DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

TECHNICAL MAGAZINE

MARCH 2022

TRONIX 22

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K.S.R. COLLEGE OF ENGINEERING

(An Autonomous Institution, Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai, Accreditated by NAAC with 'A' Grade and ISO 9001:2008 Certified Institution)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

TRONIX 2022

TECHNICAL MAGAZINE
MARCH 2022 ISSUE

ACADEMIC YEAR 2021-2022

VISION OF THE INSTITUTE

We envision to achieve status as an excellent educational institution in the global knowledge hub, making self-learners, experts, ethical and responsible engineers, technologists, scientists, managers, administrators and entrepreneurs who will significantly contribute to research and environment friendly sustainable growth of the nation and the world.

MISSION OF THE INSTITUTE

- To inculcate in the students self-learning abilities that enable them to become competitive and considerate engineers, technologists, scientists, managers, administrators and entrepreneurs by diligently imparting the best of education, nurturing environmental and social needs.
- To foster and maintain a mutually beneficial partnership with global industries and Institutions through knowledge sharing, collaborative research and innovation.

VISION OF THE DEPARTMENT

We envision as a center of excellence in the field of Electronics and Communication Engineering to produce technically competent graduates with diverse teaching and research environments.

MISSION OF THE DEPARTMENT

- To educate the students with the state of art technologies to meet the growing challenges of the industries.
- To develop an innovate, competent and ethical Electronics and Communication Engineer with strong foundations to enable them for continuing education.

Programme Educational Objectives (PEOs)

The Program Educational Objectives of B.E. - Electronics and Communication Engineering Department are:

PEO 1	**Employability and Higher education**: Excel in professional career and higher education by acquiring knowledge in mathematical, social, scientific & engineering principles.
PEO 2	**Core Competence**: Analyze, design and develop/implement core engineering problems in communication systems that are technically sound, economically feasible and socially acceptable.
PEO 3	**Interpersonal skills and Team work**: Exhibit professionalism, ethical communicating skills and team work by engaging in lifelong learning for sustainable development of the society.

Programme Specific Outcomes (PSOs)

PSO 1	**Professional Skill:**Specify, design and test modern electronic systems that perform analog and digital processing functions.
PSO 2	**Problem – Solving Skills:** Design essential elements (circuits and antennas) of modern RF/Wireless communication systems.

Programme Outcomes (POs)

Graduates of Electronics and Communication Engineering Programme will be able to

PO 1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage:** Create, select, and apply appropriate techniques, resource, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environmental and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work:** Function effectively as an individual, and as a member or leader diverse teams, and in multidisciplinary settings.
PO 10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Founder's Message

TRONIX பத்திரிகை ஆனது மாணவர்கள் மற்றும் ஆசிரியர்களிடையே உள்ளார்ந்த திறமைகளை வெளிக்கொணர்வதை நோக்கமாகக் கொண்டுள்ளது.

இந்த இதழ் ஒரு நேர்மறையான சமிக்ஞையை அனுப்பும் என்று நான் நம்புகிறேன்.

இதுபோன்ற ஒரு அற்புதமான பத்திரிகையை வெளிக்கொணர்ந்த அனைத்து பங்களிப்பாளர்களையும் வாழ்த்துகிறேன்.

FOUNDER & CHAIRMAN

Lion. Dr. K.S. Rangasamy, MJF.,

Chairman's Message

It gives me immense pleasure to pen a few words as prologue to the bi annual department magazine TRONIX exclusively meant for churning out the talent writing talent which bears immense potentiality of sharpening the student skills as part of their overall personality development. I congratulate all the contributors for bringing out such a beautiful magazine.

Vice - Chairman

Mr. R. Srinivasan, B.B.M., MISTE.,

PRINCIPAL MESSAGE

I congratulate the department of ECE for bringing the prestigious bi annual department magazine, TRONIX. I am sure that the magazine will provide a platform to the students and faculty members to expand their technical knowledge and sharpen their hidden literary talent. I am hopeful that this small piece of literary work shall not only develop the taste for reading among students but also develop sense of belonging to the institution as well. My congratulations to the editorial board took the responsibility for the arduous task most effectively. I extend best wishes for the success of this endeavor.

