return lack of -29.29 dB at 10.022 GHz. F. A bound et al[8] has given hole place model assessment of round patch antenna fed with the aid of way of coaxial probe, measured resonant frequencies of CMPA the use of substrate material with relative permittivity of .65 and thickness of 1.5875 mm with awesome radius values. Debatosh Guha [9] has given the theoretical and experimental values of resonant frequencies of CMPA (fed via probe feed) the use of substrate material with relative permittivity of .sixty five and thickness of one.5875 mm with awesome radius values. The CMPA using substrate cloth with relative permittivity of .65 and thickness of 1.5875 mm, fed thru the use of probe feed has been designed and simulated with the aid of HFSS, the antenna simulation effects are in close to agreement with literature [9]. The round patch antennas fed by using coaxial probe were simulated with the aid of HFSS, the simulated outcomes of above antennas are given such as skip again loss, VSWR, Radiation styles, benewiwireless assessment has been made among element feeding and coaxial probe feeding of spherical patch antenna.

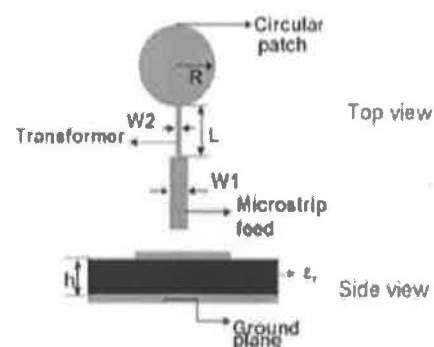


Figure. 1 Edge feeding of CMPA

An AI-Powered Automatic Lane-Line Detection System¹JOGU PRAVEEN, M.Tech Assistant Professor, jpraveen.pec@gmail.com²CHEEKATYALA ANJAN KUMAR, M.Tech Assistant Professor, anjankumarcheckatla@gmail.com
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ABSTRACT

Recently, lane line detection has received a lot of attention due to the increasing need for an intelligent transportation system. A lane line detection approach for bettering the YOLOv3 network structure is provided as a solution to the issue of the YOLOv3 algorithm's poor accuracy and high likelihood of missed detection while identifying lane lines in complicated surroundings. The change is an concentration on rapid and precise detection. First, the lane line photographs are separated into s 2S grids based on the pictures' inconsistencies in vertical and horizontal distribution density.

Introduction

Trace monitoring and autonomous vehicles are two examples of intelligent transportation systems in which lane line detection plays a crucial role [1]. Consequently, there is a growing need for lane line detecting systems [2]. Ways to identify lanes have been explored in a number of different ways. Generally speaking, these strategies may be broken down into two categories: classifications: conventional approaches and those based on deep learning methods. The statistical technique is the basis of conventional isolating characteristics of images [3] Color, grayscale, and edge detection are only a few examples. However, deep learning-based methods rely on feature extraction using convolutional neural networks [4]. It's true that conventional methods may often provide accurate

results, Ideally, the conventional method requires method that is both labor-intensive and intricate. process—of creating and releasing software [5]. Furthermore, However, the training cannot be disseminated via conventional methods. a response from its feature extractor [6] section. Consequently, this strategy is seen as harmful to manufacturing output. inserting these questions with the help of deep learning is difficulty with the conventional method. For example, a major challenge in creating a deep learning model is the compromise between precision and efficiency. rapidity with which the model is detected. Very precise models often need elaborate feature extraction, causes a slow rate of detection. Therefore, it's crucial to provide a solid foundation. both of these considerations must be taken into account while designing learning models aspects.

Related Work

The three most common approaches to lane line identification today are road feature extraction using machine vision, road model establishment, and lane line detection using a human. multi-sensor fusion detection technique [9]. The machine-extraction technique for road characteristics vision relies heavily on automated categorization tools provided by machine characteristics of lane lines' grayscale values and colours. After road's lane lines using just machine learning. Because grayscale, colour, and other image

Essential Properties and Design Principles of UWB Antennas

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Abstract

Fundamental standards for ultra-wide-band (UWB) radiation are exhibited and examined right now. The conversation begins with a portrayal of the impact of receiving wires on UWB transmission. The parameters describing radio wires in time and in recurrence area are determined. Since the quantity of conceivable reception apparatus structures is about boundless, the emphasis will be on a characterization as indicated by various radiation standards. For every one of these instruments, the run of the mill points of interest and drawbacks are talked about, and a model radio wire and its attributes are displayed. For a remote architect, the issue to illuminate is the correct structure of a reception apparatus with the ideal radiation qualities. The ultimate result of this paper is that there exist quantities of UWB radio wires, however not every one of them is appropriate for any application, particularly in perspective on radar and correspondence frameworks prerequisites.

KEYWORDS | Ultra-wide-band (UWB); UWB antenna characterization; UWB link; UWB transfer functions

I. Introduction

Typically, narrow-band antennas and propagation are described in the frequency domain. Usually the characteristic parameters are assumed to be constant over a few percent band width. For ultra-wide-band (UWB) systems, the frequency-dependent characteristics of the antennas and the frequency-dependent behavior of the channel have to be considered. On the other hand, UWB systems are often realized in an impulse-based technology, and therefore the time-domain effects and properties have to be known as well [1]. Hence there is a demand for both a frequency-domain representation and a time-domain representation of the system description. In the following, these characterizations in the

frequency domain and in the time domain are presented. All parameters are uniformly used in the whole paper but may not be necessarily compliant with the denotation presented in the cited literature. The coordinate system throughout this paper is as shown in Fig. 1.

A. UWB Frequency-Domain Signal Link Characterization

For the frequency-domain description, it is assumed that the transmit antenna is excited with a continuous wave signal with the frequency f . The relevant parameters for the frequency-domain link description are:

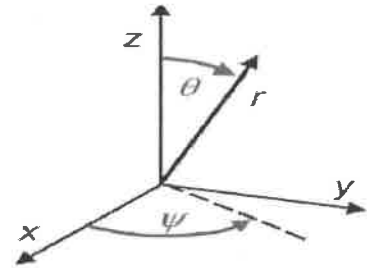


Fig. 1. Coordinate system for UWB link and antenna characterization.

description of a free space UWB propagation link is given by (2)

$$\frac{U_{Rx}(f)}{\sqrt{Z_{C,Rx}}} = \mathbf{H}_{Rx}^T(f, \theta_{Rx}, \psi_{Rx}) \cdot \frac{e^{j\omega r_{TxRx}/c_0}}{2\pi r_{TxRx} c_0} \cdot \mathbf{H}_{Tx}(f, \theta_{Tx}, \psi_{Tx}) \cdot j\omega \frac{U_{Tx}(f)}{\sqrt{Z_{C,Tx}}} \quad (2)$$

