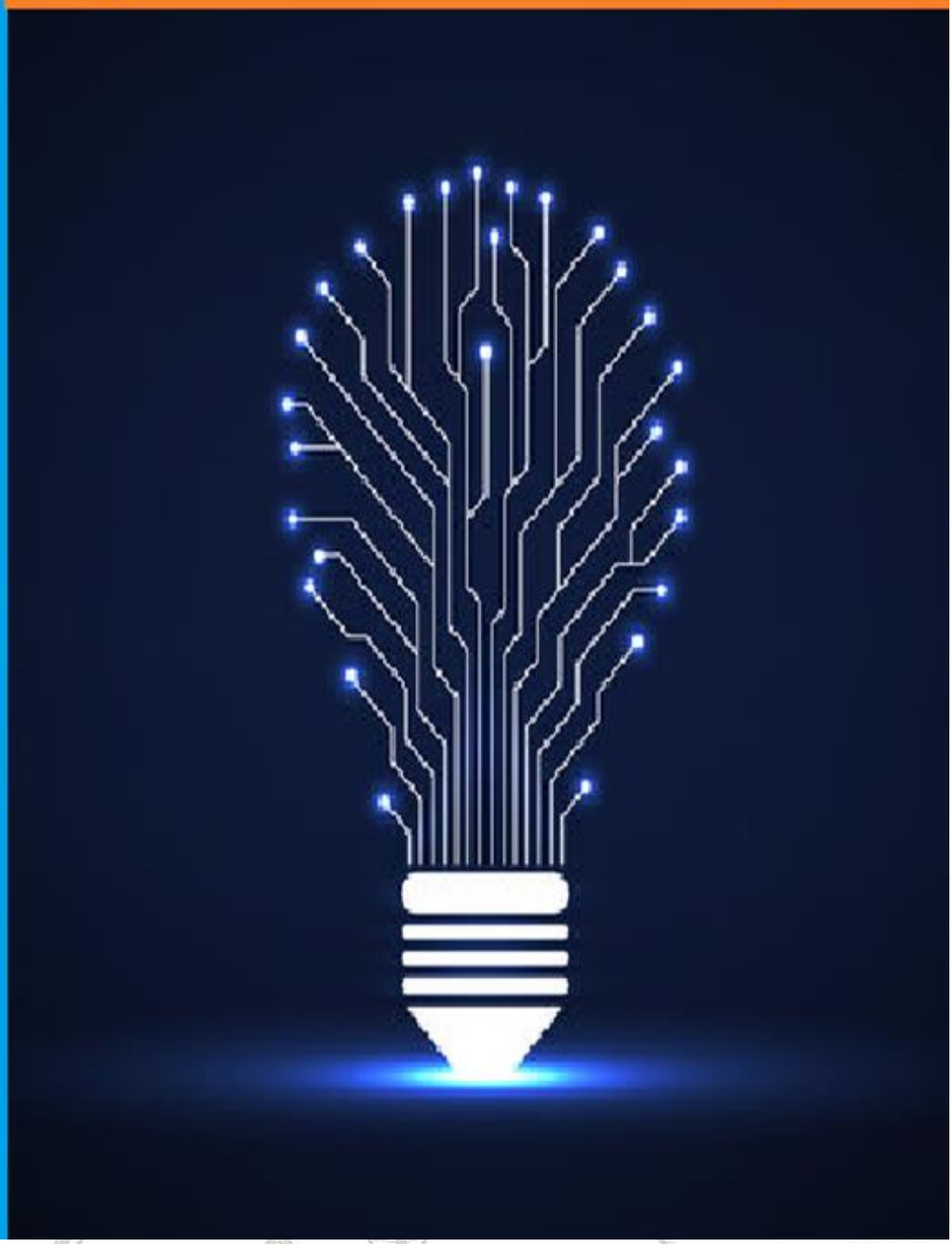
Gyan Ganga Institute of Technology & Sciences, Jabalpur

ELECTRA

July 2020

Volume - 1, Issue - 1



ELECTRA

The Yearly E-Magazine of Electrical Engineering Department
2019 – 2020 (Volume - 1, Issue - 1)

GYAN GANGA INSTITUTE OF TECHNOLOGY AND SCIENCES, JABALPUR

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ABOUT THE DEPARTMENT

Department of Electrical Engineering (EE) is established in the year 2003 with the intake of 60 students to meet the requirements of Electrical Engineers for power sector, power sector industries, productions industries (PSU/Private) and R & D activities of Electrical Engineering after the consultation with stakeholders of the institute. Excellent infrastructure and lab equipment are provided for the students, so that our students come out with knowledge of latest cutting edge technology in both software and hardware. The Electrical engineering department has been accredited with excellence by National Board of Accreditation (NBA), New Delhi till 30th June, 2021.

