SARANATHAN COLLEGE OF ENGINEERING

PROUDLY PRESENTS

WIZARDZZ

VOLUME-15

TECH MAGAZINE OF THE DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

AN HALF YEARLY PUBLISH BY STUDENTS OF ECE

FROM THE HOD’s DESK

I am delighted to see the department e-magazine getting released for this semester (2019-2020). It's been customary for our department to release an e-magazine once every semester. This initiative is an excellent way to prove and exhibit the skills of the staff and the students in technology and artistic capabilities. I really hope this would kindle a spark in the minds of the students who are yet to contribute towards the progress of the initiative in the upcoming years.

I extend my sincere thanks to the people who have contributed to this publication to enhance its perfection and beauty through their articles, drawings and photography. I congratulate the entire editorial team for their hard work and dedication that has resulted in this publication of our department e-magazine “WIZARDZZ V.15.”

All the best students!

EDITOR's DESK

We would like to thank the Management and all the staff who have supported the 'WIZARDZZ' and for having trust in the Editorial board by giving us full freedom to choose the contents and design for our magazine. We hope that this magazine serves as a pillar of motivation for each and every other student who is yet to be recognized as an Achiever and to carry this legacy forward. The student fraternity has wonderfully supported us in making this magazine a huge success. Thank you students! Go Mad, B.E. productive but at the same time B.E. creative!

This E-MAGAZINE would have been impossible to accomplish without the impeccable support from the family of Electronics and communication department. We extend our thanks to our beloved HOD Dr. M.Santhi for giving us this opportunity and Dr. S.A.Arunmozhli for guiding us in this venture.

THANK YOU ☺

G. Nithya ECE III yr

B.Moohammed Sattar ECE III yr

Varun Bhaaskar ECE III yr

K.Vanitha ECE III yr

VISION & MISSION

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Vision of the Department

To become a leading department of Higher Learning and a Research Centre of Excellence in Research in Electronics and Communication Engineering.

Mission of the Department

1. M1: To enable budding engineers to obtain technical exposure in various areas of Electronics and Communication Engineering.
2. M2: To nurture career improvement.
3. M3: To initiate and sustain research activities in the department in cutting edge areas of Electronics and Communication Engineering.
4. M4: To develop professional and ethical attitude in the students.

Program Educational Objectives (PEOs)

Graduates of Electronics and Communication Engineering will

PEO1:

have a strong foundation in the required sciences in order to pursue studies in Electronics and Communication Engineering.

PEO2:

have a broad exposure to the students in various topics related to Electronics and Communication Engineering fields, to enable them to excel in their professional career / higher studies.

PEO3:

possess innovative skills in order to solve the technical problems which will arise in their professional life.

PEO4:

have professional and ethical attitude and an ability to visualize the engineering issues in a broader social context.

PROGRAM OUTCOMES (POS)

Engineering Graduates will be able to:

1. Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2.Problem analysis:

Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

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.

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.

5. Modern tool usage:

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

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.

7. Environment 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.

8. Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

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.

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.

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.

Program Specific Outcomes (PSOs)

Graduates of Electronics and Communication Engineering will be able to:

PSO1:

Comprehend and demonstrate the principles and concepts of Semiconductor theory, Signal Processing & Embedded systems in the fields of Consumer Electronics, Medical Electronics and Defence Electronics.

PSO2:

Apply emerging Information and Communication Engineering Techniques to solve real time problems.

EVENTS CONDUCTED IN ECE DEPARTMENT

S.No	Title of the Course	Participants	Duration
1	Current Trends in Digital Communication	Faculty Members	10.06.2019 -12.06.2019
2	Technical Seminar on “Industry 4.0”	Second &Third year students	03.09.2019
3	Hands on Training on microcontroller based system design	Third year students	27.05.2019 - 30.05.2019
4	Design of Digital system usingVerilog HDL		03.06.2019 – 07.06.2019
5	Programming and Interfacing Peripherals in ARDUINO board	Second year students	27.05.2019 - 30.05.2019
6	Workshops on basics of NS2		03.06.2019 – 07.06.2019


