GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN

ELECTRO SPECTRUM 2018

Volume-3

“The modern human lives in a cesspool of man-made electromagnetic radiation.”

- Steven Magee

Vision of the Department	Produce competitive engineers instilled with ethical and social responsibilities to deal with the technological challenges in the field of Electronics and Communication Engineering.	
Mission of the Department		**Mission Statements**
	M1	Facilitate a value-based educational environment that provides updated technical knowledge.
	M2	Provide opportunities for developing creative, innovative and leadership skills.
	M3	Imbue technological and managerial capabilities for a successful career and lifelong learning.

	Program Educational Objectives Statements
PEO1	Analyze and apply the knowledge of Mathematics, Science, and Engineering concepts for solving Electronics and Communication Engineering problems.
PEO2	Solve complex problems in Electronics and Communication Engineering and its allied areas to attain optimum solutions.
PEO3	Excel in chosen career by exhibiting life skills and professional ethics in multidisciplinary fields through continuous learning and research.

	Program Educational Objectives Statements
PSO1	Acquire knowledge required for designing Electronics and Communication systems.
PSO2	Design, simulate and implement essential modules in the areas of Electronic circuits, VLSI, Embedded systems, Communication and Signal processing.

CONTENTS

DIRECTOR'S MESSAGE:

I am very much delighted and pleased to know that the College is bringing out a Magazine with good and useful information on Engineering and Technology and also the available infrastructure and facilities provided for the benefit of students and Faculty.

The efforts by the faculty and students to bring out this magazine with a beautiful getup needs a good word of appreciation. I wish this would continue in future too which certainly upholds the academic environment and decorum of this campus. Let me thank all the senior teachers and the other faculty who had shared their experiences by their rich and highly informative contributions to the Magazine.

PRINCIPAL'S MESSAGE:

As I embark upon my journey as the Principal for Gayatri Vidya Parishad Colllege of Engineering for Women, I am jubilant to meet through this page which is a driving force for the students and faculty at GVPCEW to be proactive towards learning. As we try to prepare the students always to "Think and Review" so as to discover the cause and effect of every event, would surely reveal the hidden talents of the academic fraternity. It gives me immense pleasure to encapsulate yet another occasion of success. I congratulate everyone who endeavours towards our cherished motto of empowering the students for all round development through technical education. Thorough acquisition of knowledge fringed with skills required and character building is our promise by providing necessary resources and resourceful intelligentsia ensuring expected settlement.

HOD'S MESSAGE:

Today, the corporate sector is looking for young, dynamic and creative students who are good at their technical and communicational skills. Hence it is essential that every student has to enrich themselves with these skills. In view of this, apart from regular academic curriculum, the students have to take part in various Group Discussions, Workshops and Training programs. The G.V.P. College of Engineering for Women is facilitating such a nice platform to the students of all branches to prove themselves and enrich their knowledge. Hope that each participant will enjoy the academic flavours of all programs and gain high confidence levels. I wish the program to be a grand success.

EDITORIAL MESSAGE:

It gives us immense joy and satisfaction to finally re introduce our very own e-magazine ELECTRO SPECTRUM – 2018. We have tried to churn out creativity from this mess of science. A lot of effort has gone into the making of this issue. We hope you enjoy reading the magazine.

COVER STORY

THE BUTTON DISAPPERS, AI BECOMES THE APP INTERFACE

The Impact of Artificial Intelligence:

1. AI will guide us through the trees. Despite the hype, AI has demonstrated value in industries across the board - from agriculture to biotech to manufacturing. AI is just beginning to ingest data to power services and offerings, in turn providing information necessary for better decision-making.

2. Semantic Technology will become the AI Interpreter: As artificial intelligence becomes the new consumer-facing UI for many businesses, semantic technology will emerge as the necessary interpreter. Conversational AI will need precise understanding of the communication from humans and extract meaning from the communication. Artificial intelligence in combination with semantic technology is ideally suited to address this challenge.

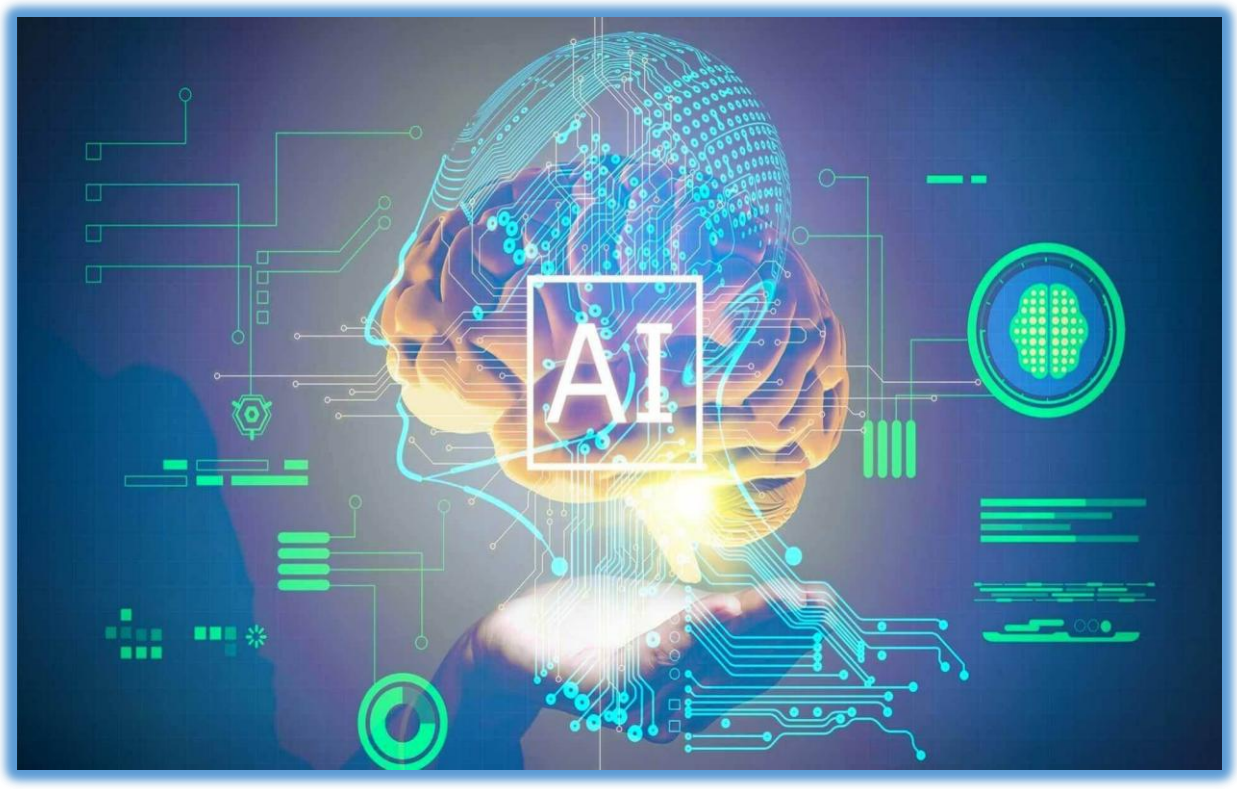
3. AI will be a creativity enabler: The role of the data analyst is changing thanks to artificial intelligence. AI is allowing marketers to focus once again on the creative art of marketing—the days of data wrangling are coming to an end. With studies indicating that up to 80% of an analyst's daily routine was relegated to data cleansing and preparation.

