

Miet **Electrospark**

(Half-Yearly Technical E-Magazine)

Vol-3, January 2021



Department of Electrical Engineering



WWW.miet.ac.in/electrical-engineering

Vision of department

To become a well-recognized department in country for electrical engineering where technical knowledge, skills & values are integrated for the development of society & industry.

Mission of department

- *To provide academic excellence in technical education & ethical values through novel teaching methods.*
- *To develop an environment which enrich the innovative ideas of students as well as faculty member.*
- *To impart multidisciplinary skill based trainings that fulfills the gap between industry and academia.*

Program Educational Objectives

- Pursue their career in the field of electrical engineering and allied industries.
- Pursue higher education in electrical engineering and other professional courses
- Demonstrate the leadership skills and communicate effectively.
- Apply their concept in solving engineering problems within realistic constraints such as social, environmental, economical, ethical, health & safety.
- Pursue their career as entrepreneur in related or any other field.

ELECTROSPARK

(2019-2020)

Patrons

Shri Vishnu Sharan
Chairman
Shri Puneet Agrawal
Vice-Chairperson

Advisory Committee

Dr. Mayank Garg
Executive-Director
Dr. D.K.Sharma
Dean Academic

Editors

Mrs.Anjali Rana
Assistant Professor
Dr.R.C.Chourasia
Associate Professor

Coordinators

Dr.A.K.Bhardwaj
Professor
Mr.Bhupendra Sharma
Assistant Professor
Mr. Puneet Kumar
Assistant Professor

Electrospark is a half yearly e-magazine, published by Department of Electrical Engineering, Meerut Institute of Engineering and Technology, Meerut, If you have any queries or feedback, address them to ramesh.chourasia@miet.ac.in, anjali.rana@miet.ac.in.

Address

Department of Electrical Engineering
Meerut Institute of Engineering and Technology, Meerut
NH-58, Baghpat Crossing Bypass Road,
Delhi Roorkee Highway, Meerut, UP.-250005

Website: <https://www.miet.ac.in/electrical-gineering>

**Message from
Chairman****Er. Vishnu Sharan**

This gives me immense pleasure to introduce ourselves as a pioneer & path breaking institute in the field of engineering in our region. Continuous efforts are made by our tedious and one of the best faculties to shape the best of student's knowledge and skills, upgrading them to be at par with the demands of Industry in today's world. A magazine not only carries the contributions but it also reflects the ethos and ambition of the students, faculty and other team members of an institution. I am happy to know that the Department of Electrical Engineering MIET Meerut is bringing out its first Electrical Engineering Departmental magazine this year. I went through the innovative project article published in this magazine. They amply demonstrate the communication skills, imagination, creativity, humour and humanism; moreover it is the reflection of the technical competence of its contributors. I wish this maiden attempt all the success.

**Message from
Vice-Chairman****Shri Puneet Agarwal**

Every great Institution stands not on bricks and mortar but the students, faculties and the alumni. What is important is that we document that journey, in the era we live in and with the tools at our disposal it is all the more imperative and easier to share ideas, express opinions, delve on uncharted paths, encourage cumulative efforts so on and so forth. Believe me, I am the happiest person to know that the dedicated team of staff and students have brought out the first-ever magazine of Electrical Engineering Department. They have presented the current era of Electrical Engineering, recent trends and technologies in the magazine in a nice way. I look forward to more innovative articles, researches and active student participation and I would recommend faculty members to mentor the students to run this magazine themselves. Electrospark represents the collective work of the team. I wish the magazine Electrospark a grand success. Good Luck & Good Speed

Message from the Desk of Director



Prof. (Dr.) Mayank Garg

It gives me immense pleasure to voice my thoughts regarding the multidimensional development in the department of Electrical Engineering, MIET, Meerut for the first volume of the e-magazine "ELECTROSPARK" brought out by the students, faculty and staff. Magazine of this type provides an opportunity to the members of MIET Meerut fraternity to express their latent talent in the form of Research/Innovative related with projects articles, views etc., about the life and experiences within and outside MIET, Meerut campus. Magazine also showcases talent spectrum of MIET, Meerut.

Department of Electrical Engineering, MIET, Meerut has made rapid strides in providing all the required facilities including academic, sports and cultural within a short span of seven year. This has been made possible due to dedicated faculty, staff and highly understanding student community. I wish to thank all of them for their contributions. I also take this opportunity to extend my heartiest congratulations to the students of the department who have made us proud through their extraordinary academic excellence that has given us the privilege of placements, higher ever in northern India.

