

Lemon Leaf Disease Detection using Image Processing Approaches

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Abstract:

Lemon leaf disease must be found and identified early in order to reduce severe losses and increase agricultural output. Lemon leaf diseases pose a serious danger to food security and will result in decreased productivity, financial loss, loss of quality, and loss of quantity. There aren't many technologies available to help farmers in different parts of the world, but if automated detection techniques are used, it will be easier, faster, and more accurate. On plant parts such the leaves, stems, and fruits, the symptoms can be seen. As a result, this research presents a novel strategy for identifying the Lemon leaf disease using digital image processing methods.

Keywords:

Lemon leaves, Area, Perimeter, Histogram

I. Introduction:

Lemons are a popular fruit that people use in small quantities to add flavor to food. Lemon is grown for their edible fruit that has countless vitamins and helpful nutrients. Lemon, usually consumed in daily diets, is a main basis of antioxidant. Their potential is manipulated across precise periods. Lemons find countless uses in both new and processed forms. Export of these processed produce of lemons yield extra income for country. In order to become good quality of processed produce the quality of lemons ought to be good. Moreover elevated labour price for recognizing good and bad lemons in industries is the main obstacle and additionally period consuming. Consequently it is extremely vital to recognize the quality of lemons for the intention of its custom by an automatic sorting contraption for assorted necessities in industries [1].

Employing MATLAB multimedia as an instrument in picture processing, we can find the quality of lemons employing assorted algorithms. In the end afterward accumulating lot of trained data centers, we have counseled precise range. With these scopes we can recognize the quality of lemons, whether it is good or bad.

Inventory Models in Industry

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Abstract:

Inventory constitutes a major component of working capital. To a large extent, the success and failure of a business depends upon its inventory management performance. It is defined as the array of goods used in production or finished goods held by a company during its normal course of business. The basic objective of inventory management is to optimize the size of inventory in a firm so that smooth performance of production and sales function may be possible at minimum cost. Inventory is a significant source in all the balance sheets concerning every business. Industries have been playing an important role for the socio-economic development of any country.

Keywords:

Inventory, Demand, Supply, EOQ Model

Introduction:

It is required at different locations within multiple locations of a supply network, to protect the regular and planned course of production against the random disturbance of running out of the materials or goods. Inventory management also concerns fine lines between the replenishment lead time, carrying costs, asset management, inventory forecasting, valuation of inventory, future inventory price forecasting, physical inventory, inventory visibility, available space for inventory, quality management, replenishment, returns ,defective goods and demand forecasting. Possessing high amount of inventory for long periods of time is not usually good for a business because of inventory storage, obsolescence, and expiry, spoilage costs.[1] On the other hand, the possessing of too little inventory isn't good either, because the business can face the risk of losing out on potential sales and potential market share as well.

Framework for Inventory Models:

General framework for inventory models has five components --- (1) Demand, (2) Order Quantity, (3) Lead Time, (4) Safety Stock and (5) Cost of Possession of Inventories.

1. Demand

Demand is an indispensable component of inventory management. Inventory decisions are always made with reference to the future demand. The decisions are taken when the manager is certain about the requirements in his department and again when the certainty is not ensured. The later state tells nothing about the likelihood of future levels.

2. Order Quantity

After determining the quality to procure, the buyer must decide as how much to buy. Most material requirements are continuing requirements, cumulative or total needs. Such a system of requirements is a far better guide than the day to day needs.

A Brief Study on Branches of Algebra

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Abstract:

Algebra is divided into different sub-branches such as elementary algebra, advanced algebra, abstract algebra, linear algebra, and commutative algebra. Algebra is one of the main branches of mathematics, covering the study of structure, relation and quantity. Algebra studies the effects of adding and multiplying numbers, variables, and polynomials, along with their factorization and determining their roots. In addition to working directly with numbers, algebra also covers symbols, variables, and set elements. The study of algebra is a subfield of mathematics that focuses on symbols and the arithmetic operations that can be performed across them. These symbols, which are referred to as variables, do not have any consistent values associated with them. When we look at the problems that we face in real life, we frequently notice certain values that are always shifting. However, there is an ongoing requirement to represent these ever-evolving values. In the context of algebra, these values are frequently denoted by symbols such as x, y, z, p, or q; the term “variable” refers to the fact that these symbols are used to represent the values. In addition, in order to determine the values, these symbols are subjected to a variety of arithmetic operations, including addition, subtraction, multiplication, and division. Addition and multiplication are general operations, but their precise definitions lead to structures such as groups, rings, and fields.

Keywords:

Mathematics, algebra, linear algebra, Pre algebra, advanced algebra

1. Introduction:

Algebra is a branch of math dealing with several symbols. Algebra represents or helps in representing problems or situations as mathematical expressions. It comprises variables such as x, y, z. Moreover, it also involves mathematical expressions like subtraction, addition, multiplication, and division in order to generate a significant mathematical expression. Moreover, Algebra has its application in all the branches of math like trigonometry, calculus, coordinate geometry, etc. In this blog let us understand the importance of algebra. Algebra is a branch of math that deals with variables, symbols, variables, numbers and the rules for manipulating it. It helps solve mathematical equations and assists in deriving unknown quantities such as the bank interest, proportions, and percentages. Thus, before we dive deep into understanding Algebra, its applications, branches, etc., let us first understand the basic terms associated with Algebra [1].

Artificial Intelligence and Computing in the Future

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Abstract:

This research looks towards the future of computing and artificial intelligence. Artificial intelligence (AI), often known as machine intelligence, is intelligence demonstrated by machines as opposed to natural intelligence demonstrated by people. According to leading AI textbooks, the area is defined as the study of "intelligent agents": any technology that observes its surroundings and takes actions that maximise its chances of success. In antiquity, there were mathematicians. The study of mathematical logic led directly to Alan Turing's idea of computation, which proposed that a machine could imitate any conceivable act of logical deduction by shuffling symbols as simple as "0" and "1". Data is now being streamed in real time, thanks to the explosive rise of digital devices, social media, cloud computing, and the Internet of things (IOT). These data are ideal for training AI systems. In a few years, AI will have impacted practically all businesses on the earth, and there are numerous ways AI is and can revolutionize certain industries. Because AI can surpass humanity in more and more industries, it has the potential to cause a human unemployment catastrophe. Another source of concern is the potential for AI to be abused by hackers, renegade states, and attackers. Computers and computer technology altered how people worked and functioned. The first computer was a Behemoth. Everything you need is now available on the computer via the internet, and even the most complex computations can be performed by these contemporary marvels.

Keywords:

Computing, Artificial Intelligence, International Futures, Forecasting.

Introduction:

For many individuals, the phrase Artificial Intelligence, or AI, conjures up a wide range of images and expectations. Some envision a world replete with autonomous vehicles zipping around without human intervention. Others may see a society in which intelligent robots work alongside humans, alleviating much of the drudgery and daily toil from their lives. Some predict that healthcare and healthcare technologies will progress rapidly, allowing humans to live healthier, fitter, and longer lives. Some may envision a world in which AI becomes the great equaliser, decreasing production costs and making a diverse variety of goods available to large segments of the population. Nonetheless, for some, AI conjures up images of a world characterized by mass labour dislocation and inequality, resulting in widespread social instability.

The overwhelming concern is that AI would outperform humans, with disastrous and unforeseen repercussions.

Emerging trends and future directions in Machine Learning and Neural Networks: A Review

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Abstract:

Machine learning and neural networks have revolutionized the field of artificial intelligence by enabling computers to learn and make intelligent decisions without being explicitly programmed. This abstract provides an overview of machine learning and neural networks, highlighting their fundamental principles, applications, and recent advancements. Machine learning is a subset of artificial intelligence that focuses on the development of algorithms and statistical models that allow computer systems to learn from data and improve their performance over time. It encompasses a wide range of techniques, including supervised learning, unsupervised learning, and reinforcement learning. By analyzing large datasets, machine learning algorithms can identify patterns, make predictions, and automate complex tasks. Neural networks, inspired by the structure and functioning of the human brain, form the basis of many machine learning algorithms. A neural network consists of interconnected artificial neurons, or nodes, organized into layers. Each neuron receives input data, performs calculations using weighted connections, and produces an output. Deep learning, a subfield of machine learning, utilizes deep neural networks with multiple hidden layers to process complex data representations.

Keywords:

Machine learning, Neural networks, Artificial intelligence, Supervised learning

Introduction:

The field of machine learning and neural networks has witnessed remarkable advancements and continues to evolve at a rapid pace. As new techniques, algorithms, and applications emerge, it becomes crucial to explore the emerging trends and future directions in this dynamic domain. The applications of machine learning and neural networks are vast and diverse. They have been successfully employed in image and speech recognition, natural language processing, recommendation systems, fraud detection, autonomous vehicles, and healthcare, among others. The ability of neural networks to capture complex patterns and make accurate predictions has fueled their adoption in numerous domains. Recent advancements in machine learning and neural networks have further propelled their capabilities. The advent of deep learning has led to breakthroughs in areas such as computer vision, where convolution neural networks excel at image analysis. Recurrent neural networks have revolutionized natural language processing tasks, including machine translation and sentiment analysis. While machine learning and neural networks have achieved remarkable success, challenges persist. Ethical considerations surrounding data privacy, bias in algorithms, and the interpretability of neural networks pose ongoing concerns. Further research and development are required to address these challenges and unlock the full potential of machine learning and neural networks in shaping the future of artificial intelligence. The perception and neural network foundations of deep learning followed by the creation of more

Psychological Effects of Mobile Game Addiction on Students

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Abstract:

During recent years gaming addiction has received increased attention from psychologist, psychiatrist, parents, teachers, media, and mental health organizations, to some extent, by gamers all over the world. Some researchers use the terminology of problematic or excessive game usage instead of disorder to denote the harmful use of video game playing. Based on published empirical studies, most of them from early 2000 to date, it appears that excessive game play or game addiction have potentially damaging effects on individuals, in the same way as other traditional addictions, including substance use addictions. Moreover, there are no uniform, psychological or physiological screening criteria available and field has been hindered by use of inconsistent and non-standardized criteria to detect mobile game addiction. Most of the recruitment methods have serious sampling biases with over reliance on selfselected samples. Clearly there exists a gap in current established understanding of gaming addiction. There is a need of epidemiological research to determine the occurrence and prevalence of clinically significant problems that are associated with gaming addiction, to ensure recovery and treatment in a better way briefly discussed in this paper.

Keywords:

Gamming disorder, Human mind, psychological effects, flow

Introduction:

Video game addiction falls into the category of Internet gaming disorders (IGDs), which have been strongly correlated with motivational control issues and are regularly compared with gambling. Many studies have suggested that behavioral addiction can result from compulsive use of the internet. Although the spectrum of internet addiction includes video gaming, online shopping, gambling, and social networking, video game addiction seems to be its most studied form. Currently, according to the Diagnostic and Statistical Manual of Mental Disorders, video game addiction is defined as the steady and repetitive use of the Internet to play games frequently with different gamers, which leads to clinically significant distress and psychological changes. Video game addiction may have both short and long-term impacts on gamers, [2] including various emotional, psychological, and neurological effects. A few studies have demonstrated that anxiety and depression are common among individuals who are dependent on video games. In the new generation of children, physical activity time is less and shorter in duration when compared with the parent's generation because children's activities moved toward indoor more than outdoor play.

Recent Advances in Composite Material Research: A Review

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Abstract:

Composite materials have gained significant attention in various industries due to their exceptional mechanical properties and versatility. This review paper provides a comprehensive overview of recent advancements in composite material research, focusing on composition, and applications. Depending on the intended application, composites can be designed to satisfy specific geometrical, structural, mechanical, chemical, and sometimes aesthetic requirements. Areas of application of these synthetic materials includes construction such as in buildings and bridges, automotive industry such as in car bodies, aeronautic, naval (e.g., ships and boats), and in the biomedical fields. The corrosion resistance, high strength, lightweight, design flexibility, durability, and in many more key benefits composite materials can have apart from regular mechanical properties. The composite has many applications from day-to-day life to industrial products. The usefulness of composite material in place of consumable material nowadays is very common.

Keywords:

Composite materials, Matrix, Fibre

Introduction:

Over 6000 years ago, the earliest composite material, wattle and daub, was used as building material for walls, marking the beginning of humankind's production and usage of composite materials [1]. This building material has since been replaced by concrete, a composite made of cement and reinforcements like gravel (aggregates), also known as loose stones, and whose annual production capacity is estimated to be in the millions of tonnes worldwide. High compression strength and low tensile strength are a couple of the mechanical characteristics of concrete [2]. In general, composite materials find applications in different areas of the human society such as in construction industry (e.g., buildings and bridges), automotive industry (e.g., automobile parts such as car bodies), aeronautics where materials with a property combination of high strength and low density is required, manufacture of housing and industrial parts such as storage tanks, bathtubs, washing sinks, and shower stalls, and in medical field as biomaterials for tissue repairs and replacements [3]. Composite materials are preferred as these are stronger, lighter or less expensive when compared with individual materials. Due to these reasons, composite materials are replacing individual materials in the engineering and construction applications.