AI becomes the UI, meaning that the synchronous, request-response model of using apps and services gradually disappears. Smartphones are still "low IQ," because you have to pick them up, launch an application, ask for something to be done, and eventually get a response. In a new generation of intelligent apps, the app will initiate

interactions via push notifications. Let's take this a step further where an app, bot, or a virtual personal assistant using artificial intelligence will know what to do when, why, where, how and just do it Two examples:

•Expense approvals app watches your pattern of approving expense reports, starts to auto-approve 99 percent of expense reports and only brings to your attention the rare report that requires your attention.

•Analytics app understands the underlying data, questions asked so far by the business user, questions asked of the same dataset by other users in the company, and each day provides a new insight that the analyst might not have thought of. As organizations gather more data, AI can help us learn what questions to ask of the data.



Developers need to figure out what data is really important to their business application, how to watch and learn from transactions, what business decisions would most benefit from this kind of proactive AI, and start experimenting. Embedded AI can predict what you need, deliver info and functionality via the right medium at the right time, including before you need it, and automate many tasks you do manually today.

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[3] Poole, Mackworth & Goebel 1998, p. 1, which provides the version that is used in this article. Note that they use the term "computational intelligence" as a synonym for artificial intelligence.

Russell & Norvig (2003) (who prefer the term "rational agent") and write "The whole-agent view is now widely accepted in the field"

FACULTY ARTICLES:

Mr. R. SUNIL KUMAR

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PLASMA ANTENNA TECHNOLOGY

ABSTRACT:

On earth we live upon an island of "ordinary" matter. The different states of matter generally found on earth are solid, liquid, and gas. Sir William Crookes, an English physicist identified a fourth state of matter, now called plasma, in 1879. We all have heard of radio antennas which are used widely at present. These are increasing day by day but there is no change in frequency, radio antennas are so cost to construct and it is heavy. We all have heard of radio antennas which are used widely at present. This was a concept developed a long time before. Indeed a long time before. The patent of this idea was given to J Hettinger in 1919. It was very recently that we were able to make practical the plasma antennas

In this article, the 'Plasma antenna technology' is introduced to solve the problems of radio antennas. On hearing the name 'plasma antenna' for the first time, we may get a wrong impression that it is something entirely different. But that is not the case. Plasma antenna is just another type of radio antenna which is currently under development. In this innovation, plasma is used as a replacement for the metal elements of the traditional antennas. It performs all the functions of the radio antennas. That is it can be used for transmission and reception of signals.

Plasma antenna is a special type of antenna in which the metal conducting elements of a conventional antenna are replaced by plasma. It employs an ionized gas enclosed in a tube as the conducting element of antenna. When gas is electrically charged or ionized to plasma, it becomes conductive and allowing radio frequency signals to be transmitted or received. When gas is not ionized the antenna element ceases to exit. When voltage is applied to antenna electric field is produced which causes current to flow in antenna. Due to current flow, magnetic field is produced. It is more advantageous than other antenna due to ionized gas. It has higher efficiency and enhanced bandwidth.

INTRODUCTION:

PLASMA ANTENNAS:

On earth we live upon an island of "ordinary" matter. The different states of matter generally found on earth are solid, liquid, and gas. Sir William Crookes, an English physicist identified a fourth state of matter, now called plasma, in 1879. Plasma is by far the most common form of matter. Plasma in the stars and in the tenuous space between them makes up over 99% of the visible universe and perhaps most of that which is not visible. Important to ASI's technology, plasmas are conductive assemblies of charged and neutral particles and fields that exhibit collective effects. Plasmas carry electrical currents and generate magnetic fields. When the Plasma Antenna Research Laboratory at ANU investigated the feasibility of plasma antennas as low radar cross-section radiating elements, Red centre established a network between DSTO ANU researchers, CEA Technologies, Cantec Australasia and Neo lite Neon for further development and future commercialization of this technology .The plasma antenna R & D project has proceeded over the last year at the Australian National University in response to a DSTO (Defence Science and Technology Organization) contract to develop a new antenna solution that minimizes antenna detectability by radar. Since then, an investigation of the wider technical issues of existing antenna systems has revealed areas where plasma antennas might be useful. The project attracts the interest of the industrial groups involved in such diverse areas as fluorescent lighting, telecommunications and radar. Plasma antennas havea number of potential advantages for antenna design .When a plasma element is not energized, it is difficult to detect by radar. Even when it is energized, it is transparent to the transmissions above the plasma frequency,which falls in the microwave region. Plasma elements can be energized and de–energized in seconds, which prevents signal degradation. When a particular plasma element is not energized, its radiation does not affect nearby elements. HF CDMA Plasma antennas will have low probability of intercept (LP) and low probability of detection (LPD) in HF communications.

