TECNO SAVIOR
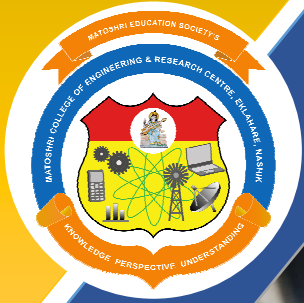
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Website: engg.matoshri.edu.in/Email: matoshricoe.hr@gmail.com
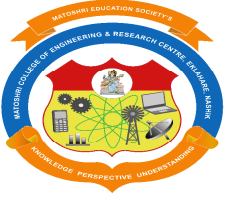
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Vision

"To Establish Omnipotent Learning Centre Meeting the Standards to Evolve as a Lighthouse for the Society."

Mission

- Setting up state-of-the-art infrastructure
- Instilling strong ethical practices and values
- Empowering through quality technical education
- Tuning the faculty to modern technology and establishing strong liaison with industry
- Developing the institute as a prominent center for Research and Development
- Establishing the institute to serve a Lighthouse for the society

Quality Statement

"We, Matoshri College of Engineering & Research Center are committed to practice a system of Quality Assurance that inculcates quality culture, aiming at quality initiation, sustenance and enhancement of quality comprehensively ultimately leading the institute as Center of Excellence."

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Techno savior

ROAD SAFETY
Mr. R. R. Kshatriya,
(Reference: https://brainly.in/question/3815282)

Road accidents have become very common due to the vehicle collisions and ignorance of proper road safety measures. The number of deaths is increasing due to the motor vehicle collisions by the people ignoring road safety rules. Under these conditions it is very important for everyone to be safe on roads and to follow all the traffic rules and regulations.

Everyone should undergo a complete driving course under the guidance of an authorized instructor before starting to drive on the roads. Road safety measures should be added in the school curriculum so that students can get complete knowledge on traffic regulation. Most of the road accidents occur because of incomplete knowledge about operating vehicles and lack of road safety measures.

Drivers should thoroughly check their vehicles daily before start of any trip and if any issue is found it has to be rectified immediately. Everyone should strictly follow the traffic rules and should always drive safely with respecting the other people and vehicles on the road. One must avoid rash driving, drunken driving and jumping red lights. Wearing helmets and seat belts could highly reduce the number of causalities during an accident. A unison effort from each and every one will definitely reduce the number of accidents and make roads safer.
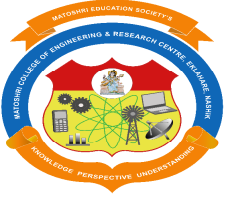
Spillway
H.M.Pawar
(Reference: https://en.wikipedia.org/wiki/Spillway)

A spillway is a structure used to provide the controlled release of flows from a dam or levee into a downstream area, typically the riverbed of the dammed river itself. In the United Kingdom, they may be known as overflow channels. Spillways ensure that the water does not overflow and damage or destroy the dam.

Floodgates and fuse plugs may be designed into spillways to regulate water flow and reservoir level. Such a spillway can be used to regulate downstream flows – by releasing water in small amounts before the reservoir is full, operators can prevent sudden large releases that would happen if the dam were overtopped.

Other uses of the term "spillway" include bypasses of dams or outlets of channels used during high water, and outlet channels carved through natural dams such as moraines.

Water normally flows over a spillway only during flood periods – when the reservoir cannot hold the excess of water entering the reservoir over the amount used. In contrast, an intake tower is a structure used to release water on a regular basis for water supply, hydroelectricity generation, etc.

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Gravity dams
Mr. R. R. Kshatriya,
(Reference: https://en.wikipedia.org/wiki/Dam)

In a gravity dam, the force that holds the dam in place against the push from the water is Earth's gravity pulling down on the mass of the dam. The water presses laterally (downstream) on the dam, tending to overturn the dam by rotating about its toe (a point at the bottom downstream side of the dam). The dam's weight counteracts that force, tending to rotate the dam the other way about its toe. The designer ensures that the dam is heavy enough that the dam's weight wins that contest. In engineering terms, that is true whenever the resultant of the forces of gravity acting on the dam and water pressure on the dam acts in a line that passes upstream of the toe of the dam.

Furthermore, the designer tries to shape the dam so if one were to consider the part of dam above any particular height to be a whole dam itself, that dam also would be held in place by gravity. i.e. there is no tension in the upstream face of the dam holding the top of the dam down. The designer does this because it is usually more practical to make a dam of material essentially just piled up than to make the material stick together against vertical tension.

Note that the shape that prevents tension in the upstream face also eliminates a balancing compression stress in the downstream face, providing additional economy.

For this type of dam, it is essential to have an impervious foundation with high bearing strength. Permeable foundations have a greater likelihood of generating uplift pressures under the dam. Uplift pressures are hydrostatic pressures caused by the water pressure of the reservoir pushing up against the bottom of the dam. If large enough uplift pressures are generated there is a risk of destabilizing the concrete gravity dam.
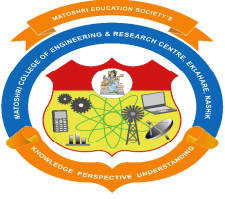
When situated on a suitable site, a gravity dam can prove to be a better alternative to other types of dams. When built on a carefully studied foundation, the gravity dam probably represents the best developed example of dam building. Since the fear of flood is a strong motivator in many regions, gravity dams are being built in some instances where an arch dam would have been more economical.

Article on Canal
(Reference :https://en.wikipedia.org/wiki/Canal)

Canals are waterways channels, or artificial waterways, for water conveyance, or to service water transport vehicles. They may also help with irrigation. It can be thought of as an artificial version of a river. Canals carry free surface flow under atmospheric pressure.

In most cases, the engineered works will have a series of dams and locks that create reservoirs of low speed current flow. These reservoirs are referred to as slack water levels, often just called levels.

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A canal is also known as a navigation when it parallels a river and shares part of its waters and drainage basin, and leverages its resources by building dams and locks to increase and lengthen its stretches of slack water levels while staying in its valley.

In contrast, a canal cuts across a drainage divide atop a ridge, generally requiring an external water source above the highest elevation.

Many canals have been built at elevations towering over valleys and other water ways crossing far below.

Canals with sources of water at a higher level can deliver water to a destination such as a city where water is needed.
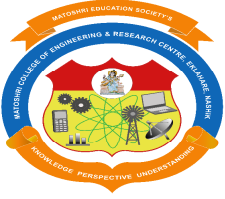
Water harvesting   Mrs. S. V. Pawar

It is the collection and storage of rainfall runoff from any catchment or watershed followed by subsequent use. Rainwater harvesting in a given area depends on topography, soil type, depth and slope and vegetative cover etc.

It largely depends on quantity and distribution of rainfall and will therefore, be more successful in areas where rainfall is sufficient. Recharge of groundwater, which is concept of rainwater harvesting, utilizes the structures like pits, trenches, dug wells, recharge wells/shafts, bore wells, check dams and percolation tanks. The water thus harvested through rainwater harvesting can be used for the **following purposes:**

(i) Used primarily for supplemental irrigation during stress periods of crop growth or when there is a long gap between two rainfall events or to meet any other aberrations during monsoon period allows drought proofing.

(ii) In the states like Punjab, Haryana, Himachal Pradesh and Eastern region, more than 200 water-harvesting dams were already constructed. The harvested rainwater is conveyed to agricultural fields through underground pipelines by gravity, thus there is no need of electric or diesel engines.

(iii) It is an ideal solution of solving water problem in areas having inadequate water resources. Centre for Science and Environment (CSE) estimated that even if half of the average annual rainfall of 1190 mm is captured on 1.12 ha of land in each of the country's 5,87,226 villages, 6.57 million liters of rainwater thus collected in each village can meet the annual cooking and drinking needs of average population of 1200 per village.

(iv) Harvested rainwater plays a greater role in sustaining surface water supplies on one hand and recharges aquifers on the other. It prevents the soil erosion.

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Techno savior

Green Concrete *Mr. R. S. Mawal*

Green Concrete is a type of concrete which resembles the conventional concrete but the production or usage of such concrete requires minimum amount of energy and causes least harm to the environment. Green concrete is very low energy & resource consumption, no environmental pollution & sustainable development. Green cement concrete is produced by using recycled waste materials such as activated fly ash and recycled concrete aggregates. Other concrete alternatives can be equally used to significantly increase the sustainability and durability. Secondly, one must plan for structural designs involving environmentally friendly maintenance strategies which will need less of energy and resources. Although green concrete seems to be providing lot of benefits, still one needs to consider the potential barriers on its way. They are increase in cost of recycling and reusing along with use of additional energies and resources for the same and the fear of failure of the green concrete as it is made from reused products. One can conclude that overcoming the above demerits would help to use green cement concrete with a potentially new environmental friendly world.
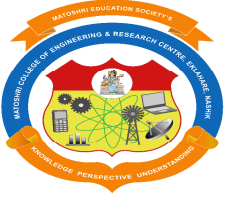
Green concrete is revolutionary topic in history of concrete industry. This was first invented In Denmark in year 1998. Green concrete has nothing to do with colour. Green concrete is concept of using eco-friendly material in concrete, to make the system more sustainable. Green concrete is very often and also cheap to produce, because for example, waste product are used as a partial substitute for cement, charges for the disposal of waste are avoided, energy consumption in production is lower, and durability is greater. The conventional concrete is one of the most widely used manmade building materials in the world. It has numerous advantages such as easy operation, durability, steady mechanical property. This advantages enable conventional concrete to be widely used in the field of civil bridges, roads, hydraulic structure, etc. despite such advantages conventional concrete has some disadvantages such as high energy and raw material consumption and environmental pollution etc. which tends to serious effect on the image of conventional concrete as a sustainable material in this respect the concept of green concrete is introduced. The CO_2 emission related to concrete production, inclusive of cement production, is between 0.1 to 0.2 tonne per tonne of produce concrete. Every one ton of cement produced leads to about 0.9 tons of CO_2 emission and 0.7643 m3 of concrete contains about 10% by weight of cement [1]. There have been of ways for reducing the CO_2 emissions from concrete primarily, through the use of lower amount of cement and higher amount of supplementary cementations material.

Why green concrete?

The main ingredient in concrete is cement and it consists of limestone (Calcium carbonate $CaCo_3$). During the manufacture of cement, its ingredients are heated to about to 800 10000 C . During this process, carbon Dioxide is driven off. Approximately 1 kg of cement releases about to reduce the emission of Carbon Dioxide.

Material used in Green Concrete

Locally available: Construction material, components, and systems found locally or regionally, saving energy and resources in transportation to the project site. Salvaged, re-furnished, or re-

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manufactured: Includes saving material from disposal and renovating, repairing, restoring, or generally improving the appearance, performance, quality, functionality, or value of a product.