VISION OF THE DEPARTMENT

- To produce Electrical Engineering graduates with sound technical knowledge and with ethical values who could excel in Electrical Systems.
- To apprise students of state of art technology and industrial engineering applications.
- To make Electrical Department as a center of excellence.
- To encourage industrial activities in department with faculty and student participation.

MISSION OF THE DEPARTMENT

- To Impart intensive and innovative teaching and training through latest technology to provide cutting-edge for achieving excellence.
- To award practical projects aiming at solutions to practical industrial problems.
- To motivate faculty and technical assistants for updating / upgrading knowledge through training, seminars, workshops, conferences and higher studies.
- To create accredited / certified center for testing of transformers and other electrical equipment to cater to the needs of power sector / industries.
- Impart knowledge / solutions of social challenges, ethics, echo / environment etc. to produce worthy citizens.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs):

PEO 1 - Graduates will enter careers in the MNCs, PSUs, Private sector companies, etc. in the field of design, application, installation, manufacturing, operation & maintenance of electrical systems.

PEO 2 - Graduates will be undertaking higher studies. Graduate will analyze real life problems, will design techno-commercially feasible solutions to social problems.

PEO 3 - Graduates will be entrepreneurs, and will produce intellectual citizen to constitute an elegant society to meet social challenges with ethical & moral values having concern for the echo and environment.

PROGRAM SPECIFIC OUTCOMES (PSOs):

On successful completion of Electrical Engineering Program, the graduate Engineers will be able to

PSO1: Apply principles of engineering, sciences, mathematics and laboratory skills for designing and developing solutions to problems of applications in the field of Electrical power and Energy systems.

PSO2: Engage in independent and lifelong learning in the technological advancements with the usage of modern design tools to analyze and design variety of complex applications in the field of Electrical Engineering.

PSO3: Communicate effectively with good leadership and managerial skills to work in a team or as team leader for techno commercially viable sustainable development of society, exhibiting core professional ethics.

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FROM THE CHAIRMAN'S DESK

I am elated at the publication of college magazine for the academic year 2021-22. I sincerely hope that the magazine proves to be an enjoyable and useful apparatus in the hands of both students and teachers of the college. I am also confident that it will serve as a source of inspiration for the teachers as well as the students to contribute articles regularly to the magazine in future. I whole-heartedly congratulate the HOD, Editors and the committee members on their successful endeavor to bring out the magazine.

Dr. Rajneet Jain

Chairman, Gyan Ganga Group

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FROM THE PRINCIPAL'S DESK

It takes me great honour in congratulating the students who have contributed for the current year's Tech Advisor magazine Acknowledging the fact that the magazine is completely created and designed by the students, I really hope this would kindle a spark in the minds of the students who are yet to contribute towards the progress of The Electric initiative in the upcoming years.

Dr. Ravindra V. Kshirsagar
Principal, GGITS, Jabalpur

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FROM THE HOD'S DESK

I am very much happy that our department have taken steps to publish the quarterly e-magazine "ELECTRA". I hope it will create enthuse among students and staffs in future. ELECTRA is a communication link between faculty members and students within and outside the department. It reports about development and areas of thrust in the field of Electrical Engineering. ELECTRA tries to bridge the gap between academic and actual mode of working in the industry by providing articles on various topics of industry. At the same time magazine also serve as a knowledge booster and helping hand to our students. We also make aware our students with the general issues related to environment, ecology, economy and rest of the society. It also helps to bring

Dr. Ruchi Pandey
Head of Department
Electrical Engineering
GGITS, Jabalpur

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FROM THE EDITOR'S DESK

The Creative minds of the Electrical Engineering Department of Gyan Ganga Institute of Technology and Sciences have come together to present what they have always wanted to and we congratulate every student who has given their contribution. They can't be appreciated enough and we can't explain how difficult it was to compile all their accomplishments into a single magazine. We take pride in showing you of how our very own GGITians have imaginations which spread across the horizons. We would like to thank the Management and all the staffs who have supported the 'ELECTRA' initiative and for having trust in the Editorial board by giving us full freedom to choose the contents and design for out magazine. The magazine should serve as a pillar of motivation for every other student who is yet to emerge as an Achiever and to carry the legacy of ELECTRA. The students who follow in the next academic years, we advise you to do the same. Go Mad, Be Productive but at the same time Be Creative!

FACULTY ARTICLES

ENERGY STORAGE SYSTEM

Electrical power infrastructures are changing dramatically around the globe due to smart grid initiatives, the establishment of renewable and the resulting distributed nature of creating electricity, the need for independent micro grids to ensure grid reliability, new demands from end users, the need to reduce greenhouse gas emissions, as well as the capability to accommodate mixed energy resources. As a result, the power network faces great challenges in generation, transmission and distribution to meet new and many times unpredictable demands of providing coherent electricity supply. Electrical Energy Storage (**EES**) has been considered a gamechanger with a number of technologies that have great potential in meeting these challenges. The suitability of a storage technology is determined primarily by its power and energy capacity and the rate at which these can be stored and delivered. Other characteristics to consider are roundtrip efficiency, cycle life, calendar life, safety, reliability, effect on the environment and ramp rate (how fast the technology can respond to a command). Other energy storage technologies such as compressed air fly wheel, and pump storage do exist, but recent generation focuses on battery energy storage systems (**BESS**) and its related applications.

