# A REVIEW: IMPROVE THE PERFORMANCE IN WIRELESS SENSOR NETWORK USING MODIFIED CSMA/CA PROTOCOL

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**Abstract:**

With the rapid advance of mobile computing, high speed Wireless Local Area Networks (LAN) attracts a lot of research interests in recent years. A new international standard IEEE 802.11 on wireless LAN has been established. Its physical transmission is realized by either spread spectrum communication or non-directive infrared. The medium access control of IEEE 802.11 is using carrier sense multiple access with collision avoidance (CSMA/CA) as the basic level access. During this paper, we analyzed our performance wherever CSMA / CA algorithm program has been appointed. Chanel access buses in performance analysis, the possibility of transmission failure included voting against all 3 frequency bands in favour of responsibility and with load variation.

**Keywords:** WSN, modified CSMA/CA, frequency, reliability, throughput.

## Introduction:

The advancement in the technology enlarges the network architecture with heterogeneity. The communication between different types of devices in a single huge network needs a common interface, results the adaption of IP interface by the Wi-Fi, LAN as well as Wimax etc. The communication path of the data packet in any network is decided by the communication protocol. A routing protocol specifies how routers communicate with each other, disseminating information that enables them to select routes between any two nodes on a computer network [6]. Different routing protocols have been designed to select the optimized path in the IP network with less delay and packet loss to transfer the data to the destination via intermediate nodes [4]. Routing is the way toward choosing paths in a network along which to send arrange movement [3]. Data link control is a mechanism which provides a link with reliable communication i.e. there is an available dedicated link (or channel) between the sender and the receiver. This assumption may or may not be true. If, indeed, we have a dedicated link, as when we connect to the Internet using PPP as the data link control protocol, then the assumption is true and we do not need anything else.

On the other hand, if we use our cellular phone to connect to another cellular phone, the channel is not dedicated. A person a few feet away from us may be using the same channel to talk to her friend. We can consider the data link layer as two sub-layers. The upper sub-layer is responsible for data link control, and the lower sub-layer is responsible for resolving access to the shared media. If the channel is dedicated, we do not need the lower sub-layer.

The upper sub-layer that is responsible for flow and error control is called the logical link control (LLC) layer; the lower sub-layer that is mostly responsible for multiple access resolution is called the media access control (MAC) layer. When nodes or stations are connected and use a common link, called a multipoint or broadcast link, we need a multiple-access protocol to coordinate access to the link. The problem of controlling the access to the medium is similar to the rules of speaking in an

# IRIS DETECTION USING IMAGE PROCESSING TECHNIQUE

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**Abstract:**

Based on a distinctive feature or attribute that the individual possesses, a biometric system automatically identifies the person. The most trustworthy and accurate biometric identification system currently in use is iris recognition. The majority of commercial iris recognition systems make use of Daugman's patented algorithms, which have flawless recognition rates. However, there have been no independent tests of the technology, and published results are frequently produced under favourable circumstances. The effort presented in this paper entails creating an "open-source" iris identification system to test the biometric performance and uniqueness of the human iris.

**Keywords:** Iris Detection, Biometric, Image Processing, Eyelid detection.

## Introduction:

The need to identify people is as old as humanity itself. In the current world, there are a growing number of human activities and transactions where quick and accurate personal identification is necessary. Passport control, computer login control, authorisation of bank ATM and other transactions, control of location access, and security system generally are examples. The unifying objectives of all such identification efforts are automation, speed, and reliability [1] [2].

It is necessary for a given biometric factor to be distinct for every person, easily measurable, and time-invariant in order to employ biometric indicia for identification. There are substantial limitations to using biometrics like signatures, photos, fingerprints, voiceprints, and retinal blood vessel patterns. Even though they are inexpensive, simple to produce, and convenient to retain, signatures and pictures cannot be reliably identified mechanically and are easily falsified. Voice alterations can affect voiceprints that have been electronically captured, and they can also be faked. Handprints or fingerprints need physical contact, and thus are susceptible to forgery and artefact tampering.

The human iris, on the other hand, is a great biometric for an identification system with the ease of speed, reliability, and automation because it is an internal organ of the eye and is well protected from the external environment while yet being easily visible from within one metre of distance. The Iris Recognition System, which is not only related to the field of personal identification but also more precisely to the field of automated identification of persons by biometric indicators, will be the subject of this thesis's experiments, implementation, and, most crucially, theoretical analysis.

The term "biometric" refers to the identification and validation of a person's identity based on specific traits or qualities in the person. Physiological characteristics and behavioural factors make up biometric systems. The physiological and biological properties that are the focus of a biometric system are included in the set of biometrics known as physiological characteristics. It specifically includes iris, hand, face, and DNA. A subset of biometrics known as behavioural characteristics is focused on

# R.O.L.S.H- RELOCATION OF LOAD FROM SHOULDERS TO HIPS

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**Abstract:**

Conventional and unconventional manufacturing processes were used to fabricate the physical prototype. The design and fabricate an upper-body exoskeleton integrated with a backpack which would reduce the overall and the oscillating load on the body so as to prevent musculoskeletal injuries, especially in the lumbosacral and spinal region. This product will find its application for the hikers, armed forces, and laborers who have to carry a considerable amount on a daily basis. This product will not only reduce the weight and prevent injuries but will also improve the posture and reduce fatigue. For the product to become available to the market, one must understand the responses of the idea from common people. So, to fulfill this, a need analysis was carried out wherein, nearly 63 individuals participated to answer the certain question regarding the application of the product.

The fatigue test was carried out through a $VO_2$max test which is the measurement of the maximum amount of oxygen a person can utilize during intense exercise. Three subjects walked for 16 min and 1 mile and the observations such as bpm etc. were calculated and the difference was checked with normal bag and with an exoskeleton. The oscillating load was carried out on two subjects during walking and climbing stairs. Piezo-sensors were installed on the shoulders and voltage values at regular intervals were checked using a millimetre. The posture analysis was done using a mobile application and the values were recorded with and without the exoskeleton.

The final results showed positive results and great promises. Further improvements can be made to the existing design with better manufacturing techniques and materials used thereby, providing better performance and prospects of commercial availability.

**Keywords:** Exoskeleton, Piezo-Sensor, $VO_2$ max.

## Introduction:

On the quest for a happier and healthier lifestyle, hiking has become a popular activity for people who are looking for enjoyment while also getting a wide range of physical and mental health benefits. Backpackers, sometimes called thru-hikers, are hikers who hike for days or weeks at a time and cover long distances each day with around 5-8 Kgs in their packs. Several studies show that nearly one-third of backpackers experience load carriage-induced injuries while performing this activity [1]. Technological advancements in the hiking industry continue to grow in efforts to maximize a backpacker's capability to carry more weight and minimize their risk of injury. Load carriage-induced injuries experienced by backpackers can be broken down into two main categories: paraesthesia of the limbs and musculoskeletal injuries. Paraesthesia results in a “pins and needles” sensation that goes away once the cause, usually sustained pressure, is relieved. [2] The backbone in your upper back is known as the upper thoracic spine. Multiple nerves enter and exit the spinal cord in this area. They can become compressed, or pinched, by a slipped disc or abnormalities of nearby ligaments or bones.

# REVIEW ON IMPROVING THE THROUGHPUT IN WIRELESS SENSOR NETWORK

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**Abstract:**

With the advancement of technologies has made the need of Wireless Sensor Networks more critical nowadays. For optimal distribution of energy among sensor nodes, in order to enhance network life time and throughput suitable protocols and applications should be developed. In this paper, various advantages and limitations of different modifications of the SEP protocol will be discussed.

**Keywords:** SEP, Modified SEP, Dead nodes, Lifetime, Throughput.

## Introduction:

In wireless communication, wireless sensor networks are crucial. The use of wireless sensor networks is advantageous in a variety of fields, including the military, civil, and healthcare. The sensor nodes that make up this network have the ability to detect changes in humidity, pressure, and temperature [7]. Data from the physical environment is collected, processed, and transmitted to the base station using this network. Sensor networks are made up of several kinds of sensors, including seismic, low sample rate magnetic, thermal, visual, infrared, and radar. The ability to monitor a wide range of environmental factors, such as vehicle movement, lightning conditions, pressure levels, soil composition, and noise levels, is one of the benefits of WSNs. For target field imaging, Earth monitoring, and disaster management in the military Sensors for fire alarms, sensors buried for precision farming, intrusion detection, and criminal investigation. The handling of the bulk of packets sensed and sent to each network node continues to be a significant problem. There are thousands of nodes in a WSN. Although the information aggregation and information fusion algorithm techniques are effective, they could always be improved. In order to maximize network throughput and save the limited power of sensor nodes, a successful wireless sensor network requires an efficient routing protocol with low routing overhead and a well-organized packet aggregation procedure [8].