Reusable or recyclable: Select materials that can be easily dismantled and reused or recycled at the end of their useful life

Recycled Demolition Waste Aggregate

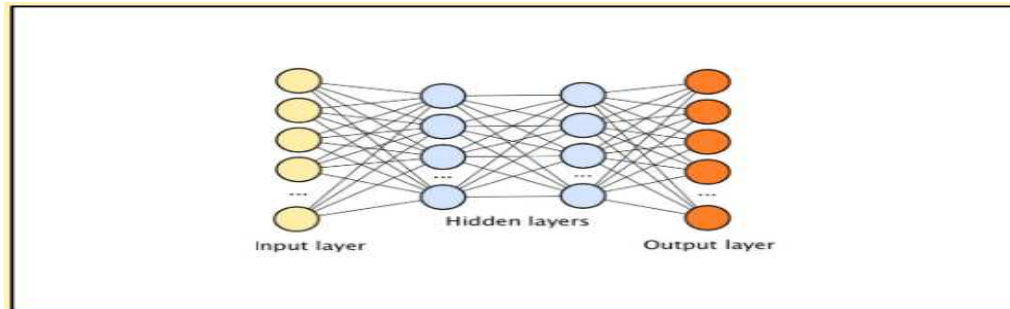Recycled Concrete Aggregate

Blast furnace Slag

Manufactured Sand

Recycled of plastic : Use to making paving stone.   Akash Mate,Student, S.E Civil

Water is one of the most important, universal and most precious natural resource. It is essential in the life of all living organisms from the simplest plant and microorganisms to the most complex living system such as of human body. Water is a combination of hydrogen and oxygen atoms, with a chemical formula, H2O and it is known to be most abundant compound (70%) on earth's surface. It is significant due to its unique chemical and physical properties.Ground water is the major source in India not only for domestic use, but also for agriculture and industrial sector. At present scenario, 85% of domestic water requirement in urban areas and 50% of process water requirement of industries are met by ground water.Ground water is ultimate, most suitable fresh water resource with nearly balanced concentration of the salts for human consumption. Acceptable ground water quality shows that shows that the ground water should be safe in terms of its physical, chemical and bacteriological parameters.International and local agencies have established parameters to determine biological and physicochemical quality of ground water. It has been estimated that the most common problems in household water supplies is mainly to hardness, fluorides, sulphides, sodium chloride, alkalinity, acidity, disease-producing pathogens such as bacteria and viruses, etc. Thus, if the physic-chemical constituents of ground water used for drinking exceed its maximum permissible limits it can caused adverse health effects on the mankind.Water plays an important role for all living organism. Chemical formula of water is H2O. It exist in the three states namely solid, liquid and gas. Water is universal solvent used as media for bio-chemical as well as chemical reaction. Water is essential for all living organism. Life cannot run without water. On earth 97.2% of water is salty and 2.8% is fresh water from which about 20% constitutes ground water (Rajesh Kumar, 2011)Rapid growth of industrialization, population urbanization spoils the ground water. Once ground water get polluted, it cannot be restored by stopping the pollutants from their source. According to WHO, about 80% diseases in human being are caused by water (Neerja Kalra, 2012). Also ground water is used by the people throughout the world for various domestic purposes such as drinking, cooking, bathing, etc. So study of ground water becomes very important lest the people are using the ground water which is unsafe. In India 90% of the rural and nearly 30% of the urban populations depends on groundwater for meeting their drinking and domestic requirements. Therefore, it is desirable

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Techno savior

Deep Learning	*Ms. Poonam R. Dholi*

Deep Learning is a part of the broader field machine learning and is based on data representation learning. It is based on the interpretation of artificial neural network. Deep Learning algorithm uses many layers of processing. Each layer uses the output of previous layer as an input to itself. The algorithm used can be supervised algorithm or unsupervised algorithm. Deep Learning is mainly developed to handle complex mappings of input and output. It is another hot topic for M.Tech thesis and project along with machine learning.

Deep Neural Network

Deep Neural Network is a type of Artificial Neural Network with multiple layers which are hidden between the input layer and the output layer. This concept is known as feature hierarchy and it tends to increase the complexity and abstraction of data. This gives network the ability to handle very large, high-dimensional data sets having millions of parameters. The procedure of deep neural networks is as follows:

1.   Consider some examples from a sample dataset.
2.   Calculate error for this network.
3.   Improve weight of the network to reduce the error.
4.   Repeat the procedure.

 Applications of Deep Learning

 Here are some of the applications of Deep Learning:

* Automatic Speech Recognition
* Image Recognition
* Natural Language Processing
* Toxicology
* Customer Relationship Management
* Bioinformatics
* Mobile Advertising

 Advantages of Deep Learning

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Deep Learning helps in solving certain complex problems with high speed which were earlier left unsolved. Deep Learning is very useful in real world applications. Following are some of the main advantages of deep learning:

- **Eliminates unnecessary costs** – Deep Learning helps to eliminate unnecessary costs by detecting defects and errors in the system.
- **Identifies defects which otherwise are difficult to detect –** Deep Learning helps in identifying defects which left untraceable in the system.
- **Can inspect irregular shapes and patterns –** Deep Learning can inspect irregular shapes and patterns which is difficult for machine learning to detect.

From this introduction, you must have known that why this topic is called as hot for your M.Tech thesis and projects. This was just the basic introduction to machine learning and deep learning. There is more to explore in these fields. You will get to know more once you start doing research on this topic for your M.Tech thesis. You can get thesis assistance and guidance on this topic from experts specialized in this field.

Telecom Networks   Ms. Harshala Antapurkar

Telecom networks are mostly used today for wide area communication. Stringing a wire between every pair of telephones that might want to communicate was not a good long term strategy. A better idea was to connect all the telephones to a central switching office. There an operator could connect one telephone to another via a switchboard.
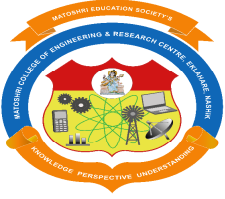
Routing a telephone call:
A call is routed up through higher level switching offices until it reaches a switching office that can reach the destination telephone by connecting with lower level switching offices, which examine the digits of the telephone number you dialed to make these decisions.

Connection Oriented Services – I :
A dedicated connection between the endpoints is maintained throughout the session. Usually, this means that the quality of service can be reasonably guaranteed to the extent of the bandwidth for the channel that is established. Message bits arrive in the same order in which they are sent. Traditional telephone circuit is a circuit switched connection-oriented system.

Transmission Media in Telephone Systems:
In traditional analogue telephone systems, the telephone is connected to the local exchange via category 3 UTP cables. This connection is called the local loop. It is typically between 1km and 10km length. Higher up in the hierarchy, higher bandwidth cables are used to carry multiple telephone calls. This is far cheaper

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than using separate cables for separate calls. Specifically, digital lines on fiber are used. Analogue systems used a technique called frequency division multiplexing (FDM) to do this.

The local loop:

The subscriber handsets are powered by a battery bank in the exchange. With echo suppressors, the transmission is half duplex. With echo cancellers, it is possible to have full duplex communication. Since the local loop is still analogue, we need modems for sending digital data. Since one bit is used for control purposes, we usually get 56kbps speed. Depending on the line condition, modems may automatically negotiate a lower speed.

Signaling:

Signaling refers to the information exchanges between terminal devices, exchanges and routers for setting up circuits, termination, billing, advanced network services etc. In common Channel signaling which is in the band, some of the bits in the frame are used for this purpose, in which is SS7 is considered standard. Whether **In band** or **Out of band**, logically the switch controllers may be considered to be an overlay network in the control plane. Out of band signaling (CCIS – Common Channel Interoffice Signaling) is more flexible as it allows arbitrarily complex message transfer, as they do not interfere with the regular channel.
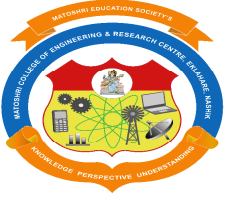
Control Plane Protocol Stack in SS7:

- **Application Service Element (ASE) –** Application level functionality such as interpreting signaling messages. Transaction Capabilities Application Part(TCAP) allows system to invoke procedure calls on remote machines.

- **Message Transfer Part 1 (MTP-1) –** it is physical bit transfer usually on a digital line like E1. One of the main applications of SS7 is Telephone User Part (TUP) which is responsible for setting up voice calls. The TUP interprets dialed digits, routes, reserves resources, maintains accounts etc.

Digital Technology in Telephone Networks:

Over the past 30 years, much of the traditional analogue telephone network has been replaced by digital technology. A device called **codec (coder/decoder)** is used to convert analogue voice signals into digital information that can be handled by digital technology. The codec is also used to convert the digital signals back into analogue voice signals that can be handled by the older analogue technology.

Only the local loop is still analogue and this loop can be replaced by **Integrated Services Digital Network (ISDN)** connections. It was envisaged as an end to end digital service. Home users would be connected by the same Cat3 cable. The digital bit streams are time multiplexed. The system uses Out of band signaling and uses the D channel for that. **NT1** is a network terminating device which connects to the

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ISDN exchange on one side and a local passive bus on the other from which up to eight terminal devices can hang. ISDN turned out to be very expensive and obsolete even before the standard was finalized. The vision of broadband ISDN was sought to be realized by ATM.

Digital Subscriber Loop:

The next attempt for converting the analog local loop went in two directions:
1. Large users could be serviced by taking fiber to their premises which could terminate on an integrated digital outlet.
2. The market for small users was driven by the demand for more bandwidth from the subscriber for Internet connection over the same Cat3 cable.

What is e-waste?   Ms. Surabhi Pagar

E-waste is electronic products that are unwanted, not working, and nearing or at the end of their "useful life." Computers, televisions, VCRs, stereos, copiers, and fax machines are everyday electronic products.E-waste is any electrical or electronic equipment that's been discarded. This includes working and broken items that are thrown in the garbage or donated to a charity reseller like Goodwill. Often, if the item goes unsold in the store, it will be thrown away. E-waste is particularly dangerous due to toxic chemicals that naturally leach from the metals inside when buried.

The ongoing challenge of how best to dispose of used and unwanted electronics isn't a new one and dates back at least to the 1970s. But a lot has changed since then, particularly the number of electronics being discarded today.
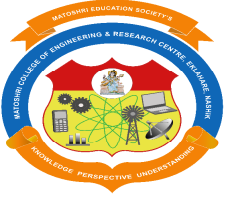
We also have something else today: a term for this issue. After several terms got suggested, including "Digital rubbish," a consensus formed around the simple word "e-waste."

How You Can Help

Fortunately, there's a proven solution. The recycling of e-waste serves a lot of useful purposes. For instance, include protecting human and environmental health by keeping those devices out of landfills. Or recovering the parts within the devices that still have value, and providing manufacturers with recycled metals that can be used to make new products.

Virtually all electronic waste contains some form of recyclable material. That includes materials like plastic, glass, and metals, which is why they may be considered "junk" or "obsolete" to consumers but still serve an essential purpose. It's ironic, in some ways, that these devices are called "e-waste," since they're not waste at all. But in far too many instances, they are thrown away.

With electronic recyclers like GLEC, we have a solution. The challenge is getting recycling rates, still stubbornly low, to increase.

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List of Common E-waste Items:

Home Appliances

- Microwaves
- Home Entertainment Devices
- Electric cookers
- Heaters
- Fans

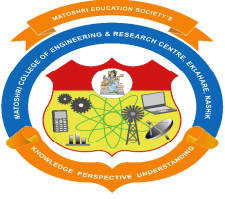**Communications and Information Technology Devices**

- Cell phones
- Smartphones
- Desktop Computers
- Computer Monitors
- Laptops
- Circuit boards
- Hard Drives

Home Entertainment Devices

- DVDs
- Blu Ray Players
- Stereos
- Televisions
- Video Game Systems
- Fax machines
- Copiers
- Printers

Electronic Utilities

- Massage Chairs
- Heating Pads
- Remote Controls
- Television Remotes
- Electrical Cords
- Lamps
- Smart Lights
- Night Lights
- Treadmills
- FitBits
- Smart Watches
- Heart Monitors
- Diabetic Testing Equipment

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Office and Medical Equipment
- Copiers/Printers
- IT Server Racks
- IT Servers
- Cords and Cables
- WiFi Dongles
- Dialysis Machines
- Imaging Equipment
- Phone & PBX systems
- Audio & Video Equipment
- Network Hardware (i.e. servers, switches, hubs, etc.)
- Power Strips & Power Supplies Uninterrupted Power Supplies (UPS Systems)
- Power Distribution Systems (PDU's)
- Autoclave
- Defibrillator

Ozone Layer Depletion   *Jayashri Nikam, TE Computer*

Ozone depletion, gradual thinning of Earth's ozone layer   in the upper atmosphere   caused by the release of chemical <u>compounds</u> containing gaseous chlorine or bromine from industry and other human activities. The thinning is most pronounced in the polar regions, especially over Antarctica. Ozone depletion is a major environmental problem because it increases the amount of ultraviolet (UV) radiation that reaches Earth's surface, which increases the rate of skin cancer , eye cataracts , and genetic and immune   system   damage. The Montreal   Protocol , ratified in 1987, was the first of several <u>comprehensive</u> international agreements enacted to halt the production and use of ozone-depleting chemicals. As a result of continued international cooperation on this issue, the ozone layer is expected to recover over time.