PRINCIPAL

Dr. P. Senthil kumar M.E., Ph.D.,

MESSAGE FROM THE CHIEF EDITOR

I am extremely happy that our department magazine TRONIX has come out very well. This magazine reflects the state of art of the department, highly qualified faculty and most prolific students. The magazine has helped in bringing out the creative instinct of the students and their proficiency. I am very happy to be a part of this magazine. I congratulate all the faculty and students in making this magazine a success.

Dr. P.S.PERIASAMY
PROFESSOR/HEAD
HOD-ECE

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Ms. KEERTHANA T – IV/ECE

INDEX

INDUCTORS IN INTEGRATED CIRCUITS

Most of the analog and digital circuits are possible to be implemented in Integrated Circuits, but it is still not possible to put inductor inside Integrated Circuits. This is because that inductor occupies a comparatively huge area in IC than all other components being fabricated inside it. Also, the induced magnetic field affects the nearby components and changes the properties of the corresponding components. Normally in ICs, pseudo inductors (i.e.) resistors and capacitors are used instead of inductors and they perform more similar as real inductors. But in some applications (i.e.) for Radio Receivers and Satellite Communications. So, there is a need to miniaturize inductors and design them into ICs to allow for low real state requirement on PCBs. The efficient solution for this problem is the use of bond wires. Inductors can be fabricated through bond wires connecting to the core die and package pins. In addition, to provide good isolation and to reduce EMI/EMC problems, Guard rings are placed around inductors. Bond wires can be made of any materials such as gold, silver, copper and aluminimum. But gold is used mostly where performance is meant to be important criteria. If properly designed, wire bonding can be used at frequencies above 100 GHz. Bond wires are usually of 15mm thickness. It can be miniaturize the size of inductors with the help of them. As guard rings provide better isolation between neighboring components, there will be no such Effect of Electromagnetic Interference (EMI) at high frequencies. In this way, inductors can be miniaturized and fabricated inside ICs meant for high frequency and satellite communications.

GANGAASRI S
IV YEAR ECE

It doesn't matter who you are, where you come from. The ability to triumph begins with you. Always. - ***Oprah Winfrey***

WIRELESS CHARGER

Emerging technologies makes our life simpler in these days. With the introduction of mobile phones life has changed rapidly. But although there are many advantages in this technology, still rely on the wired battery charges. The battery charges are required to carry everywhere to keep the battery backup. It is the process of a battery charger that charges mobile automatically. When can do our routine work and it simply charges the mobile. This method is possible by the use of microwaves also. The microwave signals are transmitted from the transmitter. It eliminates the use of physical connectors, cable, etc. It is based on the principle of "Inductive Coupling". The wireless battery charger uses two circuits. The first circuit is the transmitter circuit used to produce voltage wirelessly. And the second circuit that is receiver circuit consists of a receiver coil. Alternating current flows in the transmitter circuit creates magnetic field which links with the receiver coil. It generates current. And that current is converted into DC by the receiver circuit, thus charging takes place. This is ways the mobile get charging. It will work for very short distances only. Just place in the on the charging pad and watch your device juice up.

POOJA P
IV YEAR E

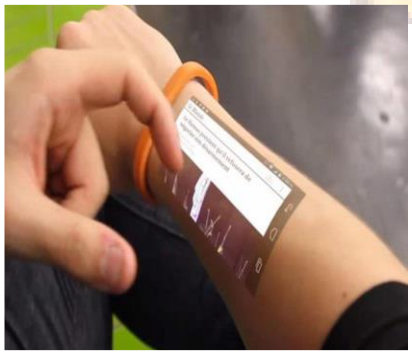
India was the first country to develop extraction and purifying techniques of sugar. Many visitors from abroad learnt the refining and cultivation of sugar from us.

HOLOGRAM BRACELET

A hologram bracelet or energy bracelet is a small rubber wristband fitted with a hologram. Manufacturers have said that the holograms "optimize the natural flow of energy around the body, and so it improves an athlete's strength, balance and flexibility. Only anecdotal evidence supports these claims and tests performed by the Australian Sceptics, the University of Wales Institute, Cardiff, and the RMIT's School of Health Sciences have been unable to identify any effect on performance.

