JULY-DEC 2022

VOLUME 2

ELECTRICAL DIGEST

JANE BROX

"Soon now, the faint tinkling of a broken filament will become another sound of another century."

YEAR IN REVIEW / Oren Harari /Nikola Tesla

GEETHANJALI INSTITUTE OF SCIENCE AND TECHNOLOGY

HALF YEARLY ELECTRICAL MAGAZINE

CREATIVE TEAM

B. Ajay Kumar
A. Tejasri
a. Sreeja
G. Lavanya
G. Deekshith

VISION-MISSION

VISION

To make the department as a hub of technological excellence, transforming the future Electrical Engineers into innovative, ethical and responsible professionals.

MISSION

DM1: Adopting effective result oriented techniques that deliver quality education in a learning environment striving to enhance the intellectual capabilities and skills of the learners.
DM2: Providing adequate infrastructure for technical skill development and encourage research in order to meet Industrial demands
DM3: Promoting industry interface and exposure, positive values of integrity, ecological awareness, and societal accountability among the Engineering aspirants
DM4:Empowering undergraduates, guiding them towards bright professional prospects through personality development and life skill-based activities.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

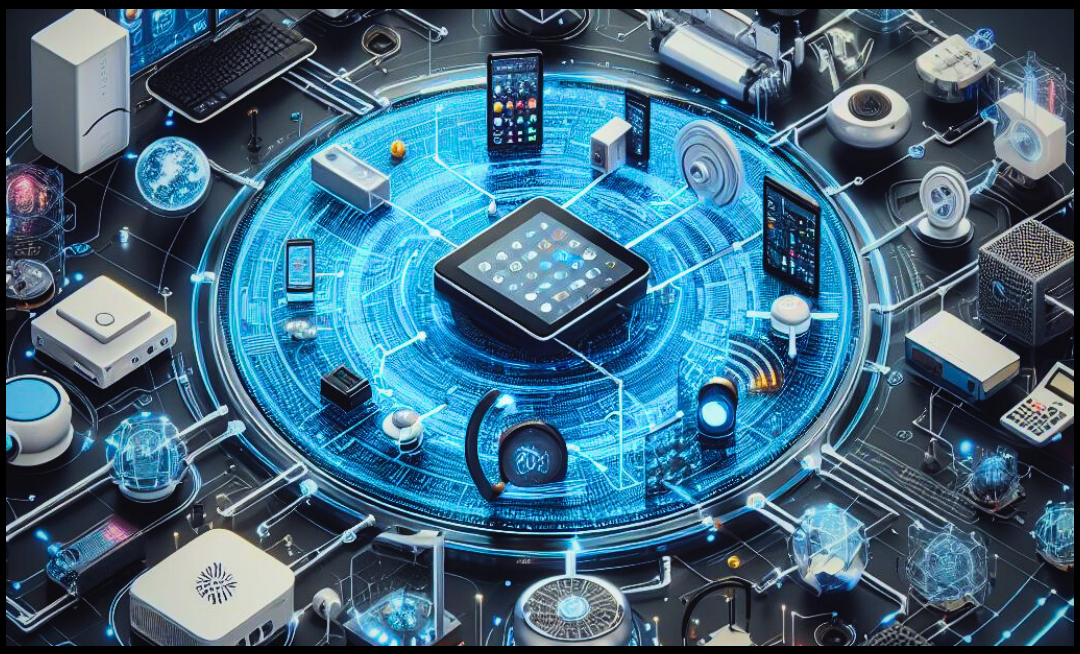
Graduates of B. Tech in Electrical and Electronics Engineering program shall able to

PEO1: Acquiring professional expertise in several kinds of industrial, societal, and pragmatic uses.
PEO2: : Pursuing higher studies, research and development, with other innovative skills and being creative striving in the fields of engineering, science, and technology, proceeding on multiple career paths.
PEO3: Exhibit excellence in Multi-Disciplinary collaborations by showcasing unique interpersonal competencies and ethical practices.
PEO4: Engage in lifelong learning and adapt to the perpetually evolving trends in profession and societal needs.

CONTENTS

INTERNET OF THINGS

B. AJAY KUMAR



The Internet of things describes devices with sensors, processing ability, software and other technologies that connect and exchange data with other devices and systems over the Internet or other communications networks.

The field has evolved due to the convergence of multiple technologies, including ubiquitous computing, commodity sensors, and increasingly powerful embedded systems, as well as machine learning. Older fields of embedded systems, wireless sensor networks, control systems, automation (including home and building automation), independently and collectively enable the Internet of things.