Overview of the Energy Storage Technologies:

Today, most common battery chemistries are based on lead, nickel, sodium and lithium electro chemistries. Emerging technologies like flow batteries utilize various transition metals like vanadium, chromium and iron as the electro active element. Carbon electrodes are a critical part of several of these battery systems. . Each storage type has distinct characteristics, namely, capacity, energy and power output, charging/discharging rates, efficiency, life-cycle and cost that need to be taken into consideration for possible applications. Understanding their chemical characteristics and related regulations are critical steps for possible use. This includes the application, sitting, installation, operation and maintenance, as well as shipping and disposing of used batteries. This topic presents a survey of available and emerging battery technologies and their design and performance characteristics. Electric Double Layer Capacitors (often referred to as ultra capacitors or super capacitors) are also addressed in this topic.

Lead acid batteries:

The lead-acid battery was invented in 1859 by French physicist Gaston Planet and it is the oldest and most mature rechargeable battery technology. There are several types of lead-acid batteries that share the same fundamental configuration. The battery consists of a lead (Pb) cathode,

a lead-dioxide (PbO_2) anode and sulphuric acid electrolyte (H_2SO_4). The deep cycle/traction and the traditional stationary battery types are the most commonly used in Smart Grid applications.

The deep cycle battery is composed of very thin plates and has a low energy density; however, its relatively high power density makes it attractive for use in motor vehicles to provide the high current required for power engine starters. The larger format and thicker plate stationary battery is used in a number of applications where interruption to the load cannot be tolerated. Common use in the energy space includes standby backup power for switchgear, turbine motors, data centres and any other application where reliability of the load is critical. Lead-acid batteries are widely used because they are less expensive compared to many of the newer technologies and have a proven track record for reliability and performance.

Nickel–Cadmium batteries

The nickel–cadmium battery (NiCd) is a rechargeable battery using nickel oxide hydroxide and metallic cadmium as electrodes. Wet-cell nickel-cadmium batteries were invented in 1899. A NiCd cell delivers around 1.2 volts output voltage until nearly the end of discharge. Compared with other types of rechargeable batteries, NiCd batteries offer satisfactory life-cycle characteristics and improved performance at low temperatures with a good capacity retention at high rates. However, the material costs are higher than that of the lead acid batteries. Moreover, NiCd cells experience the so called “memory effect” and high self-discharge rates which have a great impact to their performance characteristics. In addition, an environmental concern on the disposal of the toxic metal cadmium has dramatically reduced the use of NiCd batteries.

Nickel–metal hydride batteries

A nickel–metal hydride battery (NiMH) is also a type of rechargeable battery. Similarly to NiCd batteries, NiMH cells use nickel oxide hydroxide (NiOOH), which is formed in the positive electrode. The use of Cd in the negative electrode is replaced by a hydrogen-absorbing alloy. A NiMH battery can have two to three times the capacity of an equivalent size NiCd, and its specific energy of 80Wh/kg is about 50% of a lithium-ion battery. Main applications of the NiMH batteries are found in consumer electronics and plug-in electric vehicles and hybrid vehicles due to the technology maturity and their competitive cost to Li-ion batteries. However, Li-ion batteries are considered to most promising for the EV industry mainly due to their continuously falling cost and improved performance.

Lithium-ion batteries

In 1991, Sony and Asahi Kasei released the first commercial lithium-ion battery. A lithium ion battery (Li-ion) is a type of rechargeable battery where lithium ions move from the negative

electrode to the positive electrode during discharge. The process is reversed during charging. With a high energy density, negligible memory effect and low self-discharge, Li-ion batteries are one of the most popular types of rechargeable batteries for portable electronics. In recent years, they are also growing in popularity for military, Plug-in electric vehicle (PEV), and aerospace applications. Different types of Li-ion battery chemistries present different performance, cost and safety features that can suit a variety of applications. For example, lithium cobalt oxide (LiCoO2) batteries are used in most handheld electronics due to their high energy density and low weight. Other types such as Lithium iron phosphate (LiFePO4), lithium ion manganese oxide batteries (LiMn2O4, Li2MnO3, or LMO) and lithium nickel manganese cobalt oxide (LiNiMnCoO2 or NMC) offer lower energy density, but can provide longer lifetime and inherent safety. These types are widely used for electric tools and medical equipment. The newer emerging type of lithium–sulphur batteries promises the highest performance-to-weight ratio. Li-ion batteries present a high efficiency and a long lifespan. The technology is still under development, therefore further performance improvements may be expected in the future. In January 2017, Tesla Motors began production of lithium-ion battery cells for energy storage at its Giga factory in Nevada. The high-performance cylindrical “2170” cell, jointly designed by Tesla and its Japanese partner Panasonic, will be used in Tesla’s Power pack 2 and Power wall 2. In 2018, it is expected to be used for its Model 3 electric vehicles as well.