Fibres and Matrix:

The primary function of the reinforcement in composites reinforced with continuous fibres is to provide strength and stiffness and to support the structural load. The purpose of the matrix is to provide shape and form, to protect the fibres from structural damage and adverse chemical attack, to distribute stress, and to provide toughness. The matrix also stabilizes the composite against buckling in compressive loading situations. The combined material has good flexural properties, which are of importance to the manufacturing of submersible structures, sporting goods, and medical equipment [4].

A STUDY ON VISCOELASTIC FLUID-STRUCTURE INTERACTIONS

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Abstract:

The interaction between viscoelastic fluids and solid structures plays a pivotal role in a myriad of engineering and scientific applications. This study delves into the complex dynamics and phenomena arising from the coupling of viscoelastic fluids and structures, offering valuable insights into the behavior of these systems. The research begins by establishing a comprehensive understanding of viscoelastic fluids, emphasizing their unique characteristics, such as shear-thinning, viscoelasticity, and time-dependent behavior. These fluids are prevalent in various domains, including biomedical engineering, geophysics, and materials science. The core focus of this investigation is the examination of how viscoelastic fluids interact with solid structures. It involves the analysis of the fluid-structure interaction (FSI) phenomenon through both experimental and numerical methodologies. Experimental techniques encompass rheological measurements, particle tracking, and flow visualization, providing essential data to validate numerical simulations. Numerical simulations, conducted using state-of-the-art computational fluid dynamics (CFD) and finite element analysis (FEA) techniques, allow for the exploration of a wide range of FSI scenarios. These simulations consider parameters such as fluid viscosity, elasticity, and the geometry and mechanical properties of the solid structure. By systematically varying these parameters, the study uncovers intricate relationships between fluid and structure, shedding light on the fundamental mechanisms at play. Furthermore, the research delves into practical implications by investigating how these findings can be applied to enhance the design and performance of real-world systems.

Keywords: Viscoelasticity, Fluid-Structure Interaction (FSI), Rheology, Computational Fluid Dynamics (CFD), Finite Element Analysis (FEA), Shear-Thinning, Time-Dependent Behavior, Fluid Viscosity, Solid Structure

Introduction:

Viscoelastic fluid-structure interactions (FSI) represent a fascinating and crucial field of study with widespread relevance in numerous scientific and engineering disciplines. These interactions arise when viscoelastic fluids, characterized by their time-dependent and shear-thinning behaviors, interact with solid structures, leading to a complex interplay of forces, deformations, and dynamic responses. The understanding of viscoelastic FSI has far-reaching implications, ranging from enhancing the design of biomedical devices for drug delivery to improving seismic hazard

ADROITNESS OF MACHINE SHOP FOR MECHANICAL STUDENTS

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Abstract:

Workshop is the center of mastering approximately exceptional Materials, equipment, gear and production practices which might be discovered in exceptional production features and operations. Workshop is likewise of top significance whilst you need to acquire approximately the sensible knowledge. There are exceptional styles of workshop energy gear coping with numerous sectors of enterprise like carpentry, bench paintings and becoming store, casting and foundry, sheet metal, device store electric powered welding and plenty of others. The industry exposure program on machine shop skills development of mechanical engineering students from selected academic institutions, Paired t-test was employed in treating the data to determine the significance of the level of machine shop knowledge, behavior, punctuality, skills and habits.

Keywords: Industry exposure, machine shop, machine shop skills, mechanical engineering.

1. Introduction:

Among numerous industries via way of means of which a cheap nation can specialize or emerge with, device enterprise performs an essential function and has a widespread consideration. The truth that what makes the distinction right here is, as stated, they're machines which can be used to make device additives. By a not unusual place feel of information the significance of this strategic phase may be assumed as: Machines reduces human effort. Computer aided precision, velocity and time intake in flip allows maximum reasonably priced productivity, uniformity and perfection of the product. Economical manufacturing, locating the proper marketplace can once more upload up for mass manufacturing. This mass manufacturing makes the costs to live steady, keeping the quantity of enterprise even as on the equal time, economic system might be growing. Not all countries are proving their reducing area technicalities or abilities in device manufacturing. So supplying those with associated offerings which include B2B income of the gear, deliver of additives and servicing or B2C promoting the useless give up merchandise (i.e., merchandise produced via way of means of the beneficiary home industries) can improve the boom fee of an economic system. Indigenous manufacturing of device gear can allow different home industries for buying those machines and getting provider at surprisingly low cost, time and effort; and the lion element is that the "reasonably priced shell" might be conserved. That is, the home economic system might be spent within side the home economic system itself. Exports similarly to this may improve the economic system as well.

AN OVERVIEW OF DIGITAL IMAGE STEGANOGRAPHY TECHNIQUES

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Abstract:

Steganography is one method of covert communication that is employed to conceal covert messages on digital media. The presence of the communication is unknown to the other people. Text, an image, a video, or other types of media could be used for the hidden communication. By being embedded into the cover medium, also known as the stego-medium, the secret message is communicated. The cover image containing the hidden message is known as the stego-image, for instance, if an image is used as the cover medium. Internet users must effectively share the hidden message online. The paper discusses the benefits and drawbacks of several steganographic approaches.

Keywords: Cryptography, Predictive Coding, Reversible Image, Steganography

Introduction:

The period we live in now is a scientific and technological age. Technology is developing at an ever-increasing rate. In the area of communication, using the internet has also gained a lot of popularity. There are occasionally hidden messages in communication that only the intended recipient should be able to read. Steganography is employed for that covert communication. The art and science of invisible communication is called steganography. Data can be hidden in other data to achieve this [1].

The origin of word steganography is from the Greek word Steganos, which means “Covered” and Graphy means “writing”.

Steganography is a method for concealing secret information so that no one else, outside the sender and the recipient, is aware it exists. The message-within-a-message technique is called steganography. The host medium, also known as the covered medium, is the principal message that is visible to everyone. The media in this case can be audio, video, or visual. Let visuals be the medium of communication. In this case, the host medium may be called the host image. The message that is concealed in the host image may take the shape of text, an image, or another format. The covert message is that one. The image is referred to be a Stego-image when the hidden message is integrated into the host image or the covered image. The secret message is extracted from the stego-image on the receiving end.

AN OVERVIEW ON 3D PRINTING OR ADDITIVE MANUFACTURING TECHNOLOGY

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Abstract:

3D printing also known as Additive manufacturing technology has been dubbed the next big thing and be as equally wide spread as cellular telephone industry. 3D printers print objects from a digital template to a physical 3-dimensional physical object. The printing is done layer by layer (Additive manufacturing) using plastic, metal, nylon, and over a hundred other materials. 3D printing has been found to be useful in sectors such as manufacturing, industrial design, jewellery, footwear, architecture, engineering and construction, automotive, aerospace, dental and medical industries, education, geographic information systems, civil engineering, and many others. It has been found to be a fast and cost-effective solution in whichever field of use. The applications of 3D printing are ever increasing and it's proving to be a very exciting technology to look out for. In this paper we seek to explore how it works, and applications of 3D printing. Furthermore technology of 3d printing and its various advantages and disadvantages are also described in this paper.

Keywords: 3D printing, Additive manufacturing, process, industrial, digital

Introduction:

3D printing or additive manufacturing (AM) is a process for making a 3D object of any shape from a 3D model or other electronic data sources through additive processes in which successive layers of material are laid down under computer controls. Hideo Kodama of Nayoga Municipal Industrial Research Institute is generally regarded to have printed the first solid object from a digital design. However, the credit for the first 3D printer generally goes to Charles Hull, who in 1984 designed it while working for the company he founded, 3D Systems Corp. Charles a Hull was a pioneer of the solid imaging process known as Stereolithography and the STL (stereolithographic) file format which is still the most widely used format used today in 3D printing. He is also regarded to have started commercial rapid prototyping that was concurrent with his development of 3D printing. He initially used phoStopolymers heated by ultraviolet light to achieve the melting and solidification effect. Since 1984, when the first 3D printer was designed and realized by Charles W. Hull from 3D Systems Corp., the technology has evolved and these machines have become more and more useful, while their price points lowered, thus becoming more affordable. Nowadays, rapid prototyping has a wide range of applications in various fields of human activity: research,

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Abstract:

Radio communication is typically used to develop and manage wireless telecommunications networks. Digital data can be encoded using the Orthogonal Frequency- Division Multiplexing (OFDM) technique on various carrier frequencies. Using wavelet alterations that match the data being sent, wavelet modulation is a type of modulation. In order to improve the efficiency and accuracy of our suggested technique with regard to the bit error rate obtained after receiving the signal at the reception end, we will replace OFDM with Wavelets, i.e. OWDM. We track the planned OWDM transmitting system's bit error rate, total signal errors, and total bits transferred and received. Comparing the BER to an OFDM communication system, it is lower.

Keywords: OFDM, BER, WSN, OWDM, Sensor node.

Introduction:

The next phase of this cohesiveness between technology and nature is Wireless Sensor Networks (WSN). Despite being a new technology, there are already a wide range of applications and more are expected [1]. To monitor physical or environmental factors like temperature, sound, pressure, etc., and to jointly send their data across the network to a central location, WSN is made up of spatially distributed autonomous sensors. Modern networks may communicate in both directions, which allows for the control of sensor activity [2]. Military uses of wireless sensor networks, such as battlefield surveillance, served as the impetus for their creation. These networks are currently employed in several industrial and consumer applications, including machine health monitoring and control, industrial process monitoring, and many more [3].

WSNs, or wireless sensor networks, have been used to improve data collecting for scientific research, build more strategic military defences, locate the source of a gunshot, and keep an eye on manufacturing equipment [4]. All of these applications rely on the capacity to gather information about light, vibration, moisture, temperature, and other variables, as well as the capacity to converse with one another.

BAMBOO: GREEN BUILDING COMPONENT IN INDIA

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Abstract:

Bamboo is maximum plentiful in India. India has the large ability for bamboo with 14 million hectares of bamboo woodland area. India is the second one biggest in phrases of bamboo resources. The yield per hectare of bamboo in India could be very low as compared to China, Taiwan and Japan which make a contribution about 80% to the world's bamboo market. In coming years India is anticipated to stand wooden scarcity to be able to meet the housing desires of the growing population. Moreover, the elevated dependency on traditional substances is held accountable for degradation of surroundings. Both the motives have led to provide a concept at the use of bamboo rather for wooden and metal as it's far taken into consideration as exceptionally renewable and surroundings pleasant material. Bamboo is one of the oldest conventional constructing substances utilized by mankind. They are the biggest contributors of the grass own circle of relatives and are the fastest-developing within side the world. In fact, inside a 24 hour period, bamboo can develop 4 feet. Bamboos are of extraordinary financial and cultural importance in South Asia, Southeast Asia and East Asia, getting used for constructing substances, as a meals source, and as a flexible uncooked product. Bamboo has better compressive electricity than wooden, brick or concrete and tensile electricity that competitor's metal. This is an alternative constructing material that is renewable, surroundings pleasant and broadly available, because the wooden resources are diminishing and regulations are imposed on felling the herbal forests. Due to its fast growth, its adaptability to maximum climatic situations and due its properties, bamboo emerges as a very appropriate alternative.

Keywords: Bamboo usage, Traditional technology, sustainability, architecture, new era

1. Introduction:

Technology development and tasks taken up through the vital and nation authorities has helped in the improvement of bamboo in creation and structural applications. New technology on jointing, safety and renovation of bamboo has been evolved which has expanded its sturdiness and exceptional and opened new regions for bamboo as timber substitute. Traditional bamboo Culm utilized in rural housing can now be converted into new and modern bamboo primarily based totally merchandise with latest era and may be utilized in pinnacle grade homes in roofing, flooring, doors, windows, etc. Presently India has no export marketplace for bamboo merchandise besides a trifling export of handicrafts merchandise. India has big ability for bamboo export as it's far the second one biggest USA after China in phrases of bamboo resources. Bamboo zone has

DESIGN AND ANALYSIS OF HORIZONTAL AXIS WIND TURBINE

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Abstract:

The rapid depletion of fossil fuels and the growing concerns regarding environmental sustainability have intensified the need for clean and renewable energy sources. Among them, wind energy stands out as a promising solution to meet the escalating global energy demands. This research delves into the comprehensive study of the design and analysis of Horizontal Axis Wind Turbines (HAWTs), aiming to enhance their efficiency, reliability, and cost-effectiveness. The research begins by conducting an extensive literature review to examine the existing advancements in HAWT technology, identifying key challenges and areas for improvement. Subsequently, a novel approach to the design process is proposed, taking into account factors such as blade aerodynamics, structural integrity, and materials selection. Advanced computational tools, including Computational Fluid Dynamics and Finite Element Analysis, are utilized to optimize turbine performance and ensure robustness against various loads and environmental conditions. To evaluate the proposed design, a prototype HAWT model is fabricated and tested under real-world conditions. Performance metrics, such as power output, efficiency, and wake effects, are measured and compared against simulations to validate the accuracy of the analytical models. Additionally, the impact of turbine placement on wind farm efficiency is investigated through a series of simulations. Furthermore, this research addresses the importance of control systems in HAWTs. An intelligent control strategy is developed to enhance power capture while mitigating structural fatigue and aerodynamic loads. By incorporating machine learning algorithms, the turbine's adaptability to varying wind conditions is improved, leading to enhanced overall performance and reduced maintenance costs.