Two orthogonal polarizations are included in the Tx and Rx transfer functions, as noted above. While in narrowband systems the radiation angles and influence only the polarization, amplitude, and the phase of the signal, they influence additionally the entire frequency-dependent signal characteristics in UWB systems. For UWB links in rich scattering environments, e.g.,

A COMPACT DESIGN OF WI-MAX APPLICATION FOR CPW BASED FED KOCH FRACTAL ANTENNA SLOT

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Abstract

A dual big-band CPW-fed modified Koch fractal found out slot antenna, appropriate for WLAN and Wi-MAX operations, is proposed on this paper. right here, the jogging frequency of a triangular slot antenna is faded through the Koch new release approach ensuing in a compact antenna studies on the impedance and radiation trends of the proposed antenna suggest that a modified Koch fractal slot antenna has an impedance bandwidth from 2.38 to 3.ninety 5 GHz and 4.ninety five–6.05 GHz protective 2.four/5.2/5.eight GHz WLAN bands and the 2.five/three.5/5.5 GHz Wi-MAX bands. The antenna directional radiation coverage with a benefit better than 2.0 dBi in the entire working band. Empirical own family members are deduced and in comparison with the results.

Index Terms CPW-fed slot antenna, printed fractal slot antenna, wide-band antenna, WLAN antennas.

INTRODUCTION

The demand for low profile, light weight and low cost broadband antennas has increased in the recent years with the widespread deployment of short distance wireless communications, like the wireless local area networks (WLAN). WLAN's are designed to operate in the 2.4 GHz (2.4–2.48 GHz) and 5 GHz frequency bands (5.15–5.35 GHz and 5.725–5.825 GHz in the United States and 5.15–5.35 GHz and 5.47–5.725 GHz in Europe). Also there is the easily deployable, low cost, broadband wireless access commonly known as Wi-MAX (Worldwide Interoperability for Microwave Access) which is allocated the 2.5–2.69/3.4–3.69/5.25–5.85 GHz bands. Since these standards may be used simultaneously in many systems, there is a need for a single antenna which covers all these bands. Printed slot antennas are attractive because of their planar geometry and wide operating bands [1]. A co-planar waveguide (CPW) feed makes them more suitable for compact wireless communication devices owing to its features like uni-planar structure, easy fabrication and circuit integration. Several slot geometries like square, rectangular, triangular, trapezoidal, circular, elliptical etc. in combination with either a rectangular, fork like or circular tuning stub, optimized for wide-band operation, is found in literature [2]–[11]. Bandwidth enhancement is achieved by employing a feeding scheme that generates multiple resonances. Then by optimizing

the distance between the tuning stub and ground surrounding it, the impedance change from one resonant mode to the other is minimized, resulting in wide band operation. Since the lowest resonance of a wide slot antenna depends on the slot boundary [9]–[11], the concept of space filling of the Koch curves used in the design of compact and multi-band patch antennas [12], can also be applied for wide-slot antennas. In this letter, we present a CPW-fed modified Koch snowflake slot antenna operating over a wide frequency band, covering the 2.4/5.2/5.8 GHz WLAN and 2.5/3.5/4.5 GHz WiMAX bands. The proposed design has a compact size (mm , inclusive of the ground plane on FR4 substrate) and wider bandwidth when compared to the slot antennas reported earlier [2]–[5]. Also, the proposed antenna, designed for the WLAN/Wi-MAX applications, retains the advantage in terms of size when compared to the ultra wide band slot antennas tailored for the FCC approved UWB band (3.1–10.6 GHz), in spite of the lower frequencies of operation [6]–[9]. Even though a wide-band antenna operating from 2.3 to 6 GHz is sufficient, a dual band antenna design would significantly relax the requirements imposed upon the filtering electronics within the wireless device and would be cost-effective. Etching a particular feature in the interior of the radiating element of a planar monopole is a simple means for creating a frequency notch while maintaining the wide-band operation [13], [14]. In this letter, a half wavelength tuning slot is integrated with the wide-band Koch slot antenna for the filter action. This way the antenna achieves dual wide-band operation satisfying the WLAN and Wi-MAX bands simultaneously along with a compact profile by virtue of the Koch fractal based slot geometry.

II. DESIGN

The configuration of the proposed modified Koch slot antenna for dual band operation is illustrated in Fig. 1. The antenna is implemented on a low loss substrate of relative permittivity and thickness .A modified Koch snowflake slot is fed by a 50 CPW feed along with a tuning stub embedded with a U-shaped slot. The antenna performance is analyzed using Ansoft HFSS [15]. The basic geometry of the slot is an equilateral triangle of side , in which repeated iterations are carried out as shown in Fig. 2(a)–(d). Fig. 3 plots the simulated return loss of the antenna (without the tuning slot) for the

ANALYSIS AND DESIGN OF AUTOMATED MEDICINE VENDING MACHINE

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Abstract.

An automated treatment vending tool with a self-contained on-website pill doling out mechanism and a garage facility for the plurality of pills that may be dispensed based totally on the character requirement. crucial additives of the tool are, a scanner to take the input from person, a device that includes servo cars for doling out the medicine, big garage location to keep the tablets, sensors to come upon the motion of medication, an inventory tracking gadget to maintain track of the garage, an business agency popular vertical foam fill gadget to % the drugs one after the other and a non-contact laser inkjet printer to print the outline which includes the time at which the drugs want to be taken. The stock monitoring tool moreover continues music of the expiry date of each batch of drugs and sends alert to fill up the garage whilst the medication run out. It furthermore holds an constructed in device to acquire money from the man or woman for the medicine which may be disbursed. a majority of those systems are monitored by using manner of a primary microprocessor, that's programmed to gain enter from the man or woman through the scanner and to actuate and manipulate all of the essential components required to dispense the medicine requested thru using the consumer. The system may be seemed as an automatic pharmacy located on a commercial scale in order that endless range of client may be capable of get entry to it each time.

Introduction:

1.1 Field of invention:

The present invention relates to automatic medicine vending machine, in particular to a machine that has the capability to dynamically receive input for the user and then dispense the required type of medicine. The input, here means, the prescription by the physician to the user. The system features a machine that is capable of handling a complete range of prescription.

1.2 Background of invention:

The growing modern age has also brought with it the dawn of the age of numerous types of diseases. The use of medicine to maintain and regain physical and mental health has been growing at a rapid pace. The doctors prescribe different type of medicine for one particular type of illness. Today it has become common for a person to take at least one type of pill at regular interval each day [1]. A

statistical survey shows that about 21% patients never follow their prescription and 6% patients is not capable of identifying their own medicines. In extreme cases, between 12 and 20% take medicines of other patients [2]. But in case of the elderly people the scenario is awful. They take numerous number of pills at one particular time of the day to maintain their health. Therefore, confusion can arise both concerning the schedule and whether or not the medication has been taken. This problem has been addressed by a number of personal pill dispensing machine in related art. Wherein the dispenser is preloaded with the medicine to be taken and is programmed to dispense the medication at a particular time of the day and alert the user to take the pills. Sometime, improper loading of the medication can cause some dosage issues. Improper medication is reported to be the most common reason why some patients do not respond properly to medical treatment. Patients sometimes forget to take the pill at a particular time and then try to 'catch up' by taking more than prescribed dosage [3]. It becomes difficult to remember when to take the medication when different types of pills are required to be taken at different times. Elderly people frequently do not have sufficient mental alertness to keep track of the frequencies and dosages of their various medicines over a sustained period of time [3]. Not only elderly people but also the people who go to work have this problem due to external factor like work pressure. It is not possible for them to carry a medicine dispenser with them. Even if they carry all the medicine strips with them, there is good chance that they might forget which pill to take at the particular time.