Message from the Desk of Dean Academics



Prof. (Dr.) D.K. Sharma

I am delighted to know that the Electrical engineering department is going to publish the departmental magazine. The seeds of peace in the world have their origin in the righteousness in the heart of every individual. Such righteous citizens lead to the evolution of an enlightened society. Education with a value system has to so design that righteousness in the heart is developed in the mind young technocrats. That should be the mission of technical education. The prime learning environment is in first and second year, and the faculty should concentrate on this very active, energetic and dynamic youth for the development of themselves and ultimately the country. This publication indicates the power of great faculty and what they inculcate in the young minds. I am sure, the magazine ELECTROSPARK will be addressing the promotion of such a society through holistic technical education. My greetings and best wishes for all writers and readers for success in their mission of promoting value-based holistic technical education in our society.

Message from the HOD's Desk



Prof. (Dr.) A.K. Bhardwaj

The Department of Electrical Engineering, MIET, Meerut has recorded consistent improvement in its academic, research and placement performance. It offers a opportunity to students and staff to explore their writing skills and fathom scope of their success and range of innovatively designed programs whose curricula are constantly updated to meet the changing requirement of the industry and also to meet the needs of major stakeholders. It is not only a mode of expression in examination, but also offers insight into a subject matter that could lead towards solution of a problem We believe that our students have been well accepted in their job profiles and have consistently exceeded expectations of the corporate world.

INDEX

S.No.	Topics	Author	Page Number
FACULTY ARTICLES			
1	Electrical Engineering: A career option in India	Dr. Bhupender Sharma	1
2	Energy storage and better batteries	Professor (Dr.) A. K. Bharadwaj	2
3	Application of Drones	Ms. Anjali Rana	3
4	The Internet of Things (IoT)	Mr. Avinash Kumar	4
5	Automated client relationship and project management	Dr. R.C. Chourasia	6
6	Energy-saving lighting technologies	Ms. Shweta Shukla	7
7	Artificial intelligence	Mr. Puneet Kumar	8
STUDENT ARTICLES			
5	Wireless Solar power bank	Amadeep Baliyan	9
6	WARNING- Forest Fire	Manoj Kumar Yadav	10
7	One giant leap towards sustainability	Manoj Kumar Yadav	11
8	Arduino Based Home Automation	Akash Garg	10
9	Smart Energy meter	Ayush Arya	11

FACULTY ARTICLES

Electrical Engineering: A career option in India

Electrical engineering finds its importance from every small thing we do in our everyday life to every big thing we do for our life. I would say we can't really survive without having electrical engineering in the form of components of appliances or the gadgets that we use all around us. Student after 12th class talking about electrical engineering and think that it's a kind advanced work of an electrician, who come home to repair our electric fans and lights. But in reality it's entirely different from that and you will be learning whole lot of Electrical engineering techniques and related stuff in this course. It must be remembered that electricity is a "convenient" form of energy. Any form of energy (thermal/nuclear/hydro/solar/wind/tidal/biogas) must be converted into electricity and transmitted to the ultimate customers to make it usable. There comes the role of electrical engineers. Electrical engineering is one of the core branches of engineering. It's evergreen engineering branch. There will never be a phase without electrical engineering. We need electricity to survive, live and function in our life. So yes, the scope and the opportunities are abundant and evergreen!



No company is there which do not have job opportunities for the B.Tech. Electrical students. What you have to do is that study hard with your basic concepts clear and try to be proficient in English language. There is lot of multidisciplinary research for developing electric vehicles with great funding and scope all over there world. Being an electrical engineer we can opt for:- Industrial automation engineer, Design Engineer, Testing engineer, Maintenance engineer, Purchase and Quality Control Executive, Plant designing and planning officer, Electrical contractors, R&D Engineer in space company like NASA, ISRO etc. And list goes on. Being an Electrical Engineering graduate, in India job opportunities are available in **Government** as well as **Private sector**. Talking about Government and PSU sector jobs, the prime recruiters are: Indian Railways, Indian Armed Forces, ONGC, Power Grid Corporation of India Limited, Thermal Power Plants, Power Stations, State wise Electricity Boards, PWD Department, BHEL, GAIL, NTPC, HPCL, ECILL, BEL, CIL etc. In the above mentioned Government organizations and departments, one may find job posts of- Assistant Electrical Engineer, Junior Engineer, Graduate Engineer Trainee etc. **The core private companies offer electrical engineering jobs are:** ABB, Havells India Ltd., Bajaj International Private Ltd., Torrent power Ltd., Crompton Greaves Limited (CGL), Siemens Ltd., Reliance power Ltd., and Wipro Lighting are name to few.

Graduates may also take up teaching job after completing M.Tech. Program. Teaching career is also rewarding, with attractive remuneration packages. They may also go for Ph.D. program and venture into the Research and Development sector. Electrical Engineering branch is also a good option for girls. Girls can also do very much better than boys in this branch. The electrical engineering graduates can try for jobs in IT related industries. Moreover automation courses like PLC, SCADA and drives are good to add value to this course and get good job openings.