ACHIEVEMENT

Name	Event	Venue	Rankings
Varun Bhaaskar 3rd year, ECE B	Top Notcher’19	St. Joseph’s Institute of Management, Trichy	Mr. Top Notcher (winner)
Yellamraju Venkata Naga Anjani Jyothi, 3rd year ECE-B	HACK’iav	IIIT Kottayam Kerala	2 nd prize
Varun Bhaaskar, 3rd year ECE-B	HACK’iav	IIIT Kottayam Kerala	2 nd prize
Shaik Ayisha Kareema, 3rd year ECE-B	HACK’iav	IIIT Kottayam Kerala	2 nd prize
K.Swathi, 3rd year ECE-B	HACK’iav	IIIT Kottayam Kerala	3rd prize

T.Shakthi, 3rd year ECE-B	HACK'iav	IIIT Kottayam Kerala	3rd prize
G.SriSwarna, 3rd year ECE-B	HACK'iav	IIIT Kottayam Kerala	3rd prize
S.Priya, 2nd year ECE-B	PECMA-2019 Project Presentation	Paavai college	1 st prize
A.Thenmozhi, 2nd year ECE-B	PECMA-2019 Project Presentation	Paavai college	1 st prize

Vaishali, 3rd year ECE-B	KRIYA,2019	PSG,Coimbatore	Went to finals
G.Santhoshwaran, 3rd year ECE-B	KRIYA,2019	PSG,Coimbatore	Went to finals
P.Princy, 3rd year ECE-B	KRIYA,2019	PSG,Coimbatore	Went to finals
Varun Bhaaskar 3rd year, ECE B	Gurucool, RYLA 2019	Kodaikanal	Participation

B.Renita Blessy,3rd year ECE-B	WOMANIA ,2018 1)Polish me pretty, 2)Rhythmic queue	Saranathan college of engineering	(1)2 nd prize (2)3rd prize
S.Santhosh Kumar, 2nd year ECE-B	(1).Football-Anna university Zonals (2) Football	(1) JJ.College of Engineering (2)Sastra University	(1) 3rd Prize (2) 4th Prize
R.Uma , 2nd year ECE-B	Volleyball-anna university zonal level	Indra Ganesan College Of Engineering	Participated

In-plant training

Students from ECE 3rd year attended in-plant training in Bharat Sanchar Nigam Limited Trichy

- R.Kishor Kumar ,
- P.Karthi Vaidya ,
- M.Leo Tamizhzhagan ,
- B.MoohammedSattar,
- J.Nikesh,
- Helix Richard,
- A.Asik Babu,
- E.Azeet Kumar,
- S.Prabu,
- P.Iniyaan,
- G.Manisha,
- R.Mahalakshmi,
- P.DivyaDharshini,
- G.Nithya,
- R.Madhurabashini,
- A.K.Tamizh malar,
- A.Nandha Kumar

BSNL

Paper presentation

Paper presentation

Insignia 2k19

Topic: “IOT”

R.Scyitthra, N.Yasodha, I.Tena Teffany Edith

of 3rd year ECE-B

Topic: “Artificial intelligence”

A.Rehana Begum, R.Roshini, Vedika, Kowshika

of 3rd year ECE-B

Topic: “Nanotechnology”

G.Manisha of 3rd year ECE-A

Technovation ’19

TOPIC :”PAPER BATTERY”

G.Manisha, R.Mahalakshmi 3rd year ECE

WORKSHOPS

Industry and research oriented advanced training on “IOT cloud based product development” , IIIT Kottayam

- Varun Bhaaskar, 3rd year, ECE-B

Agrobot workshop, Shaastra-2019, IIT MADRAS

- T.Vaishali 3rd year ECE-B,
- G.Santhoshwaran 3rd year ECE-B ,
- P.Princy 3rd year ECE-B ,
- Shaik Ayisha Kareema 3rd year ECE-B .

Internshala, Udemy workshops on IOT ,blockchain

- K.Sowmiya 3rd year ECE-B,
- Shaik Ayisha Kareema 3rd year ECE-B,
- Varun Bhaskar 3rd year ECE-B.