PLASMA ANTENNA TECHNOLOGY:

Since the discovery of radio frequency ("RF") transmission, antenna design has been an integral part of virtually every communication and radar application. Technology has advanced to provide unique antenna designs for applications ranging from general broadcast of radio frequency signals for public use to complex weapon systems. In its most common form, an antenna represents a conducting metal surface that is sized to emit radiation at one or more selected frequencies. Antennas must be efficient so the maximum amount of signal strength is expended in the propagated wave and not wasted in antenna reflection .Plasma antenna technology employs ionized gas enclosed in a tube (or other enclosure) as the conducting element of an antenna. This is a fundamental change from traditional antenna design that generally employs solid metal wires as the conducting element. Ionized gas is an efficient conducting element with a number of important advantages. Since the gas is ionized only for the time of

transmission or reception, “ringing" and associated effects of solid wire antenna design are eliminated. The design allows for extremely short pulses, important to many forms of digital communication and radars. The design further provides the opportunity to construct an antenna that can be compact and dynamically reconfigured for frequency, direction, bandwidth, gain and beam width. Plasma antenna technology will enable antennas to be designed that are efficient, low in weight and smaller in size than traditional solid wire antennas.

MARKET APPLICATIONS OF PLASMA TECHNOLOGY:

Plasma antennas offer distinct advantages and can compete with most metal antenna applications. The plasma antenna's advantages over conventional metal elements are most obvious in military applications where stealth and electronic warfare are primary concerns. Other important military factors are weight, size and the ability to reconfigure potential military applications include:

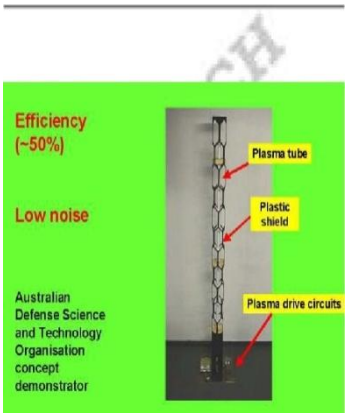
Ship board/submarine antenna replacements.

1. Unmanned air vehicle sensor antennas.
2. IFF ("identification friend or foe") land-based vehicle antennas.
3. Stealth aircraft antenna replacements.
4. Broad band jamming equipment including for spread-spectrum emitters.
5. Military antenna installations can be quite sophisticated and just the antenna portion of a communications or radar installation on a ship or submarine can cost in the millions of dollars. Plasma antenna technology has commercial applications in telemetry, broad-band communications, ground penetrating radar, navigation, weather radar, wind shear detection and collision avoidance, high-speed data (for example Internet) communication spread spectrum communication, and cellular radiation protection.

UNIQUE CHARACTERISTICS OF A PLASMA ANTENNA:

One fundamental distinguishing feature of a plasma antenna is that the gas ionizing process can manipulate resistance. When deionized, the gas has in finite resistance and does not interact with RF radiation. When deionized the gas antenna will not backscatter radar waves (providing stealth) and will not absorb high-power microwave radiation (reducing the effect of electronic warfare countermeasures).A second fundamental distinguishing feature is that after sending a pulse the plasma antenna can be deionized, eliminating the ringing associated with traditional metal elements. Ringing and the associated noise of a metal antenna can severely limit capabilities in high frequency short pulse transmissions. In these applications, metal antennas are often accompanied by sophisticated computer signal processing. By reducing ringing and noise, we believe our plasma antenna provides increased accuracy and reduces computer signal processing requirements. These advantages are important in cutting edge applications for impulse radar and high-speed digital communications .Based on the results of development to date, plasma antenna technology has the following additional attributes:

1. No antenna ringing provides an improved signal to noise ratio and reduces multipath signal distortion.
2. Reduced radar cross section provides stealth due to the non-metallic elements.
3. Changes in the ion density can result in instantaneous changes in bandwidth over wide dynamic ranges.
4. After the gas is ionized, the plasma antenna has virtually no noise floor.
5. While in operation, a plasma antenna with a low ionization level can be decoupled from an adjacent high-frequency transmitter.
6. A circular scan can be performed electronically with no moving parts at a higher speed than traditional mechanical antenna structures.
7. It has been mathematically illustrated that by selecting the gases and changing ion density that the electrical aperture (or apparent footprint) of a plasma antenna can be made to perform on par with a metal counterpart having a larger physical size.
8. Our plasma antenna can transmit and receive from the same aperture provided the frequencies are widely separated.
9. Plasma resonance, impedance and electron charge density are all dynamically reconfigurable. Ionized gas antenna elements can be constructed and configured into an array that is dynamically reconfigurable for frequency, beamwidth,powergain, polarization and directionality - on the fly.
10. A single dynamic antenna structure can use time multiplexing so that many RF subsystems can share one antenna resource reducing the number and size of antenna structures..



The following technological concepts are important to plasma antennas:

1. HIGHER POWER: Increased power can be achieved in the plasma antenna than in the corresponding metal antenna because of lower Ohmic losses. Plasmas have a much wider range of power capability than metals as evident from low powered plasma in fluorescent bulbs to extremely high-powered plasmas in the Princeton University experimental fusion reactors. In this range, a high-powered plasma antenna is still low powered plasma. Since plasmas do not melt, the plasma antennas can provide heat and fire resistance. The higher achievable power and directivity of the plasma antenna can enhance target discrimination and track ballistic missiles at the S and X band.

2. **ENHANCED BANDWIDTH:**

By the use of electrodes or lasers the plasma density can be controlled. The theoretical calculations on the controlled variation of plasma density in space and time suggest that greater bandwidth of the plasma antenna can be achieved than the corresponding metal antenna of the same geometry. This enhanced band width can improve discrimination.

3. **EMI/ECI**

The plasma antenna is transparent to incoming electromagnetic signals in the low density or turned off mode. This eliminates or diminishes EMI/ECI there by producing stealth. Several plasma antennas can have their electron densities adjusted so that they can operate in close proximity and one antenna can operate invisible to others .In this physical arrangement mutual side lobe and back lobe clutter is highly reduced and hence jamming and clutter is reduced.

4. **HIGHER EFFICIENCY AND GAIN:**

Radiation efficiency in the plasma antenna is higher due to lower Ohmic losses in the plasma. Standing wave efficiency is higher because phase conjugate matching with the antenna feeds can be achieved by adjusting the plasma density and can be maintained during reconfiguration. Estimates indicate a 20dbimprovement in antenna efficiency.

5.**Reconfiguration and multi functionality**:

The plasma antenna can be reconfigured on the fly by controlled variation of the plasma density in space and time with far moreover .sa tility than any arrangement of metal antennas. This reduces the number of required elements reducing size and weight of shipboard antennas. One option is to construct controlled density plasma blankets around plasma antennas thereby creating windows(low-density sections of the blanket) for main lobe transmission or reception and closing windows (high-density regions in the plasma blanket). The plasma windowing effect enhances directivity and gain in a single plasma antenna element so that an array will have less elements than a corresponding metal antenna array. Closing plasma windows where back lobes and side lobes exist eliminates them and reduces jamming and clutter. This side lobe reduction below 40db enhances directivity and

discrimination. In addition, by changing plasma densities, a single antenna can operate at one bandwidth (e.g. communication) while suppressing another bandwidth (e.g. radar).