Dr. Bhupender Sharma
Assistant Professor
Department of Electrical Engineering
MIET, Meerut

Energy storage and better batteries

Our lives and way we do business depend on sustainable energy supply. Yet, decarbonization, decentralization and digitalization lead to a radical transformation of the energy landscape. Increasing integration of power from renewable sources, often decentral with multidirectional energy flows, poses challenges to power grids. Despite all these changes, participant of the energy system till need to maintain grid stability, ensure power quality, enable sector coupling, deal with aging assets and reduce costs.

Bringing energy intelligence to the grid not only helps to master these challenges, but also generates new opportunities to increase asset and cyber security, efficiently balance generation and demand and create new revenue stream. This includes the edge, from where the transition towards a decentralized, distributed and decarbonized grid starts. We make energy smarter by integrating energy intelligence across the energy supply chain shaping energy applies that are cot-efficient, safe, reliable and flexible. Our holistic approach helps you to stay competitive in a changing world. No matter what's your role in the energy system.

Li-Ion

Li-ion batteries consist of a graphite electrode and a lithium-based electrode — most commonly lithium-cobalt — immersed in a liquid. When the battery is in use, charged lithium atoms (ions) flow from the graphite electrode to the lithium-based electrode through the liquid, and that flow of charged particles generates electricity. When the battery is recharged the flow is reversed, sending the lithium ions back to the graphite anode where they are stored ready for discharge.

Solid State

Pringle says one option to reduce the fire risk Li-ion batteries pose is to use ionic liquids — non-flammable molten salts with low melting points — as the liquid component. A more attractive idea is to use a solid, which sidesteps the problem of volatile and flammable liquids. But the trade-off is that electrically charged atoms don't move as freely and easily through a solid as they do through a liquid, so less electricity is generated. Some early contenders in the solid-state stationary battery space include those made with a lithium-rich ceramic as a substitute for the liquid currently being used. But these don't avoid the other problems with lithium, such as its finite availability and the justice issues associated with mining. This raises the question of whether cheaper and more abundant elements could be used instead of lithium. There's particular interest in elements such as silicon, sodium, aluminium and potassium. But the electrochemical potential of these metals is lower than lithium, so the energy density of the battery might be reduced, Pringle says.

Sodium-Sulphur

Sodium-sulphur batteries, in which the electrodes are molten sodium and molten sulphur and the electrolyte is solid, have been a promising avenue of investigation for large-scale energy storage for the grid because they are highly efficient at producing electricity, and are long-lasting. One challenge is that these batteries currently need to operate at very high temperatures. But researchers at institutions including the Massachusetts Institute of Technology and the University of Wollongong in Australia are now investigating the possibility of sodium-sulphur options that can operate at room temperature.



Professor (Dr.) A. K. Bharadwaj
Professor & (HOD)
Department of Electrical Engineering
MIET, Meerut

Application of Drones

Drones, also called unmanned aerial vehicles (UAVs), have no human pilot onboard, and instead are either controlled by a person on the ground or autonomously via a computer program. These stealth craft are becoming increasingly popular, not just for war and military purposes, but also for everything from wildlife and atmospheric research to disaster relief and sports photography. Drones are becoming the eyes and ears of scientists by surveying the ground for archaeological sites, signs of illegal hunting and crop damage, and even zipping inside hurricanes to study the wild storms. You can even rent a personal drone to soar above the horizon and snap a photo or video. Our news and features will cover developments in drone technologies, innovative uses for drones and how drone use will impact society.

A drone camera caught a close encounter between a surfer and a white shark off the coast of New South Wales, Australia, last week.

The surfer and the great_white_shark seemed mutually spooked by their brush with each other — though in the surfer's case, the shock came after he swam ashore and saw the drone footage. He would have otherwise never known that a 4.9-foot (1.5 meters) shark came within inches of his legs.

"I was surfing out the back at Sharpes Beach and just cruising on my own and I heard a splash and a noise and looked around and couldn't see anything," Matt Wilkinson, a pro surfer, said in a statement. "Then the drone came down and told me that there was a dangerous shark in the area, return to the beach."



Swimming with sharks



Drones

The drone is operated by Surf Life Saving NSW, an organization that monitors 34 popular beaches in New South Wales by unmanned aerial vehicle (UAV) to alert surfers and swimmers to the presence of large sharks. The program is part of the \$8 million NSW Government Shark Management Strategy. The goal is to prevent shark attacks by getting people out of the water when large sharks are present. When a shark is spotted, the drones broadcast a pre-recorded message warning beachgoers to head to shore. In the drone video, the shark swims toward Wilkinson, seemingly curious. As he paddles on the board, the shark approaches from behind, then seems to nose the tow rope on the surfboard. Suddenly, it darts away and out of sight.