Hologram bracelets include a small hologram which manufacturers say is programmed through an undisclosed process. Power Balance, who has manufactured the bracelets since 2007, says that the programming mimics Eastern philosophies‖. The holograms are usually installed in bracelets and wristbands but then are also sold as pendants or necklaces, anklets, shoe inserts, pet tags, or separately for users to apply to the back of a watch, for example.

Manufacturers including Power Balance and EFX Performance make no claims on their websites for their products, but carry testimonials from users who say that they improve athletic performance. Until 2010, Power Balance said that their bracelets helped improve an athlete's strength, balance and flexibility because the holograms are embedded with an electrical frequency that restores the bodies of the electrical balance on contact with its natural energy field. In December 2010, following a successful legal action by the Australian Competition and Consumer Commission, Power Balance admitted that there was no credible scientific evidence for these claims.



SENTHILKAASI R
IV YEAR ECE

ORGANIC LIGHT EMITTING DIODE

Organic Light Emitting Diode (OLEDs) operates on the principle of converting electrical energy into light, a phenomenon known as electro-luminousness. They consist of emissive electroluminescent layer comprised of a film of organic compounds (carbon, hydrogen & oxygen). In its simplest form, an OLED consists of a layer of luminescent materials sandwiched between two electrodes. When an electric current is passed between the electrodes, through the organic layer, the light is emitted with a color that depends on the particular material used.

The battery or power supply of the device containing the OLED. An electric current flows from the cathode to the anode through the organic layers. The cathode gives electrons to the emissive layer of organic molecules. The anode removes electron from the conductive layer of organic molecules. At the boundary between the emissive & the conductive layers, electron finds the electron holes. When an electron finds an electron hole, the electron fills the hole. When it happens the electron gives up energy in the form of a photon of light. The OLED emits light. The color of light depends on the type of organic molecules in the emissive layer. Manufacture place several types of organic films on the name OLED to make the color displays. The intensity or brightness of the light depends on the amount of electrical current applied the more current, the brighter the light.

SWETHA G

IV YEAR ECE

"We owe a lot to the Indians, who taught us how to count, without which no worthwhile scientific discovery could have been made."
-Albert Einstein

GOOGLE CARDBOARD

Google Cardboard is a Virtual Reality (VR) platform developed by Google for use with a head mount for a smart phone. Named for its fold-out cardboard viewer, the platform is intended as a low-cost system to encourage interest and development in VR applications. Users can either build their own viewer from a simple and a low-cost components using specifications published by Google, or purchase a pre-manufactured one. To use the platform, users can run Cardboard-Compatible applications on their phone, place the phone into the back of the viewer, and view content through the lenses.

Google Cardboard headsets are built out of a simple and A low-cost components. The headset specifications were designed by Google, which made the list of parts, schematics, and assembly instructions freely available on their website, allowing people to assemble Cardboard themselves from readily available parts. Pre-manufactured viewers were only available from third-party vendors until February 2016, when Google began selling their own through the Google Store.

The parts that make up a Cardboard viewer are a piece of cardboard cut into a precise shape, 45 mm focal length lenses, magnets or capacitive tape, a hook and loop fastener (such as Velcro), a rubber band, and an optional near field communication (NFC) tag. Once the kit is assembled, a smart phone is inserted in the back of the device and held in place by the selected fastening device. A Google Cardboard is a Compatible app it splits the smart phone display image into two, one for each eye, while also applying barrel distortion to each image to counter pincushion distortion from the lenses. The result is a stereoscopic (3D) image with a wide field of view.

The first version of Cardboard could fit phones with screens up to 5.7 inches (140 mm) and used magnets as input buttons, which required a compass sensor in the phone. An updated design released at Google I/O 2015 works with the phones up to 6 inches (150 mm) and replaces the magnet switch with a conductive lever that triggers a touch event on the phone's screen for better compatibility across devices.

BALAMURALIDHARAN R
IV YEAR ECE

NEXT ON SMART HOMES: AN EAR TO INTERNET

Technology is the campfire around which we tell our stories!

The houses have been getting progressively smarter for decades, but the next generation of smart homes may offer two cases what scientists are calling an Internet of Ears. Today's smart home features appliances, entertainment systems, security cameras and lighting, heating and cooling systems that are connected to each other and the Internet. They can be accessed and controlled remotely by computer or smart-phone apps. The technology of interconnecting commercial, industrial or government buildings, someday even entire communities, is referred to as the "Internet of Things," (IoT).