Keywords: Horizontal Axis Wind Turbine (HAWT), Wind Energy, Renewable Energy, Clean Energy, Sustainability, Energy Efficiency, Blade Aerodynamics, Structural Integrity

Introduction:

The escalating global energy demands, coupled with the growing concerns about environmental sustainability and the finite nature of conventional fossil fuels, have led to an urgent quest for alternative and cleaner sources of energy. Among the various renewable energy options available, wind energy has emerged as a promising solution due to its abundant and inexhaustible nature. Horizontal Axis Wind Turbines (HAWTs) have become the cornerstone of the wind energy industry, providing an efficient means to harness the power of the wind and convert it into

DIGITAL WATERMARKING AND ITS TYPES

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Abstract:

In order to establish ownership, image watermarking seeks to incorporate data into cover media. This goal is accomplished by including copyright information into actual data in a way that allows for the extraction of embedded data in order to verify the legitimacy of multimedia items. Watermarking can be done on a range of carrier file types, including photos, text, videos, audio, radio waves, etc. but because of their widespread use on the internet, photographs are mostly used for this purpose. Spatial domain and transform domain watermarking are two of the many watermarking methods that have been presented in recent years. On the basis of the three criteria of imperceptibility, robustness, and capability, these strategies are assessed. This study presents a review of several digital watermarking methods. The research suggests DWT-based methods for digital image watermarking robustness.

Keywords: Watermark, Discrete Wavelet Transform (DWT), Discrete Cosine Transform (DCT), LSB

I. INTRODUCTION

We exchange a lot of data these days through social networking sites. Images, text, audio, and video are all types of data. Today, protecting our data from third parties is crucial if we want to keep it safe from danger of any kind. In that situation, a third party could misuse our data. Under copyright law, personal data use that is unlawful is prohibited. The solution has been suggested to be digital watermarking, which involves adding copyright information to the material [2]. A watermark is a supplementary image that is integrated into the host image and serves as a method of image protection [1]. It serves as a digital signature that lends the image a sense of validity or ownership [1]. The digital watermarking technique is particularly effective for protecting against attacks or authenticating images. Digital watermarking has gained popularity in recent years as a result of its importance in content authentication and legal ownership for digital multimedia data. The primary elements of picture watermarking are depicted in figure1.

HANOFF STRATEGIES IN CELLULAR SYSTEM

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Abstract:

A handoff mechanism in a cellular network allows for the transmission of an active call from one cell to another. Handoff is the process of switching over signal transmission from one base station to a base station that is geographically nearby when the user is moving around. Changing the channel (frequency, time slot, spreading code, or a combination of them) associated with the current connection while a call is in progress is another way to define handoff. A good handoff algorithm reduces the amount of handoffs that perform poorly in congested areas. Prioritising handoff in such a situation can result in a significant improvement in handoff performance. This study focuses on the fundamentals and various handoff processes for cellular mobile networks.

Keywords: Cellular Network, Cell, Handoff, Base Station, Channel;

1. Introduction

Cellular technology enables mobile phones to interact with one another, however the end user, or mobile phone user, doesn't remain in one location but instead goes from one location to another. Cellular systems are in charge of maintaining effective communication among the systems even while the user is on the go [1].

The handoff or handover method, put simply, involves moving an active call from one cell to another. A current communication channel may be transferred to a different base station (BS) based on a time slot, frequency band, or code word. If the new BS has any open channels, it will be assigned to the call that was transferred. However, there are two options if all of the channels are in use or occupied at the time of the handoff: Drop the call or postpone it for a period. The theory of handoff is created as a result of the vulnerability of cellular systems [2].

1.1 Handoff or Handover

It involves moving an active call or data session from one core network-connected active channel to another. When using time-division multiple access (TDMA), frequency-division multiple access (FDMA), code-division multiple access (CDMA), or a hybrid technology, the channel can be changed using a time slot, frequency band, codeword, or any combination of these. 'Handover' is another name for the phrase "handoff." Handoff in cellular communications refers to the process of moving a call or data session that is already in progress from one channel connected to the core network to another channel. However, the handoff process in satellite communications takes a

INDIAN CONSTRUCTION INDUSTRY

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Abstract:

The Indian production enterprise bureaucracy an critical a part of the economic system and a conduit for a widespread a part of its improvement investment, is poised for boom on account of industrialization, urbanization, financial improvement and human being's growing expectancies for progressed first-class of living. Construction constitutes 40% to 50% of India's capital expenditure on initiatives in numerous sectors together with highways, roads, railways, energy, airports, irrigation, and so forth and is the second one biggest enterprise in India after agriculture. It bills for approximately 11% of India's GDP. The production zone is visualized to play an effective position in financial boom, similarly to generating systems that provides to productiveness and first-class of life. financial improvement is a time period that economics flesh presser and different have used often within side the twentieth century, modernization westernization and mainly industrialization are different phrases human beings have used even as discussing financial improvement. Financial improvement has an immediate dating with the environment. Authorities challenge to fulfill pass overseas financial targets together with fee stability, excessive employment and sustainable boom; such efforts encompass monetary and financial policies, rules of monetary enterprise exchange and tax policies.

Keywords: Growth, Housing, Infrastructure, Sectors, Policies

1. Introduction

Historically construction enterprise is one of the oldest and biggest enterprises in unorganized area presenting adequate employment to the people. Before the independence, the development interest in India turned into constrained to constructing of dwellings, non secular locations like mosques and temples etc. at character and network level, with the usage of conventional techniques, which might be nonetheless being utilized in growing international locations like India. The Taj Mahal and Lal Quila are the legendary instance of competence of Indian skills within side the discipline of creation .However very proper report of the development operation of those homes aren't to be had these days. The records of systematized or prepared creation exercise in India may be traced lower back to round 1847 AD while Lord Dalhousie installed the Public Works Department, referred to as PWD, these days, to assemble civil engineering shape which protected road, small dams, canals etc. The branch labored efficaciously for a hundred years. In 1947, the impartial India determined to release a vast multipurpose river valley project, referred to as Bhakra Nangal

MICROWAVE METAMATERIAL ABSORBER FOR SENSING APPLICATIONS

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Abstract:

This study reviews microwave sensors and antennas for biomedical applications that were inspired by metamaterials. Due to its high directive property and tiny size, meta-material is used. The performance of the tag manufactured on a conventional substrate may still be maintained by the meta-material substrate. Due to their small size, these gadgets are applicable in a number of scientific, industrial, and medical domains and can be used to construct implantable as well as wearable antennae. There has also been a brief discussion of microwave imaging and metamaterials for cancer detection.

Keywords: Metamaterials, Permeability, Permittivity, Conductivity, Split Ring Resonator

Introduction:

The demand for early disease identification and diagnosis as well as ongoing monitoring of patients' physiological characteristics has resulted in a considerable increase in the need for wireless technology in the biomedical area in recent years. Since they allow for connection between the patient and machine or workstation, microwave antennas and sensors are essential parts of these wireless technology systems [1]. Metamaterials have been introduced to improve the performance of microwave antennas and sensors.

Metamaterials are synthetic materials created to have characteristics not found in nature. Veselago completed the first theoretical investigation in the 1960s [2]. He looked studied how plane waves might go through a hypothetical material that had both negative permittivity and permeability at the same time. It was discovered that the Poynting vector of the plane wave is antiparallel to the direction of the phase velocity, in contrast to the common situation of plane wave propagation in natural media. Pendry et al. [3] have demonstrated that a medium made of periodic metallic thin wires behaves as a homogeneous material with a corresponding plasma frequency when both the structure's lattice constant and the wire's diameter are small relative to the wavelength of interest. Also demonstrated by Pendry et al., split ring resonators can produce an effective negative permeability across a specific frequency range [4]. Smith, Schultz, and Shelby built the first left-handed metamaterial in the microwave age a few years ago, and they also discovered the negative index of refraction [5]. These materials often derive their properties from their structure rather than their composition; to establish efficient macroscopic behaviour; tiny in homogeneities are inserted [6]. Metamaterials are created to have features that are smaller than the wavelength of the

NETWORKS BASED ON WIRELESS AND WIRED TECHNOLOGY

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Abstract:

The necessity for wired and wireless networking has become more and more important as society adopts new technologies. According to security, each of these networking types offers benefits and drawbacks. The range and advantages of wired networking differ, as do the hardware requirements. Range, mobility, and the many kinds of hardware required to set up a wireless network are taken into account in wireless networking.

Keyword: LAN, EMI, WLAN, WPAN, GAN

Introduction:

The ability to efficiently and effectively disseminate information inside an organisation is crucial for businesses. This technique was made possible by computer networks, which are now present in practically every industry. There are two ways that an organisation can build up a network. They can either employ a wireless network, which connects computers using radio waves, or a fully connected network, which connects computers via networking cable. Because wireless networks have made it possible for businesses to be more mobile, businesses now use a mix of wired and wireless networks.

Wireless Network:

Any sort of computer network that connects network nodes through wireless data links is referred to as a wireless network. By using wireless networking, businesses, households, and telecommunications networks can avoid the pricey procedure of installing wires inside buildings or as a connection between different pieces of equipment. Radio communication is typically used to develop and manage wireless telecommunications networks.

Examples: Cell phone networks, Wi-Fi local networks and Terrestrial microwave networks.



REVIEW OF METHODS FOR IMPROVING OPTICAL BURST SWITCHING NETWORK PERFORMANCE

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Abstract:

Optical burst switching (OBS) network literature has been reviewed in this paper, and some of the parameters have been investigated for OBS performance enhancement. Burst aggregation, routing, authentication, dispute resolution, and quality of service (QOS) are key areas where the transition from the optical switching paradigm to optical burst switching meets serious challenges. However, there are still a number of important problems that need to be fixed because they are a major factor in packet loss and have a big impact on network performance. From the standpoint of the network layer, one of the difficult issues preventing the development of optical burst switching (OBS) networks is the issue of burst losses. This report provides a thorough analysis of the variables that affect OBS network performance.

Keywords: Optical Networks, Passive Optical Network, OBS Network, Blocking Probability

I. Introduction:

Due to the Internet's rising global popularity and the expanded applications it enables, network engineers have faced an enormous issue in recent years: the exploding demand for network capacity. With such a sharp rise in demand and the expanding role of the internet in international trade and business, a network that can be set up affordably, efficiently, and with higher dependability is also required. Data loss and challenging network management are consequences of this kind of traffic [2].

A passive optical network is made up of a single, shared optical fibre that is split into distinct strands that each serve a different subscriber using affordable optical splitters. Optical networks are referred to as "passive" because they lack active electronics inside the access network, with the exception of the CO and subscriber endpoints. An optical line terminal (OLT) and an optical network unit (ONU) are components of a passive optical network. The CO (POP or local exchange) is where the OLT is located. Typically, a media converter platform or Ethernet switch would

SEISMIC VULNERABILITY ASSESSMENT OF SCHOOL BUILDING

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Abstract:

In this work, a novel method for seismic assessment of existing school buildings is presented. The suggested method just needs a small team of people with technical construction backgrounds to implement it. Disasters can be caused by either natural or human-made occurrences, and they can create rapid disruptions in social order and extensive damage to both people and property that is beyond the capacity of normal social and economic systems to handle. India is a nation in development. A sizable component of the building inventory consists of old structures. Such structures cannot be demolished to make way for new buildings. It is crucial to make the most effective and secure use of the historic structures. Besides routine care, many historic structures need to be renovated. A prioritisation method for such an inventory must be developed for safety. This requirement is highlighted in this Article. A structure will inevitably deteriorate over time for a variety of causes, including environmental effect. The study makes an effort to identify potential causes for why a condition evaluation is required. Numerous elements influence how the current situation is evaluated and suggestions for potential interventions. These issues have been covered since they have an impact on choosing the assessment methodology.