2. Design of the machine



Figure 1. User side of the

A SOLAR POWERED RECONFIGURABLE INVERTER TOPOLOGY FOR AC/DC HOME WITH FUZZY LOGIC CONTROLLER

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ABSTRACT

This study proposed a FUZZY logic controller for a hybrid AC/DC solar-powered house, with a single-phase inverter that may be configured for different applications. The key benefit of this converter is that it can operate in DC/DC, DC/AC, and grid tie modes, all of which minimize the inverter's losses and cut down on its overall cost and footprint. This is a hybrid AC/DC house, meaning it contains both AC and DC appliances. By segregating DC types of loads to the DC supply side and the remainder of the AC side, this method helps to decrease power loss by eliminating needless duplicate stages of power conversion and improves the harmonic profile. MATLAB/Semolina is used for simulation.

I. INTRODUCTION

In this century, renewable energy sources have expanded and improved in ways never seen before [1]. Increases in both the capacity and production of each and every endless innovation have been accompanied by equally impressive increases in the sophistication of their respective enabling methodologies. For the years 2009–2013, solar PVs experienced the fastest growth rate among renewable in terms of installed power capacity [2–3]. In particular, rooftop solar PV are becoming more prevalent in transportation systems due to factors such as the decreasing cost of solar board, Government strategies (such as feed in levies) to promote the use of sustainable power sources, measured quality, and less support, etc. However, the significant soundness and unwavering quality issues in the distribution system [4-6] can be traced back to the inexhaustible unpredictable nature. As a result of the revitalization of the electricity supply sector, the customer has emerged as a pivotal actor in the marketplace. Options for stockpiling energy, such as battery systems, fuel cells, and so on, are provided in the age of solar PV to reduce the associated risks.

Power quality is being negatively impacted, power outages are occurring more frequently, and the challenge for electrical engineers is growing as a result of the proliferation of nonlinear modern new advancements in homes that are meant to improve efficiency and comfort[7]. Nowadays' family burdens

Are different in kind from those shown in earlier stages [8-10]. However, symphonic moderation and its minimizations are substantial challenges in the appropriation system.

II. LITERATURE SERVEY

The peak magnitude of the line-line grid voltage is used in conventional grid-connected inverters as the dc link voltage. Two-stage conversions are needed to increase the dc voltage and reverse it for this purpose. However, this will raise the system's price, size, and risk. Technology has advanced to increase efficiency and comfort as more and more nonlinear appliances make their way into homes, they become a major contributor to the generation of harmonic current in the distribution feeder. This poses a significant challenge for electrical engineers and has a negative impact on power quality and power losses. Household loads of today are different from those of the past. The distribution system faces significant difficulties, however, when it comes to harmonic mitigation and/or its minimization.

SYSTEM SUGGESTIONS (III)

The RSC is based on the idea that a single power conversion system can be used to perform multiple operational modes, including solar PV to grid (Inverter operation, DC-AC), solar PV to battery/DC loads (DC-DC operation), battery to grid (DC-AC), battery/PV to grid (DC-AC), and Grid to battery (AC-DC), for solar PV systems with energy storage. This inverter is put through its paces in a solar-

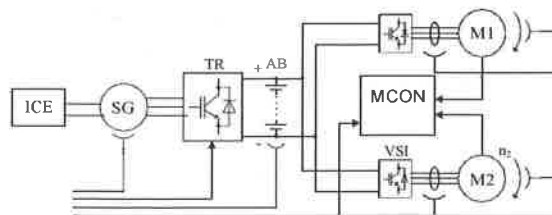
A Superior AC-AC Powertrain Association for HEVs: Comes about because of Demonstrating and Reproduction

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Abstract. Hybrid electric cars use AC/AC power trains, which are addressed extensively in this paper (HEV). With this connection, a 4QC auxiliary converter for autonomous and hybrid operation modes is no longer needed, and its function is taken care of by a smaller 0-5 matrix converter. Streamlining the connection might also contribute to a more efficient HEV drive train. Autonomous and hybrid modes of operation need a 3 5 M C matrix converter, which is utilized for traction, while the 3 5 M C matrix converter for AC is required for hybrid mode.

1. Introduction

HEVs have a significant impact on the automotive industry, the economy, and transportation and traffic services (hybrid electric vehicles). Front-end converter system with DC-voltage interconnect is used in [1], [2], [3], and [4]. An induction motor drive active front end of a VSI converter with a matrix converter (M C) has been shown to have lower semiconductor losses at full load than the active front end (AFE) in this study. M C's device current rating may be reduced by a third with similar thermal stress, [5] and [6]. [5] and [6]. Although the M C has a little higher passive component count and a slightly higher rating overall, the removal of a large smoothing capacitor is noticeable in [7]. A matrix converter-equipped AC/AC power train was developed to boost HEVs' energy efficiency [7, 8]. Because each traction motor has three phases, it is not feasible to connect two traction motors to a single direct traction converter. AB, VSI, Traction Motors (1, 2), Vehicle Control System (VCS), and Motors Control (MCON) are all traction system components (traction).



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AC/AC Modular Multilevel Converter Using HF Transformer Based on PSO Optimized PI Control Strategy

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Abstract: The main aim of this project is AC/AC Modular multilevel converter using high-frequency (HF) transformer based on Particle Swarm Optimization (PSO) based PI control strategy. The proposed converter has more advantages of modular design, high power density, no circulation current, good output voltage waveform quality. This converter has broad application prospects in the fields of high-voltage and high-power wind power generation, fractional frequency power transmission (FFTS) and power electronic transformer. The proposed converter topology can connect two three-phase AC systems with different frequencies and amplitudes directly. By introducing HF transformer, the direct series connection of input and output modules can be realized simultaneously, and the expensive industrial frequency transformer with large volume and weight can be removed. In order to achieve HF electrical isolation, the HF inversion of the output pulse is carried out at the inverter side to realize the HF output of the fundamental wave. After passing the HF transformer, the pulse is restored to the low-frequency output wave by the cycloconverter. The modulation scheme, PSO based PI control strategy and typical parameter design are developed. Furthermore, the feasibility of the proposed converter is verified by simulation results.