Flow batteries

Flow batteries are considered unique in that the power and energy of the battery are entirely decoupled. A flow battery is consists of multiple electrochemical cells connected in series in a stack. These stacks are then connected in series and/or stacks to form a Flow Battery Energy Storage System (FBESS). The stack configuration dictates the power of the cell while the energy is controlled by the chemical energy contained in the electrolyte tanks that are external to the stack. Positive and negative electrolyte solutions are pumped into the stack where they are separated by ion-exchange membranes or a porous separator. Ion exchange (accompanied by flow of electric current) occurs through the membrane while both liquids circulate in their own respective space. There are several types of flow batteries such as Fe-Cr, Fe-V (vanadium 10 redox) and hybrid flow systems such as Zinc-Bromide (Zn-Br2) and Zinc-Chloride (Zn-C12). These are typically aqueous based solutions, and thus cell voltages are limited between 1.0 to 1.8 volts to prevent hydrolysis of the water. Non-aqueous electrolyte flow battery systems have the potential for higher energy density due to high open circuit voltage and a potential for more than 1 electron per mole of the active species. However, these are still under development. Currently, the most cost effective flow

battery that exhibits good performance and safety is the all vanadium redox flow battery. Since the power and energy of the flow battery are separate, specialized cost performance models are required to determine the optimal energy to power stations for grid storage applications. Flow batteries are analogous to a fuel cell to the extent that reactants flow past or through the electrodes. The conversion is less than 100% per pass. Flow batteries have several technical advantages over conventional rechargeable batteries, but a monitoring and control mechanisms is required. Flow batteries are inherently safe as the aqueous electrolyte is non-flammable. Flow batteries are most cost effective for longer duration, energy intensive applications. However, they do retain their ability to do fast ramp rates. This enables them to provide multiple power and energy services. This operational flexibility makes the flow battery very attractive for grid scale applications.

Sodium–sulphur batteries:

A sodium–sulphur (NaS) battery is a molten-salt battery constructed from liquid sodium (Na) and sulphur (S). NaS batteries are fabricated from inexpensive materials, which form one of the main advantages of this technology type. NaS batteries have high energy density, high efficiency of charging/discharging (89–92%) and long cycle life. The main drawbacks of the NaS battery are the operating temperatures of 3000C to 3500C and the highly corrosive nature of the sodium polysulphides. Battery cells become more economical with increasing size, therefore NaS batteries are considered more suitable for stationary energy storage applications. Typical applications of NaS batteries are distribution network support and grid services and renewable energy integration. The technology has a great potential for grid services since it has a long discharge time and can respond precisely to improve power quality issues in the grid.

Sodium-nickel-chloride batteries

Sodium-nickel-chloride (NaNiCl2) is high-temperature batteries similarly to NaS batteries. Their operating temperature lies within the 2700 C-3500 C range. During the charging process, salt (NaCl) and nickel (Ni) are transformed into nickel-chloride (NiCl2) and molten sodium (Na). The process is reversed during discharge. Typical applications of NaNiCl2 batteries are grid support services and renewable energy integration.

Electric Double layer Capacitors

Electric Double Layer Capacitors (EDLCs), also known as “ultra capacitors” or “super capacitors” store electrical charge in an electric double layer (non-Faradic) at the interface between a high-surface-area carbon electrode and a liquid electrolyte. This mechanism is highly reversible and therefore just as with ECs, conventional capacitors, can be charged and discharged at high power rates with low capacitance fades for hundreds of thousands of cycles. The electrode surface

area in capacitors determines the capacitance and thus, the energy storage capability of the device. The amount of energy stored by EDLCs is very large compared to conventional capacitors because of the use of a porous carbon-based electrode material of high surface area. While ultra capacitors have very high specific power (10-20 kW/kg), and longer lifetime relative to batteries, they have a low specific and volumetric energy density (<8Wh/kg). Ultra capacitors exhibit significantly less sensitivity to temperature than Li-ion batteries. Ultra capacitors are well-suited for high power applications in a variety of areas, with applicability at Transmission, sub-transmission, as well as distribution voltage levels. The key features of ultra capacitors are extremely appealing in electricity grids: fast response time in milliseconds, high energy efficiency (> 95%), high power density and long calendar and cycle life. Deployment of EDLCs has accelerated greatly over the last 15 years; they are now widely commercialized in hybrid bus, rail, and automotive applications, as well as back-up power applications such as wind pitch control systems and uninterrupted power supplies. Moreover, there are several trials and pilot projects that study the utilization of super capacitors for grid energy storage systems. They can be a stand-alone technology or hybridized with a second, low cost high energy density technology such as flow batteries or high energy Li-ion batteries.