6. **LOWER NOISE**:

The plasma antenna has a lower collision rate among its charge carriers than a metal antenna and calculations show that this means less noise.

7. **PERFECT REFLECTOR**:

When the plasma density is high the plasma becomes a loss-less perfect reflector. Hence there exist the possibilities of a wide range of lightweight plasma reflector antennas.

ADVANTAGES:

->The advantage of a plasma antenna is that it can appear and disappear in a few millionths of a second. This means that when the antenna is not required, it can be made to disappear, leaving behind the gas – filled column that has little effect on the electromagnetic fields in the proximity of the tube. The same will be true for fiber glass and plastic tubes, which are also under consideration.

->The other advantage of plasma antenna is that even when they are ionized and in use at the lower end of the radio spectrum, say HF communications, they are still near transparent to fields at microwave frequencies.

->The same effect is observed with the use of ionosphere, which is plasma. Every night amateur radio operators bounce their signals off the ionosphere to achieve long distance communications, whilst microwave satellite communication signals pass through the ionosphere.

->High gain, Wide bandwidth, Maintainace free, Low interference, Modular.

DISADVANTAGES:

->>Plasma volumes must be stable and repeatable.

->>Ionizer adds weight and volume.

->>Ionizer increases power consumption.

CONCLUSION: As part of a “blue skies” research program, DSTO has teamed up with the ANU’s Plasma Research Laboratory to investigate the possibility of using plasmas like those generated in fluorescent ceiling lights, for antennas.

The research may one day have far reaching applications from robust military antennas through to greatly improve external television aerials. Antennas constructed of metal can be big and bulky, and are normally fixed in place. The fact that metal structures cannot be easily moved when not in use limits some aspects of antenna array design. It can also pose problems when there is a requirement to locate many antennas in a confined area.

Weapons System Division has been studying the concept of using plasma columns for antennas, and has begun working in collaboration with ANU plasma physicists Professor Jeffrey Harris and Dr. Gerard Borg. Work by the team has already led to a provisional patent and has generated much scientific interest as it is so novel. It offers a paradigm shift in the way we look at antennas and is already providing the opportunity to create many new and original antenna designs.

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OPTICAL DATA SECURITY

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ABSTRACT:

In practical systems, data security is an important issue. Optical encryption techniques provide a high level of security because there are many degrees of freedom with which to encode the information, such as amplitude, phase, wavelength, and polarization. To protect the stored information it is required to encrypt the data. Here the encryption means that the original data is converted into stationary white-noise data by key codes, and unauthorized users cannot obtain the original data without knowledge of the key code.

Original data may be encoded optically by using various encryption techniques. Double random phase encryption, three dimensional position encryption and wavelength-code encryption are some of the major techniques of encryption available at present.

INTRODUCTION:

Optical data storage is an alternative to magnetic disk data storage. Currently data access times are extremely slow for magnetic disks when compared to the speed of execution of CPUs so that any improvement in data access speeds will greatly increase the capabilities of computers, especially with large data and multimedia files. Optical memory is a technology that uses a three dimensional medium to store data and it can access such data a page at a time instead of sequentially, which leads to increases in storage density and access speed. Optical data storage systems are very close to becoming economically feasible. Photo-refractive crystals and photopolymers have been used successfully in experimental optical data storage systems. Such systems exploit the optical properties of these photosensitive materials along with the behavior of laser light when it is used to record an image of an object. Optical memory lies between main memory magnetic disk in regards to data access times, data transfer rates, data storage density.

As processors and buses roughly double their data capacity every three years (Moore's law), data storage has struggled to close the gap. CPUs can perform an instruction execution every nanosecond, which is six orders of magnitude faster than a single magnetic disk access.

As the computer evolves, so do the applications that computers are used for. Recently large binary files containing sound or image data have become commonplace, greatly increasing the need for high capacity data storage and data access. A new high capacity form of data storage must be developed to handle these large files quickly and efficiently.

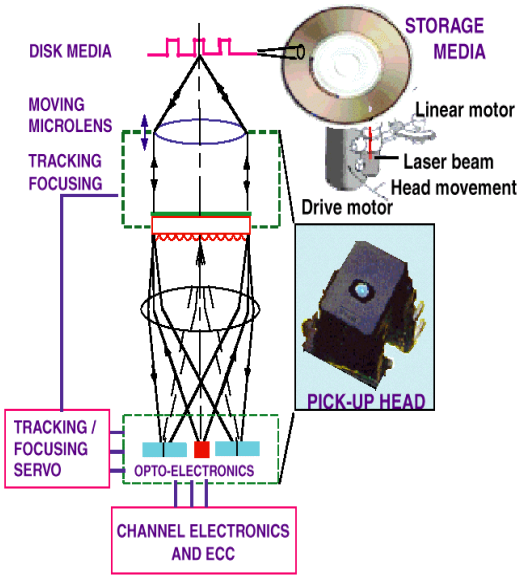
Optical Data Storage Principle:

Optical memory uses the basic principles of holography for the recording purposes and hence it is also called as holographic memory system. Optical memory is a promising technology for data storage because it is true three dimensional storage system, data can be accessed an entire page at a time instead of sequentially, and there are very few moving parts so that the limitations of mechanical motion are minimized. Optical memory uses a photosensitive material to record interference patterns of a reference beam and a signal beam of coherent light, where the signal beam is reflected off of an object or it contains data in the form of light and dark areas. The nature of the photosensitive material is such that the recorded interference pattern can be reproduced by applying a beam of light to the material that is identical to the reference beam. The resulting light that is transmitted through the medium will take on the recorded interference pattern and will be collected on a laser detector array that encompasses the entire surface of the holographic medium. Many holograms can be recorded in the same space by changing the angle or the wavelength of the incident light. An entire page of data is accessed in this way.

Currently, optical memory techniques are very close to becoming technologically and economically feasible. The major obstacles to implementing optical data storage are recording rate, pixel sizes, laser output power, degradation of holograms during access, temporal decay of holograms, and sensitivity of recording materials.