In the consumer market, IoT technology is most synonymous with "smart home" products, including devices and appliances (lighting fixtures, thermostats, home security systems, cameras, and other home appliances) that support one or more common ecosystems, and can be controlled via devices associated with that ecosystem, such as smartphones and smart speakers. IoT is also used in healthcare systems.

The main concept of a network of smart devices was discussed as early as 1982, with a modified Coca-Cola vending machine at Carnegie Mellon University becoming the first ARPANET-connected appliance, able to report its inventory and whether newly loaded drinks were cold or not. Mark Weiser's 1991 paper on ubiquitous computing, "The Computer of the 21st Century", as well as academic venues such as Ubi Comp and Per Com produced the contemporary vision of the IOT. In 1994, Reza Raji described the concept in IEEE Spectrum as "[moving] small packets of data to a large set of nodes, so as to integrate and automate everything from home appliances to entire factories". Between 1993 and 1997, several companies proposed solutions like Microsoft's at Work or Novell's NEST. The field gained momentum when Bill Joy envisioned device-to-device communication as a part of his "Six Webs" framework, presented at the World Economic Forum at Davos in 1999. The concept of the "Internet of things" and the term itself, first appeared in a speech by Peter T. Lewis, to the Congressional Black Caucus Foundation 15th Annual Legislative Weekend in Washington, D.C., published in September 1985. According to Lewis, "The Internet of Things, or IoT, is the integration of people, processes and technology with connectable devices and sensors to enable remote monitoring, status, manipulation and evaluation of trends of such devices." The term "Internet of things" was coined independently by Kevin Ashton of Procter & Gamble, later of MIT's Auto-ID Center, in 1999, though he prefers the phrase "Internet for things". At that point, he viewed radio-frequency identification (RFID) as essential to the Internet of things, which would allow computers to manage all individual things.

ARTIFICIAL INTELLIGENCE

A. TEJASRI

Artificial intelligence is the simulation of human intelligence processes by machines, especially computer systems.

Artificial intelligence (AI) is the intelligence of machines or software, as opposed to the intelligence of humans or animals. It is a field of study in computer science that develops and studies intelligent machines. "AI" may also refer to the machines themselves.
AI technology is widely used throughout industry, government and science.

Some high-profile applications are: advanced web search engines (e.g., Google Search), recommendation systems (used by YouTube, Amazon, and Netflix), understanding human speech (such as Siri and Alexa), self-driving cars (e.g., Waymo),

Artificial intelligence was founded as an academic discipline in 1956. The field went through multiple cycles of optimism followed by disappointment and loss of funding, but after 2012, when deep learning surpassed all previous AI techniques, there was a vast increase in funding and interest. The various sub-fields of AI research are centered around particular goals and the use of particular tools.