History:

- In 1969 Dutch chemist Paul Cruzan published a paper that described the major nitrogen oxide catalytic cycle affecting ozone levels. Cruzan demonstrated that nitrogen oxides can react with free oxygenatoms, thus slowing the creation of ozone (O_3), and can also decompose ozone into nitrogen dioxide (NO_2) and oxygen gas (O_2). Some scientists and environmentalists in the 1970s used Cruzan's research to assist their argument against the creation of a fleet of American supersonic (SSTs). They feared that the potential emission of nitrogen oxides and water vapour from these aircraft would damage the ozone layer. (SSTs were designed to fly at altitudes coincident with the ozone layer, some 15 to 35 km [9 to 22 miles] above Earth's surface.) In reality, the American SST program was cancelled, and only a small number of French-British Concords and Soviet Tu-144swent into service,

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so that the effects of SSTs on the ozone layer were found to be negligible for the number of aircraft in operation.

In 1974, however, American chemists Mario Molina and F Sherwood Rowland of the University of California at Irvine recognized that human-produced chlorofluorocarbons (CFCs)—molecules containing only carbon, fluorine, and chlorine atoms—could be a major source of chlorine in the stratosphere. They also noted that chlorine could destroy extensive amounts of ozone after it was liberated from CFCs by UV radiation. Free chlorine atoms and chlorine-containing gases, such as chlorine monoxide (ClO), could then break ozone molecules apart by stripping away one of the three oxygen atoms. Later research revealed that bromine and certain bromine-containing compounds, such as bromine monoxide (BrO), were even more effective at destroying ozone than were chlorine and its
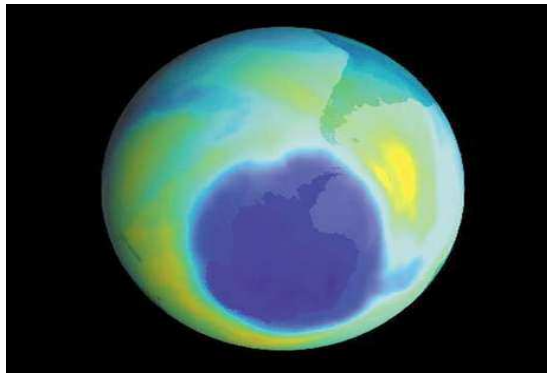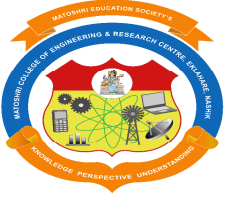

reactive compounds. Subsequent laboratory measurements, atmospheric measurements, and atmospheric-modelling studies soon <u>substantiated</u> the importance of their findings. Cruzan, Molina, and Rowland received the Nobel Prize for Chemistry in 1995 for their efforts.

<u>Reference:</u>

- The layer between 10 and 50 km that contains most atmospheric ozone, with the greatest concentration at altitudes of 20–25 km. It absorbs most of the energy from ultraviolet radiation from the Sun, and thus acts as a protective shield for life on the Earth's surface. The energy absorbed causes the rise in temperature with height that occurs in the stratosphere. It has recently been established that solar proton events (see solar wind) may cause transient decreases in ozone concentrations by $c.10$ per cent and a simultaneous increase in concentration in the upper troposphere.

Authentication Using Biometric Technology   *Manjusha Sonawane, SE computer*

Biometric Technology has contributed tremendously to boost the advancement in digital electronics.It has made it easier to authenticate a trusted user. More importantly, it has sped up the authentication process and it is 100% secure when multiple authentication methods are used together. Despite the fact that there exist some drawbacks, it is a boon to the digital world. To understand its significance, you can compare the age old pattern based authentication and one touch finger scan on your Smartphone. Biometrics comprises of methods for uniquely recognizing humans based upon one or more intrinsic

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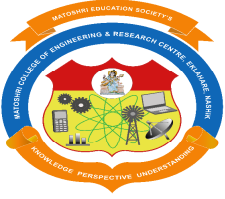
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physical or behavioral traits. Certain characteristics of every human being such as fingerprint, iris, retina, voice, face, DNA differ from each other. Biometric authentication makes use of these characteristics to identify individuals. In information technology, in particular, biometrics is used as a form of identity access management and access control. Biometric Technology is also used to identify individuals in groups.

Biometric characteristics can be divided into two main classes: Physiological and Behavioral.

- **Physiological**: This is related to the shape of the body. Examples include fingerprint, face recognition, DNA, hand and palm geometry, iris recognition etc.
- **Behavioral**: This is related to the behavior of a person. Examples include typing rhythm, voice, and gait. Some researchers have coined the term **behaviometrics** for this class of biometrics. Strictly speaking, the voice is also a physiological trait because every person has a different vocal tract, but voice recognition is mainly based on the study of the way a person speaks, commonly classified as behavioral.

Some of the commonly used Biometrics are:

- **Fingerprints** – A fingerprint includes patterns found on a fingertip. There are a variety of approaches for the fingerprint verification, such as traditional police based method and using pattern-matching devices. Fingerprint scanning seems to be a good choice for in-house systems. It can be easily found on smartphones and laptops.
- **Hand geometry** – This involves analyzing and measuring the shape of the hand. It might be suitable where there are more users or where the user accesses the system infrequently. Accuracy can be very high if desired, and flexible performance tuning and configuration can accommodate a wide range of applications. Organizations are using hand geometry readers in various scenarios, including time and attendance recording.
- **Retina** – A retina-based biometric authentication involves analyzing the layer of blood vessels situated at the back of the eye. This technique involves using a low-intensity light source through an optical coupler to scan the unique patterns of the retina. Retinal scanning can be quite accurate but does require the user to look into a receptacle and focus on a given point. It is mainly used in high-security laboratories to permit only trusted users.
- **Iris** – An iris-based biometric authentication involves analyzing features found in the colored circular tissue that surrounds the pupil. The color of the iris determines the color of the eye. This uses a conventional camera element that helps to capture high-resolution images depicting the structure of the iris. Further, it is more reliable and results in highest pattern matching.
- **Face** – Facial recognition involves identifying a person based on the high-resolution images captured. Thousands of patterns of the face are captured by the facial recognition device and stored in its database. In subsequent uses, this data is used to match and authenticate a person. This kind of matching is mostly used in the police and intelligence departments. Read more on Face Identification and Recognition.

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ARTICLES ON DISTRIBUTED GENERATION AND ITS IMPACT ON POWER   SYSTEM
Mr. Bhise D. R. (Faculty Electrical Engineering Department).

Day by day demand of Electricity is increasing so, in order to fulfill this demand we need to increase generation of power. Because of this increasing demand non-renewable energy sources are on the verge of extinction so the solution is to use renewable energy sources. One such solution is to connect DG having renewable energy sources in power system. But insertion of DG has some impact on power system. This articles deals with the evaluation of impact of DG on protection of power system.

Distributed Generation

Distributed Generation (DG) is one of the new trends that attracted attention for the past years and its penetration in distribution networks is increasing in an enormous rate. DG is presented in the form of solar (PV), wind (wind farms) and many other forms with small scale ratings up to 10MW. DG refers to electric generators that are built to generate electricity and supplying it to customers close to their locations, it can also be interconnected to the utility grids.

There are so many privileges a DG delivers to the customer, which encourages their choice to install a DG rather than constructing new distribution line, doing so might be cost effective to some customers. DG can be used to provide electricity supply to customers during peak times, it can provide a consumer full demand allowing them to operate apart from the grid, thus it can support intentional islanding. One of the most important issues that has to be considered to achieve a safe and effective use of DG is the interconnection of the DG to the utility grid.

II. Types of Distributed Generation

DG can be classified into two major groups, inverter based DG and rotating machine DG. Usually inverters are used in DG systems after the generation process, as the generated voltage may be in DC form or AC but it is required to be changed to the nominal voltage and frequency so it has to be converted first to DC then back to AC with the nominal parameters through the rectifier.

Photo voltaic

PV system is an environment friendly system as it has no emissions what so ever. PV systems utilize the sun as its fuel to generate DC voltage with a range of few megawatts then transferred to AC with the aid of inverters.

Wind Turbines

Wind turbines utilize the wind as its input to be converted to useful electricity as the output of the system. It acts as a turbine with the wind as its prime mover to rotate the turbine that is connected to the shaft of a generator. The generator gives an AC output voltage that is dependent on the wind speed. As wind speed is variable so the voltage generated has to be transferred to DC and back again to AC with the aid of inverters. The range of power generated by wind turbines could be a few mega watts for each turbine.

Fuel Cells

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Operation of fuel cells is similar to that of a battery but it is continuously charged with hydrogen which can be extracted from any hydro-carbon source, this is the charge of the fuel cell along with air (oxygen).

Micro-Turbines

The technology of micro-turbines is based on very high speed rotating turbines along with a generator to produce a high frequency output voltage. Micro-turbines are usually operated by natural gas.

Rotating Machines

Rotating machine types are the DGs that include induction or synchronous machines such as induction and synchronous generators. Synchronous types operate with fuel as its input to generate electricity, and can be of different ratings starting from kW range up to few MW ratings. Rotating machines are mainly used as standalone systems or as Backup generation systems

III .Impact of Distributed Generation on Power System

Penetration of DG in Distribution networks has an impact on various fields. These impacts could be positive or negative and are considered as the benefits and drawbacks of the distributed generation. This part is addressing the impacts of DG on different aspects of the network.
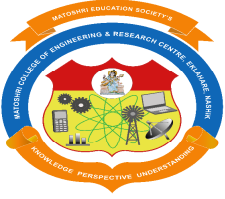
Impact of DG on Voltage Regulation

The main regulating method used in radial distribution systems is by the aid of load tap changing transformers at substations additional line regulators on distribution feeders and switched capacitors on feeders. Through the performance of the mentioned devices voltages are usually maintained within the required ranges. The criteria of voltage regulation is based on radial power flow from the substation down to all loads, DG penetration changes the radial characteristics and the system loses its radiality and power flows in different directions and a new power flow scheme is introduced. Losing radiality of the system impacts the effectiveness of standard voltage regulation technique.

Impact of DG on Losses

One of the major impacts of Distributed generation is on the losses in a feeder. Locating the DG units is an important criterion that has to be considered to be able to reach a better performance of the system with reduced losses, and this is used to reach an optimal performance of the network. So to Reduced the losses find the optimum location of DG.

Impact of DG on Harmonics

DG can be a source of harmonics to the network; harmonics produced can be either from the generation unit itself (generator) or from the power electronics equipment such as inverters used to transfer the generated form of electricity (DC) to AC to be injected to the network. The old inverter technologies that were based on SCR produced high levels of harmonics, while the new inverter technology is based

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on IGBT's (Insulated Gate Bipolar Transistor) operating with the pulse width modulation technique in producing the generated "sine" wave.
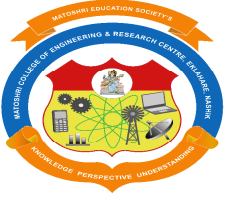
Impact of DG on Short Circuit Levels of the Network

Penetration of DG in a network has a direct impact on the short circuit levels of the network; it causes an increase in the fault currents when compared to the normal network conditions at which the substation is the only generating unit. This increase will be obtained even if the DG is of a small generating capacity. The contribution of DG to faults depends on some factors such as the generating capacity of the DG (size of the DG), the distance of the DG from the fault location and the type of DG.

Modeling of Distance Relays and Impact of TCSC on the Protection of Long Distance Transmission Lines
Ms. Ashwini Korde ME Power System Second year

The purpose of an electrical power system is to generate and supply electrical energy to the consumers. Severe interruption to the normal practice of modern society is likely if power outages are frequent or long-standing, placing an increasing prominence on consistency and security of supply are frequent or long lasting. Many items of equipment are very expensive, and so the complete power system represents a very large capital investment. There always be fault occurrence on a power system, although it is well designed, and these faults may corresponds to a risk to life and/or material goods. In order to complete the requirements of protection with the optimum speed for the many different configurations operating conditions and manufacturing features of power systems, it has been essential to develop many types of relay that respond to various functions of the power system quantities. The problem of combining fast fault clearance with selective tripping of plant is a key aim for the protection of power systems. Because of the presence of FACTS devices in a fault loop, the voltage and current signals at relay point will be affected in both steady and transient state. This impact will affect the performance of exiting protection methods, such as a distance relay Some research has been done on the performance of the distance relay for transmission system with different FACTS devices and presents the analytical results based on model of TCSC, and have studied the impact of TCSC on distance relay. To demonstrate and simulate the two source power system including TCSC, end point and distance relay at the sending end, the MATLAB software is used. This will analyse and explore the impact of TCSC employed in a transmission system on the performance of distance relay. First, a detailed model of power system including a long transmission line, distance relay and TCSC is proposed and secondly, the simulation results based for three phase to ground fault on a transmission system at different locations employing TCSC are presented and resistance-reactance plot is compared with the same system and location without TCSC. The simulation results clearly show the impact of TCSC devices on the performance of distance relay.