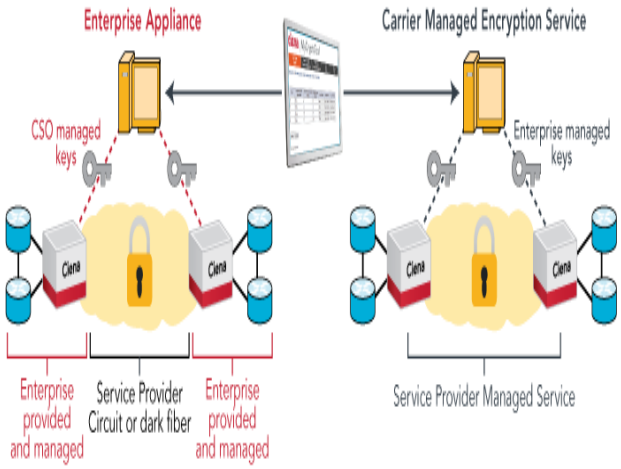
RECORDING AND READING OF DATA:

1. Optical recording of data: In holographic data storage, light from a coherent laser source is split into two beams, signal (data-carrying) and reference beams. Digital data to be stored are “encoded” onto the signal beam via a spatial light modulator. The data or strings of bits are first arranged into pages or large arrays. The o’s and 1’s of the data pages are translated into pixels of the spatial light modulator that either or transmit light. The light of signal beam traverses through the modulator and is therefore encoded with the “checkerboard” pattern of the data page. This encoded beam then interferes with the reference beam through the volume f a photosensitive recording medium, storing the digital data pages.



2. Optical reading of data

The interference pattern induces modulations in the refractive index of the recording material yielding diffractive volume gratings. The reference beam is used during readout to diffract off of the recorded gratings, reconstructing the stored array of bits. The reconstructed array is projected onto a pixilated detector that reads the data in parallel. This parallel readout of data provides holography with its fast transfer rates.The readout of data depends sensitively upon the characteristics of the reference beam .By varying the reference beam, for example by changing its angle of incidence or wavelength, Many different data pages can be recorded in the same volume of material and read out by applying a reference beam identical to that used during writing. This process of multiplexing data yields the enormous storage capacity of holography.



CONCLUSION:

Three encrypted optical memory systems have been discussed here. These systems are secure because the total number of mathematical possibilities of the multidimensional keys, which consists of two dimensional phase masks, their three dimensional positions, and wavelengths of light, is extremely large. The experimental results are very encouraging. It is expected that the encrypted memory system is to play an important role in ultra-fast secure communication systems using the spatial temporal converters with ultra-short pulse that enable communication at ultra-high speed of more than Tb/s.

It is believed that the substantial advances in recording media, recording methods and the demonstrated densities of > 30 channel Gbits/in2 coupled with the recent commercial availability of system components remove many of the obstacles that previously prevented the practical consideration of optical data storage and greatly enhance the prospects for Hallography to become a next generation storage technology.

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STUDENT'S ARTICLES

D VEDA SAMHITHA

16JG1A0430

TRANSPARENT ELECTRONICS

ABSTRACT:

Transparent electronics is an emerging science and technology field concentrates on producing 'invisible' electronics circuits and optoelectronic devices. The basic building material for transparent electronic device which is to be transparent and in visible range is a true challenge. Therefore to understand and implement such technology there are two scientific goals, to have a material which are optically transparent and electrically conductive and to implement an invisible circuitry. Development of such invisible transparent electronic devices needs expertise together from pure and applied science, material science, chemistry, physics and electronic science.

INTRODUCTION:

In transparent electronics the usual opaque semiconductor materials forming the basis for electronic device fabrication is replaced with transparent materials. The transparent electronic devices are of two types transparent passive devices and transparent active devices.

There are two technologies which preceded and underlie transparent electronics. They are,

1. Transparent Conducting Oxides (TCO's)

2. Thin Film Transistors (TFT's)

TRANSPARENT CONDUCTING OXIDES (TCO's):

The TCO is widely as oxide material as it is both electrically conductive and optically transparent. The most commonly used TCO in transparent electronics are In2o3, Sno2, Zno2 and Cdo. Transparent conducting oxide such as Sn doped In3o3, Al doped ZnO and Sb doped Sno2 are widely used as transparent LCD, solar cell, organic light emitting diode.

THIN FLIM TRANSISTORS (TFT's):

A thin film transistor is a special kind of field-effect transistor made by depositing thin films of an active semiconductor layer as well as the dielectric layer and metallic contacts over a supporting (but non-conducting) substrate. A common substrate is glass, because the primary application of TFT is in liquid crystal displays.

The two possible configurations for TFT's are : a)Bottom gate b)Topgate

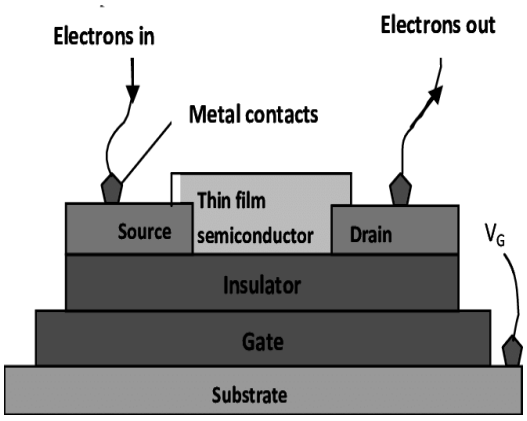

Fig a: Basic structure of thin film transistor

APPLICATIONS:

Transparent circuits will have unprecedented applications in flat panel displays, see through display or novel display structures.

And other applications like transparent solar panels, transparent UV detector, transparent OLED, touch display panels

CONCLUSION:

Transparent electronics are relatively new class of material which is applied to active devices such as TFT and UV detector. Combining of two properties that are optically transparent and electrically conductive gives lots of advantages such as high mobility, low processing temperature, high performance and flexibility, solar cell gives a tremendous advantages over conventional solar cell as it requires a less space, produces more energy, eco-friendly and replaces the ordinary window glass and become a domestic electricity generator. so this new class of electronic is more advantageous than conventional electronics.