The advancement in the technology enlarges the network architecture with heterogeneity. The communication between different types of devices in a single huge network needs a common interface, results the adaption of IP interface by the Wi-Fi, LAN as well as Wimax etc. The communication path of the data packet in any network is decided by the communication protocol. A routing protocol specifies how routers communicate with each other, disseminating information that enables them to select routes between any two nodes on a computer network [6]. Different routing protocols have been designed to select the optimized path in the IP network with less delay and packet loss to transfer the data to the destination via intermediate nodes [4]. Routing is the way toward choosing paths in a network along which to send arrange movement [3].

In order to take benefit of this description of wireless sensor nodes, we need to account for certain constraints related with them. In particular, reduce energy consumptive. We must take into consideration specific limitations associated with wireless sensor nodes in order to benefit from this description of them. Reduced energy usage is a crucial requirement for developing sensor network

# A BRIEF STUDY ON NANOMETROLOGY

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**Abstract:**

Nanometrology involves the measurement of geometrical features of size, shape and roughness at the nano scale. Though not an innate aspect of the specimen under study, these geometrical features are often measured against an arbitrarily fixed co-ordinate system, more so in an engineering application. With advent of new age metrological instruments (e.g. SPM), the parameters of measurement also include a physical quantity (e.g. force). Another important aspect that has to be borne in mind when the scale of objects reduces is the relative importance or relevance of the physical features namely size, shape and roughness. Nanometrology is a sub-discipline of metrology and is concerned with the science of measurement at the nanoscale level including the quantitative determination of dimensions as well as other physical properties e.g. mechanical, electrical, magnetic, optical properties and combination thereof, chemical and biological properties of nanomaterials and events taking place at the nanoscale.

**Keywords**: Measurement System, Nanometrology, Nanoscale, Types, Applications

## 1. Introduction:

Metrology is the science of measurements, and nano metrology is that part of metrology that relates to measurements at the nanoscale. Many governments worldwide have existing nanotechnology policies and are taking the preliminary steps towards nanometrology strategies, for example in support of pre-normative R&D and standardization work. In this *Nanowerk Spotlight*, we look at the European Commission funded project Co-Nanomet as an example of the importance of nanometrology as a key enabling technology for quality control at the nanoscale.

While a first and obvious benefit of metrology is its potential to improve scientific understanding, a second, equally important, but less obvious benefit of metrology is closely linked to the concepts of quality control or conformity assessment, which means making a decision about whether a product or service conforms to specifications. Conformity assessment provides confidence for the consumer that requirements on products and services are met, it helps producers and suppliers to ensure product quality, and it is essential for reasons of fair trade and of public interest (public health, safety and order, protection of the environment and the consumer). The conformity assessment aspect of metrology turns science and innovation into economy and prosperity. Conformity assessment is especially relevant for nanotechnology, since a great deal of concern exists about the difficulty to turn its scientific developments into innovative products.

"Metrology is necessary as the key discipline to enable the exchange of industrial products or components. To give a few examples, think of the pilot carefully observing his altitude, course, fuel consumption and speed, the food inspectorate measuring bacteria content, environmental engineers measuring air pollution, companies purchasing and selling their product using the same units. Goods and processes can be regulated and legislation can be implemented only because of measurements.

# A REVIEW OF AN EFFICIENT AND RELIABLE ALGORITHM FOR WIRELESS SENSOR NETWORKS

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**Abstract:**

Wireless Sensor Networks (WSNs) demand both energy efficiency and everlasting connections. Increasing WSN commercialization also involves monitoring application visits to improve quality of service (QoS). To keep the performance of the WSN from declining, the establishment of an energy-efficient and reliable link is essential. The Link Consistency and Energy Efficiency for Improving Throughput in Wireless Sensor Network is introduced in this object. The benefits and drawbacks of various SEP protocol modifications will be explored in this study.

**Keywords:** SEP, modified SEP, dead nodes, lifetime, throughput

## Introduction:

Wireless sensor networks are essential for wireless communication. It is useful to deploy wireless sensor networks in a range of industries, including the military, civil, and healthcare. This network's sensor nodes are able to recognise changes in temperature, pressure, and humidity [1]. This network is used to gather, process, and transmit data from the physical environment to the base station. Seismic, low sample rate magnetic, thermal, visual, infrared, and radar sensors are only a few of the several types of sensors that make up sensor networks. One advantage of WSNs is its capacity to track a variety of environmental variables, such as vehicle movement, lightning conditions, pressure levels, soil composition, and noise levels. For military catastrophe management, Earth monitoring, and target field imaging sensors for intrusion detection, buried sensors for precision farming, and sensors for fire alarms. The management of the large number of packets sensed and transmitted to each network node continues to be a major issue. A WSN contains thousands of nodes. The information fusion and aggregation algorithm techniques are efficient, but they may always be made better. A successful wireless sensor network requires an effective routing protocol with low routing overhead and a well-organized packet aggregation mechanism in order to maximise network throughput and save the finite power of sensor nodes. [2].

A WSN is made up of a substantial number of sensor nodes that are outfitted with different sensing methods to keep track of how technology changes in the real world. Four components make comprise a sensor node. A sensing device, which collects the necessary information from the targeted area, is the initial component. The memory unit, which makes up the second part, holds the data until it is transmitted to the prospect. The computing unit, which computes the compiled data, is the third component. The process is powered by the power unit, which is the last component. Since they are

# ANALYSIS ON PLANT MAINTENANCE

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**Abstract:**
Plant maintenance is the application of best practices to increase equipment up time in manufacturing facilities. This helps plants avoid unplanned downtime and ensures production stays on schedule. Understanding plant maintenance will help ensure your employees are protected from injury and your products are safe for the end-user. Every organization is equipped with lots of assets and all organizations rely on some type of maintenance. Organizations that are into production and manufacturing such as oil & gas, electronics, and pharmacy heavily rely on maintenance. Plant maintenance can be scheduled and unscheduled. It depends on the importance & priority of the asset. When priority is high then asset maintenance is done proactively. However, there are several factors included in proactive maintenance such as asset utilization, performance, how old assets are, and so on. Plant maintenance can lead to increased downtime as asset maintenance is a long process and they are not in working condition. That is why maintenance must be planned in a way so that machine downtime can be minimized. For example, maintenance can be performed on holidays and on the night shift.
**Keywords**: Maintenance, objectives, planning, needs, types

## 1. Introduction:

Plant maintenance can be defined as a particular set of activities that are required to maintain equipment, machinery and parts so as to minimize downtime and failures. The tension with plant maintenance is to achieve the best possible uptime (e.g. fewest stoppages) for the lowest cost. Ultimately, operations that lack or have poorly executed plant maintenance bear the cost to both efficiency of productivity and their bottom line.

**The major subsystems of plant maintenance are:**

**Preventive maintenance control:** Preventive maintenance control enables the organization to lower repair cost by avoidance of down time, machine breakage and process variability. It also provide planning, scheduling and control of facilities.

**Equipment tracking:** Equipment is a useful thing which needs to be protected and monitor. Its costs constitute the single largest expenditure of an organization.

**Component tracking:** Components are the subsets of larger equipment and also it deserve same amount of cost control expenditure. It enables expenditure managers to identify components with repair problems.

**Plant maintenance calibration tracking:** It allows organizations to fully use their investments in the plant maintenance module.

**Plant maintenance warranty claims tracking:** It is an administrative system to provide control of all items covered by manufacturer and vendor warranties. It includes the ability to establish the type and length of warranty. [1]

# CAUSES OF DELAY IN RESIDENTIAL PROJECTS IN INDIA

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**Abstract:**

When building residential properties, the human factor is paramount. Beyond the prerequisite technical and financial parameters, residences should accurately reflect owners' preferences, priorities and personalities. Good residential construction managers understand that they are creating a legacy and are able to translate these into valid, coherent projects with reasonable parameters and attainable goals. A construction industry has grown significantly across the world, but the delay has become a significant issue, which is observed in many civil projects. The residential projects in our country India have not escaped the tasks of failing to deliver projects on time. There are a lot of hazardous consequences due to the occurrence of delay in the construction works. The delay occurrences can be mitigated only when their causes are known. Moreover hence, the major goal of this research is to evaluate the causes and effects of delay in the residential projects of India.

**Keywords**: Residential projects, Indian society, types, Reason for delay, Effects

## 1. Introduction:

A residential building is defined as the building which provides more than half of its floor area for dwelling purposes. In other words, residential building provides sleeping accommodation with or without cooking or dining or both facilities.