Keywords: Visual Assessment, Earthquakes, Seismic hazard, Vulnerability, Structural Modification factors

Introduction:

India has a lengthy history of experiencing several earthquakes with significant numbers of fatalities and property losses. An estimated three million schoolchildren were immediately impacted by the Gujarat earthquake in January 2001, which also had an impact on the state's educational systems and infrastructure. It was stated that more than 15000 school buildings were damaged. Even though plans for restoration give schools a high priority, it's expected that it will take the entire reinstatement process ten years.

In addition to the potential loss of life, the safety of school buildings against earthquakes is one of the most crucial factors because, in the aftermath of an event, they frequently serve as emergency shelters and are crucial resources for the subsequent reconstruction process. Today's school buildings comprise a sizable stock, thus depending on how vulnerable they are, appropriate mitigating measures must be considered. The visual assessment approach is one of the most

SENSORS NETWORKS AND AD-HOC NETWORKS

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Abstract:

Ad-hoc networks and sensors have become increasingly necessary as technology evolves in society. Wireless networks and communications, distributed algorithms, protocols, embedded systems, signal processing, and information management are just a few of the interdisciplinary topics that are included in the field of sensor networks. A wireless base station or a router is not necessary for an ad hoc network, which is a network connection created for a single session. These have a variety of uses.

Keyword: WSNs, HWSNs, MANET, FPGAS, ASICs

I. Introduction:

Thousands or millions of sensors, distributed randomly and in a variety of applications, typically make up wireless sensor networks (WSNs). Sensor nodes in wireless sensor networks (WSNs) are not always of the same type. To put it another way, they are not always homogeneous, but some higher energy sensor nodes can be employed to increase the longevity and dependability of WSNs. Some sensor nodes in heterogeneous wireless sensor networks (HWSNs) have a comparatively higher energy level. We are able to see, discover, and manipulate the physical environment to a greater extent because of wireless sensor networks (WSNs). This is especially helpful in emergency or catastrophe situations where human participation would be too risky. Over time, the sensor networks have developed. Due to the hostile environment and unattended deployment, errors in wireless sensor networks are unavoidable; as a result, sensor nodes may need to operate in huge numbers. Latest generation of sensors encompasses self-organizing, flexible and scalable networks. The most recent generation of sensors includes scalable, versatile, and self-organizing networks. At least one base station serves as a gateway between a wireless sensor network and the outside world. Sensor nodes collect data about the phenomena and communicate it to the base station in a single or several hops. Users have access to base station-stored data.

An ad hoc network is a wireless decentralised network made up of nodes that set up a network on their own. Since there is no centralised management, external network equipment is not required to transport data. The network nodes that are positioned freely take part in transmission. As time passes, network nodes can move through space, but direct communication between any two nodes is typically not possible. Ad hoc networks can undoubtedly include a variety of multifunctional computing devices.

STEGANOGRAPHY TECHNIQUES FOR HIDING INFORMATION

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Abstract:

Nowadays, communication plays a major role in everyone's life. The most crucial concern in any communication is security. Therefore, a secure system is required for user-to-user data transfer. There are several different security-related approaches, including steganography, watermarking, and cryptography. To transfer information in a covered form, utilise steganography. Steganography allows us to conceal the existence of data that has to be sent securely. The host message in which the concealed data is contained remains unchanged both before and after steganography. Data is concealed in audio files using audio steganography.

Keywords: Steganography, audio steganography

Introduction:

Through the use of steganography, we can conceal the existence of a hidden message. By incorporating the hidden message into a cover media object in this, we conceal its presence. Embedding is a method to firmly fix in the surrounding mass, for example. placing a nail into wood. In steganography, the secret message is referred to as the message object, the media in which the data is to be embedded is referred to as the cover object, and the result of steganography is referred to as the stego object. You can use text, images, music, and video as cover objects. Data is incorporated into the cover object such that the cover object's quality is unaffected.

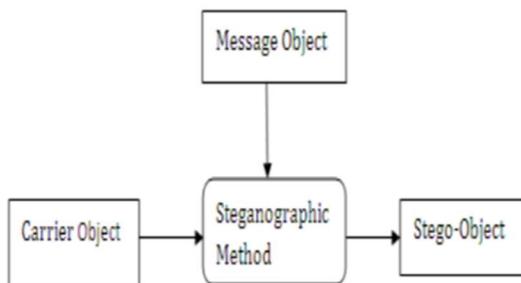


Fig1: Block diagram of audio steganography

Audio steganography:

Here, audio steganography is used. In audio steganography, the digital audio signal contains hidden data. Here, a tiny modification to the sound file's binary sequence contains a secret message. WAV, AU, or MP3 sound files all qualify as audio files. Compared to other

STUDY ON AERODYNAMIC DESIGN IN AEROSPACE

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Abstract:

Aerodynamic design plays a pivotal role in the development and optimization of aerospace vehicles, significantly impacting their performance, efficiency, and safety. This research endeavors to explore and analyze the intricate interplay between aerodynamics, engineering, and innovation within the aerospace domain. The study delves into the fundamental principles governing fluid dynamics, lift, drag, and other aerodynamic forces, elucidating their influence on aircraft and spacecraft design. Employing a multidisciplinary approach, the research investigates the latest advancements in computational fluid dynamics (CFD), wind tunnel testing, and advanced materials to create cutting-edge aerospace designs. Special emphasis is placed on the integration of numerical simulations, empirical data, and theoretical models to optimize aerodynamic profiles for a range of aerospace applications, including commercial airliners, military aircraft, and space launch vehicles. Furthermore, the research delves into the impact of aerodynamic design on fuel efficiency, noise reduction, and environmental sustainability. By addressing challenges such as sonic boom mitigation, laminar flow control, and innovative wing configurations, this study contributes to the ongoing efforts to minimize the ecological footprint of aerospace operations. This research offers a comprehensive exploration of aerodynamic design's significance in aerospace engineering, highlighting its role in shaping the next generation of high-performance and environmentally conscious aerospace vehicles. Through a synthesis of theoretical analysis, computational simulations, and experimental validation, this study provides valuable insights that pave the way for enhanced aerodynamic efficiency and innovation in the aerospace industry.

Keywords: Aerodynamic Design, Aerospace Engineering, Fluid Dynamics, Computational Fluid Dynamics (CFD), Wind Tunnel Testing, Lift and Drag, Aircraft Performance, Spacecraft Design

Introduction:

Aerospace vehicles, ranging from sleek commercial airliners to advanced space exploration craft, have long captivated the human imagination with their ability to traverse vast distances and push the boundaries of our understanding. At the heart of these remarkable feats lies the intricate science and art of aerodynamic design. The study and mastery of aerodynamics have been central to the evolution of aerospace engineering, underpinning the development of vehicles that soar through Earth's atmosphere and venture into the cosmos [1]. This introduction sets the stage for an exploration into the pivotal role that aerodynamic design plays in shaping the performance,

THE IMPROVEMENT OF ENERGY EFFICIENCY IN WIRELESS SENSOR NETWORKS

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Abstract:

The fundamental problem with wireless sensor networks is that each sensor node uses energy. Numerous energy-consuming devices, such as battery-operated computer and sensing equipment, are used by wireless sensor networks. There are numerous applications in wireless sensor networks that have storage capacity restrictions and long lifetime requirements. We must therefore create innovative strategies to lower the energy usage at sensor nodes. As S-MAC uses three methods to use energy, there is only one protocol name for it. First, nodes must periodically sleep while we listen to an empty channel. Second, while transmitting, put the radio in sleep mode. Use the message passing approach to reduce energy needed to store and send data over a network, as a last step. GPS (Gossip-Based Sleep Protocol) is an additional protocol. This protocol is used to assess wireless sensor network advancement.

Keywords: Wireless sensor nodes, energy consumption, protocols

Introduction:

For any unattended operation, a sensor network is a static ad hoc network with hundreds of nodes. Each sensor node is equipped with a sensing device, such as a low power processor, a short-range wireless transmitter and receiver, and a small amount of battery power. The job of power consumption in wireless sensor networks is highly challenging. The size and price of the sensor nodes can vary greatly, starting at hundreds of dollars. The intricacy of each sensor node determines how much each node costs. The behavior of the sensor nodes and their energy usage are better understood using the NS2 simulator. In this study, we discuss the S-MAC protocol, which was created specifically for wireless sensor networks. This protocol's main objective is to cut down on energy usage. The protocol's other objective is to prevent packet collisions. To use the energy, we must first identify the primary sources of wasteful energy use.

Numerous resources contribute to energy waste. Collisions are the main source of energy loss. The more energy is used when retransmitting packets because when we send a packet and it is corrupted, we must send it again. Overhearing occurs when a packet is transmitted to one source and is picked up by additional sources at the same time. This is the second reason for energy waste. Last but not least, needless packets waste energy. Too much energy is used in sending and receiving packets, and frequently superfluous packets are sent.

TIMBER IN CONSTRUCTION

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Abstract:

Wood, really the only one Sustainable building material should play an important role in this regard. Trees are strong or fast building material. An advantage of timber as sustainable timber Building material is the increased use of wood in buildings. Wood is a renewable material and requires less Energy is mainly used in construction around the world over the years. Wood should be considered as one the best building material because it can be used in any climatic conditions zone. Wood needs to be sustainable in many ways. Like a tree, Helps reduce carbon dioxide levels in the air atmosphere. Main advantages of wooden construction Ensuring carbon storage and efficient use of wood is critical Sustainable building with wood. Wood and forest products are among the most valuable products made from wood. This suggests that structural use is important for forestry-based economies. In addition, many wooden construction waste materials are used for secondary and tertiary purposes while maintaining their value after primary use as structures. Wood is a natural, renewable and eco-friendly material that has historically been used for many purposes including the manufacture of tools, furniture and works of art. In addition, its outstanding mechanical properties make wood the preferred building material for construction applications. Some types of wood are stronger than steel or concrete. Although the mechanical properties of wood have been extensively studied, in order to gain more detailed insight into the relationships between wood structure, composition and mechanical properties, so that the performance of wood under different environmental conditions can be evaluated. In addition, intensive research in this area is still ongoing. We aim to further improve conditions and expand their possibilities, wood or woodwork requires a well-educated or professional worker, India is a major importer of timber and timber products and ranks third in the world by volume. Due to its large population and diverse industrial uses, the country relies on imports to meet its high demand for timber. Malaysia, Germany and Ukraine are India's largest timber exporters, but other countries such as Myanmar, Canada and New Zealand also supply significant amounts. India's reliance on imported timber is driven by factors such as domestic demand, cost efficiency and unique industrial requirements.

Keywords: Timber, Building Material, Qualities of Timber, wood structure, wood treatments, import

1. Introduction:

WASTE REDUCTION AND RECYCLING

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Abstract:

The recycling of stable waste can assist cope with worldwide weather change. The distribution, utility and manufacture of merchandise, in addition to control of the ensuing waste, all bring about greenhouse fuel emissions. The prevention and recycling of waste reduces greenhouse gases is related to those sports with the aid of using decreasing methane emissions, saving energy, and growing wooded area carbon sequestration. As a result, there is lots of interest on a way to make dwelling practices greater sustainable, from decreasing plastic packaging on a big variety of merchandise inclusive of meals and drink, to introducing prices on the usage of plastic luggage in stores to inspire consumers to apply reusable luggage instead. These measures intention to lessen the quantity of bodily waste we produce in our each day lives, shrinking the scale of landfills and consequently reducing the quantity of greenhouse gases emitted thru decay. Waste prevention and recycling, normally known as waste discount, assists within side the control of the stable waste we generate. The prevention and recycling of waste are also robust techniques for decreasing greenhouse emissions.

Keywords: Plastic, waste, reduction, regional waste, recycling

1. Introduction:

Evidence shows that it's far human sports which have contributed to this warming. The chemical composition of the ecosystem has been modified appreciably through the growth in emissions of greenhouse gases, in particular carbon dioxide, methane, and nitrous oxide. As a result, seasonal and climate styles are converting and turning into greater intense with much less snow cowl and heavier rainfall, with sure flora and fauna habitats shrinking as a result. The manufacture, distribution, and use of products-as nicely as control of the ensuing waste-all bring about greenhouse emissions. Solid waste has emerged as one of the biggest anthropogenic reasons of inexperienced residence emission. Different classes of waste want to be disposed off in a different way but majority of the international locations lacks the primary and suitable waste control practices. Developing and underdeveloped international locations who do now no longer produce plenty waste are regularly the receipt of the waste from evolved international locations within side the shape of the dismantling industries, e-waste disposal and so on. The quantity of waste produced relies upon at the way of life, eating dependency and financial conditions. Our picks as customers have a sizeable effect on weather change. The way of life of use and throw and the developing urge to buy things, all outcomes in waste generation. We want to understand that there may be a

WAVELET TRANSFORM AND FILTERS FOR DENOISING ECG SIGNALS

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Abstract:

A non-stationary signal called an electrocardiogram is used to diagnose cardiac conditions. It includes crucial information but is frequently tainted by various noises. Denoise the signal is therefore necessary. In this study, different techniques for denoising the electrocardiogram signal are compared. MATLAB software is used to implement the algorithms, which are then applied to the MIT-BIH arrhythmia database.