PUBLICATIONS

- Dr.M.SANTHI “AN AREA EFFECTIVE AND HIGH SPEED SAR ADC ARCHITECTURE FOR WIRELESS APPLICATION” INTERNATIONAL CONFERENCE SPRINGER CONFERENCE ON ICCNCT 2019, May-19.
- Dr.C.VENNILA “A REVIEW ON MACHINE LEARNING TECHNIQUES FOR QOS IN WSN” INTERNATIONAL JOURNAL OF ADVANCED SCIENCE AND TECHNOLOGY, Volume 28, 2019, PP. 169-178.
- Dr. S. A. ARUNMOZHI, SRINATH VISWAS ”LIFETIME ENHANCEMENT IN WIRELESS SENSOR NETWORK USING MODIFIED ENERGY SCHEDULING ALGORITHM” SSRG INTERNATIONAL JOURNAL OF ELECTRONICS AND COMMUNICATION ENGINEERING, May-2019 ,special issue 2348 – 8549.

- Dr.P.SHANMUGA PRIYA “HYBRID BEE COLONY AND CUCKOO SEARCH BASED CENTROID INITIALIZATION FOR FUZZY C-MEANS CLUSTERING IN BIO-MEDICAL IMAGE SEGMENTATION” INTERNATIONAL JOURNAL OF INNOVATIVE TECHNOLOGY AND EXPLORING ENGINEERING, Jul-19, Volume 8, Issue 9.
- Dr.V.MOHAN “HYBRID BEE COLONY AND CUCKOO SEARCH BASED CENTROID INITIALIZATION FOR FUZZY C-MEANS CLUSTERING IN BIO-MEDICAL IMAGE SEGMENTATION” INTERNATIONAL JOURNAL OF INNOVATIVE TECHNOLOGY AND EXPLORING ENGINEERING, Jul-19,Volume 8, Issue 9.

- Ms.G. LAKSHMI, G.MERCILDA, B. PREETHA, P.L.SASIKALA “DESIGN AND IMPLEMENTATION OF HEMISPHERICAL HELICAL ANTENNA” COMPLIANCE ENGINEERING JOURNAL, Volume 10, Issue 8, Aug 2019.
- Ms.R.DEVI “IDENTIFICATION OF SKIN-COLOR BASED FACE DETECTION AND GENDER CLASSIFICATION SYSTEM” EURASIA JOURNAL OF MATHEMATICS, SCIENCE AND TECHNOLOGY EDUCATION JOURNAL FOR PUBLICATION ,E-ISSN: 1305-8223 ,ISSN: 1305-8215, May-2019.
- Ms.R.DEVI “A REVIEW PAPER ON DETECTION OF LEAF DISEASES USING DIGITAL IMAGE PROCESSING” JOURNAL OF IMAGE PROCESSING AND ARTIFICIAL INTELLIGENCE, June-2019.

STUDENT’S CORNER

BIOMIMICRY

nature inspiring technology

Biomimicry

If somebody told you that you had access to millions of years of information that could help you live a happier, healthier life, what would you do?

As inhabitants of Earth, we are surrounded by remarkable species and natural processes that have evolved over the course of our planet's long history. Over these millions of years, life has found its way into some pretty unique niches. Evolution has forced species to adapt in order to survive, a process that has found answers to almost every problem imaginable.

So, how do we leverage these millions of years of refinement to the best of our ability? This is where the fascinating field of biomimicry steps in.

What is biomimicry? The best way to see how this discipline can, and is, changing the landscape of our lives is to see it in action.

Biomimicry is an approach to innovation that seeks sustainable solutions to human challenges by emulating nature's time-tested patterns and strategies. The goal is to create products, processes, and policies—new ways of living—that are well-adapted to life on earth over the long haul. If we know that nature has this remarkable "problem solving" ability, why aren't we harnessing it? Additionally, how might we turn to nature to help solve persistent problems? As a result, saving designers, scientists, engineers, and even the common person innumerable hours of trial and error. For example, we face an endless array of complex as humans, it's easy to think that we have all the answers. We are, after all, the ones consciously innovating, inventing, and building technologies. But, if we narrow our field of inspiration to only what was born of the human hand, we are entrapping ourselves in the limitations of our own creativity.