Real estate has been an important part of Indian society for centuries, with a rich and diverse history. The evolution of the real estate industry in India can be traced back to the ancient times when land was considered as one of the most valuable assets, and was owned by the ruling class and wealthy landowners. During the Mughal period, the construction of grand palaces, forts, and mausoleums, such as the Taj Mahal, led to a thriving construction industry. The British colonial period saw the development of urban centers such as Mumbai, Kolkata, and Chennai, with the construction of railway networks, ports, and administrative buildings.

## 2. Post-independence Era:

After India gained independence in 1947, the real estate sector underwent significant changes and experienced several trends that shaped the industry. Public housing projects: In the 1950s and 1960s, the government launched several public housing projects to provide affordable housing to low-income families. These projects were aimed at reducing the housing shortage in urban areas and improving living conditions.

## 3. Emerging Real Estate in India:

India is one of the world's fastest-growing major economies, and the real estate industry contributes to overall economic growth as well as being the country's second-largest employer and third-largest recipient of FDI. By 2024, the real estate industry is anticipated to reach Rs 65,000 crore, and by 2025,

# CHALLENGES IN MATERIAL MANAGEMENT

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**Abstract:**

Materials management is an essential function within an organization that ensures the smooth flow of materials from suppliers to production and eventually to customers. It involves the planning, procurement, and control of materials to ensure that the right material is available at the right time, in the right quantity, and at the right cost. Material Management is a system that effectively controls and manages materials and supplies used in an organization. The goal of material management is to ensure that the right materials are available at the right time and in the right quantities, to support the production process and meet customer demand. Every organization, big or small, depends on materials and services from other organizations to varying extents. These materials and services are obtained through exchange of money. The various materials used as inputs, such as raw materials, consumables & spares, are required to be purchased & made available to the shops / users as & when needed to ensure uninterrupted production. Therefore, efficient management of input materials is of paramount importance in a business organization for maximizing materials productivity, which ultimately adds to the profitability of the organization.

**Keywords**: Design, objectives, history, planning, process, benefits

## 1. Introduction:

Material managers determine the amount of material required and held in stock, plan for the replenishment of these stocks, create inventory levels for each type of item (raw material, work in progress or finished goods), and communicate information and requirements to procurement operations and the extended supply chain. Materials management also involves assessing material quality to make sure it meets customer demands in line with a production schedule and at the lowest cost. Material management systems embrace all of the activities related to materials and are a basic business function that adds value to a finished product. It can also include the procurement of machinery and other equipment needed for production processes as well as spare parts.

**History:**

The evolution or History of Materials Management starts with the US and World War I. Before the 1st World war, people were unaware of the importance of Materials Management, Inventory Control and Supply chain Management. It was during and after the world war 1st that supply's too many of the manufacturing organizations got disrupted. The shortage during the war and heavy inventories build up during the great depression of the 1930s. Both contributed to a better realization of inventories problem. This only helped to understand the importance of material management with the advent of the industrial revolution as a result of improved techniques coupled with economic prosperity, the focus shifted to mass production and marketing. There was a premium on resources.

The population explosion along with income revolution further fuelled the demand for a whole range of product. The 1970s witnessed significant changes in the character of material management.

# COST OF PRODUCTION

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**Abstract:**

Production costs refer to all of the direct and indirect costs businesses face from manufacturing a product or providing a service. Production costs can include a variety of expenses, such as labor, raw materials, consumable manufacturing supplies, and general overhead. Production costs reflect all of the expenses associated with a company conducting its business while manufacturing costs represent only the expenses necessary to make the product. Cost based engineering redesign is part of system efficiency engineering and is advocated by economists to get maximum utility from available resources. Factor prices and prices of goods and services are to be taken into account to design products and processes. Industrial engineering has taken up this responsibility in the engineering disciplines. Total cost data is calculated by combining total direct costs of materials, labor costs, and total production costs.

**Keywords:** Production, cost, planning, control, needs, types

## 1. Introduction:

Engineering economics measures the revenues and total costs of engineering projects for a detailed estimate to see if they have enough profit and benefit to justify their investment in capital budgeting. Cost engineering economic analysis entails decision-making using engineering design and analysis techniques to create parametric goods and services that benefit customers at a reasonable price. The cost engineer who evaluates material selection and construction project costs should be familiar with various elements as prerequisites of engineering economics.

## 2. History:

Industrial engineering came out of Henry Towne's ideas expressed in 1886 in ASME meeting. Engineers' involvement in cost accounting and use of cost information for decision making precedes this meeting and presentation. But the advocacy for including shop accounting and efforts to reduce cost of production as part of engineers' duties and education were made in 1886.

1886 - ASME - Henry Towne - Shop Management and Works Management - Shop Accounting

American Society of Mechanical Engineers (ASME) made the beginning in the field of works management and shop management.

Henry Towne, in a paper presented to the society (ASME) in 1886 observed that the work of all engineers, especially that of the mechanical engineers, includes the executive duties of organizing and superintending the operations of industrial establishments, and of directing the labor of the artisans whose organized efforts yield the fruition of his work.

To insure the best results, the organization of productive labor must be directed and controlled by persons having not only good executive ability, and possessing the practical familiarity of a mechanic or engineer with the goods produced and the processes employed, but having also, and equally, a

# ENGINEERING MATERIALS: IMPORTANCE AND IMPLICATIONS

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**Abstract:**

Different engineering materials are employed as fundamental building blocks in various industries and are essential for daily life in modern civilization. In fields as diverse as medicine and health, national security, information technology, aerospace, telecommunications, structural engineering, transportation, agriculture, textiles, plastics, and the environment, these engineered materials have made significant contributions to numerous technological advancements. Therefore, the purpose of this article is to evaluate the developments made in engineering materials, their classification, as well as the function and significance of engineering materials in the modern world.

**Keywords:** Engineering materials, Properties, Structure, Applications

## Introduction:

Undoubtedly, materials play a bigger role in our society than we realise. Almost every aspect of our daily lives—including communication, reaction, shelter, clothing, and food production—is influenced by materials. Many technologies, including those in the fields of medical and health, information and communication, national security and space, transportation, structural materials, arts and literature, textiles, personal hygiene, agriculture and food science, and the environment, have benefited from the development of materials. It is important to fully comprehend these interdisciplinary connections between the Material sciences and other subjects in the creation of novel materials and the applications for them. It will be vital for scientists of all backgrounds to better comprehend materials science and engineering as its contribution to other fields grows. Although it is impractical for scientists to master a broad range of scientific knowledge across several fields, they must have the abilities necessary to master a few particular themes. We aim to provide a concise introduction of materials science, materials engineering, and its relevance in the modern world in this paper. Additionally, it will seek to analyse the four elements and how they interact to form the entire field of materials science and engineering.

## Materials Science and Engineering:

(a) Materials science,

(b) Materials engineering

Investigating the connections between the structures and properties of materials is the focus of materials science. Based on the use of these structure-property correlations, materials engineering involves developing or engineering a material's structure to create a predetermined set of qualities.

# HEAT TRANSFER

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**Abstract:**

A heat exchanger consists of heat transfer elements such as a core or matrix containing the heat transfer surface, and fluid distribution elements such as headers, manifolds, tanks, inlet and outlet nozzles or pipes, or seals. Usually, there are no moving parts in a heat exchanger; however, there are exceptions, such as a rotary regenerative exchanger (in which the matrix is mechanically driven to rotate at some design speed) or a scraped surface heat exchanger. The heat transfer surface is a surface of the exchanger core that is in direct contact with fluids and through which heat is transferred by conduction. That portion of the surface that is in direct contact with both the hot and cold fluids and transfers heat between them is referred to as the primary or direct surface. To increase the heat transfer area, appendages may be intimately connected to the primary surface to provide an extended, secondary, or indirect surface. These extended surface elements are referred to as fins. Thus, heat is conducted through the fin and connected (and/or radiated) from the fin (through the surface area) to the surrounding fluid, or vice versa, depending on whether the fin is being cooled or heated. As a result, the addition of fins to the primary surface reduces the thermal resistance on that side and thereby increases the total heat transfer from the surface for the same temperature difference. Fins may form flow passages for the individual fluids but do not separate the two (or more) fluids of the exchanger. These secondary surfaces or fins may also be introduced primarily for structural strength purposes or to provide thorough mixing of a highly viscous liquid. Not only are heat exchangers often used in the process, power, petroleum, transportation, air-conditioning, refrigeration, cryogenic, heat recovery, alternative fuel, and manufacturing industries, they also serve as key components of many industrial products available in the marketplace.