Keywords: Modular Multilevel Converter (MMC), Particle Swarm Optimization (PSO), High Frequency (HF) transformer

I.INTRODUCTION

Reduced access to fossil fuels heightens the urgency of switching power plants to renewable energy sources. Wind power has emerged as a feasible option in recent years due to its minimal environmental effect. Although offshore wind power is vital to helping the world meet its renewable energy target [1], research on the most efficient means of incorporating it into the grid is

just getting started. Discovering a converter has been the driving force for all of our other efforts. The output voltages from wind turbines are becoming too high for a two- or three-stage converter to handle effectively. Since the turn of the century, modular multilevel converters (MMCs) have been extensively employed to develop new types of converters [2]. MMC originally appeared in HVDC (high-voltage direct-current) networks [3]. The extensive use of voltage source converter architecture is a result of its many benefits, which include its modular design, simplicity of scaling, high output voltage waveform quality, and exceptional power characteristics. The majority of recent MMC literature is structured around subjects like fundamental circuit architecture and parameter design, mathematical model construction and analysis, modulation technique, control strategy, computer simulation technology, experiment design, and industrial device implementation. The requirement to eliminate DC fault components and the cost of establishing an offshore converter station prevent HVDC from being widely used in MMCs [8]. To connect offshore wind power networks, the fractional frequency transmission system (FFTS [9, 10], also known as low frequency alternating current (LFAC) [11] transmission system) is proposed as a revolutionary method. In [12], we assess the current state of LFAC studies and offer several transmission components designs for an upcoming offshore LFAC project. LFAC is required to connect offshore wind farms to the electrical grid, as mentioned in [11]. The offshore converter facility would have otherwise been required to convert the low-frequency electrical energy being. Following this innovation, offshore wind power projects are now more dependable and less expensive to launch. The University of Colorado's R.W. Erickson and O.A. al Naseem developed a modular multilevel matrix converter in 2001 [13] that can transition between numerous matrix levels. (M3C). The modular, multi-level

Blockage control utilizing generator and burden rescheduling

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Abstract. CM techniques are examined in this paper, as well as how the new competitive structure of the electricity market affects them. If the system's workload grows or a contingency emerges, many lines may get overloaded. Energy production and distribution must be optimized to meet demand in order for the system to function optimally. The researchers in this study used swarm intelligence techniques and the best possible rescheduling of production units and load needs to handle the CM problem. A combination of fuzzy adaptive PSO and Particle Swarm Optimization (PSO) is employed to solve the CM problem here (FA-PSO). IEEE 30 bus and Indian 75 bus are used as the test platforms for this approach to CM.

1. Introduction

So that power system security and reliability may be maintained at appropriate levels while simultaneously optimizing market efficiency, regulations are required for a deregulated power system. When electric energy producers and consumers wish to generate in amounts that exceed one or more transfer constraints, transmission networks are deemed congested. The security and reliability of the system are directly impacted by congestion. Dynamic congestion may occur if the system becomes insecure due to an interruption or outage, forcing other lines to become crowded as well. Congestion Management (CM) may be the most fundamental problem with transmission management, which requires monitoring the transmission system to ensure that transfer limits are not exceeded.

Maximizing profit necessitates bidding the extra cost of an electricity generator, which is the case for price takers. Bidding by a generator to improve profits by taking advantage of market inefficiencies is referred to as "strategic bidding. Literature offers a wide range of solutions to the CM issue. For the most part, the solutions used to alleviate the congestion include rearranging the timing of generator outputs, making provision for reactive power, and cutting down on load demands and transaction volume. OPF-based CM methods may be found all throughout the scientific literature [2].

For reducing generator rescheduling costs while also alleviating line congestion, a novel Particle Swarm Optimization (PSO) method is presented in [3]. By using the Cuckoo Search method in [4], we may reduce the cost of generator rescheduling by rescheduling them in the most efficient manner. [5] proposes an enhanced inertia weight PSO-based CM strategy for a deregulated energy market. Referencing references [7], an Artificial Bee Colony algorithm is proposed, based on generator rescheduling and inspired by the intelligent foraging behavior of honey bee hives.

**Cosmol programming reproduction of explicit acceptance engine working
circumstances**

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Abstract. COMSOL Multiphysics software was used to simulate three-phase squirrel-cage induction motors, and some of the findings for various motor operating situations are presented in this work. For both normal operation and operation with a locked rotor, the simulation was run at the nominal rotational speed and under the nominal operating conditions described above. It is shown that the currents in the rotor bars that are closest to each other, as well as the inner torque of the motor, are all shown for each tested situation. It's possible to compare the model's simulated values of numerous motor characteristics with real-world measurements taken by the manufacturer, the manufacturer, or our lab. According to known scientific values, we may compare the simulation findings to those obtained from the actual measurements. An analogous circuit for the motor may be constructed using COMSOL and its parametric values, which can then be compared to the motor data plate and to actual testing results.

1. Introduction

Electrical devices may be designed, studied, calculated or optimized using the Finite Element Method (FEM). Because it uses finite elements to break down a large problem into smaller pieces, the FEM is a powerful numerical approach [4]. For each element, a different set of element equations is used. Each element's single node point is where the answer may be found. COMSOL Multi Physics [5] is only one example of the several alternative FEM software options available.

For the purpose of creating a quasi-3D model, an out-of-plane thickness of the induction motor's windings was chosen in advance (opaque). Uses the AC/DC Module's Rotating

Cut-out shapes have a significant effect on the dynamic behaviour of composite thin circular plates.

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ABSTRACT

Effect of cut-out form on fundamental frequency and harmonic response is investigated. circular composite plates that are thin and composite, with the boundaries being kept constant. The Finite Element Method is used for this employed ANSYS Workbench 18.2's SHELL181 module. In all, there are nine unique round plates. characterized by a center equilateral triangle, square, pentagon, hexagon, heptagon, octagon, Patterns of normal nonagons, decagons, and circles have been developed to help us grasp the evolution of the how a building vibrates when its opening geometry approaches a circle. Furthermore, a robust circular plate was modelled so that measurements could be taken and compared. Deeper research on the impact of the slit shape requires everything composites of cross-ply and angle-ply have been used in the design of the constructions. The analysis of vibration at no cost has been completed. to determine the underlying tone frequency of every building. This post will discuss the solution to the harmonic response analysis challenge. using a fixed damping ratio and the Mode Superposition Technique. This study's findings have been understood by taking into account the stress, displacement response, and phase changes at a certain frequency. The According to the findings, the fundamental frequency and harmonic response are significantly impacted by the cut-form. outs of the spherical framework irrespective of Fiber orientation.

Keywords:

Harmonic resonant frequency; Cut-out geometry; Discrete element modelling.