NITHYA G III ECE A

5G To Transform Lives

2G
-1991-

SMS

0.1
MB/Second

3G
-1998-

SMS Internet

0.1 - 8
MB/Second

4G
-2008-

SMS Internet

Video 15 MB/Second

5G
-2020-

HD,3D and ultra Video SMS Internet

internet of things 1 - 10 GB/Second

5G Technology

In today's modern world, Technology plays a very important role in every individual's life. As time is passing by, a life without technology is just impossible. Also, technology is developing each day. As the technology is developing, it is necessary to stay up to date with the latest technology. From the development of 2G, 3G and 4G, today we are going towards 5G technology. Already, 4G tops out at a theoretical 100 Megabits per second (Mbps). Now, 5G tops out at 10 Gigabits per second (Gbps). This means 5G is a hundred times faster than the current 4G technology at its theoretical maximum speed, anyway.

Initially, South Korea was the first to launch 5G technology. Many countries are working over and some countries like China, Japan are planning to launch by 2020. This includes India which is planning to launch by mid-2020. The companies have already started working on the 5G infrastructure and it will launch its 5G services within six months of spectrum allocation. The 5G spectrum allocation is expected to start somewhere in late 2019.

The name 5G stands for the Fifth Generation and refers to the next and newest mobile wireless standard based on IEEE 802.11 AC standard of broadband technology.5G can support up to a million devices per square kilometre while 4G supports only up to 100,000 devices per square kilometre.

The amazing fact about 5G is that it will work in low frequencies as well as unlicensed frequencies which is used as wi-fi.

There are about eight criteria for 5G connection qualifications which includes

- **One to 10 Gbps connections to end points in the fields.**
- **One millisecond end to end round trip delay.**
- **1000* bandwidth per unit area.**
- **10 to 100* number of connected devices.**
- **Perception of 99.999 percent availability.**
- **Perception of 100% coverage.**
- **90% reduction in network energy usage.**
- **up to 10 year battery life for low power, machine type devices.**

As we know, each technology has its own benefits and challenges. The benefits of 5G includes Multiple Input Multiple Output (MIMO) which means the source and the receiver have multiple antennas, thus maximising efficiency and speed.

Millimetre waves which says that the new 5G networks will be able to transmit large amounts of data.

Network Function Virtualisation (NFV) decouples the network functions such as Network Address Translation (NAT), firewalling intrusion detection, Domain Name Service (DNS) and coaching.

The common challenges faced are

- **Multiple Services**
- **Infrastructure**
- **Communication,**
- **Navigation and sensing.**
- **Security and Privacy.**

Technological challenges of 5G includes inter-cell interference, efficient Medium Access Control. To say it in a short glimpse, 5G technology is the upcoming technology and the bandwidth is very high and having higher data transfer rate. Many big countries are investing huge amount of money on this project as it is having high demand in the future. It will altogether manufacture flexibility, degree, comparability and melting. Thus, it will satisfy the growing solicitations of rising big data, cloud, machine to machine and diverse applications.

"5G is an emerging technology that hasn't really been defined yet"

These are the words of" Michael Wyde Toxicologist" about the emerging 5G technology.

A.Nandakumar (ECE-A,III yr)

5G

All of the US carriers have now launched some form of cellular network. But what is exactly 5G and how fast it is compared with 4G? Here are the facts.

The race to 5G is on. All four major US carriers now have some form of wireless, although it's all limited rollouts only in few countries, mostly using expensive mobile phones that won't support future nationwide 5G networks.

The early 5G rollouts are more like a public beta test than a final product AT&T, Verizon and T-Mobile are all using technologies that only travel about 600 feet from a cell site, which means there is not much coverage. All four carriers are waiting for upgrades to the base stations that will improve coverage, speed, and reliability. Around the end of 2019 (or) the beginning of 2020. AT&T, Verizon, and T-Mobile all intend to launch 5G networks that are existing 4G spectrum but broader coverage. They are tested AT&T in Dallas and las Vegas; sprint in Dallas and New York; Verizon in Chicago and providence; and T-Mobile in New York. They have been being better performance and more new devices. Right now, there are 5G hotspots from AT&T, Sprint and Verizon 3 models of 5G phone from LG and Samsung and an add-on moto mod for Motorola phones.