**Keywords:** Heat transfer, oval-tubes, modes, radiation

## 1. Introduction:

A heat exchanger consists of heat transfer elements such as a core or matrix containing the heat transfer surface, and fluid distribution elements such as headers, manifolds, tanks, inlet and outlet nozzles or pipes, or seals. Usually, there are no moving parts in a heat exchanger; however, there are exceptions, such as a rotary regenerative exchanger (in which the matrix is mechanically driven to rotate at some design speed) or a scraped surface heat exchanger. The heat transfer surface is a surface of the exchanger core that is in direct contact with fluids and through which heat is transferred by conduction. That portion of the surface that is in direct contact with both the hot and cold fluids and transfers heat between them is referred to as the primary or direct surface.

To increase the heat transfer area, appendages may be intimately connected to the primary surface to provide an extended, secondary, or indirect surface. These extended surface elements are referred to as fins. Thus, heat is conducted through the fin and convicted (and/or radiated) from the fin (through the surface area) to the surrounding fluid, or vice versa, depending on whether the fin is being cooled or heated. As a result, the addition of fins to the primary surface reduces the thermal resistance on that side

# HISTORY AND INTRODUCTION OF INDUSTRIAL ENGINEERING

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**Abstract:**

Industrial Engineers plan, design, implement and manage integrated production and service delivery systems that assure performance, reliability, maintainability, schedule adherence and cost control. Industrial engineers work to reduce any waste of time, money, materials, energy or other commodities by streamlining procedures and processes. This is achieved through the application of specialist knowledge and skills to specify predict and evaluate results from processes and systems. The results of this allow for new processes and systems to be produced, with business administration activities overlapping with areas such as production and manufacturing engineering, operations research, systems and supply chain engineering, management science and engineering, safety engineering, ergonomic and logistics engineering and more depending on the needs of the user.

**KEYWORDS:** History, Industry, Management, Design, Activity

## 1. Introduction:

The focus of Industrial Engineering is how to improve processes or design things that are more efficient and waste less money, time, raw resources, man-power and energy while following safety standards and regulations. Industrial engineers may use knowledge of Math, Physics but also Social Sciences to analyze, design, predict and evaluate the results and roadblocks of processes and devices.

## 2. History:

The roots of industrial engineering can be traced back to the beginning of the Industrial Revolution in the late 18th Century. As traditional manual operations began to be mechanized through inventions such as the spinning jenny, the flying shuttle and the steam engine, so it became possible to manufacture on a larger scale from central locations. As factories and mills began to spring up across Britain, the notion of an industrialized production system began to form.

Adam Smith's influential 'The Wealth of Nations' introduced the concepts of the Division of Labor and the 'Invisible Hand' of capitalism, promoting the idea of a factory system before James Watt and Matthew Bolton created the world's first integrated machine manufacturing facility. This included ideas of waste reduction, cost control and increased productivity as well as skills training for employees.

Charles Babbage's travels to factories across Britain and the United States in the early part of the 19th Century extended these ideas, leading to the publication of his book, 'On the Economy of Machinery and Manufacturers.' The book investigated basic industrial engineering concepts such as how long it takes to a task and whether it can be subdivided into smaller repetitive tasks to create a faster overall process.

Other early innovations included the creation of the idea of interchangeable parts by Eli Whitney and Simeon North, who manufactured firearms for the US Government. They found that, by mass-producing parts that could be used in any finished product, it was possible to save costs by reducing the need for specialized workers.

# LINEAR PROGRAMMING IN REAL LIFE

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**Abstract:**

Optimization is the new need of the hour. Everything in this world revolves around the concept of optimization. It finds its use in normal production time to supply chain issues. To solve these problems, we need optimization concepts. In the curriculum of a data science course, optimization is one such tool that works everywhere. You can perform optimization in various ways. In the data science course, the optimization topic is the most important. It gives insights into the ways of optimization. A problem can be simple and complex. In both cases, optimization works very effectively. There are various ways to do optimization. But linear programming is the most simple and easy one. Linear programming is the simplest method to do optimization. The optimization process ranges from simple problems to complex problems. But with this, you can solve all problems in less time with simplicity. It helps you to solve all complex problems through its simplified assumptions.

**Keywords:** Optimization, linear programming, real life, methods

## 1. Introduction:

**Linear programming (LP)** or **Linear Optimization** may be defined as the problem of maximizing or minimizing a linear function that is subjected to linear constraints. The constraints may be equalities or inequalities. The optimization problems involve the calculation of profit and loss. Linear programming problems are an important class of optimization problems that helps to find the feasible region and optimize the solution in order to have the highest or lowest value of the function. In other words, linear programming is considered as an optimization method to maximize or minimize the objective function of the given mathematical model with the set of some requirements which are represented in the linear relationship. The main aim of the linear programming problem is to find the optimal solution. Linear programming is the method of considering different inequalities relevant to a situation and calculating the best value that is required to be obtained in those conditions.

Linear programming is a method to achieve the best outcome (such as maximum profit or lowest cost) in a mathematical model whose requirements are represented by linear relationships. Linear programming is a special case of mathematical programming.

More formally, linear programming is a technique for the optimization of a linear objective function, subject to linear equality and linear inequality constraints. It's feasible region is a convex poly tope, which is a set defined as the intersection of finitely many half spaces, each of which is defined by a linear inequality. Its objective function is a real-valued affine function defined on this polyhedron. A linear programming algorithm finds a point in the polyhedron where this function has the smallest (or largest) value if such a point exists.

## 2. History Of Linear Programming:

# MECHANICAL MEASUREMENT SYSTEM

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**Abstract:**

Measurement of mechanical systems has long been an issue for engineers. Having been trained to deal with mechanical systems, the use of electrical or electronic system to make measurements on these mechanical systems are far from obvious. For a mechanical engineer to properly select and utilize electronic measurement devices requires both an understanding of the mechanical system and an understanding of the characteristics of the transducers. This is not to say that all measurement systems are electronic, because there are a number of purely mechanical measurement devices that far predate the high tech electronic systems that are used in many of today's systems.

**Keywords**: Measurement system, objectives, planning, needs, types, applications

## 1. Introduction:

The measurement system can be defined as the all the components included from the interface to the physical property being measured, pressure, vibration etc, to the recorded data storage. This not only includes the physical devices, but the user as well. When the value of the measured quantity remains the same irrespective of whether the measurements have been obtained in an ascending or a descending order, a system is said to be free from hysteresis. Many instruments do not reproduce the same reading due to the presence of hysteresis. Slack motion in bearings and gears, storage of strain energy in the system, bearing friction, residual charge in electrical components, etc., are some of the reasons for the occurrence of hysteresis. If the width of the hysteresis band formed is appreciably more, the average of the two measurements (obtained in both ascending and descending orders) is used. However, the presence of some hysteresis in measuring systems is normal, and the repeatability of the system is affected by it.

The measurement system in its simplest form generates a human readable interface that can be used for simple monitoring. In this simple system any data must be recorded by the operator. The measurement system may include an electrical interface, allowing the data to be converted to some other format or in some other location before it is presented to the operator. Data in this configuration is still recorded by the operator, but the additional level of complexity allows for a certain amount of pre-processing to be completed. As we work through the various transducer technologies the range of pre-processing that may be useful should become evident. As stated this configuration also allows the measurement to be transmitted to some remote location. A simple example might be reading a temperature. It should be obvious that there is simply no good way to read a glass thermometer from a control room several hundred feet away, let alone several states or countries away. However if we convert this measurement to an electrical measurement, we have techniques that will allow this information to be transmitted to this remote control room, and under some conditions anywhere in the world.

# PRODUCT DESIGN PROCESS

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**Abstract:**

Product design is the process designers use to blend user needs with business goals to help brands make consistently successful products. Product designers work to optimize the user experience in the solutions they make for their users—and help their brands by making products sustainable for longer-term business needs. The definition of product design describes the process of imagining, creating, and iterating products that solve users' problems or address specific needs in a given market. The key to successful product design understands the end-user customer, the person for whom the product is being created. Product designers attempt to solve real problems for real people by using empathy and knowledge of their prospective customers' habits, behaviors, frustrations, needs, and wants. However, designers must take more responsibility for the products they create and the impact these will have on our lives. Designers need to have a social conscience and consider the way their products integrate and interact with everything that they come into contact with. Products have the ability to enhance our existence or to hinder it. Ultimately, they should be easy and enjoyable to use. They should provide benefits to the users and because they play such an important part in our lives, it is critical that they are well designed.

**Keywords**: Design, objectives, history, planning, process, benefits

## 1. Introduction:

The definition of product design describes the process of imagining, creating, and iterating products that solve users' problems or address specific needs in a given market. as product design plays an ongoing role in refining the customer experience and ensuring supplemental functionality and capabilities get added in a seamless, discoverable, and non-disruptive manner. Brand consistency and evolution remain an essential product design responsibility until the end of a product's lifespan.