We are using principles similar to those of the human ear, where vibrations are picked up and our algorithms decipher them to determine your specific movements. That's why we call it the Internet of Ears.

There is actually a constant 60 Hz electrical field all around us, and because people are somewhat conductive, they short out the field just a little. It measuring the disturbance in that field, we are able to determine their presence, or even their breathing, even when there are no vibrations associated with sound. They expect the system could provide many benefits.

The first advantage will be energy efficiency for buildings, especially in lighting and heating, as the systems adjust to how humans are moving from one room to another room, it allocating energy more efficiently.

Another benefit could be the ability to track and measure a building's structural integrity and safety, based on human occupancy which would be critical in an earthquake or hurricane.

Thus the disadvantage we are trying to predict if there is going to be structural damage because of the increased weight or load based on the number of people on the floor or how they are distributed on that floor.

“Modern Technologies make people try to do everything at once….!”

ARAVINTHAN .T
III YEAR ECE

ELECTRONIC PILLS AND THEIR APPICATIONS

Electronic pills are the holy grail of health care technology. Ever since the past microelectronic pill was developed by Prof. Jon Cooper and Dr. Erik Johansson from Glasgow University in 1972.

An electronic pill is a multichannel sensor which is used for remote biomedical measurements in the body. They can specifically deliver drugs to certain parts of the body to target the different types of cancer, stimulated damage tissues, tract gastric problems and measure biomarkers.

CURERENT PRODUCTS ON THE MARKET:

• Philips intelligent pill:

This electronic pill is a plastic capsule which is usually taken with a solid food or water. Normally, it is meant to be transported through the digestive system in a natural manner. This is usually done within 24 hours and as this is done, the drug is dispensed to different parts of the body. The size is about that of a plump multivitamin and the drug can even carry out specialized actions based on the pH level of the patient.

• Intellicap drug:

It is rightly described as an electronic pill acting as a drug delivery and a monitoring device. It is made up of a drug reservoir, wireless communication systems, electronic controllers, sensors and a delivery pump. It takes a very minuscule form and upon ingestion, it travels through the gastro intestinal tract. The presence of onboard electronics means that

GOWRI MANOHARI S
III YEAR ECE

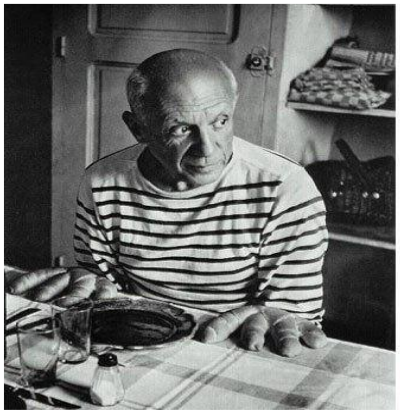
AUTOMATIC RAILWAY GATE CONTROLLER WITH HIGH SPEED ALERT SYSTEM

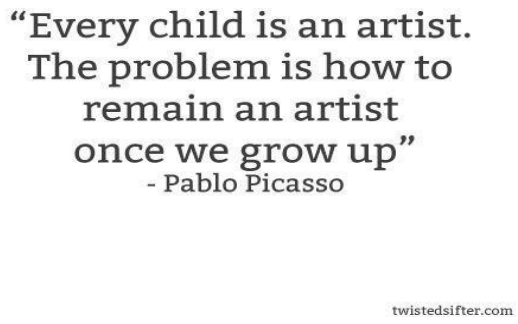
This automatically controls the operation of railway gates by detecting the arrival and departure of trains at the gate. Detectors are placed at the faraway distance on the railway track and they are connected to micro controller, which activates the motors to perform the mechanical action of opening and closing the railway gates.

The IR LEDs and photodiodes are placed on either side of the track initially. IR LED is the transmitter that continuously transmits IR light to the receiver. When train arrives, it blocks falling and we can consider that the train is moving from left to right. Now, the first sensor pair acts as counter and gets activated when the train blocks it, and the second sensor pair slops working.

The counter values generated are used to calculate the velocity of train. If the speed of the train is increased an alarm/buzzer is activated.