5G is an important one for the next decade and in previous mobile transitions, we have seen most of the big changes happening years after the 1st announcement. The first 4G phones in the US appeared in 2010. But the sorts of 4G applications changed our world did not appear until later snapchat came in 2012 and UBER became widespread in 2013, video call over LTE becomes widespread in US around 2013. So far we are getting a little bit of 5G right now, you should expect the big 5G applications to crop up around 2021 or 2022. 5G standards for fifth-generation cellular wireless and the initial standards for it were set at the end of 2017. But a standard doesn't mean that all 5G will work the same or that we even know what application 5G will enable. There will be slow but responsive 5G and the last 5G with limited coverage. The G in the 5G means at in a generation of wireless technology while most generations have technically been defined by their data transmission speeds. Each has also been marked by a break in encoding methods. 1G was analog cellular. 2G technologies such as CDMA, GSM and TDMA were the first generation of digital cellular technology. 3G technologies such as EVDO, HSPA, and UMPS brought speed from 200 kbps to few megabits per second.

G.Subramani (ECE-B,III yr.)

MISSION TO THE MOON

CHANDRAYAAN 2

The most sensational talk now is the chandrayaan-2 which would have made each and every Indian proud. Everyone thinks that the mission is collapsed .The truth is that it is not. This is the greatest achievement of Indians and every Indian should feel proud to achieve this. The mission is about reached which is a very tough task for other countries. In that way, India has achieved a great success in its first attempt.

Chandrayaan-2 was the first Indian lunar probe under Chandrayaan program. It was launched by the Indian space research organisation in October 2008, and operated until August 2009. The mission included a lunar probe orbiter and an impactor. Indian launched the spacecraft using a PSLV-XL rocket from Satish Dhawan space centre at Sriharikota, Andhra Pradesh. The mission was a major boost to India's space program. The main achievement was the discovery of widespread presence of water molecules in lunar soil.

From the success of Chandrayaan-1 the next was the Chandrayaan 2 mission which has been planned over 10 years and finally it was launched on 22nd of July, 2019 from Satish Dhawan space centre at Sriharikota, Andhra Pradesh. India launched the spacecraft using a GSLV MK3 (geosynchronous satellite launch vehicle) the name Chandrayaan comes from a Sanskrit word which literally means 'mooncraft'. Chandrayaan-2 reached the orbit on 20th august, 2019. Around 978 crores were spent for this mission to achieve.

Probably, 350 crores were for the launch and the rest was to design purposes. The main components is of launcher, orbiter, lander and rover. Orbiter's purpose is to orbit around the moon and send the pictures. Totally, 14 payloads were being used. 8 payloads were inside orbiter, 4 payloads inside lander and the rest two inside rover. The lander was given in the name of 'Vikram'. The Vikram name is given in the memory of 'Vikram Sarabhai' who was awarded with 'Padma Bhushan' and 'Padma Vibhushan' awards. He was the founder of ISRO.

The rover was given by the name ‘Pragyan’ which is a Sanskrit word meaning ‘wisdom’. The lifetime of orbiter is about 7.5 years and the lifetime of lander and rover is about only 14 days is very short, since, in moon, the day time, temperature will be very low during night time.

The place of destination for the launch is the southern pool of moon which is a dark area. The lander consists of five motors totally such that one motor is at the middle of the lander and the other four motors are at the sides.

One of the special features about Chandrayaan 2 is that all components are manufactured by India. Actually, the lander consisted of our motors initially which was tested and then remodelled with five motors for successful achievement.

Though the mission could not be completed now, the mission will be completed and make Indian feel proud at the moment.

A.K. Tamizh Malar (ECE B,III yr)

Relation between Fibonacci series and Golden Ratio

We are familiar with Fibonacci series 1,1,2,3,5,8,13,21,34,55,……

In nature, petals of flowers like sunflower, rose and breeding of rabbits are in Fibonacci series.

Fibonacci series

is also used in Approach of Message communication in Cryptology, so its being a part of our life without knowing.

GOLDEN RATIO:

Golden ratio is a special number found by dividing a line into two parts so that the longer part divided by smaller part is also equal to the whole length divided by longer part. It is represented by it. It is an irrational number that is a solution to the quadratic equation.

Golden ratio is mostly used in architecture and decimation of an Object.

Let

a=x,b=1

a+b / a = a/b

x+1 / x = x/1

x+1 = x^2

x^2 - x - 1 = 0

x =(1 + 5^½) / 2 =1.6180339887…….

Now let’s see the relation between the Fibonacci series and Golden Ratio

The Fibonacci series is

1,1,2,3,5,8,13,21,34,55,…….