INTRODUCTION

Holes in circular plates have found usage in a wide variety of technological applications. The vulnerability of these structures to stresses that might cause failure has prompted much research on their vibrational characteristics. the phenomenon of resonance, which causes structures to collapse. Furthermore, the enormous stress and potential displacement from the intense vibration imposed by such loads might potentially cause damage to these structures. Several evaluations of structural vibration, such as harmonic response analysis (Sivandi-Pour et al., 2020; elebi et al., 2018; albas Sam., 2021), have been conducted (Yu et al., 2017, Jiaqiang et al., 2018, Jived et al., 2018, and Gonenli & Das, 2021). Several studies that are important to this discussion have been briefly covered (Kumar & Sarangi, 2019; Liu et al., 2021; Son et al., 2021). Take into account the following. Zeng et al. (2019) used Finite Element Analysis to examine the vibration response characteristics that demonstrate the movement of a damaged compressor blade.

Kral looked on the resonant behaviour of laminated composites and their harmonics (2014). beams subject to various boundary conditions and confinement sequences. Response of a composite beam to a moving object. Which Gawryluk et al. determined to spin at a constant rate (2019). Abed and Majeed (2020) looked at how boundary circumstances affected the harmonic response of cross-ply and angle-ply composites of different materials and thicknesses. even and Aktaş investigated the modal and harmonic responses of carbon Fiber laminate reinforced concrete railway sleepers (2021). An inner-wall surface discontinuity was the focus of Oka and Khalif's (2020) investigation on the dynamic response of composite pipes used to transport fluids. Using the dynamic stiffness method, Zhang et al. (2018) conducted a harmonic analysis of connected plate structures. The dynamic response of a mass-spring supported, three-beam system under a moving load was investigated by Yuling et al. (2020).

CIRCULAR STRUCTURES AND THE FINITE ELEMENT APPROACH

In order to assess the fundamental natural frequency and the harmonic response of the composite thin circular plates shown in Figure 1, the Finite Element Analysis has been used. A structure's equation of motion looks like this:

$$M\ddot{\delta} + C\dot{\delta} + K\delta = F$$

where the mass, damping, and stiffness matrices are denoted by M, C, and K respectively. The vector F is the external force, while the vector δ is the generalized displacement coordinates. Various textbooks discuss how to evaluate certain matrices and vectors (Petty, 2010). When calculating a structure's basic natural frequency, it is important to assume that no external force is acting on it and that the damping is also zero. The resulting equation of motion is.

$$M\ddot{\delta} + K\delta = 0$$

Reducing Equation (2) into an eigenvalue problem gives

Do studies of political ideology that use Mechanical Turk samples have any validity?

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Abstract

Researchers are increasingly turning to Amazon's Mechanical Turk (MTurk) to find participants for their studies. We know very little about whether liberals and conservatives recruited through MTurk have the same psychological dispositions as their counterparts in the mass public, despite the fact that great attention has been paid to the demographic distinctions between MTurk samples and the national population. Some have suggested that MTurk's selection mechanism renders irrelevant the subject pool for investigating important topics in political science, however this is not supported by data. This paper's goal is to assess the veracity of this claim by contrasting a large MTurk sample with two nationally representative samples (one done online and the other face-to-face). We analyze the three samples to see if there are any consistent personality or value-based explanations for political ideology. The findings from the three samples are almost comparable, with just slight differences in the effect sizes. For the most part, the ideological and political differences between our MTurk sample's liberals and conservatives resemble those seen in the general population, but MTurk liberals seem to have more stereotypically liberal beliefs and attitudes than liberals in representative samples. Overall, our findings support the idea that MTurk may be used as a reliable recruiting method for studies of political ideology's psychological effects.

Keywords

Sample comparison, external validity, and Mechanical Turk.

Introduction

Amazon's MTurk (Mechanical Turk) is being used more and more often by academics to find participants in surveys of the general population (e.g., Ahler, 2014; Arceneaux, 2012; Clifford, 2014; Grimmer et al., 2012; Huber and Paris, 2013; Johnston et al., 2015). Using MTurk, you can quickly recruit a wide range of participants at a fraction of the cost of paid online panels (Berinsky et al., 2012). There are many different ways that researchers have tried to verify MTurk's reliability as a sample recruitment method. Framing effects (Berinsky et al., 2012; Weinberg et al., 2014), decisionmaking biases (Goodman et al., 2013; Paolacci et al., 2010), economic games (Horton et al., 2011), and cognitive psychology tasks are only some of the areas where experimental findings have been repeated on MTurk (Crump et al., 2013).

According to the findings of others, MTurk data conform to industry-standard psychometric criteria (Buhrmester et al., 2011; Shapiro et al., 2013). Respondents using MTurk are just as attentive, if not more so, than those using other methods (Hauser and Schwarz, forthcoming; Paolacci et al., 2010; Weinberg et al., 2014).

Still, MTurk's usage raises a number of questions (e.g., Chandler et al., 2014; Krupnikov and Levine, 2014). Much of the argument over whether or not MTurk can be used as a reliable recruiting tool has followed the field's "near preoccupation" with the importance of a sample's external validity (McDermott, 2002: 334). There is a persistent pattern of findings suggesting MTurk samples differ from the general U.S. population in being more politically liberal, younger, less religious, and less ethnically diverse (Berinsky et al. 2012; Huff and Tingley, 2015).

Distinctive Liberal and Conservative Mindsets

There is a wide range of psychological differences between liberals and conservatives, but the most prominent are differences in personality and values. Over the course of many decades of study, the Big Five personality qualities—Openness to experience, conscientiousness, extroversion, agreeableness, and emotional stability—have emerged as a valuable framework for analyzing the consistent features that underpin people's actions (Costa and McCrae, 1992). Ideology can be reliably predicted by two of the Big Five qualities in particular. Scores on measures of Openness are often higher among liberals, who show a stronger propensity to seek out and consider novel perspectives (Gerber et al., 2013). When it comes to reliability and self-control, conservatives tend to have higher Conscientiousness scores (Gerber et al., 2013).

Less conclusive results have been found when looking at associations between other qualities and

ELECTRO-HYDRAULIC ACTIVE SUSPENSION MODELING AND CONTROL

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Abstract

There is less of a compromise needed between ride quality and handling with an active suspension system. In order to do this, appropriate actuators will need to be used, which will need precise regulation. In this article, a model-based controller for a nonlinear suspension actuator is proposed. First, the idea is developed in the linear framework to make the latter stages of synthesis and analysis more manageable. A linear actuator model is presented and explained in that section. In addition, a two-degree-of-freedom controller that may independently mildly reference and disturbance responses is developed and contrasted with model-free PID controllers during this design phase. Next, a linear parameter variable representation of the nonlinear plant is taken into account, and the better two-degree-of-freedom controller is fitted to the nonlinear framework. At last, a test vehicle is used to prove that the nonlinear controller can be used in practice.