MONISHA D
IIIrd YEAR ECE





GROWING ROLE OF ELECTRONICS IN CARS

Today an average new automobile includes more than 40 electronic controller, five miles of wiring and more than 10 million lines of software code. The performance and connectivity are the two primary functions supported by increasing of electronics in automobiles.

Electronics have been especially important in improving the two aspects of improving vehicle performance. They are: (i) Refining the powertrain to reduce the emissions and improving fuel consumptions (ii) Refining the chassis, exterior and interior to improve the vehicle-safety and comfort “Clean Air” act which was passed in 1963.By the mid 1980 air bags had become the safety technology of choice to supplement the seat belt. Today‘s airbags include number of sensors not only to assure fast and accurate deployment but also to prevent unnecessary deployment.

Current testing and product trials suggest rather futuristic applications such as vehicle to vehicle communication that reduces the chances of collision; advance navigation systems that adjust a car’s engine to feature of terrain according to information on the route travelled and reverse parking, as well as it place vehicle into tightly parking spaces .

Ultimately, cars may drive themselves (one possible application of this capability would be platooning where self -driving vehicles travel in tightly spaced groups on highway this will be interesting to see how cars help in traffic management .Ironically, traffic is due to because of too many cars and now cars might help us to manage the same as well. Barring this, more electronics in cars will lead to changes in supply chain.

SANTHIYA G
III YEAR ECE

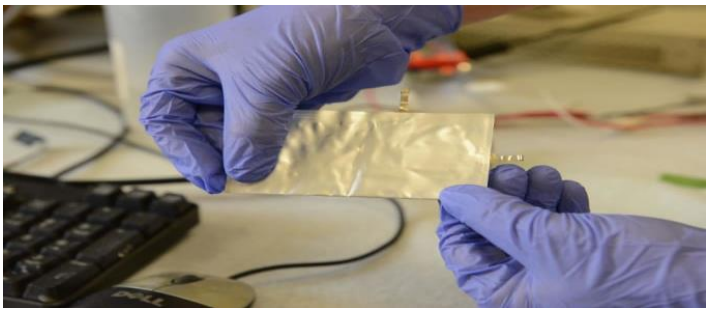
FLEXIBLE, FAST-CHARGING BATTERIES

Next to hyper-fast ground transportation, flexible batteries may seem trivial. But when the batteries that power our gadgets are freed from current technological restrictions, anything might be possible.

Here's one example: Scientists published an article about their work on a flexible aluminium-ion battery that looks like a pouch-flask you'd try to sneak into Coachella. But it can charge a phone in a minute, it lasts 70 times longer than a traditional smartphone battery, and it fits in any kind of gadget which can think of thanks to its malleable shape and Elon Musk is working on this problem, too naturally. Aluminium-ion batteries are a class of rechargeable battery in which aluminium ions provide energy by flowing from the negative electrode of the battery, the anode to the positive electrode, the cathode. When recharging, aluminium ions return to the anode.

Aluminium-ion batteries are conceptually similar to lithium-ion batteries, but possess an aluminium anode instead of a lithium anode. While the theoretical voltage for aluminium-ion batteries is lower than lithium-ion batteries, 2.65 V and 4 V respectively, the theoretical energy density potential for aluminium-ion batteries is 1060 Wh/kg in comparison to lithium-ion's 406 Wh/kg limit. The large difference in energy density potential is due to the fact that aluminium ions have three valence electrons while lithium ions only have one. Aluminium is also more abundant than lithium, lowering material costs.

Aluminium-ion battery has a relatively short shelf life. The combination of heat, rate of charge and cycling can dramatically decrease energy capacity. When metal ion batteries are fully discharged, it can no longer to be recharged. Ionic electrolyte materials are expensive of the batteries, having a far lower energy density than gasoline.



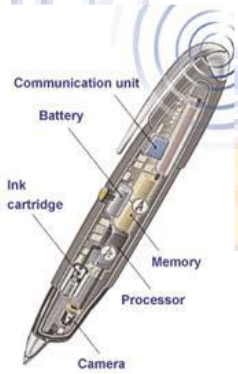
TAMILSHRI S
IIIrd YEAR ECE

DIGITAL PEN

A digital pen is one of the new electronic inventions that can help us record information. Despite the digital age, we still use pens. But it would be great to have our handwritten notes and drawings digitally recorded without having to use a scanner. The Z-pen from Dane-Electronic is a wireless pen that uses a clip-on receiver to digitally record what you write. It uploads the information to your computer where it can be viewed, edited and filed as a word processing document. The digital pen utilizes character recognition software and works by recording movement. Features include profile creation, a dictionary and fifteen language options.