Keywords: Electrocardiogram (ECG), Wavelet transforms

INTRODUCTION

The widely used device Electrocardiogram [1] is used to capture the electrical activity of the heart. Cardiovascular evaluation must include electrocardiography. It is a crucial tool for identifying any ECG anomalies. Cardiac arrhythmias are the name given to these anomalies [2]. The periodic depolarization and repolarization of cardiac cells provides the basis for an ECG. The cardiac rhythm is created by this repeating procedure. To sense the signal, surface electrodes are applied to the subject's body [3]. The heart, which is located in the mediastinum, is the most important component of the cardiovascular system. It is protected by the rib cage, the spinal column, and the bone elements of the sternum on the inside [4]. The four chambers of the human heart are the right atrium, left atrium, right ventricular, and left ventricular. The two Atria make up the upper chambers, and the two Ventricles make up the lower chambers. When the heart is healthy, it beats in a systematic fashion, beginning at the Sino Atria (SA) node in the right atrium, and a certain set of cells carry electrical impulses across the heart. The AV node receives this signal as it travels from the atria. The electrical signal is mediated by the AV node, which is connected to a collection of fibres in the Ventricles, and the impulse is transmitted to every portion of the lower chamber, the Ventricles. This channel of propagation is thoroughly followed in order to ensure that the heart is operating normally [5] [6]. The heart's internal structure is seen in Fig. 1:

A REVIEW OF ANTENNAS AND PROPAGATION FOR MIMO WIRELESS COMMUNICATIONS

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Abstract:

Wireless networks have rapidly incorporated into daily life. A few examples of commonly used wireless networks include wireless LANs, cell phone networks, and personal area networks. However, the range and data rate of wireless devices are constrained. The scientific community has worked very hard to come up with solutions to these constraints. Multiple-Input Multiple-Output (MIMO) links are one approach. MIMO systems may conduct precoding (multi-layer beamforming), diversity coding (space-time coding), and spatial multiplexing thanks to the many antennas. Beamforming involves sending the same signal, known as a wight, over all transmit antennas with varying gain and phase so that the receiver signal is maximised. A single space-time coded stream is sent through each antenna as part of diversity. By dividing a high-speed signal into many lower-speed streams and sending them through various antennas, spatial multiplexing boosts network capacity. Given that the received signals have adequate spatial signatures and that the receiver has enough antennae to separate the streams, the receiver can correctly decode each stream in spatial multiplexing. Higher data rates or longer transmit ranges can be achieved using these MIMO techniques without the need for extra bandwidth or send power. This essay provides a thorough analysis of MIMO systems. **Keywords:** Wireless Communications, Antenna, Transmitter, Receiver, Multiple-Input Multiple-Output (MIMO) Systems.

1. Overview of MIMO Systems

With the increasing use of wireless communication for data applications such as Internet access and multimedia, the demand for reliable high-data-rate services is increasing rapidly. Wireless channels introduce a variety of impairments in the transmitted signals due to fading, intermittent interference and multi-user interference [1]. In recent years, MIMO technology has shown great potential in wireless communication systems. MIMO communication systems have the capability to achieve higher throughput compared to Single-input Single-output (SISO) systems at the same bandwidth and transmit power. Wireless MIMO systems send and receive information over two or more antennas often shared among many users. The core idea behind MIMO is that the signals samples in the spatial domain at both ends are combined in such a way that they either create effective multiple parallel spatial data pipes or add diversity to improve the quality of the communication. The channel capacity of the MIMO channel depends upon the knowledge of the channel gain matrix or its distribution at the transmitter or at the receiver [1]. The term input and output refers to the radio channel carrying the signal, not to the devices having antennas. However, MIMO systems combine the multiple fading paths and users' signals to overcome multi-user interference and fading, and thereby increase data throughput and reduce Bit Error Rate (BER) as compared to SISO systems. Use of multiple antennas

AN ALGORITHM FOR FUSION OF IMAGES BASED ON A NOVEL PERFORMANCE EVALUATION METHOD

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Abstract:

Image analysis and image understanding use image fusion extensively. In this paper, a brand-new algorithm for 2-D picture fusion is suggested. The source images' multiscale edges data is used in this feature-based wavelet image fusion technique. In order to get good image edges, the denoising method and edge detection approach are combined. The process for choosing the best breakdown level has a clear physical meaning. Performance of multifocus image fusion is evaluated using statistical criteria. At the same level of decomposition, the entropy and standard deviation of the fusion image are compared to those of the source images. The efficiency of the algorithm that increases the entropy and standard deviation of the fusion image is shown by experimental findings.

Keywords: Image fusion, DWT, CT, MRI, PSNR, MSE

Image Fusion:

The term fusion means to combine the information acquired in several domains. Image fusion has become a popular technique used within medical diagnosis and treatment.

The satellite images fusion [1] is one of the subjects that kept away from studying in Iraq since the availability of different satellite images for same scene taken in different wave bands is the main obstacle among such researches, beside that many of the tools ,decisions that found in this subject literatures are taken without any explanations, from that and in order to provide a base knowledge for that area and to add a contribution to the field of satellite images fusion this thesis was prepared. Earth observation satellite provides data employing different portions of the electromagnetic spectrum at different spatial, temporal and spectral resolutions. For the full exploitation of increasingly sophisticated multisource data, advanced analytical or numerical data fusion techniques are being developed. Fused images may provide increased interpretation capabilities and more reliable results since data with different characteristics are combined. The images vary in spectral, spatial and temporal resolution and therefore give a more complete view of the observed objects. Data fusion is a process that deals with data and information originated from multiple sources to achieve refined /improved information for decision making. A general definition of image fusion is given us "the combination of two or more different images to form a new image by using certain algorithm".

DEGRADATION EFFECTS OF FADING ON COMMUNICATION SYSTEMS

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Abstract:

The propagation channel that a wireless communication system's transmitted signal travels across has a significant impact on how well it performs. A wireless communication system's channel often comprises of several pathways between the transmitter and receiver, each having a distinct attenuation and delay. Because the distance between the transmitter and receiver varies along each path, the attenuation and delays are also different. Due to destructive multipath cancellation, certain transmitted signals may completely fade out (experience high attenuation). The multipath signals may also combine favorably, increasing loudness. There are other impacts on the transmitted signal caused by the channel in addition to the multipath effect. The propagation loss is one of these and it is related to distance. The received power decreases with increasing distance between the transmitter and receiver. The shadowing effect is another one. Buildings and other obstructions that block the direct line of sight between the transmitter and receiver cause shadowing. As the receiver moves in front of or behind buildings, the received signal's amplitude changes as a result. In this article, we look at fading channel models and strategies for reducing performance loss caused by fading.

Keywords: Communication system, Receiver, Transmitter, Channels, MIMO

Communication System:

In broad sense the term communication refers to the sending, receiving and processing of information by electronic means. It is the technique of transmitting a message, from one point to another, knowing how much information, if any, is likely to be lost in the process [1]. Hence the term "communication" is covered all forms of distance communications including radio, telegraphy, television, telephony, data communication and computer networking. Communications started with wire telegraphy in the eighteen forties, developing with telephony some decades later and radio at the beginning of this century. More recently, the use of satellites and fiber optics has made communication even more widespread, with an increasing emphasis on the computer and other data communications [1-2]. A modern communications system is first concerned with the sorting, processing and sometimes storing of information before its transmission. The actual transmission then follows, with further processing and filtering noise. Finally it comes reception, which may include processing steps such as decoding, storage and interpretation [3].

EFFECT OF DIGITAL DIVIDE: A TECHNOLOGICAL GENERATION GAP ON INDIAN SOCIETY

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Abstract:

Whether we agree with it or not, we live in a society driven by technology. We are constantly in touch with this virtual world through our tablets, smart phones, and laptops. Research shows that prolonged exposure to these devices not only changes the way we work and play, but also has a dramatic impact on the way we think. Few people say that using the Internet, social media, and computer games has a negative effect on users. It reduces people's social interactions and dependence. It even affects their personal identity. However, research does not fully support this perspective. There are definitely a lot of good points! Thanks to technology, we are now connected to different parts of the world. We can learn things quickly. Digital divide in India refers to the unequal distribution of access to, use of, and influence on information and communication technologies among different groups, characterized in terms of social, geographical, geopolitical criteria, etc. One reason that already extreme inequality is widening and hindering economic development is that many people still lack the resources and expertise to use the internet. This disparity is not unique to India, but it is especially pronounced in a country where more than half of the country's 1.3 billion people are under the age of 25.

Keywords: Digitalization, information and communication technology, interest, Social Media, Urban and Rural

1. Introduction:

The term "digital divide" refers to the gap between population groups and regions that have access to modern information and communication technologies and those that have no or limited access. This term refers to gaps in access and use of information and communication technologies. Digital divides can exist between rural and urban populations, between educated and uneducated people, between economic classes, and, at the global level, between industrialized and developed countries. There is a gender. Digital divide across the country: India, which is globally recognized for its provision of IT services, faces a huge digital divide with only a relatively small proportion of its population having access to the internet. Only about 18 out of 100 people used the internet in 2014 (World Bank data). North-South, East-West divide: Southern states have higher digital literacy than northern states. This is also consistent with their traditional literacy. For example, the digital divide is lowest in Kerala and highest in West Bengal.

The 'Bharat-India' gap: While digital literacy is high in urban areas, rural areas in each state lack the equivalent. States that are more urbanized generally have higher levels of digital literacy, and vice versa. About 70% of India's more than 1 billion people live in rural areas, and only about 400 million people have access to the internet.

HIGH SPEED AND LOW POWER IMPLEMENTATION OF FIR FILTER DESIGN

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Abstract:

For voice and image processing applications, the Finite Impulse Response (FIR) filter is a more reliable and stable construction than the Infinite Impulse Response (IIR) filter. In this paper, a Radix-4 modified Booth Multiplier and Carry Look Ahead (CLA) adder are used to design and build a high speed and low power FIR filter. By multiplying filter inputs and coefficients, the Booth multiplier shortens the accumulation computation time. The standard Ripple carry adder, which adds data to the FIR filter, uses CLA to decrease its critical path delay. The Booth multiplier and CLA are used to create the 8-tap direct form FIR filter, which is then simulated and synthesized. These blocks' relevant delays and powers are computed and shown. The utilization summary of each block with regard to the target FPGA is also shown.

Keywords: FDA Tool, FIR filter, FPGA, VHDL

Introduction:

Filtering is a class of signal processing, the defining feature of filter being the complete or partial suppression of some aspect of the signal. In signal processing, the function of a filter is to remove unwanted parts of the signal, such as random noise, or to extract useful parts of the signal, such as the components lying within a certain frequency range [1].



Figure 1. Block diagram of basic filter

A filter is an electrical network that alters the amplitude and/or phase characteristics of a signal with respect to frequency. Ideally, a filter will not add new frequencies to the input signal, nor will it change the component frequencies of that signal, but it will change the relative amplitudes of the various frequency components and/or their phase relationships. Filters are often used in electronic systems to emphasize signals in certain frequency ranges and reject signals in other frequency ranges.

Filters [2] are widely employed in signal processing and communication systems in applications such as channel equalization, noise reduction, radar, audio processing, video processing, biomedical signal processing, and analysis of economic and financial data. For example in a radio receiver band-pass filters, or tuners, filters are used to extract the signals from a radio channel. In an audio graphic equalizer the input signal is filtered into a number of sub-band signals and the gain for each sub-band can be varied manually with a set of controls to change the perceived audio sensation. In a Dolby system pre-filtering and post filtering are used to minimize the effect of noise. In hi-fi audio a compensating filter may be included in the preamplifier to compensate for the non-ideal frequency

INDIAN STUDENT SEIZES OPPORTUNITY IN STUDYING ABROAD

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Abstract:

Over the past two decades, there has been a significant increase in the number of Indian students studying abroad. This trend is not restricted to any particular field or subject, but spreads across a wide range of disciplines and countries. In this blog, we will explore the reasons behind the growth of this trend, its benefits, and its impact on both students and the educational environment in India. Every year, more than 250,000 students leave India in search of a better education and study at universities in the United States, Europe, Southeast Asia and Australia. These numbers make India the country with the highest mobility of high school students after China. That's not necessarily surprising. China and India are by far the two most populous countries in the world. However, the increase in student outflows from India over the past decade has been staggering and even China pales in comparison. At the beginning of this century, India was not among the five countries of origin with the highest student mobility in the world. Basically students go abroad to get it. The number is increasing because there are more and more opportunities in our globalized world. Globalization has opened up many different opportunities for students. Globalization determines both demand and supply side educational factors. What are demand side factors? Factors that motivate potential students to pursue higher education outside their home country Home country and supply-side factors refer to factors that motivate the host country. Countries invite international students to study at their educational institutions. Not only that, as globalization sweeps across the globe, the students have found that a 'foreign' experience, where some time is spent studying and working abroad, gives them a definite edge over other candidates, when it comes to job market and the like. Also, the quality of education in developed countries like the US, the UK, Canada and Australia etc. also attract many students. Usually, pursuing studies in these countries present the student with a wider range of course choices, streams, campus facilities and chances for extra-curricular activities, not to mention the exposure to many different nationalities and cultures, in form of fellow students or teachers or the destination in itself. This is also a major deciding force.