Introduction

Passenger automobiles' ride and handling are greatly impacted by the suspension system. Passive suspension systems usually need a compromise between competing criteria describing road handling and passenger comfort throughout the design process. But active suspensions made feasible by sensors, controllers, actuators, and a data processing unit may apply more suspension forces on demand, easing the tension between ride quality, handling, and safety. Such suspensions often have a two-tiered control scheme. Different control techniques, from the simple skyhook controller to the intricate optimum controller design methods [1, 2], have been examined in order to identify how the vehicle body controller calculates the additional forces required for the real driving state. On a more fundamental level, the actuator controller must ensure that the actuator produces the specified reference force as specified by the vehicle body controller. Most studies on active suspension systems (e.g. [3]– [6]) treat the actuator as a perfect source of force, ignoring the fact that it has its own internal dynamics that interact in various ways with the vehicle's overall dynamics. Actually, most actuators have nonlinear behaviour [7], have a restricted bandwidth [8], and are subject to external disturbances, which increases the complexity of the controller design and places extra demands on the controller design procedure. Moreover, realizing active suspensions has often

been the subject of purely theoretical studies with little relevance to actual application.

Modelling and describing the system

The actuator shown in Fig. 1a consists of a standard shock absorber cylinder, two movable valves to provide unidirectional damping resistance, and two accumulators to compensate for volume change in the cylinder chambers. The actuator mimics the behaviour of a passive spring-damper in this setup. A power-pack consisting of a hydraulic pump and an electric motor is added so that active forces may be exerted, i.e., regardless of the amplitude and sign of deflection velocities \dot{z}_e .

A mathematical model that is nonlinear

When the system needs it, accumulators may release their stored hydraulic energy. Assuming the gas undergoes a polytropic phase transition, the

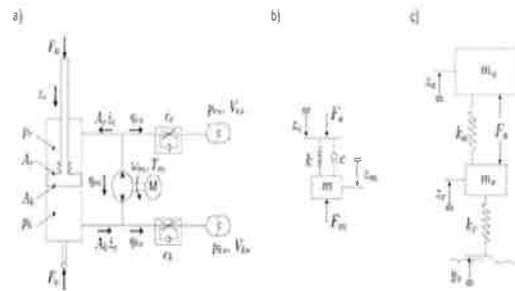


Figure 1: A quarter-car model with a nonlinear actuator (a) and a linearized actuator (b) based on [9]. (c)

FIGURE 1A: Pressure in the bottom accumulator, for which the following state equation may be derived

$$p_{ks} V_{ks}^\kappa = p_0 V_{k0}^\kappa \quad \text{OR} \quad p_{ks} = p_0 \left(\frac{V_{k0}}{V_{ks}} \right)^\kappa$$

where p_0 is the static charge pressure, V_{k0} is the starting gas volume, $V_{ks} = V_{k0} - R \int q_{ks} dt$ is the actual gas volume owing to fluid flow q_{ks} , and κ is the poly tropic gas constant. Differentiating (1)

EVALUATION OF THE PERFORMANCE OF VARIOUS MATERIALS AS CHILLS IN SAND CASTING OF AN ALUMINUM ALLOY

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Abstract:

This study has evaluated the effectiveness of metallic materials as chill in sand casting of aluminium alloy. Four plates of dimension 165mm x 80mm x10mm were cast using sand mould. Steel, copper and brass chills in form of cylindrical bar of geometry 7mm in diameter and 50mm long were inserted, side by side at regular intervals of 30mm in each sand mould and the last sample was left unshelled. Experimentation involved testing of mechanical properties and metallographic analysis of cast samples. The results obtained revealed that the sample chilled with copper has the highest mechanical properties.

Keywords:

casting; chills, aluminium alloy, impact strength test, mould

INTRODUCTION

Metal casting is a shape forming process whereby molten metal is poured into a prepared mould and allowed to solidify such that the shape of the solidified object is determined by the shape of the mould cavity. Sand casting is a metal casting process characterized by using sand as the mould material (Ibadite, 2001). Casting can be broadly divided into two main categories as expendable and nonexpendable mould casting. It can also be classified according to the mould material used to cast the metal such as sand casting, ceramic casting or metal mould casting and depending on the pouring methods as gravity casting, low pressure die casting and high pressure die casting (Navaneeth, 2009). Good mechanical properties are achieved in sand casting with the help of metallic insert in the mould known as chill (Mehr, 2012). Strong directional solidification is difficult to obtain in casting of intricate part made of aluminium alloys without the use of chills. The tendency for solidification to start throughout the metal makes proper feeding difficult. Chills must often be used to obtain satisfactory directional solidification (Chi-Yuan et al., 2006). Chills are metallic inserts moulded into the sand surface to promote high solidification rate in metal casting. Normally the metal in the mould cools at a certain rate relative to thickness of the casting. When the geometry of the moulding cavity prevents directional solidification from occurring naturally, a chill can be strategically placed to help promote it to obtain good mechanical properties. Chills are of two types, internal and external chills. Chills are

usually made from iron, aluminium or copper and can be machined or cast. The type of chill used depends on ease of manufacture and the desired thermal effects of the chill. Its effectiveness depends on size, conductivity, thermal capacity and the thermal transfer across the molten metal alloy/chill interface. Chilling has been found to improve the soundness of a casting when measured by standard non-destructive testing techniques like radiography or dye penetration inspection, but the influence of microstructure and mechanical properties can be significant (David, 2011). This research purely emphasized on evaluation performance of different material as chill in sand casting to increase solidification rate and to improve the mechanical and microstructural properties.

MATERIALS AND METHODS

The materials used in this research work include; # Aluminium alloy scrap: Aluminium alloy scrap was obtained from pantmaker (a spare part market) in Kaduna metropolis, Nigeria. # Chills: Mild steel, brass and copper chills were used in this research work. # Foundry sand: Foundry sand and other additives used in the present investigation were made available in metallurgical and Materials engineering foundry workshop of Ahmadu Bello University, Zaria. □

Equipment

Furnace: The melting of the alloy was carried out on charcoal fired furnace available in metallurgical and Materials engineering workshop. # Vicker Hardness Tester: Vicker Hardness machine of capacity 10 kg was used to carried out the hardness test of the samples. # Charpy Impact Tester: Impact test was carried out on a Charpy Impact Testing Machine of capacity 25J. # Optical Metallurgical Microscope: Microstructural examination was conducted on optical metallurgical microscope available at Metallurgical and Materials Engineering workshop. # Hounsfield Tensimeter: Tensimeter machine in Mechanical Engineering workshop was used to carry out tensile test for the samples. # Thermocouples: Thermocouples were employed in the measurement of temperature

Examining the influence of winglets on the blade geometry of tiny horizontal-axis wind turbines is an area that has seen a lot of experimental study recently.