Comparison of battery storage technologies

A summary of the energy storage technologies discussed above is presented at table. Different types are compared by their main technical characteristics, such as cycle life performance and efficiency.

Prof. Amit Gupta

Asst. Prof. Electrical Engg. Dept.

GGITS, Jabalpur

TRANSDUCER: – AN INDUSTRIAL INSTRUMENT

Instrumentation is the heart of industrial applications. Instrumentation is the art and science of measuring and controlling different variables such as flow, level, temperature, angle, displacement etc. A basic instrumentation system consists of various devices. One of these various devices is a transducer. A transducer plays a very important role in any instrumentation system. An electrical transducer is a device which is capable of converting the physical quantity into a proportional electrical quantity such as voltage or electric current. It converts any quantity to be measured into usable electrical signal. This physical quantity which is to be measured can be pressure, level, temperature, displacement etc. The output which is obtained from the transducer is in the electrical form and is equivalent to the measured quantity. There are of many different **types of transducer**, they can be classified based on various criteria as

- Types of Transducer based on Quantity to be Measured
- Temperature transducers (e.g. a thermocouple)
- Pressure transducers (e.g. a diaphragm)
- Displacement transducers (e.g. LVDT)
- Flow transducers
- **Types of Transducer based on the Principle of Operation**
- Photovoltaic (e.g. a solar cell)
- Piezoelectric
- Chemical
- Mutual Induction
- Electromagnetic
- Hall effect
- Photoconductors
- Types of Transducer based on Whether an External Power Source is required or not

Active Transducer

Active transducers are those which do not require any power source for their operation. They work on the energy conversion principle. They produce an electrical signal proportional to the input (physical quantity). For example, a thermocouple is an active transducer.

Passive Transducers

Transducers which require an external power source for their operation is called as a passive transducer. They produce an output signal in the form of some variation in resistance, capacitance or any other electrical parameter, which than has to be converted to an equivalent current or voltage signal. One of the important transducers used in industrial purposes is piezoelectric transducer

Piezoelectric material is one kind of transducers. We squeeze this material or we apply force or pressure on this material it converts it into electric voltage and this voltage is function of the force or pressure applied to it. The material which behaves in such a way is also known as **piezoelectric Sensor**. The electric voltage produced by **piezoelectric transducer** can be easily measured by voltage measuring instruments, which can be used to measure stresses or forces. The physical quantity like mechanical stress or force cannot be measured directly. Therefore, piezoelectric transducer can be used.

Piezoelectric actuator behaves in reverse manner of **piezoelectric sensor**. It is the one in which the electric effect will cause the material to deform i.e. stretch or bend. That means in piezoelectric sensor, when force is applied to stretch or bend it, an electric potential is generated and in opposite when on a **piezoelectric actuator**, an electric potential is applied it is deformed i.e. stretched or bend.

Piezoelectric transducer has high sensitivity. So, it acts as sensor and used in accelerometer due to its excellent frequency of response. The piezoelectric effect is used in many applications that involve production and detection of sound, electronic frequency generation. It acts as ignition source for cigarette lighter and used in sonar, microphone, force, pressure and displacement measurement

Application of Piezoelectric Materials

1. In microphones, the sound pressure is converted into electric signal and this signal is ultimately amplified to produce louder sound.

2. Automobile seat belts lock in response to a rapid deceleration is also done by piezoelectric material.

3. It is also used in medical diagnostics.

4. It is used in electric lighter used in kitchens. Pressure made on piezoelectric sensor creates an electric signal which ultimately causes flash to fire up.

5. They are used for studying high speed shock waves and blast waves.

6. Used in fertility treatment.

7. Used in Inkjet printers

8. It is also used in restaurants or airports where when a person steps near the door and the door opens automatically. In this the concept used is when person is near the door a pressure is exerted persons weight on the sensors due to which the electric effect is produced and the door opens automatically.