Keywords: Globalization, Higher education, Student migration, India, environment, factors, challenges

1. Introduction:

Trend factors:

Several factors are contributing to the growing trend of Indian students choosing to study abroad.

OPTICAL DIGITAL COMMUNICATION FOR BLAST GAUGE

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Abstract:

Optical digital communication is the well-proven technology of today. Optical fibers are preferred over electrical cables as they offer many distinct advantages of higher bandwidth, low loss and immunity to RF/EMF. For that reason, the optical fibers are used in hazardous explosion environment. In this paper, we have presented the instrumentation system for transmitting the data on optical fiber to the control room. The blast pressure produces equivalent charge across PZT sensor. The blast data is conditioned and further digitized. It is stored in the NV RAM as event takes place and then transmitted using pulse modulation technique. This eliminates any chance of corruption of data while transmitting it to the control room. It has another added advantage that the system needs not to be calibrated.

Keywords: Optical Fiber, Blast Gauge, Transducer, Amplifier

Introduction:

The experimental measurement of air-blast pressures is a notoriously difficult problem. An ideal sensor for the task would have to be sufficiently robust to withstand a blast loading; small to reduce interaction with the flow; without significant inertia to record the pressure-time history accurately, and insensitive to various types of noise, both electromagnetic and mechanical, produced by the blast. While each of these requirements may be addressed separately with relative ease, no truly comprehensive solution has been presented so far. For example, commercially available specialized piezo-electric gauges are very robust with working pressures of hundreds of bar and rise times on the microsecond scale. Nevertheless, they are typically expensive, bulky (over 1 cm in diameter), and susceptible to acceleration, which makes accurate pressure measurements nearly impossible, especially for flows around relatively small structures. Optical fibre pressure sensors have several potential advantages that are pertinent to this application. Their small size results in good spatial resolution and high packing density for mapping the pressure distribution over the surface of a test model. The low mass diaphragm is relatively insensitive to acceleration and, with resonant frequencies typically above 1 MHz, enables data capture over a bandwidth exceeding 100 kHz. The all-dielectric construction provides immunity to electromagnetic interference and pickup, and electrical connections are not required. The manufacture of sensor bodies by silicon wafer processing techniques is expected to lead to a low cost per sensor.

Pressure fluctuations of 90 kPa (100 kPa = 1 bar) were measured at the 8 kHz rotor blade passing frequency with a solution of 0.65 kPa, with harmonics of up to 180 kHz. The experiments reported

REVIEW OF OPTICAL FIBER COMMUNICATION

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Abstract:

For global broadband networks, fibre optic systems are crucial pieces of telecommunications infrastructure. In today's applications, a wide bandwidth signal transfer with less delay is essential. Optical fibres are presently the transmission medium of choice for long distance and high data rate transmission in telecommunication networks because they offer massive and unparalleled transmission bandwidth with little delay. This essay addresses the benefits and drawbacks of fibre optic communication networks as well as an outline of their core technology.

Keywords: Optical communications, Optical technology, Optical devices, Fiber lasers, Waveguide, Optical fibers

Introduction:

Communication may be broadly defined as the transfer of the information from one place to another. When information is to be conveyed over any distance a communication system is usually required. Within a communication system the information transfer is frequently achieved by superimposing on modulating the information to an electromagnetic wave, which acts as a carrier for the information signal. The modulated carrier is transmitted to the required destination where it is received and the original information signal is obtained by demodulation. Communication may also be achieved using an electromagnetic carrier, which is selected from the optical range of frequencies.

In the design of large and complex digital systems, it is often necessary to have one device communicate digital information to and from other devices. One advantage of digital information is that it tends to be far more resistant to transmitted and interpreted errors than information symbolized in an analog medium. This accounts for the clarity of digitally-encoded telephone connections, compact audio disks, and for much of the enthusiasm in the engineering community for digital communications technology. However, digital communication has its own unique pitfalls, and there are multitudes of different and incompatible ways in which it can be sent.

The idea of using low-loss optical glass fiber wave-guides for long distances optical transmission was proposed earlier and it has achieved great success. The combination of a low-loss compact optical transmission medium and a miniature, directly current modulated laser diode or LED for the optical source for an optical signal transmitter paved the way to revolution in communication technology. For the past 20 years or so, there were dramatic progresses made in the field of the optical fiber

ROLE OF WOMEN IN BUSINESS MANAGEMENT

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Abstract:

In the modern economy, the role of women is specified; accepted. Being a woman is always a blessing. Women are now every day participates in all kinds of social activities. All women entrepreneurs strive hard for this. They make the nation safe and serve the nation by doing business. The more you make a profit. Art of management is a gift to women by nature. Women are born to take responsibilities and perform them. Women entrepreneurs play an extreme role in Modern business and an attempt has been made to analyze the role of women in Business in a complex society like India. Women is playing a vital role in Modern business since from the beginning Women always passionate about work, right from the evolution of human beings. It's in their nature to shoulder an entire burden of responsibilities and handle everything producing perfect results. Their inherent qualities like abundant patience, exceptional communication skills and the habit of giving everyone an equal say in every crucial matter make them way different from men. Women have become engines for economic growth. Achieving gender diversity in enterprises is of critical importance to improving business outcomes. However, women remain under represented in business, particularly at senior management levels. Women rarely attain executive management positions or serve as members of company boards. Yet, women have increasingly overtaken men in terms of tertiary education attainment.

Keywords: Marketing, skills, challenges, women, management, economic growth rate

1. Introduction:

Discrimination against women exists both at home and in society. Despite the inequalities that existed between men and women, Gender inequality has been on the agenda of social research and action in many sectors for decades. The leadership of the organization was shamefully ignored. The number of working women has increased over time; the world has increased the number of highly skilled human resources. A woman with technical skills, however, discrimination against women in the workplace is on the rise. Hindered their growth to a more prestigious position among men, Gender inequality in Workplaces manifest themselves in many ways, including occupational segregation and wage disparities, It also depends on gender and discrimination. Working women don't just fight horizontally Segregation also includes the separation of men and women by gender. Including women on leadership teams is often associated with higher levels of social engagement a more participative leadership style. An investigation of women's influence in cooperative enterprises; each has different organizational and purpose characteristics, indicating that their influence can lead to something greater. Improved motivation and performance, Strengthen measures to promote work-life balance.[1] National growth and improved quality of life for families are the benefits of women's leadership. Women's

THE APPLICATIONS OF MECHANICAL ENGINEERING IN MEDICINE AND BIOLOGY

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Abstract:

A branch of science known as mechanics, which is made up of the concepts of statics, kinetics, and kinematics, studies the behavior of physical objects (solids and liquids) under the influence of forces. The developments and research in applied mechanics have broad applications in practically all academic disciplines, including biology and medicine. Based on its use in these two revered domains, the relationship between mechanical engineering and the biological and medical sciences is examined in this research. We highlight a few emerging mechanical approaches used in medical research and treatment.

Introduction:

The necessity to design and produce medical technologies, ranging from small individual parts and devices to enormous systems that can be engaged in practically every element of technology, has given rise to the vast engineering discipline known as mechanical engineering, which encompasses a variety of activities and functions. It includes information on fluid dynamics, heat transport, robotics, solid mechanics, design, manufacture, maintenance, and control. This broad foundation aids scholars and mechanical engineers in defining, guiding the direction of technology, and playing a crucial part in resolving global problems and difficulties in many areas of interest outside mechanical technologies. Due to the fusion of novel fields and novel approaches, the intersection of mechanical engineering and medical now exceeds what were before unthinkable. We can list a variety of themes and pressing problems, such as engineering procedures, biosensors, and biodevices in the fields of medicine, biology, and healthcare, where mechanics plays a crucial role in problem-solving [1].

Following are some topics that connect mechanics with medicine and biology:

- Biofluid Mechanics, Biorheology, Blood Flow dynamics
- Hemodynamics using Computational Fluid Dynamics (CFD).
- Biomaterials and Biosensing
- Cellular, Subcellular, Genetic, Epigenetic, or Molecular Biomechanics
- Medical Nanoelectro-mechanical Systems (NEMS)
- Medical Robotics.
- Reproductive and Urogynecological Mechanics.
- Muscle/Neuromuscular/Musculoskeletal Mechanics and Engineering.
- NEMS/MEMS, Microfluidics.
- Mechanobiology and healthcare
- Computational Biomechanics/Physiological Modelling
- Clinical Biomechanics.
- Cellular and Tissue Mechanics/Engineering.

THE MATH BEHIND ENCRYPTION

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Abstract:

Cryptology is the science of using mathematics to hide data behind encryption. Confidential information is stored along with the keys needed to access the raw data. It is impossible to know what the original document is without breaking the code. While cryptography is also used in the science of data security, cryptanalysis is also important for understanding the mathematical aspects of data encryption and decryption. It uses code-breaking, a combination of mathematical tools, pattern finding, analytical thinking, determination, and a little variation. The term "crypto analyst" usually refers to someone who attacks systems and looks for vulnerabilities. There are several ways to apply encryption to files. The essential difference is to prevent your brother from reading your diary and to prevent the government from viewing your data. The strength of encryption is determined by the resources and time required to recover the raw text. However, the main result of encryption should always be the same. It is very difficult to understand the cipher text without knowing the appropriate decryption tools and keys. Today's advances in computer technology make it billions of times more complex than it used to be. Strong cipher text prevents cryptanalysts from retrieving your data, even against highly skilled hackers. This explains all aspects of the mathematics behind encryption and the different ways to encrypt your data using modern algorithms.

Keywords: Mathematics, Cryptography, ultra, enigma, history, CREST Crypto-Math Project

1. Introduction

Although modern cryptographic mathematics is very different from the ancient one, it is still based on the same concepts used in ancient times. The earliest known examples of codes were found in hieroglyphics carved into clay in the Old Kingdom of Egypt, dating back to 1900 BC found. Historians believe that messages shouldn't be complicated, but they should still be engaging and fun to solve. There are also Mesopotamian clay tablets dating back to 1500 BC. It is thought to date back to 1500 BC and was probably encrypted to hide the recipe for the pottery glaze, as it had commercial value and the seller was private. Perhaps the most famous source of ancient codes is the use of mono alphabetic substitution codes around 400 BC. In 400 BC, in India Mrekkitavikalpa was called "the art of code writing". Cryptography has come a long way over the past 100 years. You've probably seen simple ciphers such as the Caesar cipher, also known as the shift cipher. ROT13 is one of the most common types of shift ciphers, meaning the alphabet rotates "13" times. Cryptography is one of the oldest studies, and one of the most active and important. The word cryptography comes from two Greek words: *κρυπτ* τ *το* *ος* (kryptos), meaning secret and *γραφω* (grapho), meaning to write. As these roots imply, it all began with the need for people to communicate securely. The basic setup is that

A REVIEW ON VARIOUS ERROR DETECTION AND CORRECTION METHODS USED IN COMMUNICATION

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Abstract:

Error control pertains to the methods by which a network manages and identifies problems, particularly in the data connection layer. We provide an overview of error control with reference to error detection and error repair in this work. In the data link layer, error control takes place. In order for the receiver to extract the actual data, we mostly talk about the kinds of error detection algorithms that are used to find the faults and how those errors will be fixed. The conclusion and recommendations for further work are provided at the end of this publication.

Keywords: Data Link Layer, Error Control, Parity Check, Checksum, Cyclic Redundancy Check

1. INTRODUCTION:

The data link layer, or layer 2, is the second layer of the seven layer OSI model of computer networking. Data link layer is accountable for converting data stream to signals bit by bit and to send that over the underlying hardware. At the receiving end, Data link layer picks up data from hardware which are in the form of electrical signals assembles them in a noticeable frame format, hands over to upper layer. The data link layer affords the purposeful and procedural means to transfer data between network entities and might provide the means to detect and probably correct errors that may occur in the physical layer.