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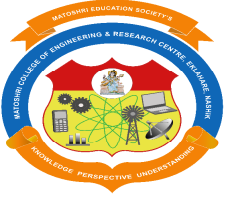**Recognition of 2(F)/12(B) from University Grant Commission (UGC).**

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Hingorani and Gyugyi proposed that the presence of FACTS devices results in new issues in the field of power system protection. Warkad proposed work about designing of numerical mho relay in MATLAB/ SIMULINK to be used for distance protection schemes of long distance transmission lines with better result and characteristics. The required mho relay algorithm is estimated by using MATLAB to model the power system under different fault condition and simulate it by using phasor-based method available in MATLAB simulation. Dhote presented that the measured impedance at the relaying point of compensated transmission lines with TCSC under different fault conditions. It is shown that the presence of TCSC on a transmission line has a great influence on the apparent impedance. Kiran presented the opportunity of implement-ing a model of a Mho type distance relay with a three zones by using MATLAB/SIMULINK package. SimPowerSystem toolbox was used for comprehensive demonstrating of distance relay, transmission line and fault simulation. Abande proposed the scheme of investigating the operation of distance relay in a power system containing flexible alternating current transmission controller such as static synchronous compensator is proposed. Mrehel explained the building process of Simulink model for distance relay, inside the modeling, fault detection, apparent impedance calculation for all types of faults, zone coordination were designed and implemented. Several operating and fault conditions have been simulated in order to validate the relay model. Marefatjou presented the modelling and simulation of two types of FACTS devices, TCSC and STATCOM to the standard 9 bus power system for load flow studies, also voltage stability phenomena and continuation power flow method, used in voltage stability analysis of power systems, are presented. Vaidya and Venikar[8] presented distance protection scheme for protection of long transmission line considering the effect of fault resistance by using the ANN approach. Traditional electromechanical distance relays used for protection of transmission lines are prone to effects of fault resistance. the effect of TCSC on the protective zone is studied. The impedance seen by the relay is influenced by the injected voltage of the TCSC. Since deviation of the measured impedance is not constant, because of the varying parameters of the injected reactance by TCSC, the proposed work presents a mitigation technique with the modification of signals input to the Mho relay. In addition, the use of fixed capacitor is also proposed as one of the mitigation techniques. The simulation results show clearly the impact of TCSC on distance relay performance. The apparent impedance is influenced by the reactive power injected by the TCSC resulting in either under reaching or over reaching of the distance relay. For the installation position of TCSC at 115 km away from relay location for a 300 km long transmission line, the measured impedance at the relaying point is evaluated. This impedance depends on the controlling parameters of TCSC, as well as the system operational and structural conditions.

Inverter design using high frequency   Mr. C. R. Shinde

we are developing inverter which is very cheap in cost and portable we are using 50KHz frequency for DC Technique and output 250V DC, 500mA, 100watt and then by level shifting and full bridge converter topology we are converting it into 220AC with the frequency of 50Hz. DC to AC power

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inverter is commonly used in uninterruptable power supply, Lighting, fan and other applications. This method has disadvantages like large size, large weight and costly so, it will be advantageous to minimize size, weight, and cost and improve overall efficiency. In which we are developing an inverter which is to be light in weight, compact and highly energy efficient. This can possible with the help of High Frequency Inverter; hence we have selected this project. We have used push pull convection and full bridge conversion topology.
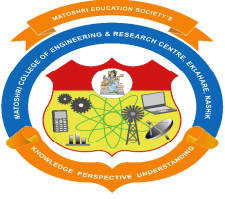
INTRODUCTION

We are converting DC to AC (Square wave) with the help of switching device like MOSFET and then again converting it into DC by the process of rectification by high frequency technique. We are doing this to get compactness and to become economical. There are lot of applications like laptop charging, Domestic & commercial lighting. We have used IC SG3525 which will set the oscillator frequency also by pulse width modulation we get controlled constant voltage. There are lot of advantages behind choosing high frequency technique. We have also used ferrite transformer because normal transformer substantial losses at high frequency operation instead, Ferrite reduces losses and its cost is much less. We are using this IC SG3525 for two purposes. Generating 50 KHz frequency and 50 Hz.

MATERIAL SELECTION

Here we are going to used special integrated circuit for high frequency name as IC SG3525 for two purposes.Generating 50 KHz frequency and 50 Hz frequency Ferrite Transformer The selection of magnetic core materials for a particular inductor or fly back transformer application can be very confusing. Each magnetic material has inherent advantages and disadvantages. Attributes such as permeability, core loss, saturation flux density, winding losses caused by fringing flux, electromagnetic emissions and costs all need to be considered. The objective often is to choose a core material that will result in a design with the lowest cost component, that supplies enough inductance to filter high frequencies or store energy, functions with an acceptable temperature rise and does not emit electromagnetic interference. Marrying inexpensive soft ferrites that have low core loss with inexpensive iron powder that have distributed air gaps in a composite core is a great way to meet such objectives. Ferrite are ceramic compound of the transition metal with oxygen, which are ferromagnetic but non conductive. Ferrite that are used in transformer of electromagnetic core contain nickel, zinc and manganese compound. Ferrite core is a type of magnetic core made of ferrite on which the winding of electric transformer and other wound components like inductor are

CONCLUSIONS

- We have seen the performance of the IC SG3525 pulse width modulation. The output of this IC is square wave and its amplitude is according to supply voltage (12V BATTERY).
- We also observe the frequency which is set by the IC as per designed.
- We have also checked the output voltage of DC Technique as well as DC to AC Technique and we are getting successful results.
- Due to High frequency, our circuit has become compact, light in weight and economical.

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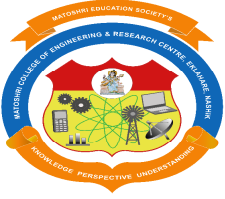
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- With the Process of full bridge converter and level shifting we have got the AC output voltage and the cost required for circuit is very less for 100W.
- We have also checked the designed component, which is working properly even though MOSFET performance specially heating is very less and efficient.
- By the costing Sheet, our circuit has become cheaper and efficient

REDUCTION IN POWER FLUCTUATIONS WHEN PV MODULES ARE CONNECTED TO GRID BY USING PI CONTROLLER

Mr. Pathare Akshay Ashok ME Power System Second year

The use of renewable energy resources to generate clean electric energy is becoming a common trend worldwide. The main motivation behind this is to overcome the problems associated with the excessive use of fossil fuels in electricity generation. These problems include the depletion of fossil fuel reserves as well as the environmental pollution and global warming problems. On-grid photovoltaic (PV) systems utilize the abundant energyavailable from the sun to generate electricity. The advances in the technology of manufacturing the PV modules coupled with the efforts to reduce their prices are themain factors behind the widespread use of these systems. Moreover, many customers tend to install PV systems in the distribution network to benefit from the incentives that the governments and utilities offer. Most of the electric power plants use fossil fuels to generate electric energy. For example, more than 45% of the electricity in the US is generated in coal power plants which have a typical efficiency of 33% . In 2006, the electric utilities in the US reported the largest poisonous emissions of any industry sector, with 69% of all emissions of mercury and mercury compounds The growing concern about environmental. Gridconnected PV systems are currently being widely installed in many of the developed countries, such as Japan, Spain, and U.S. In addition to their environmental benefits, PV systems have a number of technical and economic benefits. They can be operated to decrease the losses and 2010 IEEE OMRAN et al Investigation of methods for reduction of power fluctuations generated improve the voltage profile of the feeder to which they are connected Moreover, the owners of PV systems usually receive incentives from utilities by setting a high selling price for the energy generated from these systems. For example, the Ontario Power Authority (OPA) in Canada offered to pay 42 c/Kw for the power generated from PV systems under the Ontario's Standard Offer Program that was launched in 2006.

Photovoltaic (PV) technology converts one form of energy (sunlight) into another form of energy (electricity) using no moving parts, consuming no conventional fossil fuels, creating no pollution, and lasting for decades with very little maintenance. The use of a widely available and reasonably reliable fuel source-the sun-with no associated storage or transportation difficulties and no emissions makes this technology eminently practicable for powering remote scientific research platforms. Indeed, numerous examples of successfully deployed systems are already available. The completely scalable nature of the technology also lends itself well to varying power requirements-from the smallest autonomous research platforms to infrastructure-based systems. This technology can be limited, however, by annual

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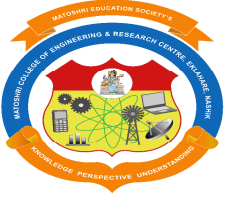
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fluctuations in solar isolation, especially at extreme latitudes. In 2009, the OPA introduced a new program, the Feed in Tariff, which provided customers with higher incentive prices for the kilowatt-hour generated from PV systems. Instantaneous change in the irradiance reaching the PV arrays leads to a corresponding change in their output power. The time frame for the short-term fluctuations in irradiance is in the order of seconds to few minutes thus, some studies have considered the fluctuations in the PV power to be within the same time frame .However, other studies have recommended the use of 10-min irradiance data when studying the power fluctuations generated from PV systems. This is especially suitable for system with ratings in the order of tens of megawatts that extend over a large land area, such as the 10 MW PV plant in Pocking,Germa. A recent report published by the North American Electric Reliability Corporation showed that the output power of existing large PV systems, with ratings in the order of tens of megawatts, can change by 70% in a five to ten min time frame . It should be noted that for a number of small systems that are distributed over a large land area, the resulting combined fluctuations are much less due to the smoothing effect .

 The power displayed in the figure is based on actual irradiance and temperature measurements at latitude 39.74∘N and longitude 105.18∘W with a 10 min time resolution obtained from a weather station. Recently, the OPA has announced that 176 PV projects with a total power of 651 MW were awarded contracts under the new program many of which are in the distribution networks with ratings in the order of tens of megawatts. In 2006, the electric utilities in the US reported the largest poisonous emissions of any industry sector, with 69% of all emissions of mercury and mercury compounds The growing concern about environmental pollution as well as the expected depletion of fossil fuel reserves is driving many countries, especially the industrial countries, to consider renewable energy resources to generate electricity.Photovoltaic (PV) systems that use the energy from the sun are one of the systems that can be used for this purpose. These systems vary in size from few kilowatts to tens of megawatts (PV farms). According to the IEEE standard 929, 2000. PV systems are divided into three categories:

1. Small systems rated at 10 kW or less.

2. Intermediate systems rated between10 kW and 500 kW.

3. large systems rated above 500 kW.

Carrying out detailed analysis to study the performance of the electric network in the presence of PV systems is an essential step prior to the installation of these systems. This will help predict the possible impacts of these systems on the electric network, which is important, especially for large PV systems in the order of tens of megawatts. However, performing such analysis might not be an easy task due to the large volume of data involved as a result of the fluctuating nature of the output power generated from PV systems. Different systems can be used to control output fluctuations. However, when the system capacity is more then energy storage is considered to be an effective means to improve the competitiveness of electric power production systems based on renewable energy resources. The intrinsic volatility of such energy resources has a negative impact on the quality of the electrical energy supply, and complicates efficient operation.

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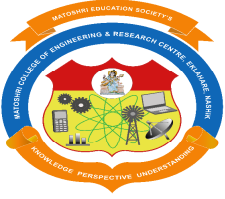## SPACE VECTOR PULSE WIDTH MODULATION (SVPWM) BASED DYNAMIC VOLTAGE RESTORER (DVR) TO MITIGATE VOLTAGE SAG
Mr. Hire Swapnil Dipak ME Power System Second year

Power distribution systems, ideally, should provide their customers with an uninterrupted ow of energy at smooth sinusoidal voltage at the contracted magnitude level and frequency However, in practice, power systems, especially the distribution system, have numerous nonlinear loads, which significantly affect the quality of power supplies. As a result of the nonlinear loads, the purity of the waveform of supplies is lost. This ends up producing many power quality problems. While power disturbances occur on all electrical systems, the sensitivity of today's sophisticated electronic devices makes them more susceptible to the quality of power supply. For some sensitive devices, a momentary disturbance can cause scrambled data, unterrupted supply system however, distribution systems, have numerous disturbance frequency. bution producing many communications, a frozen mouse, system crashes and equipment failure etc. A power voltage spike can damage valuable components. Power Quality problems encompass a wide range of disturbances such as voltage sags/swells, Flicker, harmonics distortion, impulse transient, and interruptions.