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SNIFFER

N VYSHNAVI

17JG110477

INTRODUCTION:

A Sniffer is a program or a device that eavesdrops on the network traffic by grabbing information travelling over a network .Sniffers basically are "Data Interception" technology. They work because the Ethernet was built around a principle of sharing. Most network use broadcast technology wherein messages for one computer can be read by another computer on that network. However computers can be make to accept messages even if they are not meant for them. This is done by means of Sniffer. This article seeks to explore the topic of sniffers, how they work, detecting and protecting your assets against the malicious use of these programs.

HOW A SNIFFER WORKS?

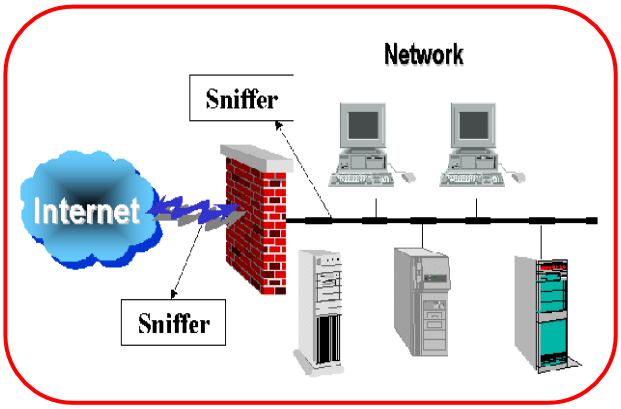
A computer can connected to the LAN has two addresses. One is MAC (media access control) address that uniquely identifies each node in a network and is stored on the network card itself. It is the MAC address that gets used by the Ethernet protocol while building "frames" to transfer data to and from a machine. The other is the IP address , which is used by applications .The Data Link Layer uses an Ethernet header with the MAC address of the destination machine rather than the IP address. The Network Layer is responsible for mapping IP network addresses to the MAC address as required by the Data Link Protocol. It initially looks up the MAC address of the destination machine in a table, usually called the ARP(Address Resolution Protocol) cache.

NETWORK SNIFFING:

Network sniffing involves using sniffer tools that enable real-time monitoring and analysis of data packets flowing over computer networks. It can be a hardware device or a sepetare software program or a combination of both. It is also called as packetsniffing,snoop,network probe,packet analyzer ,network analyzer protocol analyzer.

TYPES:

- ARP Sniffers
- IP Sniffers
- MAC Sniffers

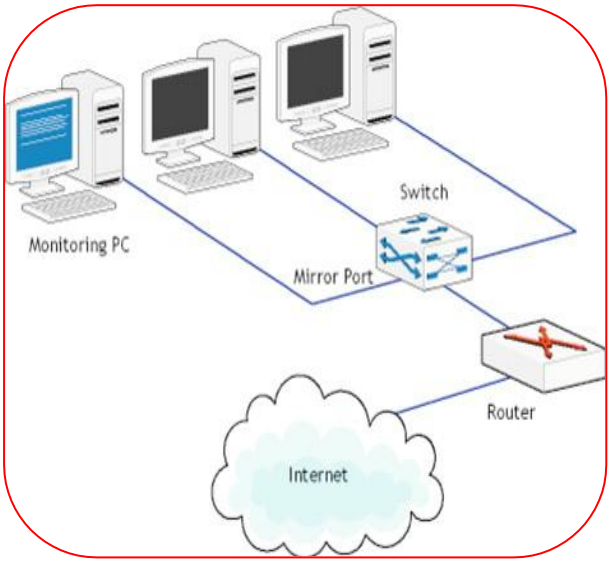


- LAN Sniffers
- Protocol Sniffers
- Web password Sniffers

DETECTING SNIFFERS:

A Sniffer is usually passive, it just collect data. Hence it becomes difficult to detect sniffers, especially when running on a Shared Ethernet.Here is an overview of the detection methods:

- Ping Method



- ARP Method
- On Local Host
- Latency Method
- ARP Watch
- Using IDS

PREVENTION:

The best way to secure yourself against sniffing is to use encryption.While this won't prevent a sniffer from functioning.If you are on a Switched network, the chances are the ARP spoofing will be used for sniffing purposes. Sniffing Tools:

- Tcpdump
- Sniffit
- Ethereal
- Hunt
- Ettercap
- Dsniff
- icrzoex

CONCLUSION:

Packet sniffers can capture things like cleartext passwords and usernames or other sensitive material. Packet sniffers are a serious matter for network security. Since sniffing is possible on non-switched and switched networks, it's a good practice to encrypt your data communications.

REFERENCES:

1] http://www.google.com

[2] http://www.scribd.com

[3] http://www.seminarsonly.com

[4] http://seminarprojects.co

KNOW THE SCIENTIST

HEINRICH RUDOLF HERTZ

Heinrich Rudolf Hertz(22 February 1857 - 1 January 1894) was born in Hamburgthen a sovereign state of the german Confederation into a prosperous and cultured Hanseatic family. His father was Gustav Ferdinand Hertz. His mother was Anna Elisabeth Pfefferkorn.

While studying at the Gelehrtenschule des Johanneums in Hamburg, Hertz showed an aptitude for sciences as well as languages, learning Arabic and Sanskrit. He studied sciences and engineering in the German cities of Dresden, Munich and Berlin, where he studied under Gustav R. Kirchhoff and Hermann von Helmholtz. In 1880, Hertz obtained his PhD from the University of Berlin, and for the next three years remained for post-doctoral study under Helmholtz, serving as his assistant. In 1883, Hertz took a post as a lecturer in theoretical physics at the University of Kiel

In 1886, Hertz married Elisabeth Doll, the daughter of Dr. Max Doll, a lecturer in geometry at Karlsruhe. During this time Hertz conducted his landmark research into electromagnetic waves.

MAJOR WORKS:

•During his relatively short career as a scientist and theoretical physicist Heinrich Hertz accomplished a lot but it was his research on electromagnetic waves that stands out as the greatest achievement in his career. Prior to Hertz's research electromagnetic waves had only been a theory propounded by James Clerk Maxell. Those waves were what came to be later known as radio waves.