Examples of Piezoelectric Material

1. Barium Titanate.

2. Lead zirconatetitanate (PZT).

3. Rochelle salt.

Advantages of Piezoelectric Transducer

1. No need of external force.

2. Easy to handle and use as it has small dimensions.

3. High frequency response it means the parameters change very rapidly.

Disadvantages of Piezoelectric Transducer

1. It is not suitable for measurement in static condition.

2. It is affected by temperatures.

3. Output is low so some external circuit is attached to it.

4. It is very difficult to give desired shape to this material and also desired strength.

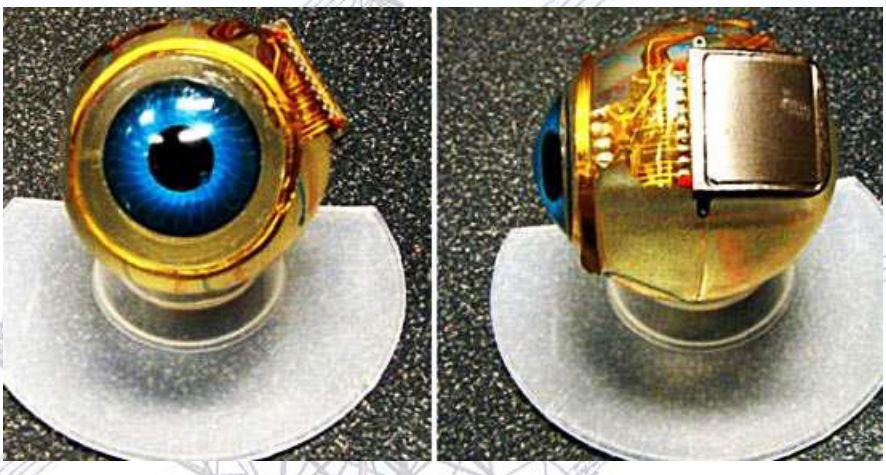
Conclusion

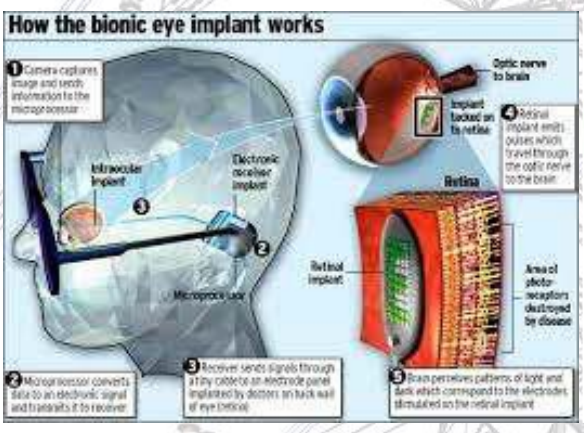
A transducer can be used in industry for various purposes by which the physical, mechanical or optical quantity to be measured is transformed directly by a suitable mechanism into an electrical voltage or current proportional to the input measured.

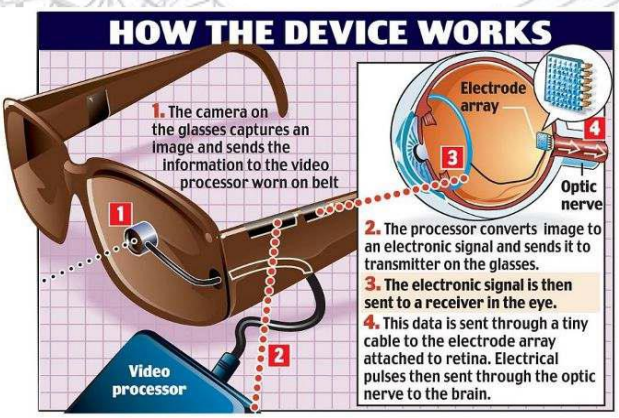
Prof. Raghuwansh Singh
Asst. Prof. Electrical Engg. Dept.
GGITS, Jabalpur

STUDENTS ARTICLES

BIOINIC EYE







In 1983 Joao Lobo Antunes, a world renowned Portuguese doctor, implanted a bionic eye in a person born blind. Many devices have been developed, usually modeled on the cochlear implant or bionic ear devices, a type of neural prosthesis in use since the mid-1980s. The idea of using electrical current (e.g., electrically stimulating the retina or the visual cortex) to provide sight dates back to the 18th century.

This bionic eye system will consist of a small digital camera, external processor and a implant with a microchip and stimulating electrodes surgically placed in the back of the eye.

The bionic vision system consists of a camera, attached to a pair of glasses, which transmits high-frequency radio signals to a microchip implanted in the eye. Electrodes on the implanted chip convert these signals into electrical impulses to stimulate cells in the retina that connect to the optic nerve. These impulses are then passed down along the optic nerve to the vision processing centres of the brain, where they are interpreted as an image.

A person using a retinal implant to see will not experience vision in the same way a person with healthy vision does. Vision will be quite basic to start with and people will need training to adapt to

the implant. With time, training and patience, people will be able to use this visual information to be more independent and mobile.