- Voltage dip: A voltage dip is used to refer to short-term reduction in voltage of less than half a second.
- Voltage sag: Voltage sags can occur at any instant of time, with amplitudes ranging from 10 - 90% and a duration lasting for half a cycle to one minute.
- Voltage swell: Voltage swell is defined as an increase in r.m.s. voltage or current at the power frequency for durations from 0.5 cycles to 1 min.
- Voltage spikes or impulses or surges: These are terms used to describe abrupt, very brief increases in voltage value.
- Voltage transients: They are temporary, undesirable voltages that appear on the power supply line. Transients are high over-voltage disturbances (up to 20kV) that last for a very short time.
- Harmonics: The fundamental frequency of the AC electric power distribution system is 50 Hz. A harmonic frequency is any sinusoidal frequency, which is a multiple of the fundamental frequency. Harmonic frequencies can be even or odd multiples of the sinusoidal fundamental frequency.
- Flickers: Visual irritation and introduction of many harmonic components in the supply power and their associated ill effects.

Causes of Sags and Surges

- Rural location remote from power source
- Unbalanced load on a three phase system
- Switching of heavy loads _ Long distance from a distribution transformer with interposed loads
- Unreliable grid systems
- Unsuitable equipment for local supply

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2.1.2 Causes of Transients and Spikes

1. Lightening
2. Arc welding
3. Switching on heavy or reactive equipment's such as motors, transformers, motor
4. drives
5. Electric grade switching

Standards Associated with Voltage Sags

Standards associated with voltage sags are intended to be used as reference documents describing single components and systems in a power system. Both the manufacturers and the buyers use these standards to meet better power quality requirements. Manufacturer develop products meeting the requirements of a standard and buyers demand from the manufacturer that the product meet the required standard condition to perform uent operation.

The most common standards dealing with power quality are the ones issued by IEEE (Institute of Electrical and Electronic Engineers), IEC (International Electrotechnical Commission), CBEMA (Computing Business Equipment Manufacturers Association), and SEMI (Semiconductor Equipment and Material International).

IEEE Standard

The Technical Committees of the IEEE societies and the Standards Coordinating Committees of IEEE Standards Board develop IEEE standards. The IEEE standards associated with voltage sags are given below.

IEEE 446-1995: IEEE recommended practice for emergency and standby power systems for industrial and commercial applications range of sensibility loads.The standard discusses the effect of voltage sags on sensitive equipment, motor starting, etc. It shows principles and examples on how systems shall be designed to avoid voltage sags and other power quality problems when backup system operates.

IEEE 493-1990: IEEE recommended practice for the design of reliable industrial and commercial power systems.The standard proposes different techniques to predict voltage sag characteristics, magnitude, duration and frequency. There are mainly three areas of interest for voltage sags. The different areas can be summarized as follows: Calculating voltage sag magnitude by calculating voltage drop at critical load with knowledge of the network impedance, fault impedance and location of fault.By studying protection equipment and fault clearing time it is possible to estimate the duration of the voltage sag based on reliable data for the system and knowledge of the system parameters and estimation of frequency of occurrence can be made.

IEEE 1100-1999: IEEE recommended practice for powering and grounding electronic equipment. This standard presents different monitoring criteria for voltage sags and has a chapter explaining the basics of voltage sags. It also explains the background and application of the CBEMA (ITI) curves. It is in some parts very similar to Standard 1159 but not as specific in defining different types of disturbances.

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IEEE 1159-1995: IEEE recommended practice for monitoring electric power quality. This standard is to describes how to interpret and monitor electromagnetic phenomena properly. It provides unique de_nitions for each type of disturbance.

IEEE 1250-1995: IEEE guide for service to equipment sensitive to momentary voltage disturbances. This standard describes the effect of voltage sags on computers and sensitive equipment using solid-state power conversion. The primary purpose is to help identify potential problems. It also aims to suggest methods for voltage sag sensitive devices to operate safely during disturbances. It tries to categorize the voltage-related problems that can be _xed by the utility and those which have to be addressed by the user or equipment designer. The second goal is to help designers of equipment to understand the environment in which their devices will operate. The standard explains different causes of sags, lists of examples of sensitive loads, and offers solutions to the problems.
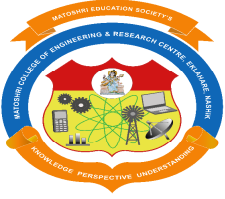
SEMI International Standards

The SEMI International Standards Program is a service offered by Semiconductor Equipment and Materials International (SEMI). Its purpose is to provide the semiconductor and at panel display industries with standards and recommendations to improve productivity and business. SEMI standards are written documents in the form of specifications, guides, test methods, terminology, and practices. The standards are voluntarytechnical agreements between equipment manufacturer and end-user.

The standards ensure compatibility and inter-operability of goods and services. Considering voltage sags, following two standards address the problem for the equipment.

SEMI F47-0200: Speciation for semiconductor processing equipment voltage sag,immunity. The standard addresses specifications for semiconductor processing equipment voltage sag immunity. It only specifies voltage sags with duration from 50ms up to 1s.It is also limited to phase-to-phase and phase-to-neutral voltage incidents, and presents a voltage-duration graph.

SEMI F42-0999: Test method for semiconductor processing equipment voltage sag immunity. This standard defines a test methodology used to determine the susceptibility of semiconductor processing equipment and how to qualify it against the specifications. It further describes test apparatus, test set-up, test procedure to determine the susceptibility of semiconductor processing equipment,and _nally how to report and interpret the result. There are mainly two types of stabilizer, static and rotating. Static stabilizer are further classi_ed into power electronic based and saturable reactors.Power electronic stabilizer are classi_ed under commutation i.e. line commutated converters and self commutated converters. DVR comes under self commutated converters.Line commutate converter classi_ed into thyristor switched capacitor (TSC) and thyristor controlled reactor(TCR) with _xed capacitor (FC) or switched capacitor (TSC).

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Safety System for FOG and ROCK falling — *Mayuri Hire*
Reference-www.google.com

Environmental protection is a practice of protecting the natural environment on individual, organizational or governmental levels, for the benefit of both the environment and humans. The amount of greenhouse gas in the atmosphere is already above the threshold that can potentially cause dangerous climate change. We are already at risk of many areas of pollution. It's not next year or next decade, it's now. Around 70 percent of disasters are now climate related.

According to the National Crime Records Bureau (NCRB), in 2014, 9039 road crashes took place because of unfavourable weather conditions, especially fog, killing 5,300 people. Government officials said since all these accidents and deaths happen in two-three months, there is a need to put special focus on managing the crisis. "Two factors- missing lane marking, signages, signals and weak enforcement are primarily response for the bloodbath on our roads. The three necessary features on our roads to guide drivers are missing and there is no enforcement on our highways. which account for 65% of the total road deaths," road safety expert Roll it Baluja said. Government officials said since all these accidents and deaths happen in two-three months, there is a need to put special focus on managing the crisis.

With almost 1% of the reported accidents being associated with slope stability problems, landslides and rock fall have been responsible for nearly 25% of fatalities in hill slopes and surface mines over past few decades. Morpho-dynamic terrain of Himalaya is continually facing challenges in stability of rock/slopes, which are aggravated due to increased disturbance level in rock/soil mass due to human intervention. Lack of enough knowledge and understanding of the phenomenon, frequent occurrences of rock fall along state and national highways, the consequent inconveniences and loss of lives highlight the importance of addressing the subject on a priority basis. On the contrary, benches at intermediate height reduced the energy of falling blocks but could not restrict the blocks to cross over the ditch on to the road. An optimisation of the angle of inclination of the ditch angle was also carried out. The study will be very useful for safe design of structures for prevention and mitigation of hazards due to rock failures along these slopes.

To overcome the problems we build a Safety system for fog and rock falling using Programmable Logic Controller (PLC). It will count no. of vehicles entering & exiting in this area which will be compared and that vehicles will be passing through all the sensors. And if no. of vehicles will be less than entering vehicles into that area that means something is wrong inside. Then automatically siren will be raised and signals before that area will be red and barrier will be closed automatically so that another vehicle will not enter and will prevent to bump again. Sensors will detect the fog & rock falling in hill areas or highways to act for safety of public and roads. Even the counting will provide us the data about how much vehicles pass through dangerous roads to make the system more effective.

Fog is produced by the suspension of very fine moisture droplets in the air. When light hits these droplets, it scatters and results in a loss of contrast and a dense white background. As these droplets get smaller, fog gets thicker and makes for roadways that are even more blanketed. As a result, cur drivers

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cannot see very far ahead, and car accidents become an even greater possibility than normal and the hazard due to rock fall is primarily at locations on, and some distance radiating away from, the incline where the fall occurs. This can affect a very wide area, and rock la hazards are there will be diffliculty to contain and control. In the aim of reducing the number of traffic accidents or at least limiting their impact, vehicles are increasingly being fitted with active safety systems. Such systems however only prove effective once the accident is well into its occurrence phase. To avoid this type of situation from arising in the first place, it becomes necessary to anticipate the associated risks and act accordingly. 'this stage requires good perception coupled with an acute understanding of the driving environment. This framework has given rise to introducing special sensors (cameras, laser, radar) into certain vehicles. Given the negative economic and community impacts of rockfalls, a targeted method for identifying the highest risk rockfall areas along state routes is crucial to ensure a safe, efficient transportation system that can function during emergency events.

Wireless Communications from High Altitude Platforms   D.D.Ahire
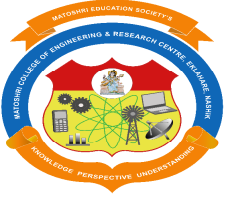Reference-www.google.com

Abstract

The demand for wireless communication is increasing day by day. People want a high speed of communication in less time. No one is interested in use of bunch of wires. So we move to wireless communication. As technology increases a demand also increases. Now everyone wants a fast communication from anywhere to anyone. Even rural area also requires internet facility. It is too hard to establish a Base station for particular small village for broadband communication or any wireless communication. Even it's too costly to launch a satellite for particular rural area. So Engineers made a intermediate way to satisfy both facilities of data transfer from terrestrial to satellite and satellite to terrestrial via HAP (High Altitude Platform). HAP is operated at altitude of 17-22km. HAP provides facilities of wireless communications.

INTRODUCTION

In current era demand for wireless communication is notoriously increases. A terrestrial and satellite system provides wireless communication services. Terrestrial systems are used in mobile applications while satellite systems are used where terrestrial system not reached. HAPs are airship or airplanes which altitudes at 17-22km above earth surface. HAPs have been proposed mobile services in stratosphere. It have advantages of both terrestrial as well as satellite. It also provides services like 3G, emergency services and Wi-MAX. HAP networks are provides different services like military application, earth monitoring, traffic monitoring and control. In terms of services, HAP offering low cost and high facility services.

HAP INFRASTRUCTURE

Infrastructure of HAPs is categories in different types which are as follows

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1) Balloons : The earliest aerial platforms were balloons.• It was filled by hydrogen.• It was used in military applications

2) Airships : Airships are helium filled containers of the order of 100m or more in length. Electric motors and propellers are used for station keeping, and the airship flies against the prevailing wind. Prime power is required for propulsion and station-keeping as well as for the payload and applications; it is provided from lightweight solar cells in the form of large flexible sheets

3) Aeroplane : It is unmanned solar powered plane, which needs to fly against the wind.

It is having wide range of topologies due to their rapid deployment and kind of service to provide. Basically there are three types of it. First, intermediate between satellite and terrestrial system, improving the satellite radio links, coverage and resource management implies. Second, it can be used in the stratospheric, with a terrestrial network. Third, it can be again used as a stratospheric, But also using a satellite for areas without connection to terrestrial networks where satellite links are available.