Instant Prints

Creating instant prints from a digital camera is one of the new electronic inventions in printing. The Polaroid PoGo™ is a small portable printer that weighs only a few ounces. The printer produces full color 2" x 3" prints using an "inkless" technology. The images are created from heat activated crystals in the photo paper. The photos are water proof, tear proof and smear proof. This new electronic invention connects to a digital camera using a USB cable or to a mobile phone through wireless Bluetooth. It uses rechargeable batteries or an AC adapter.



PRAVEENKUMAR R

II YEAR ECE

"Go," is the shortest complete sentence in the English

LI- FI TECHNOLOGY
TRANSMISSION OF DATA THROUGH LIGHT

Transfer a data from one place to another is one of the most important day-to-day activities. The current wireless networks that connect us to the internet are very slow when multiple devices are connected. As the number of devices that access the internet increases, that fixed bandwidth available makes more difficult to enjoy high data transfer rates and connect to a secure network. But, radio waves are just a small part of the spectrum available for data transfer. A solution to this problem is by the use of Li-Fi. Li-Fi stands for Light-Fidelity. Li-Fi is a transmission of a data through illumination by taking the fiber out of fiber optics by sending a data through an LED light bulb. It is the term which has used to label the fast and cheap wireless communication system, which is the optical version of Wi-Fi. Li-Fi uses visible light instead of Gigahertz radio waves for data transfer. It is based on LEDs or other light source for the transfer of data. The transfer of the which data can be the help of all kinds of light, no matter the part of the spectrum that they belong. The light can belong to the invisible, ultraviolet or the visible part of the spectrum. Also, the speed of the communication is more than sufficient for downloading movies, games, music and all in very less time.

Li-Fi can be the technology for the future where data for laptops, smart phones, and tablets will be transmitted through the light in a room. Security would not be an issue because it can be used in high security light can't be seen data wouldn't be accessed. As a result, it can be used in high security military areas. It is the upcoming and on growing technology acting as competent for various other developing and already invented technologies. Hence the future applications of the Li-Fi can be predicted and extended to different platforms and various walks of human life. Possibilities for future utilization are abundant. Every light bulb can be converted into Li-Fi signal receptor to transfer data and we could proceed toward the cleaner, safer, greener and brighter future.

S. SANGAVI
IInd YEAR ECE

GPS BASED CONTROL SYSTEM FOR FISHING BOATS

India, being a peninsular country has a vast coastline of about 6100kms and shares its maritime boundary with Sri Lanka and Pakistan. This long coastal boarder has not yielded the expected resources but has resulted in hostage of innocent fishermen which in turn lead to many problems to the coastal villagers. Approximately more than 100 fishermen are caught as captives of each month by the Sri Lankan Navy alone. This idea mainly throws light on preventing the guiltless fishermen from crossing the international borders. The heart of this technology lies on GPS. This controller is connected, when the reading of the GPS receiver system, which shows the latitude & longitude of each point on earth accurately exceeds a certain value, an alarm is activated to warn the fishermen and if they tend to cross the boarders, violating the rules, a signal is given to the coastal guard through a transmitter.

This can be act as a security system to trace the missing and the border crossed boats, Generally motor boats are used for deep sea fishing when an alarm signal is given to the coastal guard, the motors of the violating boats are blocked from running, which is done by interfacing with controllers and the stranded boats captured by the guards. The government of our nation can not only safeguard the innocent fishermen and their family, but also prevent those men, who try to cross the border purposely either for their own cause or to involve in immoral activities using these boats. This technology will have a great impact to improve the growth of coastal villagers their quality of living.

The GPS receiver in this system is OREGON 400 which is the system for marine applications. This GPS receiver has an electronic compass inbuilt which is used as the main objective in this technology. The GPS system must be interfaced with the other 6 controlling components. In order to achieve this USART-Universal Synchronous Asynchronous Receiver Transmitter is used with FPGA. The FPGA used is the SPARTAN 6 which enables the reducing system costs by up to half for lower power 'GREENER' products.