And it's much more than just what users see on their screens. System design and process design are critical behind-the-scenes components that eventually drive users to see and interact with the interface design.

Product design takes a long time and a great deal of effort. It is important to target the design program to minimize time and costs and to plan for it to be successfully completed within allocated resources. Time is very much of the essence, the minimum compatible with optimal development.

In a product design plan, there are many activities to be first recognized and then coordinated; some activities are worked in sequence, some in parallel. In particular, multidisciplinary activities are focused in the same direction and coordinated in time. The master plan coordinates the various people and their mini-projects in an overall time and resource plan so that the product design can be controlled.

The plan begins with the product design specifications. These include a profile of the product characteristics as defined by the consumer, the structure and composition, safety factors, convenience and aesthetics, and also indicates the manufacturing, processing and storage variables and their effects

# REVIEW ON THE DESIGN AND ANALYSIS OF WIND TURBINES FOR EFFICIENT ENERGY CONVERSION

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**Abstract:**

For many years, wind has been used as a source of energy. Because conventional energy sources are running out and environmental concerns are getting worse, the production of electrical energy from wind has increased dramatically during the past ten years. The increasing demand for sustainable and renewable energy sources has spurred significant advancements in wind energy technology. Wind turbines play a pivotal role in harnessing wind power and converting it into electricity. The fundamental principles governing wind turbine operation, including aerodynamics, blade design, and the interaction of the rotor with the incoming wind flow. Various turbine configurations, such as horizontal-axis and vertical-axis wind turbines, are critically examined to understand their advantages and limitations in different applications. The advanced modeling and simulation techniques used for wind turbine analysis, including computational fluid dynamics (CFD), finite element analysis (FEA), and multi-body dynamics (MBD). The innovative design approaches and technologies aimed at enhancing wind turbine efficiency. These include the application of advanced control strategies for optimal power extraction, aerodynamic enhancements through blade shape optimization, and the utilization of intelligent monitoring and maintenance systems for improved reliability and lifespan. The emerging trends in wind turbine, including the exploration of floating wind turbines, multi-rotor configurations, and hybrid systems integrated with energy storage solutions.

**Keywords:** Wind turbines, Energy conversion, Aerodynamics, Blade design, Rotor, efficiency, Computational fluid dynamics, Finite element analysis, Renewable energy

## Introduction:

In the quest for sustainable and renewable energy sources, wind power has emerged as a promising solution. Wind turbines, with their ability to convert the kinetic energy of the wind into electrical energy, have become integral to the global efforts to transition towards cleaner and greener power generation [1]. However, the efficiency of wind turbines in converting wind energy into usable electricity is a critical factor that influences their overall performance and viability. The design and analysis of wind turbines play a crucial role in achieving efficient energy conversion. By optimizing various aspects such as aerodynamics, blade design, and rotor configuration, engineers can maximize the energy capture from the wind while minimizing losses. The rotor, consisting of the blades and the hub, plays a key role in capturing the kinetic energy of the wind and converting it into rotational mechanical energy. Moreover, the advancements in computational tools enable accurate simulations and analysis, aiding in the development of more efficient and reliable wind turbine systems. The fundamental principles underlying wind turbine operation, including the interaction between the rotor and the wind flow, and the design considerations that impact energy capture. Understanding the aerodynamics of wind turbine blades and their interaction with the incoming wind flow is crucial for enhancing energy capture and overall

# TENDERING PROCESS IN CONSTRUCTION FIELD

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**Abstract:**
In the construction industry, tendering occurs when a company that needs specific products or services asks prospective suppliers to submit their bids for supplying those products. An invitation to tender is a request that a client submits, and tenders are the responses that interested suppliers send in response to the invitation. Potential suppliers describe in the tenders how they intend to meet the client's needs and what cost will be necessary for their work. Finding the business (suppliers) who will provide us with the commodities, services, or products that our firm needs is the procedure that is known as tendering. Both public and private tenders are available on the market, but the latter is much more common. The reason for this is that private companies are not required to perform the tendering then they often cooperate with the same suppliers for years.

**Keywords**: Contract, contractor, client, management, construction

## 1. Introduction:

Tendering for business is the process of inviting third parties to submit a proposal or bid to deliver goods and/or services to an organization that needs them. This invitation is formally known as a Request for or Invitation to Tender. Tenders can be used to describe any request for goods and/or services that a buyer makes public and allows suppliers to react to, whether the supplier is providing a formal contract, seeking quotes, or simply seeking information on what can be offered. Different forms of the tendering process are used by varying types of organizations, in many different industries, across all sectors: public, private and not for profit. There may also be different forms of the tendering process used based upon the value of the goods and/or services sought.

Tendering is more prevalent in some industries, with governments, councils, other public sector organizations, and non-profit organizations particularly using it frequently. To ensure a fair and impartial process, using the public tendering process for contracts exceeding a predetermined value level is typically mandated by law or specified in procurement policy. Tendering is also increasingly prevalent in other industries, including engineering, construction, business consultancy, and information technology (IT). Construction industry must make a case in their tender for why they are the best contractor or supplier for the project in order to win the work. It is typically a formal process designed to find the customer the most economically advantageous choice or options. The supplier/contractor responds to the request of the buyer and provides evidence of how they will fulfill the requirements of the contract.

## 2. Benefits of Tendering:

Tendering process brings benefits for parties, clients and suppliers:

- Higher transparency of the process
- Possibility to build a network of contacts
- Better control of the whole process

# THE VAPOR COMPRESSION IN REFRIGERATION

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**Abstract:**
Out of all refrigeration systems, the vapor compression system is the most important system from the view point of commercial and domestic utility. It is the most practical form of refrigeration. In this system the working fluid is a vapor. It readily evaporates and condenses or changes alternately between the vapor and liquid phases without leaving the refrigerating plant. During evaporation, it absorbs heat from the cold body. This heat is used as its latent heat for converting it from the liquid to vapor. In condensing or cooling or liquefying, it rejects heat to external body, thus creating a cooling effect in the working fluid. This refrigeration system thus acts as a latent heat pump since it pumps its latent heat from the cold body or brine and rejects it or delivers it to the external hot body or cooling medium.

**Keywords**: Vapor, Compression, Cycle, Components

## 1. Introduction:

Refrigeration may be defined as the process of achieving and maintaining a temperature below that of the surroundings, the aim being to cool some product or space to the required temperature. One of the most important applications of refrigeration has been the preservation of perishable food products by storing them at low temperatures. Refrigeration systems are also used extensively for providing thermal comfort to human beings by means of air conditioning. Air Conditioning refers to the treatment of air so as to simultaneously control its temperature, moisture content, cleanliness, odor and circulation, as required by occupants, a process, or products in the space. The subject of refrigeration and air conditioning has evolved out of human need for food and comfort, and its history dates back to centuries. The history of refrigeration is very interesting since every aspect of it, the availability of refrigerants, the prime movers and the developments in compressors and the methods of refrigeration all are a part of it.

## 2. History:

Chinese harvested ice from rivers and lakes as early as 1.000 BC. They even had religious ceremonies for filling and emptying ice cellars. Hebrews, Greeks, and Romans placed large amounts of snow into storage pits and covered it insulating material like grass, chaff, or branches of trees. They used these pits as well as snow to cool beverages. Egyptians and ancient people of India would moisten the outside of the jars and the resulting evaporation would cool the water that was inside of the jars. The first group of people to use cold storage to preserve food was Persians. They invented Yakhchal, a type of an ice pit.

Ice harvesting was for centuries the only method of food refrigeration. In 18th century England, servants collected ice in the winter and were putting it into icehouses. Icehouses were places where the sheets of ice were packed in salt, wrapped in flannel, and stored underground to keep them frozen until summer. In the 19th century, the first ice boxes started appearing in England. At that time, the first commercial ice started appearing with spreading of ice-storehouses and iceboxes. Frederic Tudor started harvesting ice in New England and shipping it to the Caribbean islands and to the southern states. At first he had

# A REVIEW OF SOME SECURITY ASPECTS OF WIMAX

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**Abstract:**

WiMAX-based mobile wireless connectivity has such a promising future. WiMAX is developing a strong place in the upcoming generation of wireless networks as a result of its rising popularity. Wireless is not as secure as other networking technologies because of the development of new technology. On the other hand, the trend is towards converged networks, in which voice and data transmission share the same networking infrastructure. To secure a converged network, numerous security issues are required. This essay will discuss research on WiMAX and security issues related to the technology. In a converged network, WiMAX security is investigated. Review of potential security risks in converged networks for WiMAX and solutions available to address these risks.