AWARDS AND ACHIEVEMENTS:

Heinrich Hertz's nephew Gustav Ludwig Hertz was a Nobel Prize winner, and Gustav's son Carl Helmut Hertz invented medical ultrasonography. His daughter Mathilde Carmen Hertz was a well-known biologist and comparative psychologist. Hertz's grandnephew Hermann Gerhard Hertz, professor at the University of Karlsruhe, was a pioneer of NMR-spectroscopy and in 1995 published Hertz's laboratory notes.[28]

- The SI unit hertz (Hz) was established in his honor by the International Electrotechnical Commission in 1930 for frequency, an expression of the number of times that a repeated event occurs per second. It was adopted by the CGPM (Conférence générale des poids et mesures) in 1960, officially replacing the previous name, "cycles per second" (cps).
- In 1928 the Heinrich-Hertz Institute for Oscillation Research was founded in Berlin. Today known as the Fraunhofer Institute for Telecommunications, Heinrich Hertz Institute
- In 1969 a Heinrich Hertz memorial medal was cast. The IEEE Heinrich Hertz Medal, established in 1987, is "for outstanding achievements in Hertzian waves presented annually to an individual for achievements which are theoretical or experimental in nature".
- In 1980, in Italy a High School called "Istituto Tecnico Industriale Statale Heinrich Hertz" was founded in the neighborhood of Cinecittà Est, in Rome.
- A crater that lies on the far side of the Moon, just behind the eastern limb, is named in his honor. The Hertz market for radio electronics products in Nizhny Novgorod, Russia, is named after him. The Heinrich-Hertz-Turm radio telecommunication tower in Hamburg is named after the city's famous son.
- Hertz is honored by Japan with a membership in the Order of the Sacred Treasure, which has multiple layers of honor for prominent people, including scientists.[30]
- Heinrich Hertz has been honored by a number of countries around the world in their postage issues, and in post-World War II times has appeared on various German stamp issues as well.

- The Italian Society of Sciences awarded Heinrich Hertz with the Matteucci Medal, in 1888.

- In 1890 the Royal Society awarded Hertz with the Rumford Medal. Between 1886 and 1889 Hertz would conduct a series of experiments that would prove the effects he was observing were results of Maxwell's predicted electromagnetic waves. Starting in November 1887 with his paper "On Electromagnetic Effects Produced by Electrical Disturbances in Insulators", Hertz would send a series of papers to Helmholtz at the Berlin Academy, including papers in 1888 that showed transverse free space electromagnetic waves traveling at a finite speed over a distance.[14][15] In the apparatus Hertz used, the electric and magnetic fields would radiate away from the wires as transverse waves. Hertz had positioned the oscillator about 12 meters from a zinc reflecting plate to produce standing waves. Each wave was about 4 meters long. Using the ring detector, he recorded how the wave's magnitude and component direction varied. Hertz measured Maxwell's waves and demonstrated that the velocity of these waves was equal to the velocity of light. The electric field intensity, polarization and reflection of the waves were also measured by Hertz. These experiments established that light and these waves were both a form of electromagnetic radiation obeying the Maxwell equations.

SELECTED WORKS:

1)Cathode rays

2) Photoelectric effect

3) Contact mechanics

4) Meteorology

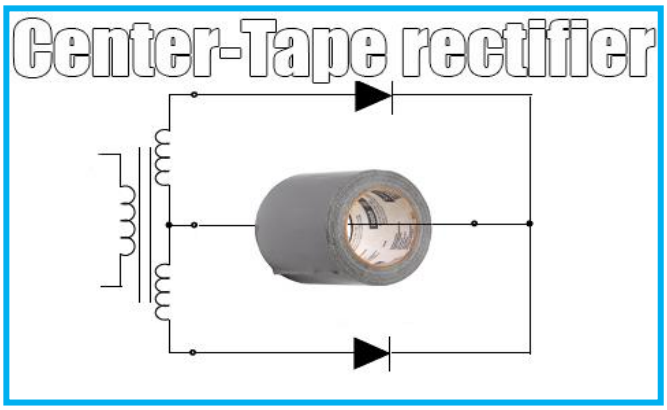
PERSONAL LIFE AND LEGACY:

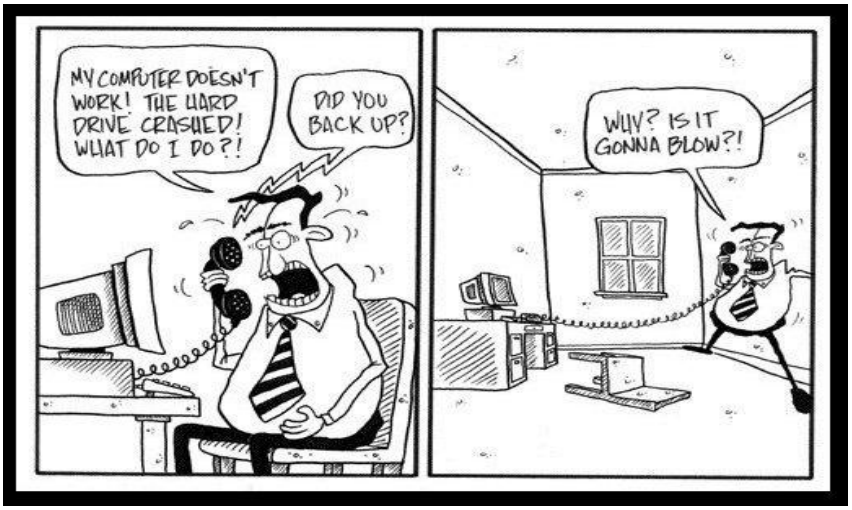
•Heinrich Hertz got married to Elisabeth Doll who was a lecturer of geometry at the University of Karlsruhe. They couple had two daughters, named Johanna and Mathilde. Mathilde followed in the footsteps of his parents and excelled in academia as a biologist.