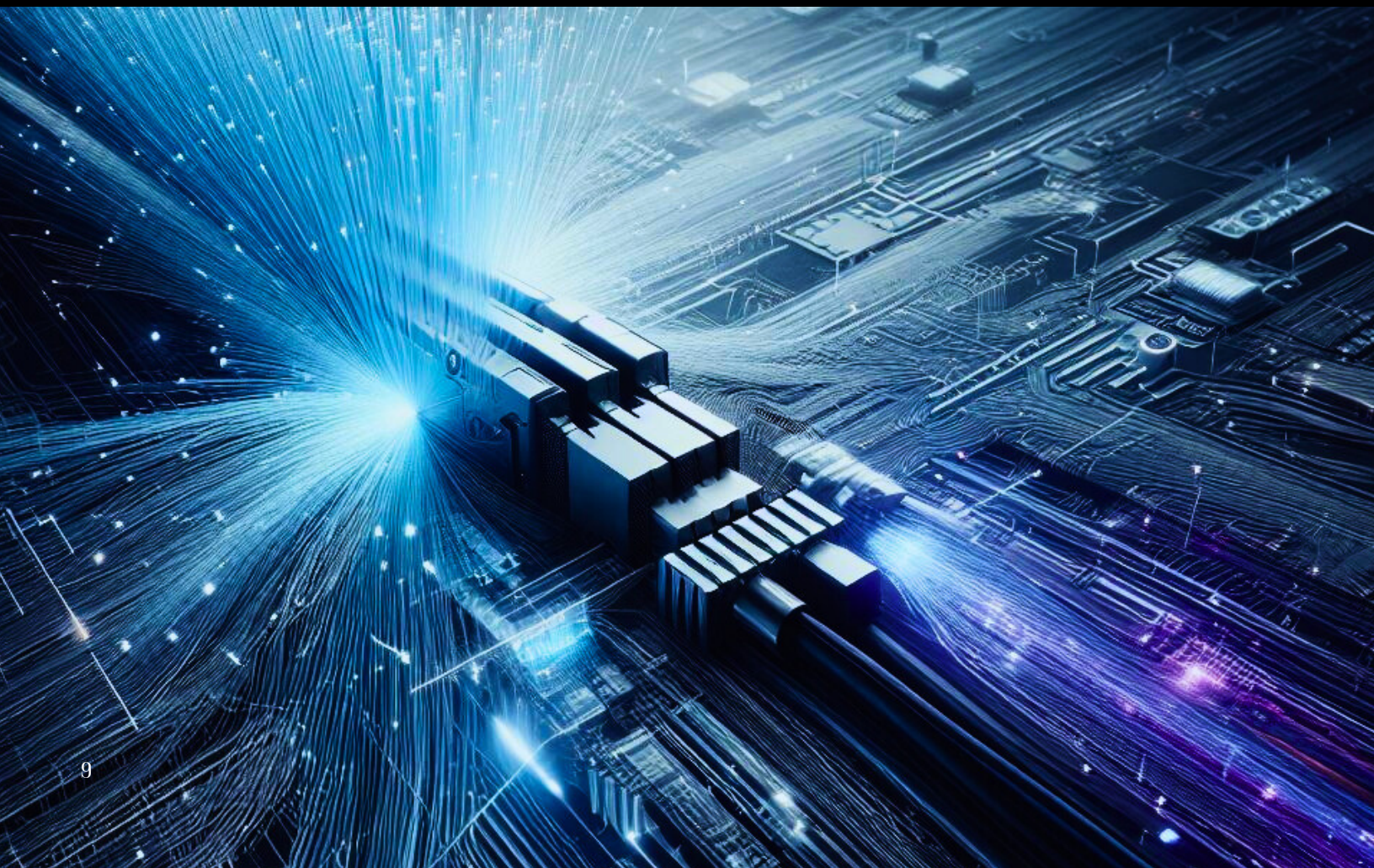
EVER

Optical fibre is the technology associated with data transmission using light pulses travelling along with a long fibre which is usually made of plastic or glass.

HOW OPTICAL FIBERS WORK ?