**Keywords**:WiMAX; Converged Network; Security threats; Security mechanisms; Wireless Technologies

## 1. Introduction:

WiMAX (Worldwide Interoperability for Microwave Access) IEEE802.16 is a technology which provide the facility of wireless broadband access with the high speed data rates across whole cities or countries. As the use of Wimax has increased the problem of security has also increased. The meaning of security in communication is how to save our data by the attackers and the main challenge is privacy, WiMax is transmitted from line of sight (LOS) and point to multipoint (PMP) with higher frequency (10-66GHz) and lower frequency (2-11GHz). WiMax uses air as a medium for the purpose of data transmission [1]. Since air is an open channel that's why there is large probability of the information getting affected by the attacker. For the transmission air is used as a medium which connect physical layer to MAC layer since it use air as a medium so there is large range for the attacker to move and affect the information.

## 2. Standards of WiMax Security:

The Protocol Stack used for WiMax is similar to that used for WiFi. The structure is the same, but WiMax uses more sublayers. The standards for WiMax Security are also similar. These standards are discussed in the following sections.

### 2.1. Data Link Layer Security:

The Data Link Layer for WiMax has three sublayers. Privacy and security is handled in the bottom layer. The MAC sublayer is next, which implements secure key exchange and encrypts traffic. The last sublayer is the Service-Specific Convergence sublayer. Figure 1 shows the Protocol Stack for WiMax. The WiMax MAC layer uses a scheduling algorithm opposed to contention access used in the WiFi

# A REVIEW ON MOBILE INTERNET PROTOCOL (MOBILE IP)

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**Abstract:**
Compared to the networking protocols that are already in use for embracing connectivity and communication, mobile IP is a new internet protocol. The traditional desktop computer has been replaced by mobile computing devices, and the hosts (users) who want connectivity are no longer stationary. Prior to Mobile IP, there was no protocol that would address such problems. The population's desire for a consistent internet connection, regardless of breastfeeding, is met by mobile IP. This essay discusses the background, workings, overview, necessity, and conclusion in regard to mobile IP.
**Keywords:** Mobile IP, Mobility Vocabulary, Mobile IP functions, agent

## Introduction:

Mobile Computing is becoming increasingly important due to the rise in the number of portable computers and the desire to have continuous network connectivity to the Internet irrespective of the physical location of the node. The Internet infrastructure is built on top of a collection of protocols, called the TCP/IP protocol suite. Transmission Control Protocol (TCP) and Internet Protocol (IP) are the core protocols in this suite. IP requires the location of any host connected to the Internet to be uniquely identified by an assigned IP address. This raises one of the most important issues in mobility, because when a host moves to another physical location, it has to change its IP address. However, the higher level protocols require IP address of a host to be fixed for identifying connections. The Mobile Internet Protocol (Mobile IP) is an extension to the Internet Protocol proposed by the Internet Engineering Task Force (IETF) that addresses this issue. It enables mobile computers to stay connected to the Internet regardless of their location and without changing their IP address. More precisely, Mobile IP is a standard protocol that builds on the Internet Protocol by making mobility transparent to applications and higher level protocols like TCP [1]. This article provides an introduction to Mobile IP.

## Terminology:

Before getting into more details, it is a good idea to frame the discussion by setting some terminology, adapted from the mobile IP specification [2]. Mobile IP introduces the following new functional entities:

**Mobile node**- A host or router that changes its point of attachment from one network or subnetwork to another, without changing its IP address. A mobile node can continue to communicate with other Internet nodes at any location using its (constant) IP address.

**Home agent** - A router on a mobile node's home network which delivers datagrams to departed mobile nodes, and maintains current location information for each.

**Foreign agent**- A router on a mobile node's visited network which cooperates with the home agent to complete the delivery of datagrams to the mobile node while it is away from home.

A mobile node has a home address, which is a long-term IP address on its home network. When away from its home network, a care-of address is associated with the mobile node and reflects the mobile node's current point of attachment. The mobile node uses its home address as the source address of all

# A REVIEW ON WI-FI VS WI-MAX

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**Abstract:**

In WI-MAX/IEEE 802.16 with mobility support, a mobile station's network entrance process consists of multiple steps. These consist of doing an initial range, searching for an open channel, and figuring out how much power and timing offset are required. When starting up or preparing to undertake a handover, mobile stations need to take these actions as soon as possible to avoid network access delays or lost connections. We suggest strategies that a mobile station can employ to minimise the amount of time needed for scanning and range operations when attempting to establish network connectivity or carry out a handover between neighbouring base stations. I attempted to do an analytical and comparative analysis of Wi-Fi and WI-MAX technologies in this research.

**Keywords:** Wireless, WI-FI, QOS, internet, WI-MAX

## 1. Introduction:

In this era of Internet and Mobile technologies, to access the Internet basically three different options are available: Wi-Fi, Broadband and Dial-up access [1].Wi-Fi access is inexpensive but the problem is that it needs hot spots which are very small therefore the coverage area is less. For broadband, either a DSL or Cable Modem is required. It is less expensive but still not able to reach all areas. Dial-up access approach is a very old method. People who do not have the facility of broadband access or think that broadband access is too expensive are still availing this facility. To tackle all these problems, a new technology, Wi-MAX has emerged. Wi-MAX provides high speed wireless broadband service and is less expensive than cable or DSL and also covers large area including suburban and rural areas. The rest of this Paper is organized as follows: Section II presents Review of literature. Section III provides an Overview of Wi-Fi and Wi-MAX technologies in terms of Features, Specifications, Architecture, Advantages, Limitations and Security. In Section IV, a Comparison is made between Wi-Fi and Wi-MAX. Finally, Section V Concludes the Paper [2].

## 2. Wi-Fi:

Wi-Fi is a technology which provides Internet as well as network connections through radio waves. Wi-Fi Alliance defines Wi-Fi as any “Wireless Local Area Network (WLAN) products that are based on the Institute of Electrical and Electronics Engineers” 802.11 standard (IEEE 802.11).

The Wi-Fi technology used different ways as follows:

**City-wide Wi-Fi**

# ADVANCEMENTS IN MITIGATING NOISE POLLUTION FROM INFRASTRUCTURE

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**Abstract:**

Noise pollution, arising primarily from infrastructure-related activities, has emerged as a growing concern in urban environments. This abstract highlights recent advancements in the field of mitigating noise pollution from infrastructure, focusing on innovative technologies, strategies, and policies that aim to reduce the adverse impacts of noise on human health and well-being. The first section of this abstract provides an overview of the global noise pollution problem, emphasizing its detrimental effects on public health, quality of life, and ecosystem disruption. It also underscores the urgency for adopting effective mitigation measures to address this challenge. The second section outlines some of the key advancements in noise pollution mitigation. These include the development and deployment of low-noise road surfaces, innovations in noise barrier design and materials, improved construction techniques, and the use of intelligent traffic management systems. Furthermore, advances in noise-reduction technologies, such as quieter transportation options, noise-absorbing materials, and noise-cancelling devices, are discussed. The abstract also highlights the importance of urban planning and zoning regulations that incorporate noise mitigation strategies into infrastructure development projects. These policies encourage the integration of noise-reducing features into the design and construction of buildings and transportation networks. Lastly, this abstract touches upon the need for public awareness and community engagement in noise pollution reduction efforts. Involving communities in noise pollution assessments, impact studies, and decision-making processes can lead to more effective and sustainable mitigation solutions. It is emphasizes that the combined efforts of innovative technologies, updated policies, and community involvement are vital in mitigating noise pollution from infrastructure.

**Keywords:** Noise pollution, Infrastructure, Mitigation, Urban environments, Innovative technologies, Noise barriers, Low-noise road surfaces, Construction techniques, Noise-reduction technologies, Traffic management

## Introduction:

The advent of modernization and urbanization has brought numerous conveniences and technological advancements, but it has also given rise to a significant and often underestimated challenge: noise pollution. In today's increasingly urbanized world, noise pollution, primarily stemming from infrastructure-related activities, has emerged as a critical issue affecting the well-being of millions of people [1]. This introduction delves into the multifaceted problem of noise pollution and highlights the pressing need for advancements in its mitigation. Noise pollution, the unwanted or harmful sound that disrupts the natural acoustic environment, has profound implications for public health, the quality of life, and ecological balance. The relentless hum of traffic, the incessant construction clamor, and the ceaseless roar of industrial machinery infiltrate our urban landscapes, making peace and tranquility a rare and treasured commodity. Moreover, the detrimental effects of noise pollution extend beyond mere annoyance. Prolonged exposure to excessive noise has been linked to a range of health problems, including sleep disturbances, hearing loss, increased stress, and cardiovascular issues. It can impair

# CDMA POWER CONTROL: AN OVERVIEW

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**Abstract:**

In CDMA, since all the mobiles transmit at the same frequency, the internal interference of the network plays a critical role in determining network capacity. Further, each mobile transmitter power must be controlled to limit the interference.