Data-link layer uses error control techniques to ensure that accuracy of frames. These errors can be single bit or multiple bits, which make the information unreadable at the receiver's end. These types of error are also known as single bit or multiple bits burst errors. To overcome these types of errors, two phases of error checking are involved, i.e. error detection and correction. Generally the data link layer offers some functions to detect and correct such errors. Different error detection such as Parity bit checking, Checksum method, error detection based on Hamming Distance, cyclic redundancy checking, etc., and correction such as Automatic repeat Request, Forward error correction code, Low Density Parity Checking, etc. [1] are also used in the data link layer to solve these types of problems [2].

2. ERROR:

The data can be corrupted during transmission from source to receiver. It may be affected by external noise or some other physical imperfections. In this case, the input data is not same as the received output data. This mismatched data is called "Error" in figure 1. The data errors cause loss of data. Even

AN OVERVIEW OF MOBILE IP ISSUES, CHALLENGES, AND SOLUTIONS

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Abstract:

The number of people using mobile internet has increased dramatically over the past few years, and mobility support is now essential for smooth internet connectivity. The field of mobile computing has experienced rapid expansion. People all across the world utilise devices like PDAs, handhelds, digital cell phones, etc. In this paper, we have conducted a thorough investigation of the operation of mobile intellectual property (IP), as well as the range of issues and solutions that it faces.

Keywords: Mobile IP, Network, Agent, TCP, Tunneling

1. Introduction

We want to keep our IP addresses wherever we are, but a traditional IP design does not support mobility. So, whenever we change our location, we also need new IP addresses. Changing IP addresses is undesirable for several reasons. As we know, most Internet traffic is TCP, and changing the IP address forces TCP to establish a new connection. As a result, packets might get lost during this change. Moreover, a mobile node will be assigned a foreign IP address instead of a local IP address. Then, using the foreign IP address makes it difficult for users to gain access to their private or local networks, such as local printers. Mobile IP was designed to solve all these problems. Mobile IP is a standard that allows users to move from one network to another without losing connectivity. Mobile devices have IP addresses that are associated with one network and moving to another network means changing IP address. Using the mobile IP system will allow users to achieve this and at the same time make the underlying process transparent for a user. Cell phones allow users freedom of movement and Personal Digital Assistance “PDA” offers users to access email in any location. Global Positioning System (GPS) has the capability to pinpoint the location of the device anywhere in the world. Mobile IP is scalable for large number of users, and users can be confident that no one can read their messages or use their resources.[1]

2. Features of Mobile IP

Mobile IP was successful as it has several notable features like no geographical limitation, no physical connectivity required, supports security, no modifications for the current IP address. The main factors that influence the need for Mobile IP are:

- Mobility Support, increased number of mobile users.
- Standardization, uses the current IP Protocol
- Inter-Operability, can be used across different service providers
- Alternative Technologies, lack of proper alternatives other than Mobile IP

CHALLENGES IN DEVELOPMENT OF THE MECHATRONIC SYSTEMS

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Abstract:

Traditionally, a team of design professionals from many design fields develops mechatronic devices. Thus, developing mechatronic products is quite difficult. The essential difficulties in mechatronics must be properly understood and supported by appropriate techniques and tools in order to address this. By undertaking a comprehensive and in-depth review of the most pertinent studies on mechatronic design, this paper seeks to identify the key problems.

Keywords: Mechatronics, Mechatronic System Designs, Electrical Engineering, Electronics Engineering, Modern Machines

1. Introduction

The name Mechatronics has its origin in the 1969 when a Japanese company used it to define the integration of mechanics ("mecha") with electronics ("tronics"). During the next years the term has taken a wider meaning and a number of definitions have been proposed in the literature. One of the most commonly used definitions emphasizes on synergy. According to this, Mechatronics is the "synergistic integration of mechanical engineering with electronics and intelligent computer control in the design and manufacture of products and processes"[1]. Another definition focuses on functioning and defines Mechatronics as these systems "whose function relies on the integration of electrical and mechanical components coordinated by control architecture." During last years the term was significantly changed mainly due to the increasing importance of software in today's systems. A brief description of the evolution of mechatronics can be found in [2] where a wider definition for the term is also proposed. According to this, the term mechatronics can be used to describe a philosophy in engineering and not just the technology itself. There is currently an overlapping between the terms mechatronic system and embedded system. An embedded system "often includes task-specific hardware and mechanical parts" as is the case of the hard disk of the personal computer. This is why a big influence from software engineering and embedded system's engineering is expected into the mechatronic systems development process. The development of electronic and software parts of mechatronic systems are currently dominated by embedded systems development processes and toolsets. However, according to the results of an inventory carried out on European companies in the embedded domain [3], "the development process is unsatisfactory and many years behind their desktop counterparts." Authors of the same paper also argue that "currently used development technologies do not take into account the specific needs of embedded systems development." The common practice is that software development starts when the development of electronic and mechanical is already at a

CLIMATE CONTROL IN MODERN BUILDINGS

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Abstract:

Buildings and their rooms are constantly subject to internal and external influences. Urbanization is one of the many causes of climate change. Climate change has become a global issue. It not only changes the outside temperature, but also affects other aspects of the interior, which affects the lifestyle of the people living there. Regions with naturally hot and humid climates are most affected by climate change. Climate change in terms of heat, atmospheric emissions, and moisture loss/gain of the purpose of the BAS is to coordinate the operation of the HVAC system and maintain a desirable indoor environment throughout the building as much as possible conditions. In this way, the BAS acts as an interface between buildings. HVAC system and he HVAC system alone can work perfectly. BAS's job is to manage all capacity or turn it off completely. In between - that is, all part-load scenarios. This applies to all buildings, but arguably the most common mode of operation. So BAS plays a role. It plays a critical role in providing HVAC services throughout most of a building's lifespan.

Keywords: Climate control, energy consumption, environment, models, HVAC

1. Introduction

A common approach has been central control of supply air temperature (SAT). A ventilation system that uses optimization algorithms to determine the minimum energy consumption of the entire system while maintaining overall building comfort. Similar studies have found that up to 30% of energy is consumed. Potential savings in educational environment compared to keeping SAT constant Setting value. These results are also consistent with those using the optimal climate controller controls in scale models of academic buildings compared to keeping it constant For SAT values of 12–14 °C, this strategy resulted in energy savings of 54–14 °C. 61% in summer and winter environmental conditions; Plus, you can expect savings of 29-36% per year. Multi-zone office building model the overall operation of the ventilation system has been optimized. Simple adaptive control Models of processes have been used to estimate responses to various external and environmental responses.[1] Internal state while the solver is looking for a compromise between air handling Energy and comfort aspects. It has been found that energy savings of up to 40% can be achieved depending on the weather conditions compared to maintaining a constant set point.

2. Adapting buildings to climate change

The building sector is responsible for the majority of carbon emissions and occupants. Expectations for comfort will also increase. This represents a huge opportunity for energy savings this has become a top priority area for climate change countermeasures. Buildings should adopt this method Adaptation and mitigation to address climate change. The devastating effects of extreme weather events are due

E-LEARNING IN EDUCATION SYSTEM

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Abstract:

Online learning and courses are increasingly becoming part of the education system worldwide. Online channels have made education convenient and easily accessible to everyone all. India's education sector continues to grow. India was one of them it is the largest sector in the world when it comes to higher education. However, online or in remote locations, Courses have been around for a long time and the introduction of online course mode Compared to traditional face-to-face classes at universities It has only recently begun to be considered in India. Most universities in India offer many educational services Problems and obstacles that can be overcome using technology. Open source platforms such as the e-learning platform Module, It has been implemented at many universities in Indiana. Module can be used as a tool to deliver e-content and provide various ways to implement asynchronous web-based e-learning modules. Increase motivation with interactive e-learning features learning process of bachelor's degree students. Online from an institutional perspective Learning is a cost-effective way to increase student enrollment and revenue without requiring learning Make the right investments in your infrastructure. Additionally, there is no longer a need for a medical checkup. Classroom presence and online learning have the potential to make education accessible to all. It has a much larger population while meeting the demands of a fast-paced global society when it comes to Indians, Face-to-face classes are always at the forefront of the education system is required but E-learning has transformed the educational sector by enabling students to share information and data in a relatively easy way.

Keywords: Online learning; students' challenges, motivation, web-based education, face to face learning

1. Introduction

Online courses are a newly introduced mode it's part of the lesson, not part of the regular lesson. Investigate and analyze how online courses are perceived and experienced by students and instructors Studying in different universities in India helps education experts to understand. Make changes to meet teacher and student needs the result, Institutions and executives who will become online providers in the future Learning requires a deeper understanding of how both students and teachers perceive and respond Online courses as a learning mode to most effectively apply these approaches another, What was important to me when reviewing previous studies was the online evaluation. The training content focused on and considered the student's perspective. Consider the teacher's perspective. The teacher's perspective is equally important. If you are a dissatisfied education provider and are not satisfied with the online mode; the very foundation of education is being weakened. The introduction of this new online course will Equally challenging for teachers who are struggling to learn in this new way

ENERGY EFFICIENCY IN OPTICAL NETWORKS

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Abstract:

In this essay, we spoke about how much electricity an optical network uses. According to a review of several publications, wavelength division multiplexing, or WDM, is a method that can handle the growing need for bandwidth. Additionally, when data is transported through channels from source to destination, additional energy is consumed. The routers, connections, network components, etc. in optical network use energy. There are numerous strategies and algorithms that have been developed to reduce energy use.

Keywords: Energy minimization, routers, optical network, network components

Introduction:

With fast growth of the Internet and World Wide Web, the network bandwidth requirements have increased dramatically in recent years. The research and technology development in Wavelength Division Multiplexing (WDM) networks are now evolving at a staggering pace to fulfill the increasing bandwidth requirement and the deployment of new network services. WDM wide-area networks (WANs) employ tunable lasers and filters at access nodes and optical/electronic switches at routing nodes which increase the bandwidth considerably.

In communication networks, the use of the optical technology has been popular for the need of wide band width, high speed transmission and large no of nodes. An important goal of the design of WDM (wavelength division multiplexing) networks is to use fewer wavelengths to serve more communication needs.

According to the wavelength conflict rule, the number of wavelengths required in a WDM network is at least equal to the maximal number of channels over a fiber (called maximal link load) in the network. By placing wavelength converters at some nodes in the network, the number of wavelengths needed can be made equal to the maximal link load.

For optical transmission, wavelength division multiplexing (WDM) is proposed which has the ability to allocate many independent optical wavelengths on a single fiber link. A light path is an optical channel which may be used to carry circuit-switched traffic and it may span multiple fiber links. In the absence of wavelength convertors, a light path would occupy the same wavelength on all fiber links through which it passes.

GROWING USE OF NANOTECHNOLOGY IN SMART CIVIL STRUCTURES

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Abstract:

Nanotechnology has emerged as a transformative force in the field of civil engineering, revolutionizing the design, construction, and maintenance of smart civil structures. This abstract explores the escalating utilization of nanotechnology in civil engineering and its pivotal role in the development of intelligent and resilient infrastructure. Nanomaterials, such as nanoparticles and nanocomposites, have opened new avenues for enhancing the durability, functionality, and sustainability of civil structures. The integration of nanotechnology into civil engineering has enabled the creation of self-healing materials, sensor networks, and energy-efficient solutions, contributing to the establishment of "smart" civil structures. Self-healing materials with embedded nanocapsules are capable of autonomously repairing microcracks and damage, thus prolonging the lifespan of structures. Additionally, the incorporation of nanoscale sensors allows real-time monitoring of structural health, ensuring early detection of potential issues and facilitating timely maintenance. Nanotechnology is also contributing to the development of advanced construction materials that possess remarkable strength and durability while minimizing environmental impact. Nanomaterials have unique functions in term of strength, durability, high speed of construction, and environmental impact reduction. Nanomaterials have the potential to enhance the performance of concrete, steel, and other structural elements, making them more resilient to environmental factors and reducing the need for maintenance and repair. Furthermore, the utilization of nanocoatings can provide protection against corrosion and wear, ensuring the longevity of civil structures. The adoption of nanotechnology in civil engineering is not without challenges, such as safety concerns and regulatory considerations. However, the promising benefits in terms of enhanced performance, sustainability, and economic efficiency make it an attractive and evolving area of research and application.