"I've been surfing with sharks my whole life, and I understand they're there and know enough about them to know they have not too much interest in humans. I'm just glad today the shark reconsidered at the last second," Wilkinson said.

Nevertheless, Wilkinson said he felt "a bit weird" after the encounter. "I realized how close it came without knowing it was there," he said.



Ms. Anjali Rana
Assistant Professor
Department of Electrical Engineering
Meerut Institute of Engineering & Technology

The Internet of Things (IoT)

Executive Summary

The Internet of Things is an emerging topic of technical, social, and economic significance. Consumer products, durable goods, cars and trucks, industrial and utility components, sensors, and other everyday objects are being combined with Internet connectivity and powerful data analytic capabilities that promise to transform the way we work, live, and play. Projections for the impact of IoT on the Internet and economy are impressive, with some anticipating as many as 100 billion connected IoT devices and a global economic impact of more than \$11 trillion by 2025.

This overview document is designed to help the Internet Society community navigate the dialogue surrounding the Internet of Things in light of the competing predictions about its promises and perils. The Internet of Things engages a broad set of ideas that are complex and intertwined from different perspectives. Key concepts that serve as a foundation for exploring the opportunities and challenges of IoT include:

- **IoT Definitions:** The term Internet of Things generally refers to scenarios where network connectivity and computing capability extends to objects, sensors and everyday items not normally considered computers, allowing these devices to generate exchange and consume data with minimal human intervention. There is, however, no single, universal definition.
- **Enabling Technologies:** The concept of combining computers, sensors, and networks to monitor and control devices has existed for decades. The recent confluence of several technology market trends, however, is bringing the Internet of Things closer to widespread reality. These include *Ubiquitous Connectivity, Widespread Adoption of IP-based Networking, Computing Economics, Miniaturization, Advances in Data Analytics, and the Rise of Cloud Computing.*
- **Connectivity Models:** IoT implementations use different technical communications models, each with its own characteristics. Four common communications models described by the Internet Architecture Board include: *Device-to-Device, Device-to-Cloud, Device-to-Gateway, and Back-End Data-Sharing.* These models highlight the flexibility in the ways that IoT devices can connect and provide value to the user.
- **Transformational Potential:** If the projections and trends towards IoT become reality, it may force a shift in thinking about the implications and issues in a world where the most common interaction with the Internet comes from passive engagement with connected objects rather than active engagement with content. The potential realization of this outcome – a “hyper connected world” — is testament to the general-purpose nature of the Internet architecture itself, which does not place inherent limitations on the applications or services that can make use of the technology.

Five key IoT issue areas are examined to explore some of the most pressing challenges and questions related to the technology. These include security; privacy; interoperability and standards; legal, regulatory, and rights; and emerging economies and development.



Security

While security considerations are not new in the context of information technology, the attributes of many IoT implementations present new and unique security challenges. Addressing these challenges and ensuring security in IoT products and services must be a fundamental priority. Users need to trust that IoT devices and related data services are secure from vulnerabilities, especially as this technology become more pervasive and integrated into our daily lives. Poorly secured IoT devices and services can serve as potential entry points for cyber attack and expose user data to theft by leaving data streams inadequately protected.

The interconnected nature of IoT devices means that every poorly secured device that is connected online potentially affects the security and resilience of the Internet globally. As a matter of principle, developers and users of IoT devices and systems have a collective obligation to ensure they do not expose users and the Internet itself to potential harm.

Privacy

The full potential of the Internet of Things depends on strategies that respect individual privacy choices across a broad spectrum of expectations. The data streams and user specificity afforded by IoT devices can unlock incredible and unique value to IoT users, but concerns about privacy and potential harms might hold back full adoption of the Internet of Things. This means that privacy rights and respect for user privacy expectations are integral to ensuring user trust and confidence in the Internet, connected devices, and related services.

Indeed, the Internet of Things is redefining the debate about privacy issues, as many implementations can dramatically change the ways personal data is collected, analyzed, used, and protected. For example, IoT amplifies concerns about the potential for increased surveillance and tracking, difficulty in being able to opt out of certain data collection, and the strength of aggregating IoT data streams to paint detailed digital portraits of users. While these are important challenges, they are not insurmountable. In order to realize the opportunities, strategies will need to be developed to respect individual privacy choices across a broad spectrum of expectations, while still fostering innovation in new technology and services.