Power control is essentially needed to solve the near-far problem. The main idea to reduce the near-far problem is to achieve the same power level received by all mobiles to the base station. In wireless cellular communication, it is essential to find effective means for power control of signals received from randomly dispersed users within one cell. Effective power control will heavily impact the system capacity. In this paper, we review different approaches for power control, focusing on CDMA systems.

**Keywords**: CDMA, TDMA, FDMA, Multipath, Power Control, QOS

## 1. Introduction

In CDMA system users access the complete bandwidth available [1]. In Frequency Division Multiple Access or FDMA strategies, the focus is on the frequency dimension. The total bandwidth (B) is divided into N narrowband frequency bands. So several users are allowed to communicate simultaneously by assigning the narrowband frequency bands to the different users, where the narrow band frequencies are assigned to a designated user at all time. Since the total bandwidth (B) is subdivided into N frequency bands or channels, only N users can be supported simultaneously. In TDMA all users use the whole bandwidth but in different time slots. Unlike FDMA/TDMA the users in CDMA are isolated by codes rather than frequency slots or time slots. Each user is identifying via orthogonal codes. Sixty four Walsh functions are used to identify forward link channels and 64 long PN codes are used for identification of reverse link channels user. Due to this frequency reuse in CDMA system is very high which enhances the spectral efficiency. There is no limit on number of users in CDMA system. Each time a user is added, noise level for another mobile unit increases. So CDMA system has soft capacity which is more than any other multiple access schemes. In reality it is hard to maintain the orthogonal nature of the codes, thus this added with the multipath propagation and synchronization problem will result in interference. In FDMA and TDMA access schemes, the number of available frequencies and time slots are the factors which limit the number of users. When the number of users is more than available frequencies and time slots then blocking occurs. In CDMA blocking occurs when the interference tolerance limit is exceeded. Therefore in CDMA the level of interference is the limiting factor.

## 2. System Structure

Designing a perfect radio channel [2-3] in mobile communications would be practically an impossible task since the channel is stochastic in nature as the mobile terminals keep moving almost all the time with different speeds and the channel fades are unpredictable. The signals in a radio channel undergo

# DEVELOPMENT OF THE MECHATRONIC SYSTEM DESIGN AND ITS APPLICATIONS

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**Abstract:**

Mechanical electronic systems are referred to as "mechatronics," which is a theoretical mix of electronics, electrical, computer control, and mechanics that, when put together, produces straightforward, workable, and dependable systems. To manage complexity in the design and communication of engineered systems, mechatronics includes sensors, actuators, signal conditioners, power electronics, decision and control algorithms, and computer hardware-software. Design, product synthesis, analysis, and processes integrating elements from other disciplines are all part of systems engineering. System engineering can use the platform provided by mechatronics to assist the creation of products through the design, model, simulation, improvement, analysis, prototype, validation, and deployment cycles.

**Keywords:** Mechatronics, mechatronic systems, electrical engineering, electronics engineering, modern machines.

## 1. INTRODUCTION

Among the various definitions of mechatronics, two of them summarize the main subjects of this article:

1. Mechatronics can be defined as the science of motion control that comprises the control of desired motion (tracking control) and the control of undesired motion (vibration cancelation) [1-2] and
2. Mechatronic design is the integrated design of a mechanical system and its embedded control system [3].

The definition 1 reveals the aspects that should be included during the design of mechatronic systems: control actions, system motions and flexibilities. Therefore, simulation tools for supporting the design of mechatronic systems should allow the dynamic modeling of the machine, the control system design and the closed-loop system evaluation. The control system design can be more specifically described by the definition of a control strategy, the selection and configuration of sensors and actuators, the control gains, etc. The standard design approach, i.e. a sequential monodisciplinary approach, has been used successfully in the past and is still used in cases where stiff structures are considered and performance requirements are not so strict [2]. Nowadays, the designers need to cope with the ever increasing demand for faster and more accurate machines. Faster machines can be designed using smaller and lighter components, which may significantly modify the machine structural resonances, but also by using high-bandwidth controllers, which typically yield to shorter response times. However, a high bandwidth controller also implies in a system which is sensitive to noise and to parameter variations [4]. Therefore,

# EVALUATE THE PERFORMANCE OF ENERGY CONVERSION DEVICES

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**Abstract:**

An electronic system for gathering data from experimental energy conversion devices such as sun cells and fuel cells for micro-electronics applications is given in this communication. The electronic system consists of software installed on a personal computer and an electronic circuit connected to a four-wire terminal where electrical variables such as voltage and current from experimental cells can be measured. The programme includes a feedback control system to ensure that the greatest amount of power is sent from the energy conversion device to the electrical load. The resulting data can be recorded and plotted in real time for a dynamic study of the experimental devices under transient or stable state settings. It is a portable, low-cost device that can be used for educational and research purposes.Using energy more effectively is a critical technique for lowering global CO2 emissions. Due to time and resource constraints, activities must be concentrated on the efficiency measures that will yield the greatest gains.

**Keywords:** Data acquisition system, energy conversion device, I-V curve tracer, E-I curve tracer

## Introduction:

Energy is continually moving from one form to another in most processes. We refer to this as an energy conversion. Examples include how living systems synthesise food using carbon dioxide and water during photosynthesis, transforming solar energy into chemical energy. Additionally, a generator can transform the mechanical energy of a cascade into electromagnetic energy. The potential chemical energy in petrol is converted by an internal combustion engine into heat, which is ultimately converted into the kinetic energy that propels a vehicle. Solar energy is transformed into electrical energy by a solar cell, which may subsequently be utilised to run a computer or light a lamp [1].

It is obvious why utilising energy more effectively is beneficial: it relieves strain on finite energy resources, lowers energy prices by minimising waste, and, probably most urgently, lowers carbon dioxide (CO2) emissions associated with energy use, which contribute to climate change. The well-known Kaya identity [4] states that the population, per capita wealth, energy intensity (energy per unit wealth), and carbon intensity (CO2 per unit energy) are the four main determinants that influence the production of energy-based CO2 emissions.

When measuring electrical signals obtained from energy conversion systems or devices, it is crucial to employ precise equipment [5]. Any solar cell or fuel cell's characteristic curve (I-V plot) is defined by significant signals like voltage and current. Important factors that could affect fuel cell performance include temperature, flow rate, and fuel concentration. On the other hand, the decisive factors that govern the performance of solar cells are the temperature and irradiance. The acquisition of voltage, current, as well as the factors that regulate the electrical power of the energy conversion device, must be taken into account by the electronic system for measuring the electrical variables[6].

Energy supply options such as nuclear power, carbon capture and storage (CCS), fuel switching, and renewable energy technologies have been the main focus of emission reduction plans up to this point. However, according to the International Energy Agency (IEA), "energy efficiency improvements.

# FEATURES AND CHALLENGES OF WIRELESS 4G

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**Abstract:**
Since the main wireless service providers intend to begin deploying 4G networks by the middle of 2010, the scientific and business communities are under pressure to discover answers to some of the significant problems that are currently unresolved in 4G networks. The new services that 4G networks will offer, such Internet access anytime, anyplace, worldwide roaming, and expanded support for multimedia apps, are what are generating the most interest in these networks. We will go over some of the main advantages, difficulties, and suggested fixes for 4G networks in this essay.
**Keywords:** Fourth Generation, MIMO, SDR, Technology, Internet

## 1. INTRODUCTION

The existence of 4G Networks in today‘s technology- driven society is important indicators of advancement and change. 4G, or Fourth Generation networks, are designed to facilitate improved wireless capabilities, network speeds, and visual technologies. It is anticipated that as these networks continue to thrive, the demand for advanced related technologies will also grow, thereby creating new alternatives for savvy technology users to exceed their desired expectations. The following discussion will evaluate the current state of 3G Networks and will examine the future potential of these networks in expanding technology-based capabilities for consumers and industries alike.
In this paper we present an overall vision of the 4G networks starting by presenting some of the key features they will provide, and then discussing key challenges the researchers and vendors are attempting to resolve, and finally briefly describing some of the proposed solutions to these problems.

## 2. THE BENEFITS OF 4G

### 1. **Quicker connections speeds**

In fact the foremost obvious profit to come back from 4G is speed will increase on networks, with potential speeds of 30Mbit/s touted by some within the trade. This should commence a full new era of applications and services, with information transfers, downloading and video conferencing all rather more accessible, whereas accessing sites and loading videos, typically the reason for abundant frustration on 3G, ought to currently be easy.

### 2. **Improved in-building coverage**

There's nothing worse than not having the ability to select up an honest information association reception or within the workplace, particularly after you are in a town wherever signal ought to be present.