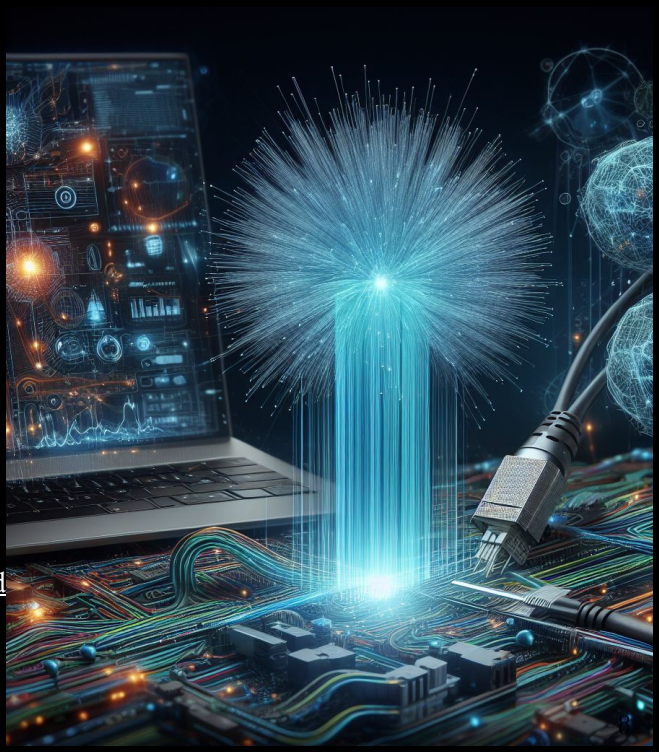
WONDER

G. LAVANYA



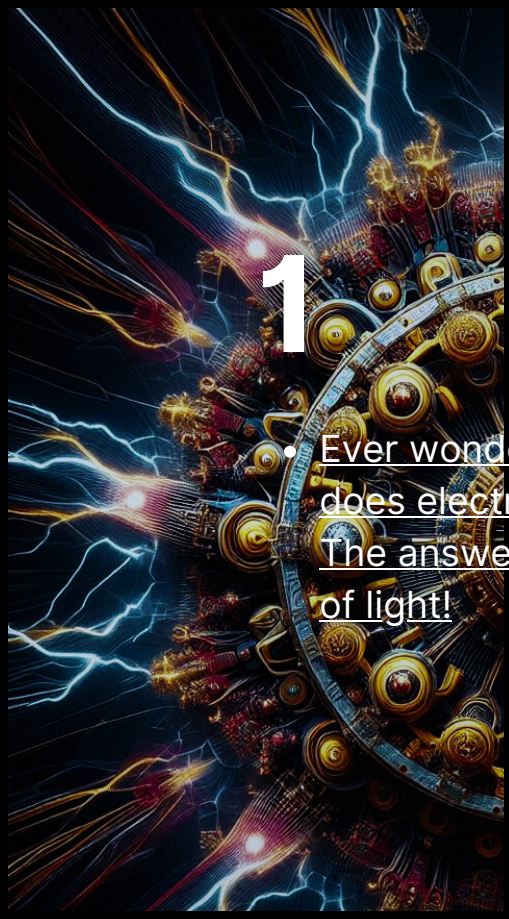
An optical fiber, or optical fibre in Commonwealth English, is a flexible glass or plastic fiber that can transmit light[a] from one end to the other. Such fibers find wide usage in fiber-optic communications, where they permit transmission over longer distances and at higher bandwidths (data transfer rates) than electrical cables. Fibers are used instead of metal wires because signals travel along them with less loss; in addition, fibers are immune to electromagnetic interference, a problem from which metal wires suffer. Fibers are also used for illumination and imaging, and are often wrapped in bundles so they may be used to carry light into, or images out of confined spaces, as in the case of a fiberscope. Specially designed fibers are also used for a variety of other applications, such as fiber optic sensors and fiber lasers. Glass optical fibers are typically made by drawing, while plastic fibers can be made either by drawing or by extrusion. Optical fibers typically include a core surrounded by a transparent cladding material with a lower index of refraction. Light is kept in the core by the phenomenon of total internal reflection which causes the fiber to act as a waveguide. Fibers that support many propagation paths or transverse modes are called multi-mode fibers, while those that support a single mode are called single-mode fibers (SMF). Multi-mode fibers generally have a wider core diameter and are used for short-distance communication links and for applications where high power must be transmitted. Single-mode fibers are used for most communication links longer than 1,050 meters (3,440 ft). Being able to join optical fibers with low loss is important in fiber optic communication. This is more complex than joining electrical wire or cable and involves careful cleaving of the fibers, precise alignment of the fiber cores, and the coupling of these aligned cores. For applications that demand a permanent connection a fusion splice is common. In this technique, an electric arc is used to melt the ends of the fibers together. Another common technique is a mechanical splice, where the ends of the fibers are held in contact by mechanical force. Temporary or semi-permanent connections are made by means of specialized optical fiber connectors. The field of applied science and engineering concerned with the design and application of optical fibers is known as fiber optics. The term was coined by Indian-American physicist Narinder Singh Kapany. Daniel Colladon and Jacques Babinet first demonstrated the guiding of light by refraction, the principle that makes fiber optics possible, in Paris in the early 1840s. John Tyndall included a demonstration of it in his public lectures in London, 12 years later. Tyndall also wrote about the property of total internal reflection in an introductory book about the nature of light in 1870:

When the light passes from air into water, the refracted ray is bent towards the perpendicular... When the ray passes from water to air it is bent from the perpendicular... If the angle which the ray in water encloses with the perpendicular to the surface be greater than 48 degrees, the ray will not quit the water at all: it will be totally reflected at the surface...



The angle which marks the limit where total reflection begins is called the limiting angle of the medium. For water this angle is 48°27′, for flint glass it is 38°41′, while for a diamond it is 23°42′. In the late 19th century, a team of Viennese doctors guided light through bent glass rods to illuminate body cavities. Practical applications such as close internal illumination during dentistry followed, early in the twentieth century. Image transmission through tubes was demonstrated independently by the radio experimenter Clarence Hansell and the television pioneer John Logie Baird in the 1920s. In the 1930s, Heinrich Lamm showed that one could transmit images through a bundle of unclad optical fibers and used it for internal medical examinations, but his work was largely forgotten. In 1953, Dutch scientist Bram van Heel first demonstrated image transmission through bundles of optical fibers with a transparent cladding. That same year, Harold Hopkins and Narinder Singh Kapany at Imperial College in London succeeded in making image-transmitting bundles with over 10,000 fibers, and subsequently achieved image transmission through a 75 cm long bundle which combined several thousand fibers.