Legal, Regulatory and Rights

The use of IoT devices raises many new regulatory and legal questions as well as amplifies existing legal issues around the Internet. The questions are wide in scope, and the rapid rate of change in IoT technology frequently outpaces the ability of the associated policy, legal, and regulatory structures to adapt.

While the legal and regulatory challenges are broad and complex in scope, adopting the guiding Internet Society principles of promoting a user's ability to *connect, speak, innovate, share, choose, and trust* are core considerations for evolving IoT laws and regulations that enable user rights.

Emerging Economy and Development Issues

The Internet of Things holds significant promise for delivering social and economic benefits to emerging and developing economies. This includes areas such as sustainable agriculture, water quality and use, healthcare, industrialization, and environmental management, among others. As such, IoT holds promise as a tool in achieving the United Nations Sustainable Development Goals. The broad scope of IoT challenges will not be unique to industrialized countries. Developing regions also will need to respond to realize the potential benefits of IoT. In addition, the unique needs and challenges of implementation in less-developed regions will need to be addressed, including infrastructure readiness, market and investment incentives, technical skill requirements, and policy resources.



Er. Avinash Kumar
Assistant Professor
Department of Electrical Engineering
Meerut Institute of Engineering & Technology

Automated client relationship and project management

Client relationship manager

Think of client relationship managers as the liaisons between the important, non-customer-facing members of your team and the clients they service. Building and maintaining these relationships is the goal of client relationship managers. How they choose to go about it will vary from person to person. But for the most part, you can count on client relationship managers to do everything from congratulating long-term customers on personal milestones to achieving KPI sales goals by the end of the quarter

Client management

Client management is a system that businesses use to attract, manage, and build relationships with customers. Client management can be practiced by any type of company in any industry. Whether this area of business is run by a project manager or a specialist, there are a number of tactics, tips, and trends available to maximize its effectiveness.

Once you have a system in place, it's easy to identify any missing links or underperforming segments and get everything back on track. Managing all of your client data, relationships, and evolving needs can be tricky, but there are plenty of cutting edge tools available to streamline it.

Client management software, systems, and tools

While there is no one way to manage clients, you'll definitely want to include one or more of these in your arsenal, regardless of what your goals are:

- **A great client status report template.** As the name implies, a client status report explains who the client is, what their goals are, and where they are currently in the buying/selling process. Templatizing this type of documentation keeps records uniform and searchable. It's also important to choose a tool that can automatically fill in missing information gaps, update files with new notes, and merge duplicates to keep client communication running efficiently.
- **A set of customer profile requirements.** These will provide a foundation for your client status template. Most CRMs will allow you to create custom fields so you can tailor your profiles to your business goals or unique audience requirements. A customer overview template is a great tool for this as well. When your customer overview template is filled with your customer profile requirements, it allows your teams to get important information at a glance for any and all clients they service.
- **A system for sending client updates and communication.** Progress reports, meeting notes, and quick weekly check-ins all fall in this category. But keeping track of who did (or didn't) send what when can get really confusing in messy inboxes. And that's where these systems really shine. Combine yours with an automated email tool, a fully visible project management platform, and a client update email template, and you'll be off to a good start.
- **Collaborative work management software.** For example, Wrike provides client relationship managers with features that help keep everyone informed while building trust among existing customers. When used correctly, this type of tool can also help teams offer more accurate timelines, strategically manage unexpected roadblocks, and keep their clients well within their original budget.

Now that you know exactly what client management is, what duties it includes, and what tools you need to succeed, let's learn more about the context surrounding the subject.



Dr. R.C. Chourasia
Associate Professor
Department of Electrical Engineering
Meerut Institute of Engineering & Technology

Energy-saving lighting technologies

The lighting industry is continuously improving and developing new products geared toward reducing energy use while meeting the illumination requirements for a given space. "Halogen lamps can be used to replace incandescent general service and parabolic aluminum reflector (PAR) lamps to provide energy savings, and in many cases, longer lamp life," says Anderson. "Compact fluorescent lighting (CFL) also can replace incandescent to deliver similar benefits. New, lower-wattage, pulse-start metal halide systems with electronic ballasts are another option that delivers energy savings and longer lamp life. Solid-state (LED) lighting also is a viable option for replacing incandescent, HID, halogen and CFLs in a variety of indoor and outdoor applications."

To understand the kind of savings new technologies yield, consider that a 65-watt incandescent bulb produces roughly the same amount of light as a 15-watt CFL or an 11-watt LED, assuming that each is using the same fixture, says Jeff Spencer, director of project management — commercial at Juno Lighting Group. He also says that newer technologies do more than slash energy consumption and utility budgets. Modern lighting systems also can reduce maintenance costs by delivering longer lamp life and easier replacement methods.