A. A terrestrial-HAP-satellite system: It is a mixed infrastructure, includes a HAPs network using a satellite as a link to the terrestrial networks to the final users. It provides best features of both HAPs and satellite communications. It can support high QOS(Quality Of services). First, the capability of the satellites of broadcasting and multicasting are used to transmit information from fiber networks to the HAP network deployed below the satellite. Second, HAPs are used to improve the satellite performance over the earth.

B. A integrated terrestrial – HAP system: This system works without the satellite-HAP link. Haps are considered to project one or more macro cells Here HAP network can be connected to terrestrial network through gateway.

C. A standalone HAP system: This system is used in many applications. For example broadband for all. In rural or remote area, it is expensive to deploy terrestrial systems. Satellite system is costly to be launched if traffic demand is small. This system may be deployed economically and efficiently.
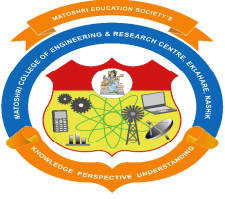
HAP APPLICATIONS

HAPs offer such a big variety of services according to the topologies as broadcasting services (TV and radio) , Internet access, telephony etc. Main applications of HAPs are as follows: i. Broadband Fixed Wireless Access Applications ii. 2G/3G and 4G applications iii. Emergency and disaster scenarios iv. Military Communications v. Earth monitoring and positioning

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SMART POWER GENERATION FROM WASTE HEAT BY THERMO ELECTRIC GENERATOR
Prashant Rumne
Reference-www.google.com

Abstract- Generating electricity in present there is a shortage of fossil fuel, oil, gas, etc. burning of these fuels causes environmental problem like radio activity pollution, global warming etc. So that these (coal, oil, gas) are the limiting resources hence resulting new technology is needed for electricity generation,

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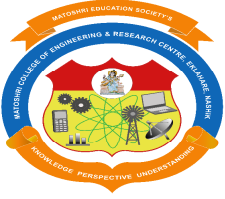
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by using thermoelectric generators to generate power as a most promising technology and environmental free and several advantages in production. Thermoelectric generator can convert directly thermal (heat) energy into electrical energy. In this TEG there are no moving parts and it can not be produce any waste during power production hence it is consider as a green technology. Thermoelectric power generator convert direct waste heat in to generate electricity By this it eliminated emission so we can believe this green technology. Thermoelectric power generation offer a potential application in the direct exchange of waste-heat energy into electrical power where it is unnecessary to believe the cost of the thermal energy input .This method will have an maximum outcome. The application of this option green technology in converting waste-heat energy directly into electrical power can too improve the overall efficiencies of energy conversion systems. Heat source which is need for this conversion is less when contrast to conventional methods. By using this energy is used to charge the mobile electronics

INTRODUCTION Recently we are depending upon fossil fuels for maximum electricity generation. However, the reserves of fossil fuels will be goes on depleting, since oil & gas are the least sources. Recent years .cost of unit electricity has increasing to unpredictable levels due the less supply of (oil gas coal). Thus the , green energies are more attractive artificial to electricity generation, as it will also provide a pollution free and cost less. In this innovative project, we are using one device which is used to be created and introduced by human as a renewable energy that is thermo electric generator equipment to generate electricity As we know Renewable energies are, solar energy, wind energy,hydro energy, tidal energy, etc. above energies can produce electricity in different forms and way of generating method. There are some disadvantages. Solar cells are the most commonly used in applications such as household industrial and spacecraft electrical systems. However, if there is no sun light there will no production of electricity alternative sources are necessary for generating electricity. or a method of storing energy for future use. Wind and hydro electric energy have their own drawback making them less power production and insufficient for wider usage. The device by converting heat energy to electrical energy. This thermoelectric generator is suitable power for space research, Satellites and even unmanned facilities. Satellites are settled at the planets that so for from the earth. For example, thermoelectric devices can be used in vehicles to producing electricity using the waste heat of the engine also.

TEG is used to convert thermal energy (heat) into electricity based on "Seebeck effect" directly. Here there is charge movement in the media. Advantages of Thermoelectric power generators are. - Small size and less weight. . - Green Technology. - increase the overall efficiency (5% to 8%). - Alternative power sources of energy. - It require less space and cost compare to other source waste heat to generate the power is to decrease the cost-per-unit of the devices. TEG can be used in , Jet Engine parts, IC Engines parts, Furnace cover, Hot water tubes, Refrigerator Computer/laptop Body heat etc

Theory and the technology

when "electrons" are in motion, we have an electrical current (i.e., charge per unit time per unit area).electrical voltage ("pressure") usually is the driving force but, other forces like temperature difference andhence flow of thermal energy/heat can drive the electrons

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PROBLEM DEFINITION

Some developing countries and most populated industrialized countries (India china Mongolia Korea) etc. have average of 3 to 10 hours of daily power-cuts because the increase in demand of consumer utilization electricity exceeds so that the production of electrical energy is lesser then the consumer demand. And also shortage of fossil fuel and coal i.e. about 60% of electricity is generated from fossil fuels. (Oil and gas) are imported from Arabian countries. So that pollution also may occur due to the combustion of this fossil fuel. And also the generating the power from these conventional sources may lead to harmful environment and pollute the nature. In the new generation they are depending upon the rechargeable batteries or diesel /petrol engine etc. when there is no power and at the time of load shedding. The use of generator is common in industrial and commercial sector. This ultimately increases the shortage of power and more cost. And also the people are not utilizing the power properly they were unnecessarily wasting the power and they are not designing the power consumption properly hence basically a low power production in that also wasting means in the future we live without light Now a days consumer demand is more then the power production that is the major difficulty to overcome.
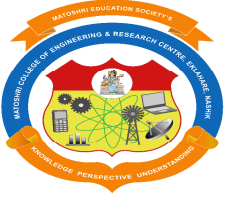
Objective

The main aim of this project is to develop much cleaner noise less cost effective different way of power generation method for charging the battery as well as to utilization proper only the requirement of usage, which helps to reduces the global warming as well as reduce the power shortages, load shedding and also we can transfer the portable generating unit. In this project the conversion of waste heat into generate electricity by using thermoelectric generator. Waste may refrigerator heat, vehicle radiator heat, laptop heat, even body heat can be used as a input source as a waste heat to generate electricity and it can be charged directly mobile battery and also stored in a rechargeable lead acid battery for further usage. And also waste energy human body locomotion also produce electricity body weight locomotion of the energy in to electrical energy by using electromagnetic induction principle. The control mechanism carries regulator circuit etc and the power saving mechanism carries microcontroller relays etc. 1) Charge the mobile battery where ever waste heat is obtained 2) Maintain the heat transfer from hot side to cold side because of uniform charging mobile battery 3) Charge the 12v battery for further usage to converting by using inverter to 220v

SCOPE OF THE STUDY

The scopes of project study are; 1) by using thermoelectric generator connecting in series /parallel we can generate the power for maximum level 2) even body heat also generate the heat that can be utilizing by using TEG to generate the power to charge the portable equipment like laptop mobile etc 3) by installed in the vehicle above the radiator means the vehicle battery will charge self

CONCLUSION

Present method for electricity generation is converting thermal energy into mechanical energy by turbine then into electricity by using generator. Burning of these fuels causes environmental problem like radio activity pollution, global warming. hence (coal, oil, gas) are the limiting resources resulting new technology is needed. The project paper is tested and implemented. The system gives the best

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economical pollution free, required energy solution to the people. Two power generators have been built using TEG modules and tested. The power of the first one could reach about 500 W (predicted using experimental data) with a temperature difference of about 200°C between hot and cold sides. This work can be used for many applications in urban and rural areas where power availability is less or totally absence. By making this system generates and charge 12v which is capable to recharge a mobile. it avoiding dependency of grid supply. This is a Promising technology for solving power crisis to an affordable extent

Eye Directive Wheelchair   D.D.Dighe
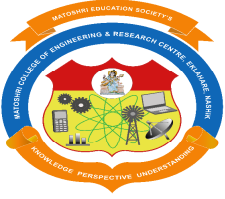
The Eye Directive wheelchair is a mobility-aided device for persons with moderate/severe physical disabilities or chronic diseases as well as for the elderly. There are various interfaces for wheelchair available in the market, still they remain under-utilized, the reason being the ability, power and mind presence required to operate them. The proposed model is a possible alternative. In this model, we use the optical-type eye tracking system to control powered wheel chair. User's eye movements are translated to screen position using the optical type eye tracking system, without any direct contact. When user looks at appropriate angle, then computer input system will send command to the software based on the angle of rotation of pupil i.e., when user moves his eyes balls left (move left), right (move right), straight (move forward) in all other cases wheel chair will stop. Also, obstacle detection sensors are connected to the arduino to provide necessary feedback for proper operation of the wheelchair and to ensure the user's safety. The motors attached to the wheelchair support differential steering which avoids clumsy motion. The wheelchair has also been provided with a joystick control to ensure safe movement in case of tired vision and with a safety stop button, which will enable the user to stop the wheelchair at his own ease

Introduction

The wheel chair model design illustrated here is a wellequipped and flexible motorized wheelchair for paralytic and motor disabled patients to drive the wheelchair without straining any of their physical posture. The gaze movement is tracked autonomously and the wheelchair is directed according to the eye position. It is an eco-friendly and cost-effective wheelchair that dissipates less power and can be fabricated using minimum resources. System has been designed taking into consideration the physical disability, thus it won't affect the patient physically. Obstacle and ground clearance sensing is performed to ensure patient's safety. Audible notification for the obstacles has been provided. Alternatively a joystick has been embedded for the control of wheelchair

Design and Specifications

In Image Capturing Module, images are captured using wireless camera and are sent to the base station (computer/ laptop) for further processing. In Microprocessor Interfacing, the generated electric digital output from the base station is used to direct the motors of the wheelchair. Microprocessor also takes care of the obstacles and the user inputs.

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Wireless camera: Eye of the user is captured with a pin hole wireless camera which transmits the images to the base station wirelessly.

Computer Base station: The images received from the camera are processed using Open source Computer Vision library and the gaze movement is sent to the chair via X-Bee communication.

Microcontroller: They are used to maintain wireless communication protocols and on the receiver side, it also takes care of obstacles and manual user inputs. The microcontroller used in this model is Arduino. Arduino is a single-board microcontroller, intended to make building interactive objects or environments more accessible. The hardware consists of an open-source hardware board designed around an 8-bit Atmel AVR microcontroller, or a 32-bit Atmel ARM. The system uses two microcontrollers. The Transmitting Microcontroller is connected to the processing unit. This microcontroller converts the information received from the processing unit into signals and transmits them wirelessly over to the receiving microcontroller attached to the wheelchair. The Receiving Microcontroller receives signals from the transmitting microcontroller wirelessly and accordingly initiates the movement in the required direction. This microcontroller is mounted on the wheelchair and is connected to the motor driver. It is also connected to the object sensors, joystick control and the emergency stop button. This microcontroller can start the motion, change the direction and even stop the system on receiving commands from the above mentioned attachments.

Motor Driver: They provide the high current required to drive the motors. Motor driver is required to run the motors since the motors require more current than the microcontroller pin can generate. Motor driver is basically a current amplifier which takes a low-current signal from the microcontroller and gives out a proportionally higher current signal which can control and drive a motor. In most cases, a transistor can act as a switch and perform this task which drives the motor in a single direction.

Obstacle Sensors : The wheelchair has been mounted with four ultrasonic sensors to avoid collision and damage to the user. The three sensors monitor the forward, left and right directions. Ultrasonic sensors use electrical-mechanical energy transformation to measure distance from the sensor to the target object. The arduino rings the buzzer if any obstacle is detected within the range of 100-230 cm from the wheelchair, so that the obstacle can clear the way and ensures safe passage for the wheelchair. But if the obstacle still prevails within the 30cm range from the wheelchair, then the arduino sends stop command to the motor driver, ensuring the system comes to a halt. The fourth sensor is used for ground clearance. Ground clearance measures the height between the sensor and the flat surface (ground). The arduino will send stop command to the motor driver if there is a sudden step and/ slope.