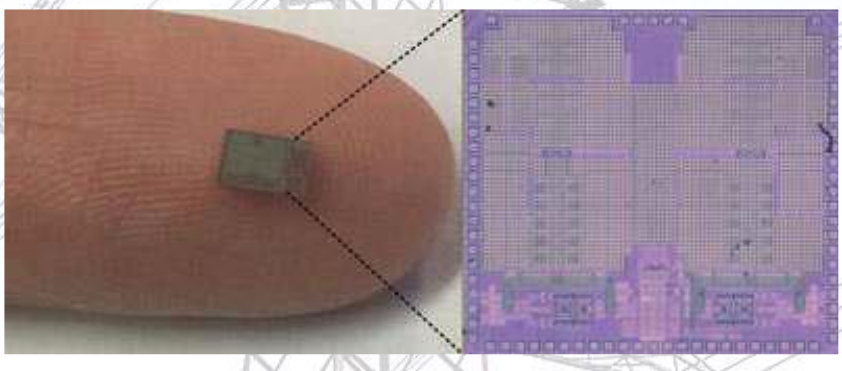
The retinal implant bionic eye works by stimulating the perception of light in a patient. A phosphene is a perceived spot of light in the visual field. What our technology aims to do is stimulate many of these phosphenes across the visual field in a way that enables the patient to put together a picture of what they are looking at. The more electrodes an implant contains, the more phosphenes are capable of being generated and the more detail a patient may be able to see.

Ms. Kainat Khan

TECHNOLOGY FOR DOUBLE RADIO FREQUENCY DATA CAPACITY

A team of Columbia Engineering researchers has invented a technology-full-duplex radio integrated circuits (ICs)-that can be implemented in nanoscale CMOS to enable simultaneous

transmission and reception at the same frequency in a wireless radio. Up to now, this has been thought to be impossible: transmitters and receivers either work at different times or at the same time but at different frequencies. The Columbia team, led by Electrical Engineering Assoc. Prof. Harish Krishnaswamy, is the first to demonstrate an IC that can accomplish this.



In the era of big data, the current frequency spectrum crisis is one of the biggest challenges researchers are grappling with and it is clear that today's wireless networks will not be able to support tomorrow's data deluge. Today's standards, such as 4G/LTE, already support 40 different frequency bands, and there is no space left at radio frequencies for future expansion. At the same time, the grand challenge of the next-generation 5G network is to increase the data capacity by 1,000 times.So the ability to have a transmitter and receiver re-use the same frequency has the potential to immediately double the data capacity of today's networks. Krishnaswamy notes that other research groups and startup companies have demonstrated the theoretical feasibility of simultaneous transmission and reception at the same frequency, but no one has yet been able to build tiny nanoscale I Cs with this capability.

Mr. Ram Chouksey

Expert Lectures, Workshops, Webinars Organised by the Department

- Expert lecture on **"Power system Generation Scenario and Switchgear System"** was organized for the Electrical Engineeing students on 05/10/2019 by the Department of Electrical Engineering.

  Resource Person: Mr. K. K. Murti Retd. Chief Engineer, MPPKVVCL Jabalpur.

-

- Department has organized Expert lecture on **"Smart Grid"** for the Electrical Engineering students on 10/08/2019.

  Resource Person: Dr. Ashok Kumar Tiwari Course Director.

- Department has organized a **"Hands on Workshop"** on **"Arduino Programming and IOT Application"** Conducted by **Eagle Foundation** for V Semester Students.

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  Rajneesh Yadav, Aishwarya Vishwakarma, Nishkarsh Singh Thakur and Ritik Kesharwani, Students of Department of Electrical Engineering, who won the first prize in the event of AICTE sponsored, **Charta Vishwakarma Award 2019**. The event was organized in AICTE on **20 DEC 2019.**

  One day workshop on **"Matlab"** is organized for the Electrical Engineering students on 03/08/2019 by the Department of Electrical Engineering.

  Resource Person: Prof. Anand Goswami Asst. Prof., EE Department, GGITS Jabalpur.

- A Seven Days Hands on Training on **"EDA (Electrical & Electronics Design Automation)"** is delivered by Mr. Vivek Singh, Engineer, Jabalpur Incubation Center, Jabalpur from 08/07/2019 to 14/07/2019. Students of 3rd Sem Electrical Engineering Department had been benefited.

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  Expert lecture on **"Power System Security & Theft Monitoring"** was organized for the Electrical Engineering students on 28-03-2020 by the Department of Electrical Engineering.

  Resource Person: Dr. Vivek Chandra, GM & Head IT MPPKVVCL Jabalpur

  Guest lecture on **"Energy Management and Auditing"** was organized for the Electrical Engineering students on **07-03-2020** by the Department of Electrical Engineering.

Resource Person : Mr. M.M Dhoke, Superintendent Engineer MPPKVVCL Jabalpur

Three day workshop on **"Circuit Simulator"** was organized for the Electrical Engineering students on 06/02/20 to 08/02/ 2020 by the Department of Electrical Engineering.

Resource Person : Mr. Vivek Singh, Director Eagle Foundation Jabalpur

Workshop on **"e-sim"** was organized for the Electrical Engineering students on 10/01/2020 by the Department of Electrical Engineering.