There are other benefits. "With all the dust, dirt and light depreciation in older buildings, new energy efficient lighting also can improve the appearance," says Spencer. "It makes a space look the way it is supposed to look. You get clean new lamps with an upgrade, and all of a sudden it looks new again." Improvements in the energy performance of lighting technology has led the federal government to take action to drive the market to more efficient products. In 2000, DOE issued regulations requiring the phase out of magnetic T12 fluorescent ballasts for 4-foot linear lamps and 2-foot U-lamps with medium bi-pin bases, 8-foot linear lamps with single-pin bases, and 8-foot linear lamps with RDC bases. The Energy Policy Act of 2005 — widely known as EAct — went further, requiring the phase out of ballasts for T12 energy saving lamps. As of last month, regulations bar the manufacture of T12 magnetic ballasts for use in both new fixtures and replacement applications. What's more, by July 2012, new federal energy standards will eliminate the manufacture or import of many popular T12 lamps as well as a few T8 lamps.

But replacing existing ballasts with electronic ones is only one option. Facility managers with facilities using T12 lamps and magnetic ballasts have other energy-efficient upgrade choices. As Casanova says, "Many facility managers look at lighting upgrades as just changing lamps or upgrading the ballast from magnetic to electronic." But there are other considerations. When selecting from the wide array of new technologies, factors to consider across a number of products include:

- Efficiency improvements (lumens per watt)
- Efficiency standards
- Environmentally conscious products
- Long-life products

"It's bad for the environment if you have to throw away all of the fixtures in a building every five years," Spencer says. "It's only a matter of time before the replaceable light engine feature of some LED fixtures becomes a requirement rather than a nice option."



Ms. Shweta Shukla
Assistant Professor
Department of Electrical Engineering
Meerut Institute of Engineering & Technology

Artificial intelligence

The term artificial intelligence was coined in 1955 by John McCarthy, a math professor at Dartmouth who organized the seminal conference on the topic the following year. Ever since, perhaps in part because of its evocative name, the field has given rise to more than its share of fantastic claims and promises. In 1957 the economist Herbert Simon predicted that computers would beat humans at chess within 10 years. (It took 40.) In 1967 the cognitive scientist Marvin Minsky said, “Within a generation the problem of creating ‘artificial intelligence’ will be substantially solved.” Simon and Minsky were both intellectual giants, but they erred badly. Thus it’s understandable that dramatic claims about future breakthroughs meet with a certain amount of skepticism. Let’s start by exploring what AI is already doing and how quickly it is improving. The biggest advances have been in two broad areas: perception and cognition. In the former category some of the most practical advances have been made in relation to speech. Voice recognition is still far from perfect, but millions of people are now using it — think Siri, Alexa, and Google Assistant. The text you are now reading was originally dictated to a computer and transcribed with sufficient accuracy to make it faster than typing. A study by the Stanford computer scientist James Landay and colleagues found that speech recognition is now about three times as fast, on average, as typing on a cell phone. The error rate, once 8.5%, has dropped to 4.9%. What’s striking is that this substantial improvement has come not over the past 10 years but just since the summer of 2016.



Er. Puneet Kumar
Assistant Professor
Department of Electrical Engineering
Meerut Institute of Engineering & Technology

STUDENT ARTICLES**Wireless Solar power bank**

The objective of this research is to design a Solar Powered Portable Power Bank form mobile phone using sunlight as its ultimate power, which can be used effectively during disaster events. It has in-built solar panel which converts the solar energy to electrical energy. The charge is the n transferred to a battery for storage of charge for further use, with the battery having a microcontroller indicating the percent of charge present in the battery. The battery is connected to a charging circuit having an USB port as output to the respective Mobile phones.



Solar energy can only be harnessed when it is daytime and sunny. To overcome this,

1. Solar panels can be coupled with back-up battery which can store the excess power generated during the day and use it to provide energy to system in the absence of sunlight.
2. The Lead-acid battery used in the design is large in size and heavy in weight which makes the device non-portable. Hence a battery of pocket size and optimal weight may be designed to make the device portable.