SOME UNKNOWN FACTS !



1

- Ever wondered how fast does electricity travel? The answer is the speed of light!

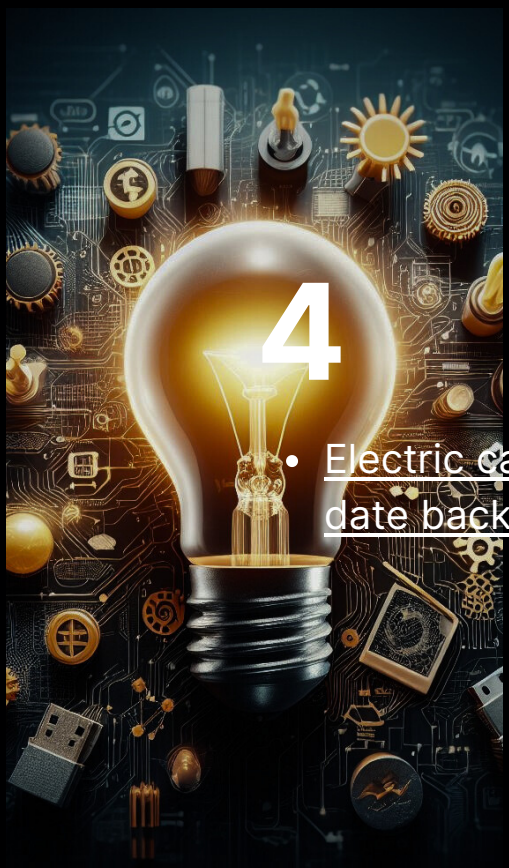
AN INVENTION IS A UNIQUE OR NOVEL DEVICE, METHOD, COMPOSITION, IDEA OR PROCESS.

2

- Lightning is caused by the discharge of electricity in the atmosphere

G. DEEKSHITH

- Electricity was first discovered in 600BC



- Electric cars actually date back as far as 1832

- Electric eels can produce up to a 600-volt shock
- 54% of all electricity is wasted