Resource Person : Prof. Ruma Deb, Asst. Prof., GGITS, Jabalpur

One day webinar on **"Role of Intellectual Property& Innovation Management in Engineering science under make in India"** was organized for the Electrical Engineering students on 04/01/20 by the Department of Electrical Engineering.

Resource Person : Prof. S.K Bajpai, GGITS, Jabalpur

One day Expert lecture on **"Industrial Application of Power Electronics"** was organized for the Electrical Engineering students on 15/09/20 by the Department of Electrical Engineering.

Resource Person : Mr. J.P Giri Assistant Engineer PGCIL Jabalpur

Mohd. Asad Mansoori of 4th semester EE Department had received **Patent** for **Ventilated Personal Protective Equipment (VPPE) on 06/06/2020.**

Patent No. 202021023833

6/6/2020 PATENT eFiling

Government of India
Ministry of Commerce & Industry
Department of Industrial Policy & Promotion
Controller General of Patents Design & Trade Marks

Welcome MOHD ASAD MANSOORI Sign out

Online Filing Of Patents

INTELLECTUAL PROPERTY INDIA

Controller General of Patents, Designs & Trade Marks

सत्यमेव जयते

INTELLECTUAL PROPERTY INDIA
PATENTS | DESIGNS | TRADE MARKS
GEOGRAPHICAL INDICATIONS

G.A.R.6
[See Rule 22(1)]
RECEIPT

Docket No 35393

Date/Time 2020/06/06 20:20:11

To
MOHD ASAD MANSOORI

HOUSE 40 BHUMI VIKAS BANK
COLONY ADHARTAL JABALPUR

Userid: MOHDASAD

CBR Detail:

Sr. No.	Ref. No./Application No.	App. Number	Amount Paid	C.B.R. No.	Form Name	Remarks
1	202021023833	TEMP/E-1/26326/2020-MUM	1600	16883	FORM 1	VPPE (VENTILATED PERSONAL PROTECTIVE EQUIPMENT) OR VICE VERSA

TransactionID	Payment Mode	Challan Identification Number	Amount Paid	Head of A/C No
N-0000658694	Online Bank Transfer	0606200003199	1600.00	1475001020000001

Total Amount : ₹ 1600

Amount in Words: Rupees One Thousand Six Hundred Only

Received from MOHD ASAD MANSOORI the sum of ₹ 1600 on account of Payment of fee for above mentioned Application/Forms.

* This is a computer generated receipt, hecnce no signature required.

Print

- **Satyam Saini, Satyansh Singh, Ratnakar Nayak and Prasann Hardaha** have been participated in **MP Tech Innovation Challenge 2019** conducted by RGPV, CII and Young Indians, Bhopal Chapter. They have developed and submitted a working model of **"Smart Waste Management System Using IOT (Smart Dustbin)".**

Hindi Diwas was Celebrated on 14/09/2019
On the Occasion Poetry Competition Conducted by the Department
Students of each Semester of the EE Department have Participated in the Event.

- **Shubhi Shrivastava** was the Quarter-finalist in **DST and Texas Instruments** India Innovation Challenge Design Contest 2019 powered by **AICTE** and anchored by **NSRCEL@IIMB.**

- **Certificate of Merit** Awarded to ***Shubhi Shrivastava*** in recognition of excellent performance in the ***IICDC-2019-LIC*** - an online contest on ***1st Nov 2019*** by TI University Program.

- **Certificate of Merit** Awarded to ***Shubhi Shrivastava*** in recognition of excellent performance in the ***IICDC-2019-c2000*** - an online contest on ***3rd Nov 2019*** by TI University Program.

- **Certificate** awarded to ***Shubhi Shrivastava*** for the participation in ***IICDC-2019- c2000*** - an online contest on ***2nd Nov 2019*** by TI University Program.

- **Certificate** awarded to ***Shubhi Shrivastava*** for the participation in ***IICDC-2019- Business test*** - an online contest on ***30th Oct 2019*** by TI University Program.

- **Aishwarya Vishwakarma, Nishkarsh Singh Thakur, Rajneesh Yadav and Ritik Kesharwani** of 4th Semester EE Department presented innovative solution under the theme **"How to Enhance the Income of Village"** in the AITCE Sponsored **Chhatra Vishwakarma Award 2019**, held on 20/12/02019.

- **Subhi Shrivatava, Giransh Takhlate, Kainat Khan, Mayank Paysi, Palash Kori, Ruchi Shukla and Saral Yadav** have participated in **IICDC Texas Instrumentation** Innovation under **Texas Instruments and AICTE**, held on 30/11/2019. The team has presented their Innovative Idea as **"IOT Based Smart Energy Meter For Demand Side Load Control and Management"** and qualified for **Quarter Final Round**.

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CONGRATULATIONS

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