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ABSTRACT

This study aims to examine and improve the performance of a tiny horizontal axis wind turbine blade operating at low wind speeds. The experimental blades were created utilizing an additive manufacturing method including 3D printing. At wind speeds between 2 and 6 meters per second, we examined air foils including the E210, NACA2412, S1223, SG6043, E216, NACA4415, SD7080, SD7033, S1210, and MAF. At a Reynolds number of 100,000, Foil was used to study the air foils and determine the ideal blade shape. Tip speed ratios between 3 and 10 were examined, along with solidities between 0.0431-0.1181 and angles of attack between 2 and 20 degrees. To optimize and further investigate the power coefficient, lift coefficient, drag coefficient, and lift to drag ratio, these variables were later adjusted in the MATLAB and Foil software. The rotors' cut-in wind speed was 2 and 2.5 m/s with and without winglets, respectively. Air foils with optimal geometries for the given operating circumstances and production process outperformed their NACA 2412, S1223, SD7080, S1210, and SD7003 counterparts. These included the E210, SG6043, E216, NACA4415, and MAF.

Keywords:

Keywords: air foils, aerodynamic efficiency, power coefficient, rigidity, tip speed ratio.

INTRODUCTION

Horizontal-axis wind turbines (HAWTs) and vertical-axis wind turbines (VAWTs) are the two main types of wind generators (HAWT). Generally speaking, VAWTs can produce greater power at a lower wind speed than HAWTs. As a result, VAWTs are more cost-effective for usage in neighbourhoods. At the same wind speed, however, HAWT is predicted to create greater power due to reduced aerodynamic drag and increased wind power generated by the spinning of all blades (Lee et al., 2016). Most SWTs are built to operate in a broad range of wind speeds without the ability to adjust their pitch. Given their intended function, it is preferable that SWTs have air foils that are effective at low Reynolds numbers, can start up and generate energy at relatively low wind speeds, and need little in the way of maintenance. Additionally, SWTs should be accessible to the common person in terms of price, dependability, and

lack of maintenance. As a result, there is often a compromise to be made between maximizing performance and keeping the design and operation as simple as possible (Ismail et al., 2018). One needs at least 4.2 m/s of wind speed for a tiny wind turbine with a horizontal axis to function. The improved blade may be used to lower the beginning speed without the need for external effort, opening up the possibility of deployment in roadside or rooftop settings (Abrar et al., 2014).

Another study looked at the first-use performance of tiny rotors and found that the majority of the torque-generating power came from the blade tips (Wright and Wood, 2004; Clifton and Wood, 2007). The Blade element momentum (BEM) model was shown to provide the highest accuracy and the most computing efficiency in calculating propeller performance after being compared to other blade element models (Gur and Rosen, 2008). Subsonic flow was studied in two dimensions over a NACA 0012 and SG6043 air foil at a Reynolds number of 3×10^6 in a different study (Patel et al., 2014 and Chaudhary & Prakash 2019). The distribution of chord and twist angles of tiny wind turbine blades was also researched to determine the optimal values for maximizing the yearly energy output of such devices.

METHODS AND MATERIALS

The BEM technique is widely used as a viable option for designing wind turbines. This theory proposes that Blade Element Theory and Momentum Theory may be used to determine the axial and tangential forces operating on the turbine blade. For a wind turbine, a power coefficient of 0.593 is the highest possible value. The Betz limit refers to this upper bound. In this research, we utilized Foil to create a new kind of air foil and



Bioactivity of food peptides: biological response of rats to bovine milk whey peptides following acute exercise.

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ABSTRACT

The higher availability of bioactive peptides in whey protein hydrolysate (WPH) has been linked to a number of physiologically positive benefits.

Aims: The goal of this study was to examine the effects of WPH's four BCAA-containing dipeptides on immunological regulation, HSP expression activation, muscle protein synthesis, glycogen content, satiety signals, and the influence of these peptides on plasma free amino acid profiles.

WPH was used as a control group. The animals were placed into six groups: control, water, Ile-Leu, Ile, Leu, and Val-Val. WPH was also used as a control group. Except for the control, all animals were subjected to intense physical activity for a short period of time.

Results: Leu-Val increased HSP90 expression whereas Ile-Leu promoted immunological response, hepatic and muscular glycogen, and HSP60 expression. We found that all three of the dipeptides lowered the levels of GLP-1 and GDF-1, but there was no change in leptin levels. NF- κ B expression was suppressed by all peptides. Plasma amino acid time-course demonstrated peptide- and isomer-specific metabolic characteristics, including a rise in BCAA concentration.

According to the findings, Ile-Leu was able to reduce the effects of exercise-induced immune suppression, increase glycogen levels, and activate an anti-stress

impact (HSP). The expression of HSP90, p-4EBP1, p-mTOR, and p-AMPK was also elevated by Leu-Val. Peptides found in WPH may have a role in a variety of health benefits, according to the research.

Introduction

A number of biological responses have been shown to be improved by whey proteins (WPs), including cytoprotective effects mediated by increased heat shock protein (HSP) expression, increased glycogen content, increased protein synthesis in muscles, immune response modulation, and an increase in satiety [1–6]. An important aspect of the body's natural defence mechanism, the HSPs help cells withstand and tolerate various stresses while also repairing and preventing harm. During times of stress, HSPs preserve cell integrity and shape, hence boosting cell survival [7]. For example, hydrolyzed WPs produce bioactive peptides, particularly BCAA-containing dipeptides, which are capable of regulating physiologic activities at the cell and tissue level [9]. [8] Peptides from whey protein hydrolysate (WPH) may be responsible for the favourable health benefits of WP intake, notably the WPH's bioactive peptides [2]. Exercise and proper homeostasis are often related with the favourable benefits of WP consumption. Because regular physical activity has been shown to alter homeostasis, it is worth including into your routine.

To get a deeper understanding of how these proteins might help counterbalance some of the negative



Confidential bank clients' acknowledgment of versatile financial administrations

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Abstract:

Third most significant revolution after agricultural and industrial revolution, according to some experts. Due to the rise of the internet and the subsequent dot-com burst, traditional banking systems were modified into modern ones such as the Automated Teller Machine (ATM), telebanking, e-funds transfer, and m-funds transfer. Banks and their customers have accepted e-banking like any other technology innovation because it is critical to providing high-quality financial services. As e-banking and smart phones have grown in popularity, more people have begun using mobile apps instead of traditional banking methods. This study is useful for both private and public banks since it provides an insight into the most recent advancements in mobile banking and how customers respond to it. What are people's views on mobile banking apps? Does a person's m-banking activity change as they become older? New Delhi private bank clients are divided into three groups: those who already use their mobile devices to conduct financial transactions, those who do so via mobile apps and the rest who don't use mobile devices at all. Using a pre-made questionnaire, we gathered information from our clients. Data analysis methods include percentage methods, averages, standard deviations, regression, and correlation.

Key words: Apps for smart phones and private banks; technological adoption; e-banking and mobile banking.