# INDIAN AUTOMOBILE INDUSTRY

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**Abstract:**

The automobile industry is one of the most important drivers of the country's economic growth. India's automobile industry is one of the largest and most dynamic industries in the country cover a wide range of vehicles including passenger cars, commercial vehicles, two-wheelers, and three-wheelers. The automobile industry attracts attention by economists around the world. However, the Indian automobile industry recorded uneven growth from the mid-20th century to the last quarter 20th century stuff. In the 21st century, all types of vehicles are produced and assembled within industry. Assembly structure at one level it is an industry segment that is subject to regulatory policy, but at a more fundamental level the key factors are technology and diversification And collaboration has defined and driven the strength of the corporate segment. Indian Car Company is one of the major contributors to his to the country's GDP. In recent years, the Indian automobile industry has grown by leaps and bounds. There are two reasons for this impressive growth rate factors, primarily the rising standard of living of the Indian middle class and the resulting rise in disposable income. This increased the amount of electricity purchased and contributed to the growth of the automobile industry as a whole. After the challenges posed by the COVID-19 pandemic, the Indian automobile industry has made a remarkable comeback and is gradually regaining momentum. This is because semiconductor supply bottlenecks are slowly and steadily being cleared month by month. This comprehensive article delves into a detailed analysis of various segments ranging from passenger cars to commercial vehicles, three-wheelers, two-wheelers, and tractors.

**Keywords:** Automobiles, Industry, Sales, Production, E Vehicles, domestic sale, exports

## 1. Introduction

A car “usually has four wheels and internal combustion engine used for land transportation also called "automobile"."Four-wheeled vehicle" is also defined usually driven by one. The automobile industry is one of them, along with the automobile supply industry. India's key industry a well-developed transportation system plays an important role in this area. Economies are developing and India is no exception cars are one of them. The largest industry in the world market with strong front and rear connections, across several major segments of the economy; Auto motive sector occupies an important position in the structure of the Indian economy. Automotive sector is a product and process leader Technology in manufacturing.[1] It is recognized as one of the driving forces behind Economic growth and the domestic automobile industry are seen as barometers economy. Such beliefs are in most cases mature and are in line with international trends. It is believed that the performance of the automobile industry reflects the influence of economic health. This sector has become the future sector of the Indian economy.

## 2. History of Indian automobile industry:

History of Indian automobile industry shows that it has grown dramatically, Border since 1898 when there were cars for the first time; I set foot on the streets of India. But now India is rewriting history in an environment different from home 40 million cars and Indians Manufactured automobiles and other

# MOBILE IP: ISSUES AND CHALLENGES

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**Abstract:**
The number of people using mobile devices to access the internet has increased dramatically in recent years, and mobility support is essential for stable internet connectivity. With the help of the mobility support protocol known as Mobile IP, users can roam between different Access Points without having to re-establish their end-to-end connection. In this work, we argue that Mobile IP will end up being the protocol for enabling mobility in the future despite a number of obstacles. In order to persuade the reader that Mobile IP's benefits outweigh its drawbacks, we provide evidence for our assertion by examining the aspects that might affect its broad acceptance. We then analyze the opposing arguments.

**Keywords:**
Mobility, Datagram, Mobile IP, Network, Issues

## Introduction:

With the rapid rise in the mobile and personal computers (PC's) [1] such as laptops, notebooks, etc the point of attachment to the Internet or network is not static. Current versions of Internet Protocols work on the fact that connection point between the network and the host is fixed. Datagrams are sent on the basis of network address which is contained in the IP address. The location/network address may vary from 8bit to 24bit depending upon its class in case of classful addressing. This network address is not the personal address of the host which it can carry from one point to another. This is only valid when a user (host) is adhered with the network. Using this association routers deliver the packets to the network with which the host is connected. But the problem now is what when if users (hosts) are not stationary?

So, when the hosts move from one network to another the Internet Protocol needs to be modified in such a way that it may serve the hosts with the network connection using the same TCP/IP suite irrespective of location. Some of the proposed solutions to this cause are;

### A. Changing the Address:

In this solution the prominence was that mobile hosts will change its address as soon as it enters the new network by using Dynamic Host Configuration Protocol (DHCP). But this approach had many drawbacks; First drawback was that every time host moves from one network to another it needed to be rebooted. The second drawback was that the Domain Name System (DNS) tables needed to be revised so that other hosts in the network also get to know about it. The third drawback was that the configuration files needed to be changed every time.

### B. Two Addresses:

This approach was more feasible than the earlier one as this approach employed two addresses instead of one. The permanent address of the host is called the home address and the temporary address in the visited or foreign network is known as the Care-of-address. This gave rise to the Mobile Internet Protocol (Mobile IP) which uses two addresses for the mobile host.

# REVIEW ON SINGLE ELECTRON TRANSISTOR (SET)

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**Abstract:**

Over the past few decades, integrated circuit (IC) technology has advanced significantly. The main objective has been to create logic and memory devices with small physical footprints that are high-performing and low-power. As a result, silicon chip interconnects and devices have been scaling continuously. Technology scaling is crucial for enhancing integrated circuit performance in terms of power dissipation, latency, and signal integrity. Innovative devices that address multiple scaling issues include graphene-FETs, FinFETs, nano-electromechanical systems, and single-electron transistors (SETs). Heterogeneous 3D integration of disparate technologies is suggested as the direction of the IC industry. Based on the principles of quantum mechanics, a SET is a promising nanodevice that can be co-integrated with complementary metal-oxide semiconductor technology, which is extensively used, to improve its performance at scaled technology nodes. This research does a thorough literature review to investigate the viability of SET. The assessment of the literature includes a thorough analysis of research on SET theory, design, and fabrication. Furthermore, a room temperature computing system design based on SET is described. The results of a thorough assessment of the literature and a variety of subsequent investigations show that the SET has the potential to be a nanodevice for use in future technologies.

**Keywords:** SET, structure of SET, Quantum Dot, coulomb blockade, coulomb staircase

## Introduction

Over past 20years, new fabrication techniques have repeatedly contributes for scaling the feature size of the MOS. But it has been observed that techniques are on their limits further which decrease in the device size (W/L) is not possible because the lack of such precise lithographic patterns. Shrinking of feature size has been reached to 10nm [1]. Conventional MOSFET architecture is not able to provide the feature size below 20nm due to short channel effects which results in severe limitations in the current drive capability [2]. The laws of quantum physics and limits of lithographic patterns are preventing the further scaling of feature size of MOS. So all these reasons are forcing for the need of an alternate is rising to have more compact high dense and low power devices. Single electron transistors have recently attracted the scientists for its feature size in nano scale and ultralow power dissipation.

Devices developed using SET have the potential to manipulate electrons on the level of elementary charge. A SET is just similar to the MOSFET schematic is shown in Fig.1. It also includes the two electron reservoirs named “Source” and “Drain”, the difference lies in the channel.

# THE ROLE OF COMMUNICATION IN ENHANCING WORK EFFECTIVENESS OF AN ORGANIZATION

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**Abstract:**

One of the most crucial management tools that a business can use to build teams and produce worthwhile results is communication. Management and communication are complimentary fields with important roles in successful corporate operations. In the corporate world, management skills are crucial, but so are those that pertain to communication protocols and the manager's ability to engage with employees. Being a manager entails more than just controlling operations; it also entails learning how to lead a team and communicate above all else.

**Keywords:** Business communication, organizational communication, work productivity

## 1. Introduction

In the information age [1], we have to send, receive, and process huge numbers of messages every day. But effective communication is about more than just exchanging information; it's also about understanding the emotion behind the information. Effective communication can improve relationships at home, work, and in social situations by deepening your connections to others and improving teamwork, decision-making, and problem solving. It enables you to communicate even negative or difficult messages without creating conflict or destroying trust. Effective communication combines a set of skills including nonverbal communication, attentive listening, the ability to manage stress in the moment, and the capacity to recognize and understand your own emotions and those of the person you're communicating with. While effective communication is a learned skill, it is more effective when it's spontaneous rather than formulaic. A speech that is read, for example, rarely has the same impact as a speech that's delivered (or appears to be delivered) spontaneously. Of course, it takes time and effort to develop these skills and become an effective communicator. The more effort and practice you put in, the more instinctive and spontaneous your communication skills will become.

## 2. Effective Communication Strategies

- Making eye contact (like many nonverbal cues, this is culturally specific; in some cultures, direct eye contact is a sign of disrespect)
- Use attentive body language: sit slightly forward with a relaxed, easy posture
- Be aware of your gestures
- Stay on the topic
- Don't be phony, be yourself
- Be cultural sensitive
- Focus on the other person