Name-Amadeep Baliyan
Roll no -1806820901
Semester-VIth

“WARNING- Forest Fire”

Forest fire has been one of the major factors in destroying the forest and the environment. It is a phenomenon that is seen every year around the globe. These fires set mainly in pine forests on the slopes of the sub-Himalayan region, produced clouds of smoke. The forest department estimated that 3,500 hectares (8,600 acres) of forest had been burnt. Nearly 1,600 incidents of fires were detected which were brought under control by 2 May. Fires destroy biodiversity directly and have more indirect long-term impacts including the encouragement of fire and pioneer species. It has been suggested that the dark carbon dust emitted by the fires deposited on Himalayan glaciers could hasten their melting. The average temperature of northern India saw an increase of 0.2°C. One of the major fallouts of the wildfire was the generation of 'black carbon'. Black carbon, which is created by the incomplete combustion of any biomatter and fossil fuels, coats the Himalayan glaciers in the region. This makes the glaciers attract more heat and melt faster-causing floods in the plains. In 2018, the forest department has released Rs 12.5 crore from the state budget and Rs 1.75 crore from CAMPA to rejuvenate forests like it was earlier. Out of 13 districts in the state, 10 burnt out each year. In 2016, the Central Government earmarked Rs. 5 crore for the fire-fighting operations. In 2016, 70 hectares in Rajaji Tiger Reserve and 60 hectares in Kedarnath Musk Deer Sanctuary had come under fire.

Satellite-based remote sensing technology and GIS tools have been effective in better prevention and management of fires through the creation of early warning. Major satellites of ISRO that provide data of forest fire are INSAT 3D, INSAT 3DR. A number of 37,059 fires were detected in the year 2018 using **MODIS** sensor data. In India, the National Remote Sensing Centre in collaboration with Forest Survey of India presently disseminates in near real-time active fire alerts to forest departments during the fire season using **MODIS TERRA and AQUA** satellite datasets acquired at the NRSC Earth station. Still, a robust fire danger rating system is required in India, which can identify the fire proneness of a region on a daily basis.

“All forests in the world need to be given the same name, so that people can understand that there is only one forest in the world and that every burning forest is his own forest, no matter where in the world!”

— **Mehmet Murat ildan.**



Name –Manoj Kumar Yadav
Roll No- 1806820016
Semester- Vth

“One giant leap towards sustainability”

The roots of exploration are on our earth. We orientate them by our creativity, discoveries and innovative approaches. Earth has provided us with indispensable conditions for our survival and evolution. Millions of years have passed since humans were evolved and now we cannot deny the fact that it's time to go back to the drawing board with sustainable approaches for the sake of humanity. Despite the progress that we have made in the history of space technology, there are a lot of challenges we need to overcome for humanity in outer space.

We call ourselves homo sapiens but were never wise enough to this land. Recent research states that three-quarters of earth land is under pressure because of humans. We have used technology in a way that has destroyed humanity, resulting in young students asking to give them the sustainable future we promised. Very rightly said “never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it is the only thing that ever has – Margaret Mead” Before we miss the boat and our planet comes to its darkest sides, with commitments and complete efforts we need to have peaceful and socioeconomic ways. Scientists, engineers are working on multi-billion dollar rockets as we see outer space in the future of our life. Space agencies have advanced technologies, satellites, antennas, that are providing us updated data, records and useful information. We are not supposed to reconstruct those ground stations in outer space. Resulting in more area for other species and requirements for our survival. Only the stations required to receive information are to be worked over.

Advanced technology should be sent before any species and get all the data required, with less budget and non-identical approaches such as Mangalyaan mission. There must be a space community from every country that will lead in outer space. These communities will directly communicate to the space agencies on earth. The places which are mostly being affected, people from those should be transferred first. For the shelters and every other necessary construction can be made by the resources from the places on earth where people have migrated. No places should be affected on earth where the space sustainable work is going on and no place is to be affected just to full fill the greed. As of 2019, 8378 satellites are orbiting around earth. Most of them are not in an active state. Current demand is to find out the ways to remove debris. We “the wise humans” have sent many satellites for making ‘records’ in order to have popularity. This is what needs to be stopped. Only the satellites required for data are to be orbited. Debris needs to be removed. In outer space, around the globe, only the required satellites are to be orbited for the communication with the active satellites on earth. New satellites should be constructed in a way that they can be deorbited when deactivated. We need innovation in different directions. Innovation leading to a sustainable future.

The main focus is to have the ability of all humanity to use outer space for and in peaceful and socioeconomic benefits. All the laws treaties that are created keeping everything in mind for the benefit of species, needs to be followed. Some of them are:

- Outer space treaties
- Rescue agreement
- Moon agreement
- Liability convention

Despite all the technical approach, there is something humans need to understand. “The earth is what we have in common”, which is now changing, every species is connected genetically. Every country needs to get together since it's a fight between the problems we created and us. We were warned by our scientist Stephen Hawking that if humanity does not become a space faring species, we may go extinct! Trusting the statement “somewhere, something incredible is waiting to be known – Carl Sagan”. The time has arrived to not repeat history and take humanity in outer space in a safe and sustainable way.