I. Introduction

Technological advances, particularly those related to the internet, are rapidly spreading and leading to significant changes in how businesses engage with



Effects of organic food consumption on human health; the jury is still out!

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ABSTRACT

It has recently been discovered that the nutritional makeup of organic vs conventional foods differs significantly, according to current systematic literature reviews and meta-analysis. As a result, organic vegetables had greater antioxidant concentrations, while cadmium and pesticide levels were lower. Organic meat and dairy products also had higher omega-3 fatty acid concentrations. Organic food intake has been linked to a lower risk of some acute disorders (e.g. pre-eclampsia, hypospadias) and obesity in a limited number of human cohort studies. Some people are concerned about the possible negative effects of organic food intake on their health (such as the danger of iodine deficiency in organic milk), although human cohort studies have yet to provide data to back up these claims. The lack of published data on (1) long-term cohort studies looking at chronic illnesses (such as cardiovascular disease, diabetes, cancer, and neurodegenerative ailments) or (2) controlled human dietary intervention trials comparing the effects of organic and conventional diets is troubling. As a result, it is presently impossible to determine how organic food intake affects human health.

Introduction

Many affluent nations in Europe, North America, and Asia/Oceania have seen the demand for organic food soar in the previous two decades [1]. Consumers believe that organic farming is better for the environment, biodiversity, animal welfare, and food quality and safety than conventional farming, and this drives demand. Organic farming has gained growing scientific support for biodiversity and environmental sustainability, but there is still much scientific debate on whether or not and to what degree organic production techniques result in food quality and safety, and human health advantages [7–11]. As a result, we'll go through the current research on organic food's compositional changes and possible health effects below.

Meta-analyses of variations in composition

The amounts of nutritionally important components in organically and conventionally produced foods vary significantly, according to recent systematic reviews and meta-analyses [12–14]. These systematic reviews found the following findings:

- Higher antioxidant activity and between 18 to 69 percent higher individual antioxidant concentrations in organic crops have been linked to reduced risk of certain chronic diseases, such as cardiovascular disease,



Fabrication of silver nanoparticles by *Phoma glomerata* and its combined effect against *Escherichia coli*, *Pseudomonas aeruginosa* and *Staphylococcus aureus*

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Abstract

Using *Phoma glomerata*, we synthesised extracellular silver nanoparticles (Ag-NPs) and tested their efficiency against *Escherichia coli*, *Staphylococcus aureus*, and *Pseudomonas aeruginosa*. A combination of antibiotics and Ag-NPs exhibited extraordinary sensitivity to bacteria that were resistant to other antibiotics. Methods and Results: The silver nitrate (1 mmol/l) was used to challenge the fungal cell filtrate in order to biosynthesise Ag-NPs. Characterization of the Ag-NPs was carried out using a UV-Visible spectrophotometer and a Fourier transform infrared spectrometer. The size of Ag-NPs was determined using scanning electron microscopy. Evaluation of the combined effect(s) against *E. coli*, *Staph. aureus*, and *Ps. aeruginosa* was done using the disc diffusion technique. In the end, the biosynthetic technique seems to be environmentally benign and simple to scale up the process. Because of their biogenic character, these Ag-NPs may show to be a superior medication candidate and avoid the issue of chemical agents. The Study's Importance and Impact: Antibiotic-resistant microorganisms are emerging at an alarming pace. An urgent need exists for the development of bactericides to address this issue effectively. Bacteria that are resistant to antibiotics may be able to be treated using Ag-NPs.

Keywords

Drug resistance, extracellular, Fourier transform infrared spectroscopy, *Phoma glomerata*, scanning electron microscopy, and silver nanoparticles are some of the other terms associated with this study.

Introduction

Engineering functioning systems at the molecular scale is what nanotechnology (NT) is all about. An NT is the capacity to operate at the molecular, atomic, and supramolecular levels in order to comprehend, build, and utilise materials, technologies, and systems that have fundamentally different characteristics and functionalities because of their tiny size. In order to investigate and modify biological systems, NT uses tools and technological platforms provided by biology, while biology gives NT with inspiration models and bio-assembled components (Mihail 2003). Topical bactericides such

as silver are used in medical practise (Yamanaka et al. 2005). Nanoparticles have more surface atoms than microparticles, which considerably enhances their physical and chemical properties as a result of the advancement of NT. Even though physical and chemical techniques exist to synthesise silver nanoparticles (Ag-NP), they need a great deal of

energy to sustain high pressure and temperature. Humans may be harmed by the use of dangerous substances during the synthesis process (Chen et al. 2003).

It is vital to note that micro-organisms such as bacteria and fungus may play a key role in the remediation of hazardous metals, which is why these biological systems have been widely exploited for the quick and environmentally benign manufacture of metal nanoparticles (Bhattacharya and Gupta 2005). Nanoparticles may be synthesised both intracellularly and extracellularly by uni- and multicellular organisms, since they can produce inorganic materials both in and out of the cell.

Studies on the use of microbes in the synthesis of various metal nanoparticles have been conducted in the recent past, including studies on bacteria for gold (Beveridge and Murray 1980); silver (Joerger et al. 2000); CdS (Smith 1998); ZnS (Labrenz 2000); magnetite (Lovley et al. 1987); iron sulfide (Watson et al. 2001); and iron sulfide sulphate (Robinson et al. 1997). Fungi have been used extensively to synthesise a variety of different metal nanoparticles, including gold nano particles from *Fusarium oxysporum* and *Colletotri chum* species, *thermomonospora* sp., and Lichen fungi (*Usnea longissima*) and silver nanoparticles from *Fusarium acu minatum*, *F. semitectum*, and *Aspergillus f.* Among other things, these fungi have also been used



Formation of 1,3-Thiazine Catalyzed by Gold and Isolation of a Rare Tautomer

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ABSTRACT

This is the first paper to describe the synthesis of 1,3-thiazine/1,3-thiazinane using gold as a catalyst, followed by its separation. The method described herein has the potential to rapidly and reliably produce a broad range of 1,3-thiazine derivatives in high yields. It's important to keep in mind that, depending on the although the 1,3-thiazine isomer cannot be found in crystalline forms, the 1,3-thiazinane isomer may be synthesized. Isomer. Significant progress toward a new method for the synthesis of chemicals that may have important biological functions has been made in this work, making it notable. Method for identifying and omitting tautomerisms.

INTRODUCTION

The scientific community has been fueled by the discovery of new ways to efficiently synthesize heterocyclic compounds¹, giving chemists a lofty target to go towards in their quest for novel molecules. Techniques for synthesizing that focus on differences between elements. Thiamine, in particular, is a member of the class Contrary to the great majority of other possible structural centers, heterocyclic scaffolds that are doable in three different configurations. N and S Atomic Positions There are six rings. Because of this, certain species are crucial: Anti-microbial, anti-epileptic and anti-spasmodic properties are only few of the found biological actions. The powers