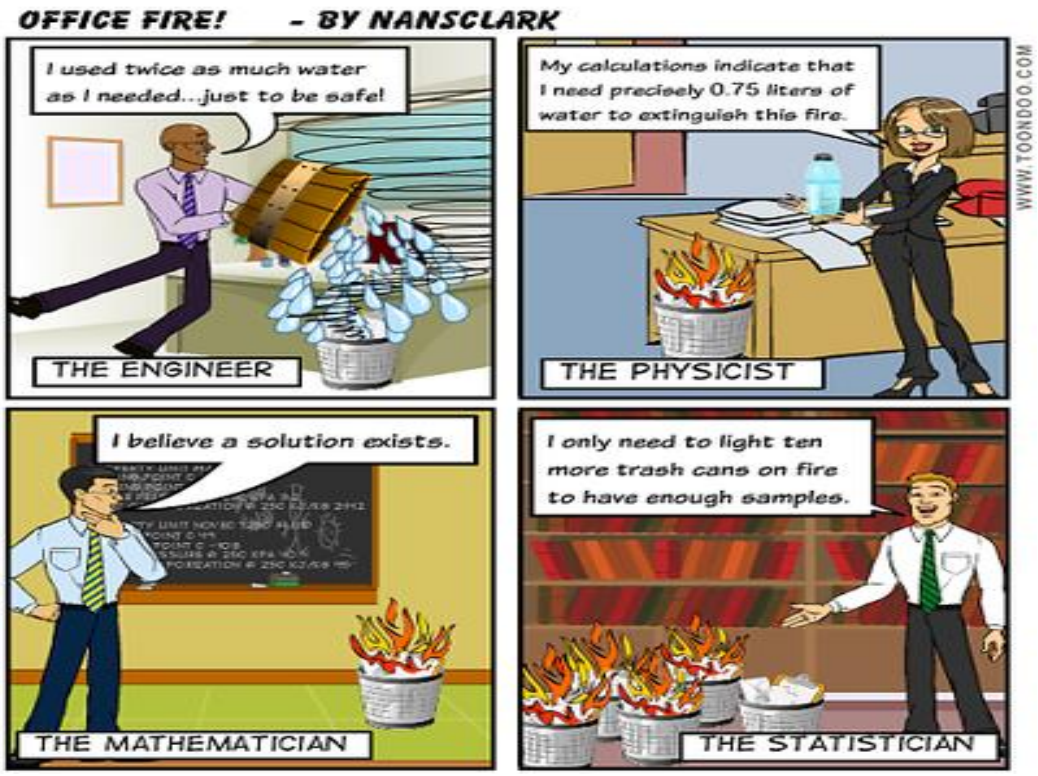
•Heinrich Hertz died on 1 January 1894 in Bonn due to granulomatosis with polyangiitis also known as GPA. Two years prior to his death he had an operation to cure migraine but that had led to complications that culminated in his death, at the age of 36.

•Hertz, the unit used to denote frequency, has been named in his honour.

STUDENT CORNER







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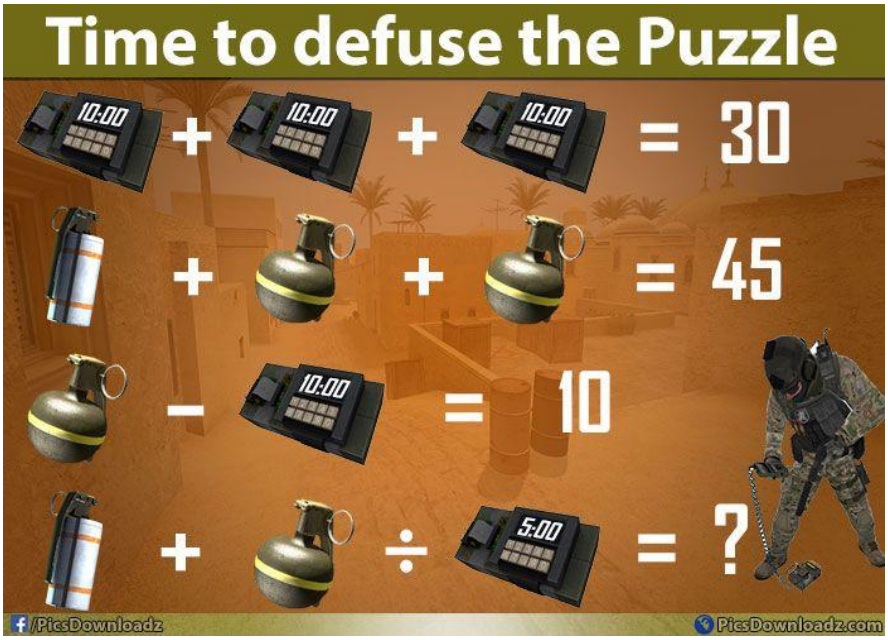
PUZZLE



RIDDLES

1) What fuels electronics but drains a relationship?

2) What do you call a circuit board that identifies as a different electronic component?

3) Which electronic component do cops hate?

DEPARTMENT ACTIVITIES

GUEST LECTURE:

1)SUBJECT NAME: Milestones in the History of Science

RESOURCE PERSON: Dr.D.N.Madhusudhana Rao & Dr.B.S.Murthy Professors, ECE, GVPCEW

DATE: 28-02-18

DESCRIPTION: The lecture which was given by Dr.D.N. Madhusudhana Rao &Dr.B.S. Murthy is really helpful to the students, through this students have come to know about the incredible inventions in the history of science and students are really motivated to know do something new and to learn new things . Students were really keen to know the history of science and this session went on really well when students had an interactive session with the lecturers .

2)SUBJECT NAME: Under Water Communication

RESOURCE PERSON: Dr.G.V. Krishna Kumar, Additional Director& HOD, Warship Technology Wing, NSTL, Visakhapatnam.

DATE: 28-07-18

DESCRIPTION: Through this lecture, students have come to know about the communication that takes place through different mediums, especially through water. Dr.G.V. Krishna Kumar Sir had an astounding interactive session with the students.

3)SUBJECT NAME: Optical Communications

RESOURCE PERSON: Dr.B.S. Murthy Professor, Dept.of ECE, GVPCEW

DATE: 04-10-18

DESCRIPTION: Dr.B.S. Murthy has given an outstanding lecture on optical communication, through this lecture students have come to know that ,the signals can be carried to the remote end through light instead of current and different types of optical communication . The lecture ended with an interative session with the students.

TECHNICAL EVENT:

[4] SUBJECT NAME: Student Power Point Presentations on Latest Trends

DATE: 14-12-18 & 15-12-18

DESCRIPTION: Students from 1st,2nd,3rd years participated in two days technical event by presenting power point presentation on latest trends . Through this event , students have acknowledged latest technologies and developments in the electronics and communication engineering .

ANSWERS

RIDDLES:

1. Battery
2. A transistor
3. Resistors

PUZZLE: 7

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Vision of the Department	Produce competitive engineers instilled with ethical and social responsibilities to deal with the technological challenges in the field of Electronics and Communication Engineering.	
Mission of the Department	**Mission No.**	**Mission Statements**
	M1	Facilitate a value-based educational environment that provides updated technical knowledge.
	M2	Provide opportunities for developing creative, innovative and leadership skills.
	M3	Imbue technological and managerial capabilities for a successful career and lifelong learning.