THE STORY BEHIND

A. SREEJA

LIGHT BULB

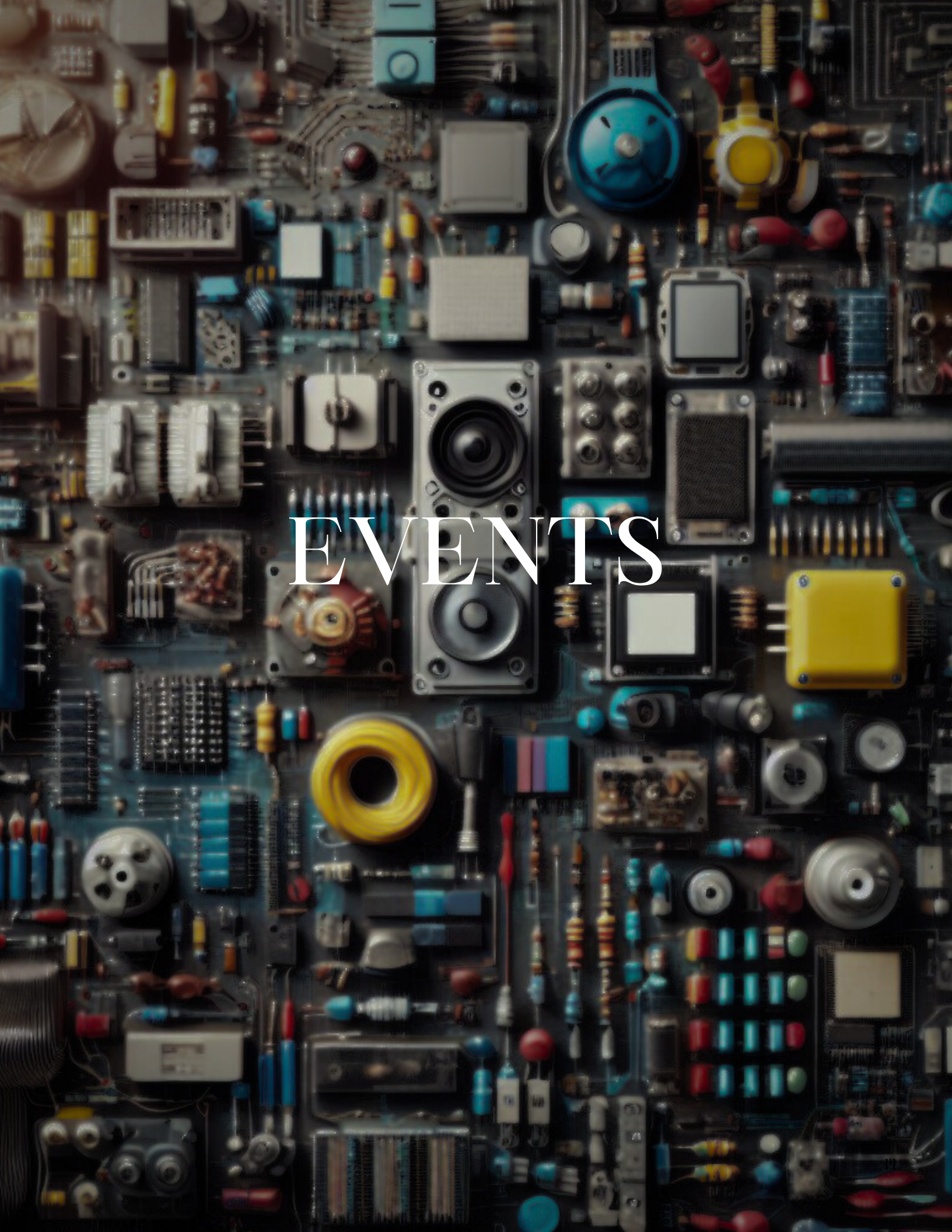
LIGHT BULB

Historians Robert Friedel and Paul Israel list inventors of incandescent lamps prior to Joseph Swan and Thomas Edison of General Electric.[failed verification] They conclude[citation needed] that Edison's version was able to outstrip the others because of a combination of three factors: an effective incandescent material, a higher vacuum than others were able to achieve (by use of the Sprengel pump) and a high resistance that made power distribution from a centralized source economically viable.

Historian Thomas Hughes has attributed Edison's success to his development of an entire, integrated system of electric lighting. The lamp was a small component in his system of electric lighting, and no more critical to its effective functioning than the Edison Jumbo generator, the Edison main and feeder, and the parallel-distribution system. Other inventors with generators and incandescent lamps, and with comparable ingenuity and excellence, have long been forgotten because their creators did not preside over their introduction in a system of lighting.

In 1761, Ebenezer Kinnersley demonstrated heating a wire to incandescence.
In 1802, Humphry Davy used what he described as "a battery of immense size", consisting of 2,000 cells housed in the basement of the Royal Institution of Great Britain, to create an incandescent light by passing the current through a thin strip of platinum, chosen because the metal had an extremely high melting point.

It was not bright enough nor did it last long enough to be practical, but it was the precedent behind the efforts of scores of experimenters over the next 75 years.
Over the first three-quarters of the 19th century, many experimenters worked with various combinations of platinum or iridium wires, carbon rods, and evacuated or semi-evacuated enclosures. Many of these devices


EVENTS

INDUCTION PROGRAME

Induction programs are designed to help new students adjust and feel comfortable in the new environment, inculcate in them the ethos and culture of the institution, help them build bonds with other students and faculty members, and expose them to a sense of larger purpose and self-exploration . The purpose of a student induction program is to welcome new students to higher education and prepare them for their new role. It is a well-planned event to educate the new entrants about the environment in a particular institution and connect them with the people in it .

The induction program engages with the new students as soon as they come into the institution, before regular classes start. At the start of the induction, the incumbents learn about the institutional policies, processes, practices, culture, and values, and their mentor groups are formed . The program could cover a number of different aspects such as socializing, associating, governing, and experiencing . The activities could include physical activity, mentoring, familiarization to department/branch, creative arts and culture, literary activity, lectures by eminent people, visits to local areas, and extra-curricular activities in college

SEMINAR

- The seminar could cover the following topics:
  - Introduction to Artificial Intelligence
  - Applications of Artificial Intelligence
  - Machine Learning
  - Deep Learning
  - Natural Language Processing
  - Robotics
  - Ethics in Artificial Intelligence
- The seminar could start with a brief introduction to Artificial Intelligence, its history, and its applications in various fields such as healthcare, finance, and transportation.
- The speaker could then delve into the details of Machine Learning, which is a subset of Artificial Intelligence. The speaker could explain the difference between supervised and unsupervised learning, and provide examples of how Machine Learning is used in real-world applications.