At certain values dividing it by previous values the obtained is nearly equal to Golden Ratio

5/3=1.667, 8/5=1.6, 13/8=1.625, 21/13=1.615 , 34/21=1.619, 55/34=1.618

While dividing 10^{th} term by 9^{th} term we get the exact Golden Ratio.

The Golden spiral is a logarithmic spiral whose growth factor is in Golden Ratio and while connecting the quadratic circles of the spiral it forms a Fibonacci series.

The Golden spiral also called as Fibonacci spiral can be seen in various natural things like DNA, Shell, Cyclones ,Human Fingerprints, Androecium cluster of Sunflower, galaxies, some branches and leaf placement in trees follows this Sequence, human face can be represented in Golden Rectangular sequence (obtained by connecting the radius of quadratic golden spirals), the head forms a golden rectangle with eye as its starting point, the mouth and nose are each placed at golden sections of the distance between the eyes and the bottom of the chin. This can be used in face recognition and other medical uses.

In humans the lower arm and palm are in Golden ratio. This combination represents a normal human hand structure.

The Human DNA is in the form of Golden Spiral. DNA measures 34 angstrom by length and 21 Angstrom wide, this measurement is also in Golden ratio, these kinds of discoveries plays a vital role in Study of DNA by artificial intelligence and other forms of medical treatment.

The relation between Fibonacci series and Golden ratio naturally present in Nature and it can be used for various developmental activities in Automation and Study of Universe.

M. Leo Tamizhzhagan III ECE A

HYPERLOOP

Humans have long been fascinated with travel. Wherever we are, we want to get somewhere else, and when we've got there, we want to be able to get there faster. Concorde was once the world's fastest commercial passenger jet, travelling at speeds of over 2,000 km/hour, more than twice the speed of sound.

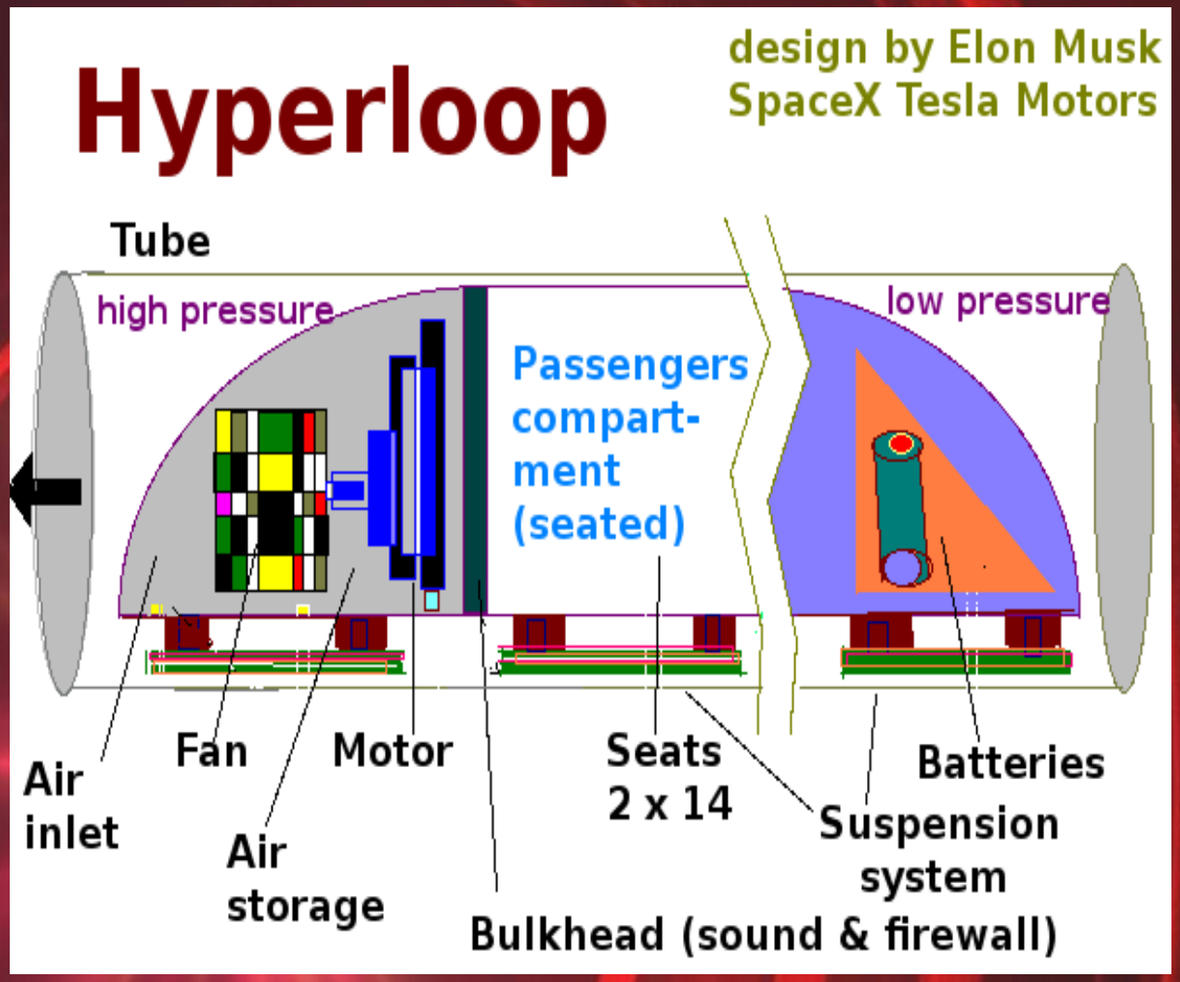
More recently, Japan's magnetic-levitation bullet train became the world's fastest train, travelling at speeds of 600 km/h. Now there is the Hyperloop, a high-speed ground travel system that is tipped to be the world's next fastest mode of transport. And cities are taking it seriously.