Keywords: Nanotechnology, Civil structures, Smart infrastructure, Nanomaterials, Self-healing materials, Nanoscale sensors, Structural health monitoring, Advanced construction materials

Introduction:

The convergence of nanotechnology and civil engineering has sparked a paradigm shift in the way we conceptualize, design, and construct smart civil structures. Nanotechnology, the science of manipulating materials and devices at the nanoscale, has begun to play a pivotal role in reshaping the landscape of modern infrastructure. This introduction provides an overview of the growing use of nanotechnology in smart civil structures, highlighting the transformative potential and benefits that this integration offers [1]. Civil engineering has always been at the forefront of innovation, responding to the ever-evolving demands of urbanization, population growth, and environmental sustainability. As we strive for infrastructure that is not only functional but also intelligent, resilient, and sustainable,

IMAGE COMPRESSION: A REVIEW

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Abstract:

A communication network now needs more capacity due to the ongoing advancements in technology. However, increasing bandwidth is not meeting the needs due to increased pixel size and grey level resolution in sensor technology and digital picture representation. Thus, picture compression emerges as a hot topic for study. Image compression reduces the amount of bits required to represent the image without sacrificing the image's original quality. The various kinds of compression techniques are briefly covered in this work.

Keywords: Image Compression, types of images, performance assessment metrics, and compression techniques

1. Introduction

An image is a two-dimensional communication processed by the human visual system. The impulses that depict images are usually analog. Computer applications convert them from analog to digital for processing, storage, and transmission [1]. A digital image is a 2D pixel array. Image compression reduces the amount of storage space required for photos and movies, hence improving storage and transmission performance. Lossy or lossless image compression is possible. Lossless compression entails compressing data so that it may be decompressed into an identical reproduction of the original [2-4]. However, in lossy compression techniques, some of the image's finer details can be sacrificed in order to save a little more bandwidth or storage space.

Working procedure of image compression techniques:

The most common processes in compressing an image are [2]:

1. Specifying the Rate (available bits) and Distortion (tolerable error) parameters for the target image.
2. Classifying the visual data according to their relevance.
3. Distributing the available bit budget across these classes in such a way that distortion is minimized.
4. Using the bit allocation information acquired in step 3, quantify each class independently.

REVIEW ON OPTICAL CHARACTER RECOGNITION

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Abstract:

The electronic conversion of a picture of printed or typewritten text into machine-encoded text is known as optical character recognition. It is a typical technique for text digitization from print. Benefits include simple storing, editing, searching, etc. OCR is a branch of computer vision, artificial intelligence, and pattern recognition research. Its ability to convert an image into an editable document has made it more significant in earlier decades. The goal is to create an application that is easy to use and can convert images into data that can be edited and searched. After receiving an image as input, the OCR extracts the text from it and creates an editable document out of it. Applications for this system include the banking and legal sectors, among others. Its primary goal is to reduce labor costs and time.

Keywords: Image Processing, MATLAB, Optical Character Recognition (OCR), Segmentation, Template Matching and Correlation

1. Introduction

Pattern recognition is the assignment of a physical object or event to one of several pre-specified categories [1]. It has many applications such as—classification and analysis of RADAR signaling, character (letter or number) recognition, and handwriting analysis (notepad computers). Other applications include bank checks, tablet computers, personal digital assistants (PDAs), Cheque reading, postcode recognition, form processing, and signature verification [2]. Optical character recognition has many different practical applications. The main areas where OCR has been of importance are text entry (office automation), data entry (banking environment) and process automation (mail sorting) [3].

Character is the basic building block of any language that is used to build different structure of a language. Characters are the alphabets and the structures are the words, strings and sentences etc. [4]. Character recognition techniques as a subset of pattern recognition give a specific symbolic identity to an offline printed or written image of a character [16]. Character recognition is better known as optical character recognition because it deals with the recognition of optically processed characters rather than magnetically processed ones. The main objective of character recognition is to interpret input as a sequence of characters from an already existing set of characters. The advantages of the character recognition process are that it can save both time and effort. It provides a fast and reliable alternative to typing manually.

REVIEW PAPER ON WIRELESS NETWORKS

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Abstract:

Using wireless technology, humans reduced their efforts in accessing data from various locations by replacing wired infrastructure with wireless infrastructure and also allowing mobile devices to access data. In wireless networks, signal fading, mobility, data rate improvement, minimizing size and cost, user security, and Quality of Service (QOS) are some of the key challenges due to the small size of wireless devices and bandwidth limitations.

Keywords: Wireless LAN (WLAN), WPAN, QOS, data security

1.1 INTRODUCTION

The explosive growth in wireless networks over the last few years resembles the rapid growth of the internet within the last decade. Wireless communication continues to enjoy exponential growth in the cellular telephony, wireless internet and wireless home networking arenas. With advent of Wireless LAN (WLAN) technology, computer networks could achieve connectivity with a useable amount of bandwidth without being networked via a wall socket. New generations of handheld devices allowed users access to stored data even when they travel. Users could set their laptops down anywhere and instantly be granted access to all networking resources. This was, and is, the vision of wireless networks, and what they are capable of delivering. Today, while wireless networks [1] have seen widespread adoption in the home user markets, widely reported and easily exploited holes in the standard security system have stunted wireless deployment rate in enterprise environments. The distinguishing feature of wireless networks is that packets (segments) are transmitted with the presence of wireless links. A device can send messages in a wireless network via the wireless medium, air, to another device provided that the receiver is within the transmission range of the sender. This adds flexibility to how a wireless network is formed and structured. Besides, it supports device mobility.

1.2. WIRELESS NETWORKS

Wireless Networks provide the transport mechanism among devices and the traditional wired networks. Wireless networks enable one or more devices to communicate without physical connections—without requiring network or peripheral cabling. Wireless Networks use radio frequency transmissions as the means for transmitting data, whereas wired technologies use cables. Wireless technologies range from complex systems, such as Wireless Local Area Networks (WLAN) and cell phones to simple devices such as wireless headphones, microphones, and other devices that do not process or store information. They also include infrared (IR) devices such as remote controls, some cordless computer keyboards and mice, and wireless hi-fi stereo headsets, all of which require a direct line of sight between the transmitter and the receiver to close the link. Wireless networks allow devices to be moved about with varying degrees of freedom and still maintain communication with each other.

ROLE OF TEAMWORK ON AN ORGANIZATION'S PERFORMANCE

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Abstract:

Organizational progress is achieved through the presence of people who are constantly looking for ways to work intelligently, both individually and organizationally. Increasing the effectiveness of human resources leads to increasing organizational efficiency. Many organizations require process improvement to grow, improve performance, and progress on the path to excellence. These programs typically start with a lot of enthusiasm and promise, but often fail to meet management's expectations. This gap is typically the result of models used by senior management in an organization and has little to do with the efforts of those running the model. Performance management is a management tool that helps managers of a company or organization to monitor and evaluate the quality of employees. One of the goals of a performance management program is to create an environment in which people can use their full potential to produce high-quality work at the highest levels of efficiency and effectiveness. Performance management is the effort to guide employees toward achieving their goals and the goals of the organization. For organizations to survive and thrive in a competitive world, they must continually improve their performance. Human resources can also be said to be one of an organization's most important resources. In recent years, companies have been paying more and more attention to their employees, and the challenge has been to find ways to improve the working environment and employee development.

Keywords: Teamwork, employee performance, effectiveness; ethnicity; self-awareness

1. Introduction

A team can be defined as a group of people working together to achieve the same goal or desire. We provide excellent service quality. Teamwork has the ability to enable participants. Teams have higher levels of emotional safety, self-confidence, and creative potential. Make decisions proactively with others. It also helps create a healthy working environment. Manageable agenda, innovative activities, and great strategy and values on the other hand, a lack of teamwork concepts and strategies can lead to professional failure, disappointment, low morale, and decreased productivity, which threatens organizational integrity. Staff, that is if you work in an organization that doesn't have a strong teamwork mindset, you usually won't be able to do it. To achieve the expected results and achieve the goals and vision of this organization; the presence of teamwork concept is a crucial rule to assist the personnel in working together in the direction of common targets and goals creatively. The work performance of the team is greater than individual overall performance when the work requires a broader scope of knowledge, judgment and opinion. The benefit of teamwork is extensive productivity increase in the spheres that require creative solving of exceptional tasks, a high degree of adaptability and operational management.[1] The success of any business enterprise or organization requires the fine force of teamwork because it helps the employees to empower and boost themselves and their

UNDERSTAND THE INTERACTION AMONG VARIOUS PROCESSES IN THE HYDROLOGIC CYCLE

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Abstract:

The primary natural resource that sustains ecosystems, life, and human society is water. For sustainable development, it is crucial to understand the water cycle. A deeper understanding of the water cycle is required in light of global climate change. Our most valuable and possibly most underappreciated natural resource is water. It is necessary for supporting life on Earth, producing food, and fostering economic growth. Water also has a major impact on how weather and climate are shaped. The planet's water supplies are continually in danger from misuse and contamination due to the expanding global population. Addressing this issue requires an understanding of how land and atmosphere interact. For big basin investigations, systematic methodologies need also be established. Multiple scales of the water cycle are inherently linked to social traits, necessitating the use of multi-process and multi-scale models. This new paradigm should be used in hydrological studies as part of the water-food-energy frontier study. In line with the sustainable development goals of the UN, this will support interdisciplinary research in the scientific and social sciences. The main elements of the hydrological cycle are discussed in this study along with the current state of space observations, related data products, and models for retrieving hydrological variables.

Keywords: Water cycle, Hydrological cycle, water-food-energy, global population, weather, climate

Introduction:

The hydrological cycle is typically described as a cyclical result of many ways that water moves through the environment and changes in its physical condition in a specific part of the Earth (a river or Lake Basin, a continent, or the entire planet). The hydrological cycle involves the circulation of water through all four components of the overall Earth system—atmosphere, hydrosphere, lithosphere, and biosphere—and is highly dependent on regional variations in each of these systems. The mechanism by which water resources are created on a specific piece of land is why the terrestrial hydrological cycle is of particular relevance. In addition, the role of the global hydrological cycle in relation to other geophysical processes and the global climate is frequently taken into account. [3]

The actions that transport water among these storages can be seen as a sequence of storages in the hydrologic cycle. With regard to this, the oceans, which house 97% of the planet's water, are the biggest reservoirs. About 78% of the remaining 3% of freshwater is kept in ice in Antarctica and Greenland. Groundwater, which is kept underground in sediments and rocks, makes up around 21% of all the freshwater on the planet. Less than 1% of the world's freshwater and less than 0.1% of its total water are found in rivers, streams, and lakes combined.

“ENLIGHTENING THE FUTURE OF ENGINES: THE REVOLUTIONARY LASER IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES”

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Abstract:

In order to meet the strict emission standards being imposed globally and to continue the pursuit of better engine performance, automotive engineers are being forced to investigate and develop new combustion technologies. A promising alternate igniting method for spark ignition engines is the laser. Potential benefits of laser ignition over traditional spark plug ignition. Since there are no spark electrodes in a laser ignition system, there is no energy loss to the electrodes, which are also not subject to erosion. Experimental research was done on the likelihood of ignition and minimal ignition energy (MIE) of premixed gasoline-air mixtures at various equivalency ratios. The outcome was contrasted to spark ignition. The mixture had a starting pressure of 0.1 MP and a starting temperature of 363 K. According to the research, within the flammable range, the likelihood rises as the ignition energy rises, and for both laser and spark ignition, the distribution of MIE with equivalence ratios has a U-shape.

Keywords: Laser Ignition System, Internal Combustion Engine, Fuel, Emissions, and spark

Introduction:

For a system to operate properly in technical equipment like an internal combustion engine, reliable ignition is necessary. In spite of economic and environmental obstacles, fuel consumption and exhaust emissions from motor vehicles have both dropped. The most effective engines at the time for lowering fuel use and exhaust pollutants are those with direct fuel injection. Unfortunately, the classic spark plug ignition only allows for one ignition location to be chosen due to significant damage when compared to contemporary spray-guided combustion methods. The use of a laser to ignite the fuel/air mixture has a lot of potential, according to gas engine R&D engineers. Laser ignition is particularly effective at meeting the thermodynamic requirements of a high compression ratio and high power density. Additionally, the gas flow within the combustion chamber can be impacted by the spark plug electrodes. Pollutant production and the degree of fuel conversion are both significantly influenced by ignition. This can be accomplished with reliability using a laser ignition method [1].

Need and Invention:

Energy shortages and environmental issues have gotten progressively worse with the growth of industry and the economy. The internal combustion engine and the car industry face formidable and practical obstacles. One of the efficient solutions to the challenges listed above is lean burn. However, due to ignition-related issues including the sluggish flame initiation and propagation as well as potential misfiring, existing engines cannot be operated sufficiently lean. Future spark ignition engines are expected to run at far greater compression ratios, faster compression rates, and considerably thinner fuel-to-air ratios. Conquering these obstacles. In order to make up for an engine's loss of power, the combustion chamber's charge density might be increased. However, with a spark ignition engine using