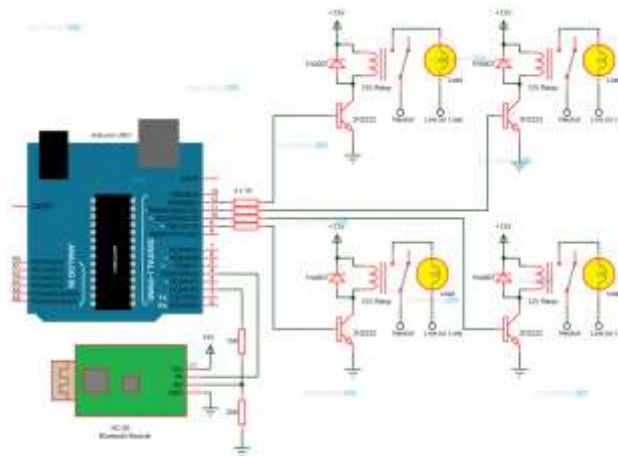


NAME-Manoj Kumar Yadav
ROLL No- 1806820016
SEMESTER- Vth

Arduino Based Home Automation

How To Make Arduino Based Home Automation Project via Bluetooth? We are living in 21st century where automation of any form i.e. home or industrial plays an important role in human life. When it comes to industrial automation, the concept is applied to large machines or robots which help in increasing the efficiency in terms of production, energy and time. Home automation on the other hand involves automating the household environment. This is possible because of the smart phones and internet that we are widely using. Home automation can be again divided in to just controlling the appliances using a Smartphone from a remote location and another type filled with sensors and actuators which controls the lighting, temperature, door locks, electronic gadgets, electrical appliances etc. using a "Smart" system. In this project, we will design a simple home automation project using simple components using which different electrical appliances can switched on or off. The project is based on Arduino and we have used Arduino UNO for the project.

Circuit Diagram



Applications

- Using this project, we can turn on or off appliances remotely i.e. using a phone or tablet.
- The project can be further expanded to a smart home automation system by including some sensors like light sensors, temperature sensors, safety sensors etc. and automatically adjust different parameters like room lighting, air conditioning (room temperature), door locks etc. and transmit the information to our phone.
- Additionally, we can connect to internet and control the home from remote location over internet and also monitor the safety.

Limitations

- The system needs a continuous power supply to be practical or else we might not be able to control the appliances.
- Hence, best way to design the system efficiently would be to implement both the automated control and manual control through switches at a time.



NAME: - AKASH GARG
ROLL NO: - 1706820004
SEMESTER: - 7TH

“Smart Energy meter”



Energy theft is a very common problem in countries like India where consumers of energy are increasing consistently as the population increases. Utilities in electricity system are destroying the amounts of revenue each year due to energy theft. In this Modern World, Internet administrations and mobiles have turned into an inseparable piece of everyday life. Yet, tragically, the specialist co-ops of power are as yet utilizing the traditional strategies for getting data on vitality devoured by the clients, which is obsolete, wasteful and tedious one. I am present a smart energy meter for an automatic and superior metering and billing system,

What is SMART ENERGY METER?

A smart meter is a digital meter that replaces old Analog meters, which are used in homes to record Electrical usage. These digital meters can transmit

Energy consumption information to the utility (As it is connected to the internet) in frequent intervals, and can monitor consumption more precisely, thereby enabling more informed energy choices.

How does Smart Energy meter Work?

Smart meters use a secure national communication network (called the DCC) to automatically and wirelessly send your actual energy usage to your supplier. If you have a smart meter you don't need to rely on estimated energy bills or provide your own regular readings. Smart meters also come with an in-home display. This display gives you real-time usage info, including kWh use and cost.



Benefits of a Smart Meter,

1. More accurate bills Smart meters mean the end of estimated bills, the end of having to remember to provide meter readings and/or have a stranger come into your home to read your meter.
2. Better understanding of your usage With the smart meter display, you can see the direct impact your habits and lifestyle have on your bill. This is particularly useful if you have a prepayment meter, so you can better track how your usage impacts your available credit.
3. For consumers, smart meters help in monitoring and managing electricity consumption and save money. It can be like your mobile pre-paid connection. You can buy electricity for a fixed amount, and use it. After finishing, you can top-up, just like a mobile recharge.
4. It can reduce billing errors.
5. Smart meters help power distribution companies to conduct power-quality analysis in near-real time, taking into consideration factors such as maximum demand, voltage fluctuation, outage detection etc.
6. It helps discom reduce peak power purchase cost, thereby improve business efficiency. This in turn reduces their debt, thereby helping the economy.
7. Smart meters also aids in the recovery of receivables, which has caused a huge stress on the system. Estimates say that Rs 1 lakh crore worth power was unbilled last year. So, it can help discom plug leakages in the whole chain.



Name - Ayush Arya
Roll No.- 1900680209002
Semester- Vth