SRI KOWSIKA. V, IIND YEAR ECE

FLEXIBLE PHOTOTRANSISTOR

The flexible phototransistor could improve the performance of myriad products - ranging from digital cameras, night-vision goggles and smoke detectors to surveillance systems and satellites — that rely on electronic light sensors. Integrated into a digital camera lens, for example, it could reduce bulkiness and boost both the acquisition speed and quality of video or still photos.

Like human eyes, phototransistors essentially sense and collect light, then convert that light into an electrical charge proportional to its intensity and wavelength. In the case of our eyes, the electrical impulses transmit the image to the brain. In a digital camera, that electrical charge becomes the long string of 1s and 0s that create the digital image.

While many phototransistors are fabricated on rigid surfaces, and therefore are flat, Ma and Seo‘s are flexible, it means they more easily mimic the behavior of mammalian eyes. One important aspect of the success of the new phototransistors is the researchers innovative flip-transfer, fabrication method, in which their final step is to invert the finished phototransistor onto a plastic substrate. At that point, a reflective metal layer is on the bottom. In this structure unlike other photo detectors light absorption in an ultrathin silicon layer can be much more efficient because light is not blocked by any metal layers or other materials,.

The researchers also placed electrodes under the photo transistor ultra thin Silicon Nano membrane layer and the metal layer and electrodes each act as reflectors and improve light absorption without the need for an external amplifier.

There is a built-in capability to sense weak light, and this flexible phototransistors open the door of possibility. This demonstration shows that great potential in high-performance and flexible photo detection systems, whose work was supported by the U.S. Air force. It shows that the capabilities of high-sensitivity photo detection and stable performance under bending conditions, which have never been achieved at the same time.

V. HARISH
II YEAR ECE

E-MOBILITY

The importance of e Mobility is increasing rapidly for the automotive industry and for people who want to go green. In 2018 there were 3.3 million battery electric vehicles on the streets worldwide. One of those measures is the Clean Hydrogen Fuel Cell which provides clean electricity and reduces dependency on diesel generators.

The Hydrogen (H2) is made from water in an electrolyser, powered by 100% renewable energy (from a wind farm or solar panels), so it does not pollute the atmosphere with fumes or carbon dioxide. The fuel cell combines hydrogen with the oxygen from the air to create 150kW of electrical energy, which then it powers the electric cars.

The automotive industry has certainly been getting a lot of flak in recent decades for being one of the primary contributors to environmental degradation, particularly in air pollution. And one of their moves is to produce more environment-friendly vehicles. Electric cars seen to be one of the best solutions, and this spurred the introduction of electric mobility or e-mobility technologies.

Even a 1979 vintage Volkswagen Bull-E showcased at the festival runs on electric power. “That supports the way we want to live - happily, sustainably and in harmony,”

Benefits of E-mobility:

- E-mobility will help reduce the amount of energy required and utilized by the transportation sector.
- E-mobility challenges car makers and manufacturers to think outside the box. As the threat of competitors coming out with more efficient electric vehicles increase, they are also likely to put in more effort and resources into making vehicles that are better more energy-efficient, lighter, and offer higher performance.
- E-mobility will create employment opportunities. The automotive industry will be more confident in the development
- Globalized standards and e-mobility technology will minimize barriers to trade, allowing for harmonious working relationships among manufacturers and among nations.

YASUDHIN U
II YEAR ECE

POEMS

Because you are my friend

Because you are my friend,
my life is enriched in a myriad of ways.
Like a cool breeze on a sweltering day,
like a ray of sunshine parting glowering clouds,
you lift me up.
In good times, we soar,
like weightless balloons
over neon rainbows.
In bad times, you are soothing balm
for my pummeled soul.
I learn so much from you;
you help me see old things in new ways.
I wonder if you are aware
of the bright seeds you are sowing in me.
I'm a better person for knowing you,
so that everyone I interact with
is touched by your good effect on me.
You relax me, refresh me, renew me.
Your bounteous heart envelops me
in joy and love and peace.
May your life be filled
with dazzling blessings,
just as I am blessed

by being your friend.

DHANRAAJ S
II YEAR ECE

POSITIVE ATTITUDE

A positive attitude helps you cope more easily with the daily affairs of life. It brings optimism into your life, and makes it easier to avoid worries and negative thinking. If you adopt it as a way of life, it would bring constructive changes into your life, and makes them happier, brighter and more successful.