Battery : The system uses lithium ion cells to supply power to the components mounted on the wheelchair. The battery contains 30 cells of Li-Ion having 3.7V 1.5AHr each. Battery is connected in 6x5 fashion i.e. 5 sets of batteries having 6 cells in series are connected in parallel. Hence battery gives overall 22.2V output with 7.5AHr capacity.

Conclusions

The system functions with an accuracy rate of 70-90 %. The aim of this project is to contribute to the society in our small way by setting out an idea for a system which could actually better the lives of

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millions of people across the globe. Direction in which pupil looks is decided by fixing range to the particular direction as user looks. Detection of pupil is done even on illumination unless the illumination is covering whole eye, this is because when the light hits the pupil and illumination spreads on the pupil covering whole pupil which ignores those pixels so as we treat the illumination spots it will leave behind a maximum change edges that cannot be determined and the operator will consider another position to be a iris location. This process works even if image taken in little dark environment.

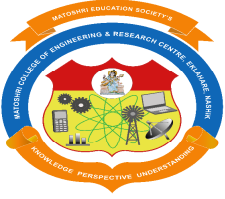## Radio Frequency Energy Harvesting - Sources and Technique

Vishwas Wadeakar

Energy harvesting technology is attracting huge attention and holds a promising future for generating electrical power. This process offers various environmentally friendly alternative energy sources. Especially, radio frequency (RF) energy has interesting key at tributes that make it very attractive for low-power consumer electronics and wireless sensor networks (WSNs). Ambient RF energy could be provided by commercial RF broadcasting stations such as TV, GSM, Wi-Fi, or radar. In this study, particular attention is given to radio frequency energy harvesting (RFEH) as a green technology, which is very suitable for overcoming problems related to wireless sensor nodes located in harsh environments or inaccessible places. The aim of this paper is to review the progress achievements, the current approaches, and the future directions in the field of RF harvesting energy. Therefore, our aim is to provide RF energy harvesting techniques that open the possibility to power directly electronics or recharge secondary batteries. As a result, this overview is expected to lead to relevant techniques for developing an efficient RF energy harvesting system.

As the demand for wireless sensor networks (WSNs) increases, the need for external power supply drastically increases as well. Besides the problems of recharging and replacing, size and weight, batteries are an exhaustible source with an adverse environmental effect. For these reasons, it is highly desirable to find an alternative solution in order to overcome these power limitations.

The environment represents a relatively good source of available energy compared with the energy stored in batteries or super-capacitors. In this context, energy harvesting, also known as power harvesting and energy scavenging, is an alternative process for primary batteries, where energy is obtained from the ambient environment. An energy harvester typically captures, accumulates, stores, and manages ambient energy in order to convert it into useful electrical energy for autonomous wireless sensor networks. The use of energy scavenging minimizes maintenance and cost operation; therefore, batteries can be eventually removed in WSNs as well as in portable electronic devices. Many potential ways to harvest energy from environment are available, including solar and wind powers, radio frequency energy and ocean waves, and thermal energy and mechanical vibrations.

The basic structure of a radio frequency energy harvesting system consists of a receiving antenna, matching circuit, peak detector, and voltage elevator. Where electromagnetic waves are captured by the antenna, voltage is amplified using the matching circuit, signal is converted to a voltage value thanks to

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the peak detector, and finally this voltage output is adjusted using the voltage elevator. The whole system formed by receiving antenna, matching network, and rectifier is usually known as a rectenna or an RF/direct current (DC), which is able to harvest high-frequency.
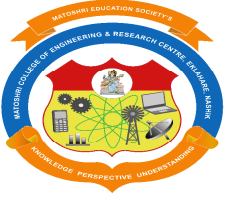
Energy in free space and convert it to DC power. The detail of each block is subsequently discussed in order to define specifications and limitations of the power conversion system. Further, a block of power management and another for energy storage could be integrated into the energy harvesting system. The energy storage subsystem is responsible for storing all the captured energy and providing a constant output voltage. Energy harvester is a promising power solution for WSNs. Instead of depending on centralized power sources for charging, sensor devices operate the existing energy in the environment. The DC voltage is stored in a holding capacitor or super-capacitor in order to power supply integrated circuits.

Antenna RF energy harvesting technique needs, as mentioned in the previous section, an efficient antenna with a circuit capable of converting alternating current (AC) voltage to direct current voltage. The front end is a key component to ensure the successful operation of RFEH system. It has the duty of capturing electromagnetic waves, which will be used later to power the integrated system. Moreover, the antenna efficiency is related to the frequency: energy obtained from an antenna with small bandwidth, than a wideband receiver antenna used to capture signals from multiple sources. RF antenna can harvest energy from a variety of sources, including broadcast TV signal (ultrahigh frequency (UHF)), mobile phones (900–950 MHz), or Local Area Network (2.45 GHz/ 5.8 GHz).

Matching circuit Matching circuits are essentially used to match the antenna impedance to the rectifier circuit in order to achieve maximum power and improve efficiency, by using coils and capacitors. Several matching circuits are available; however, the main configurations that have been proposed are the transformer, the parallel coil, and the LC network.

Rectifier Radio frequency signal captured by the antenna is an alternating current (AC) signal. In order to get a DC signal out of AC signal and improve the efficiency of the RF–DC power conversion system, a rectifier circuit is used. Rectification subsystem or peak detector, which has been already used on crystal radio, consists only of diodes and capacitors.

RF energy harvesters open up new exciting possibilities in wireless communication and networking by enabling energy self-sufficient, environmentally friendly operation with practically infinite lifetimes, and synergistic distribution of information and energy in networks. The energy is harvested from commercial RF broadcasting stations, especially for powering wireless sensor networks or other applications that require only a small amount of energy ($10-3$ to $10-6$ W). Further, RFID sensors can be powered by scavenging ambient power from radio frequency signals in order to prolong the lifetime to several decades and reduce maintenance costs.

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Waste Management Using IoT   :   Gauri Shimpi (B.E I.T)

Enormous amount of wastage is created every day. Such waste management is one of the primary problem that the world faces irrespective of the case of developed or developing country. The Internet of things describes the network of physical objects—a.k.a. "things"—that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the Internet. The prime problem is that the garbage bin at public places gets overflowed well in advance before the start of the next cleaning process. It in turn leads to various hazards such as bad odour & ugliness to that place which may be the root cause for spread of various diseases. To avoid all such hazardous scenario and maintain public cleanliness and health this work is mounted on a smart garbage system. This process is aided by the ultrasonic sensor which is interfaced with Arduino UNO to check the level of garbage filled in the dustbin and sends the alert to the municipal web server once if garbage is filled. After cleaning the dustbin, the driver confirms the task of emptying the garbage with the aid of RFID Tag. RFID is a computing technology that is used for verification process and in addition, it also enhances the smart garbage alert system by providing automatic identification of garbage filled in the dustbin and sends the status of clean-up to the server affirming that the work is done. The whole process is upheld by an embedded module integrated with RFID and IOT Facilitation. An Android application is developed and linked to a web server to intimate the alerts from the microcontroller to the urban office and to perform the remote monitoring of the cleaning process, done by the workers, thereby reducing the manual process of monitoring and verification.
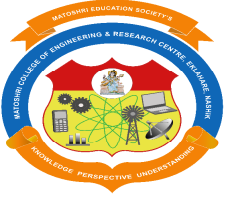
The proposed article features an introduction to the garbage system based upon IoT. With the advent of technology we can see smart garabage collector systems in the near future which can help and take the hygiene at next level.

Global Positioning System (GPS)   Varsha Mogal (B.E I.T)

The Global Positioning System (GPS) is a satellite-based navigation system that consists of 24 orbiting satellites, each of which makes two circuits around the Earth every 24 hours. These satellites transmit three bits of information the satellite's number, its position in space, and the time the information is sent. These signals are picked up by the GPS receiver, which uses this information to calculate the distance between it and the GPS satellites.

With signals from three or more satellites, a GPS receiver can triangulate its location on the ground (i.e., longitude and latitude) from the known position of the satellites. With four or more satellites, a GPS receiver can determine a 3D position (i.e., latitude, longitude, and elevation). In addition, a GPS receiver can provide data on your speed and direction of travel. Anyone with a GPS receiver can access the system. Because GPS provides real-time, three-dimensional positioning, navigation, and timing 24 hours

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a day, 7 days a week, all over the world, it is used in numerous applications, including GIS data collection, surveying, and mapping.
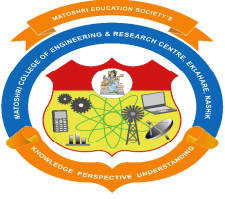
GPS (Global Positioning System) is the only system today able to show ones own position on the earth any time in any weather, anywhere. This paper addresses this satellite based navigation system at length. The different segments of GPS viz. space segment, control segment, user segment are discussed. In addition, how this amazing system GPS works, is clearly described. The various errors that degrade the performance of GPS are also included. DIFFERENTIAL GPS, which is used to improve the accuracy of measurements, is also studied. The need, working and implementation of DGPS are discussed at length. Finally, the paper ends with advanced application of GPS.

Like the Internet, GPS is an essential element of the global information infrastructure and revolutionary technology that changing and operate in the various field of development. The free, open, and dependable nature of GPS has led to the development of hundreds of applications affecting every aspect of modern life. GPS technology is now in everything rom cell phones and wristwatches to bulldozers, shipping containers, and ATM's. The technology of the Global Positioning System is allowing for huge changes in society. The applications using GPS are constantly growing. The cost of the receivers is dropping while at the same time the accuracy of the system is improving. This affects everyone with things such as faster Internet speed and safer plane landings.

Health Care Heart Monitoring System   -Patnaik Prabeen(T.E I.T)

Health monitoring system is used every field such as hospital, home care unit, sports. It is difficult to keep track on abnormalities in heartbeat count for patient itself manually. A normal resting heart rate for adult ranges from 60-100 beats per minute. For children ages 6-15, the normal resting heart rate is between 70-100 bpm. Patients are not well versed with manual treatment which doctors normally use for tracking the count of heartbeat. There are various instruments available in market to keep track on internal body changes. But there are many limits in maintenance part due to their heavy cost, size of instruments and mobility of patients. The biomedical sensor like heart rate sensor is used for monitoring the health condition which is integrated on single system on- chip. If any varied change takes place it is notified. This notification would help to take an appropriate action at an instance of a time. This would save patients from the future health problem which would arise. This would also help patient's concern doctor to take an appropriate action at proper time.

Internet of things (IoT) refers to the ever growing network of physical objects that feature an IP address for internet connectivity, and the communication that occurs between these objects and other internet enabled devices and systems. In India many patients are dying because of heart attacks and reason behind this factor is that they are not getting proper help during the period. To give them timely and proper help first we want to continuous monitoring of patient health. In this paper, we are going to develop Health Care application. The main primary aims of this paper to design an IOT based architecture for health related issues such as Heart Monitoring system, Pulse rate measurement. Arduino

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is acting as IoT proxy in this paper and is used to deploy the health information of patients into the database. The Data obtained through sensors are uploaded to the database and in case of any critical condition the SMS is send to the doctor or any family member. So that we can easily save many lives by providing them quick service.

Using remote video monitor attendance   -Tupe sampada (T.E I.T)

Face recognition is a well known research area which takes more attention of many researchers in computer technology. The human face recognition from video sequences is a challenging task, because there are variations present in the background of the images, facial expression and illumination. Most of face detection methods focus on detecting the frontal face of human and ignore other things like buildings, trees and background in image. Face detection and recognition is often referred to as characteristic of person face image input through camera. It measures overall facial structure, distances between eyes, nose and mouth.
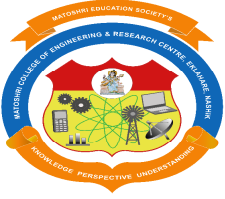
The proposed visual system monitors the student attendance in seminars and lectures. Basic idea is to estimate the number of people in the room using face detection algorithm. An Attendance Monitoring System using face detection is one of the important research topics in computer technology. Viola-Jones Algorithm is used to detect the human faces. The attendance system is proposed using surveillance camera which is used to record the attendance of students in a classroom with some time interval in a day. This automation reduces human efforts of paper work, maintaining the attendance registers, generating reports as needs of academics. Further it may be used for anomaly prevention (e.g. cheating) and in specific cases for security or legal matters.