With a positive attitude you see the bright side of life, become optimistic, and expect the best to happen. It is certainly a state of mind that is well worth developing.

Positive attitude manifests in the following ways:

- Positive thinking.
- Constructive thinking.
- Creative thinking.
- Optimism.
- Motivation and energy to do things and accomplish goals.
- An attitude of happiness.

A positive frame of mind can help you in many ways, such as:

- Expecting success and not failure.
- Making you feel inspired.
- It gives you the strength not to give up, if you encounter obstacles on your way.
- It makes you look at failure and problems as blessings in disguise.
- Believing in yourself and in your abilities.
- Enables you to show self-esteem and confidence
- You look for solutions, instead of dwelling on problems.
- You see and recognize opportunities.

A positive attitude leads to happiness and success and can change your whole life. If you look at the bright side of life, your whole life becomes filled with light. This light affects not only you and the way you look at the world, but it also affects your environment and the people around you. If this attitude is strong enough, it becomes contagious. If this attitude is strong enough, it becomes contagious. It's as if you radiate light around you.

Negative attitude says: you cannot achieve success
Positive attitude says: You can achieve success

GOKUL K
II YEAR ECE

RIDDLES

1) What word, when written in capital letters are the same forwards backwards and upside down?
2) Two boys play checkers. They play 5 games, they win the same amount. How?
3) What is that when you take away the whole, you still have some left?
4) There is a common English word that is nine letters too long. Each time you remove a letter from it, it still remains an English word, from nine letters right down to a single letter. What is the original word and what are the words that it becomes after removing one letter at a time?
5) There is only one ten letter word in the English language which can be typed using only the top row of the keys on a type writer (or keyboard) what is it?
6) The day before yesterday I was 25 and the next year I will be 28. This is true only one day in a year. What day is my birthday?
7) What mathematical symbol can be placed between 5 and 9 to get a number greater than 5 and smaller than 9?
8) What can you break but not touch?
9) Say my name and I disappears what am I?
10) What kind of pet always stays on the floor?

ANSWERS

1) NOON
2) They did not play each other
3) wholesome
4) startling
5) Type writer
6) Born on Dec31st and spoke about it on January 1st
7) Decimal – 5.9
8) Promise
9) Silence
10) Orpit

JINU R
II YEAR ECE

A SMILE

A smile costs nothing, but gives much-

It takes but a moment, but the memory of it usually lasts forever.

None are so rich that can get along without it-

And none are so poor but that can be made rich by it.

It enriches those who receive, without making poor those who give-

It creates sunshine in the home, Fosters good will in business,

And is the best antidote for trouble-

And yet it cannot be begged, borrowed, or stolen, for it is of no value

Unless it is given away.

Some people are too busy to give you a smile-

Give them one of yours-

For the good Lord knows that no one needs a smile so badly

As he or she who has no more smiles left to give

You've got to take the good with the bad, smile with the sad, love what you've got."

PANDISELVI P
II YEAR ECE

FACTS ABOUT INDIA

- Around 100 million years ago, India was an island.
- India's name is derived from the ―Indus‖ river.
- Indus Valley Civilization is the world's oldest civilization.
- India has been the largest troop contributor to the United Nations Peacekeeping Missions since its inception.
- India has the world's third largest active army, after China and USA.
- The Tirupati Balaji temple and the Kashi Vishwanath, both receive more visitors than the Vatican City and Mecca combined.
- In a village called Shani Shingnapur in Maharashtra, people have been living in houses with no doors for generations. This is because they believe that whoever steals anything from this place will incur the wrath of Shani God and will have to pay for his/her sins very dearly. There is no police station in this village either.
- Magnetic Hill is a gravity hill located near Leh in Ladakh, India. The hill is alleged to have magnetic properties strong enough to pull cars uphill and force passing aircraft to increase their altitude in order to escape magnetic interference.
- Chess was invented in India.
- Buttons were invented in India. Yes, your shirt's buttons.
- Martial Arts were first created in India.
- The world's biggest family lives in India. One man, 39 wives and 94 children.
- India is the world's largest importer of arms.
- But India has never invaded or attacked a country.

DHARANIDHARAN B
II YEAR ECE