The face detection and recognition system will reduce the amount of work done by the lectures. There is no need for specialized hardware for installing the system as it only uses a computer and a camera. The camera plays a critical role in the working of the system hence the image quality and performance of the real time scenario must be tested especially if the system is operated from a live camera feed.

3 D Printer Introduction : Khaire Ashwini (TE IT)

3d Printing is also called additive manufacturing is simply a process of adding layers upon one another, in a desired manner to print three dimensional solid figures from CAD designs. 3d printing would be manufacturing without any boundaries. Prototyping which would take up to weeks in the old days can be done in a matter of hours using 3d printing. The innovators today are only limited by their imagination. anything they can think of can be printed irrespective of the complexity of the shape.3d printing offers freedom to create. Keywords: 3d Printer, types, Applications

3d Printing is also called additive manufacturing is simply a process of adding layers upon one another, in a desired manner to print three dimensional solid figures from CAD designs.3d printing would be manufacturing without any boundaries. Prototyping which would take up to weeks in the old days can

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be done in a matter of hours using 3d printing. The innovators today are only limited by their imagination. Any thing they can think of can be printed irrespective of the complexity of the shape.3d printing offers freedom to create. From kids in school rooms to researchers in their high tech laboratories, all find it to be beyond compare Charles hull first invented stereolithography apparatus back in 1983 and attained a patent for it in 1986.he later went onto become the CEO of 3DSYSTEMS,which is still a giant in the 3d printing field. In 1987,Carl Deckard of the University of Texas filed for a patent in selective laser sintering(SLS).in 1992 Scott Crump received the patent for FDM printing. up to the year 2007,the 3d printer were really expensive and many quite frankly had no idea what it was. It was much similar to what a computer was 20 year back.

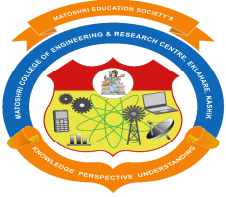In schools there were back benchers

And in colleges
There are mechanical and civil
engineer

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MORAL- first benchers are taking
revenge....

– MAN

YourQuote.in

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What Is Nanotechnology?

Mr. Piyush Ganore, -BE Mechanical

Nanotechnology is science, engineering, and technology conducted at the nanoscale, which is about 1 to 100 nanometers.Nanoscience and nanotechnology are the study and application of extremely small things and can be used across all the other science fields, such as chemistry, biology, physics, materials science, and engineering.

Fundamental Concepts in Nanoscience and Nanotechnology

It's hard to imagine just how small nanotechnology is. One nanometer is a billionth of a meter, or 10-9 of a meter. There are 25,400,000 nanometers in an inch.A sheet of newspaper is about 100,000 nanometers thick .On a comparative scale, if a marble were a nanometer, then one meter would be the size of the Earth

Nanoscience and nanotechnology involve the ability to see and to control individual atoms and molecules. Everything on Earth is made up of atoms—the food we eat, the clothes we wear, the buildings and houses we live in, and our own bodies.

But something as small as an atom is impossible to see with the naked eye. In fact, it's impossible to see with the microscopes typically used in a high school science classes. The microscopes needed to see things at the nanoscale were invented in the early 1980s.Once scientists had the right tools, such as the scanning tunneling microscope (STM) and the atomic force microscope (AFM), the age of nanotechnology was born.

Although modern nanoscience and nanotechnology are quite new, nanoscale materials were used for centuries. Alternate-sized gold and silver particles created colors in the stained glass windows of medieval churches hundreds of years ago. The artists back then just didn't know that the process they used to create these beautiful works of art actually led to changes in the composition of the materials they were working with.

Today's scientists and engineers are finding a wide variety of ways to deliberately make materials at the nanoscale to take advantage of their enhanced properties such as higher strength, lighter weight, increased control of light spectrum, and greater chemical reactivity than their larger-scale counterparts.

Source:- https://www.nano.gov/nanotech-101/what/definition

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Title: Mechanical engineering on the nanoscale:- Mr. Pratap R. Sonawane

ME researchers in the Autonomous Insect Robotics Laboratory are developing insect-sized flying robots for tasks such as surveying crop growth and detecting gas leaks. Photo by Mark Ston

Nano engineering is the manipulation of materials and processes at the nanoscale—about 1-100 nanometers. With so many advances over the last decade, nanotechnology has become the new frontier of engineering, creating endless possibilities for manufacturing, microfluidics, robotics, biomedicine, energy, heat transfer and storage, nanomaterials, and computational modeling. Nano engineering is also one of the most interdisciplinary of the sciences, requiring knowledge of mechanical engineering, chemical engineering, electrical engineering, biology, physics, photonics, and materials science.

Popular research fields include nanoscale energy transport, conversion, and storage, nano and micro electromechanical systems, nanomaterials, and alternative energy systems, including solar photovoltaic devices. Chemically modified nanomaterials are having huge impacts on biochemical sensing and human health. Carbon-based nanomaterials continue to evolve and are known for high strength, conductivity, and light weight.

Nano systems and Mechanical Engineers

Advances in Nano engineering expand the mechanical engineer's toolbox. Naturally occurring materials have a certain range of material properties and functions that most mechanical engineers have utilized. In contrast, Nano engineered materials can be designed to provide enhanced properties such as biochemical sensitivity, mechanical strength, selective transport, thermal or electrical conductivity, and optical properties.

"Although the underlying science of nanotechnology is interesting and important, most mechanical engineers tend to focus on the parts of Nano engineering that best support their own particular design needs," says Carol Livermore, associate professor of mechanical engineering at Northeastern University

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in Boston, MA. "For example, the strong, lightweight, high-conductivity nature of carbon nanomaterials makes them of high interest to MEs working on airborne and space applications."

Products created with Nano engineering can often be incorporated into a mechanical engineer's current work, with only a little additional training or education to use them effectively. An example is the integration of carbon nanotube yarns or sheets into airborne or space applications as shielding or electrical conductors.

Source: -https://www.asme.org/topics-resources/content/nano-engineerings-new-frontier

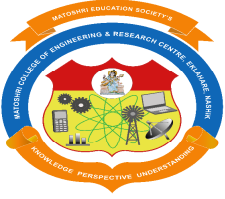## *Automatic lubrication system:- Mr. Sagar Gaikwad, BE Mechanical*

An **Automatic Lubrication System** (**ALS**), sometimes referred to as a **Centralized Lubrication System (CLS)**,is a system that delivers controlled amounts of lubricant to multiple locations on a machine while the machine is operating. Even though these systems are usually fully automated, a system that requires a manual pump or button activation is still identified as a centralized lubrication system. The system can be classified into two different categories that can share a lot of the same components.

Oil systems: Oil systems primary use is for stationary manufacturing equipment such as CNC milling

Grease systems: Grease primary use is on mobile units such as trucks, mining or construction equipment.

Automatic lubrication systems are key aspects in maintenance & reliability programs. They supply lube points with metered amounts of grease or oil from a central location. The pump supplies the system with the chosen lubricant and is fed from a reservoir that is easily accessible. Depending on the application, the reservoir ranges in sizes and can be as small as 2 liters all the way up to an intermediate bulk container or even a bulk tank. The options are almost limitless and are application specific. These systems have the option to be monitored remotely with feedback and can be tied directly into your plant's PLC. So whether you're running an excavator, driving a ready-mix truck, operating a crusher, or making steel, you can rest assured that your assets are being properly lubricated at all times

Source: -Shiveley, Zach. "Automatic Lubrication Systems". ReliaLube LLC.

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Different Plastic Types And How They Are Recycled
Ms. Sarika Gavate, BE Mechanical

It's in bottles, containers, wrapping, and other everyday items. Plastic is as versatile as it is recyclable. By recycling the plastics you use every day, you can reduce your impact on the environment and help businesses cut costs. However, not all types of plastics are created equal. The number within the recycling symbol on plastic containers, known as an SPI Code, provides a wealth of information about the safety and biodegradability of each plastic type. Understanding these codes will help you know how to sort out used materials for recycling. For quick reference, here's a quick look at the different codes:

Polyethylene Terephthalate (PETE or PET)

High Density Polyethylene (HDPE)

Polyvinyl Chloride (P or PVC)

Low-Density Polyethylene (LDPE)

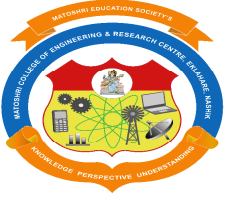Polypropylene (PP)

Polystyrene (PS)

Miscellaneous Plastics

Now let's dive in deeper to learn more about each of the seven plastic types:

1. PETE or PET (Polyethylene Terephthalate): First used in 1940, PET plastics are commonly found in beverage bottles, perishable food containers and mouthwash. Clear PET plastics are generally considered safe, but can absorb odors and flavors from foods and liquids stored in them. They can also be dangerous if exposed to heat, such as if a water bottle is left in a hot car. Over time, this can cause Antimony to leach out of the plastic and into the liquid. Luckily, these plastics are easily recyclable, and most recycling plants accept them, so properly disposing them is easy. PET plastics are recycled into carpet, furniture, and fiber for winter garments.

2. HDPE (High Density Polyethylene): One of the newest types of plastics, HDPE was first created in the 1950s by Karl Ziegler and Erhard Holzkamp. HDPE is the most commonly recycled plastic and is usually deemed safe for food contact by the FDA. Because of its internal structure, HDPE is much stronger than PET, and can be reused safely. It can also be used for items that will be stored or used outdoors, because it does well in both high and freezing temperatures. HDPE products have a very low risk of leaching into foods or liquids. You'll find this plastic in milk jugs, yogurt tubs, cleaning product containers, body wash bottles and similar products. Many children's toys, park benches, planting pots, and pipes are also made from HDPE. Recycled HDPE is made into pens, plastic lumber, plastic fencing, picnic tables and bottles.

3. V or PVC (Polyvinyl Chloride): First discovered in 1838, it's one of the oldest plastics. Also known as Vinyl, PVC is a common plastic that starts out rigid, but becomes flexible when

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plasticizers are added. Found in credit cards, food wrap, plumbing pipes, tiles, windows and medical equipment, PVC is seldom recycled. PVC plastics contain harmful chemicals linked to a variety of ailments, including bone and liver diseases and developmental issues in children and infants. Keep PVC items away from foods and drinks. Specialized programs recycle PVC into flooring, paneling and roadside gutters to name a few.

4.LDPE (Low-Density Polyethylene): LDPE has the simplest structure of all the plastics, making it easy to produce. That's why it's mostly used for many types of bags. A very clean and safe plastic, LDPE is also found in household items like plastic wrap, frozen food containers and squeezable bottles. More recycling programs are beginning to accept LDPE plastics, but it's still quite difficult to recycle. Recycled LDPE is made into such items as garbage cans, paneling, furniture, flooring and bubble wrap.

5.PP (Polypropylene): Discovered at a petroleum company in 1951, PP is hard, sturdy and can withstand high temperatures. It's also considered a safe plastic, and as a result, it's found in tupperware, car parts, thermal vests, yogurt containers, and even disposable diapers. While it can be recycled, it's thrown away much more often. When recycled, it's turned into heavy-duty items like pallets, ice scrapers, rakes and battery cables. Many recycling programs accept PP.

6.PS (Polystyrene): PS, or Styrofoam, was discovered by accident in Germany in 1839. An easily recognizable plastic, PS is found in beverage cups, insulation, packing materials, egg cartons and disposable dinnerware. It's cheap and easy to create, and so is found everywhere. However, it's unsafe because Styrofoam's notorious both for leaching harmful chemicals, especially when heated, and for poor recyclability. Like PP, it's usually thrown away, although some recycling programs may accept it. PS is recycled into various items including insulation, school supplies and license plate framing.

7.Miscellaneous Plastics: SPI code 7 is used for all plastics not part of the other 6 types. Despite their inclusion in popular items such as sunglasses, computer casing, nylon, compact discs and baby bottles, these plastics contain the toxic chemical bisphenol A or BPA. Not only are they dangerous, but these types of plastics are also extremely hard to recycle as they don't break down easily. When recycling plants do accept it, Plastic #7 is primarily recycled into plastic lumber and specialized products.

*Source:https://www.generalkinematics.com/blog/different-types-plastics-recycled/

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