A new project led by US-based company Hyperloop One aims to take people from Dubai to Abu Dhabi in just 12 minutes,a trip that currently takes about two hours. The Hyperloop is a proposed high-speed transportation system in which specialized pods are accelerated through a low-pressure tube to achieve speeds near the speed of sound. The system is intended to provide a more cost-effective and faster mode of travel between cities separated by distances less than approximately nine hundred miles. First conceptualized in 2012 by Elon Musk, the tech entrepreneur leading numerous high-profile companies including SpaceX and

Tesla Motors, hypothetical benefits of the Hyperloop include immunity to weather, lack of crashes, rapid speed, low power requirements, and energy generation for its own operation Designing and building the Hyperloop poses numerous technical and economic challenges. As of early 2016, a group of approximately one hundred engineers from across the United States are completing a technical feasibility study to assess if construction is realistic from an engineering standpoint. Musk has estimated that implementing a full passenger-plus-cargo version of the Hyperloop would cost approximately $7.5 billion USD.

From Concept to Design:

After Musk's initial proposal in 2012, engineers from both SpaceX and Tesla Motors worked informally for about nine months on creating a reasonable Engineering and cost-assessment proposal for the Hyperloop, which was released in August 2013.Musk has described Hyperloop operation as a cross between the Concorde supersonic jet, a railgun (which can accelerate projectiles to supersonic speeds rapidly using the principles of electrodynamics), and an air hockey table, which creates small bearings of air that act as a cushion for objects to move with little friction. In his original proposal, Musk suggests a Los Angeles – San Francisco route which could be traversed in about 35 minutes, in comparison with over five hours by car and over an hour by plane. Energy to accelerate and maintain the speed of pods in the Hyperloop would be obtained from solar Panels mounted along the track.



However, the vacuum pumps required to achieve this would be extremely costly and any equipment malfunction could be devastating to Hyperloop operation.

To address this problem, it is instead proposed that the Hyperloop tube operate at very low pressure: 100 Pascals, about 1/6 the pressure of the atmosphere of Mars. This pressure is one thousand times less than atmospheric pressure at sea level and as a result air resistance is drastically decreased. After initial acceleration, Hyperloop pods can therefore mostly glide without applying any thrust until the deceleration at the end of the journey. Even though the Hyperloop tube will operate at very low pressure, pods must still be designed with aerodynamics in mind. To keep material costs down, the cross-sectional area of the tube would be very close to the cross-sectional area of the pods, so that the walls of the pod are close to the walls of the tube. If the walls are too close, the pod behaves as a syringe: it pushes the entire column of air in front of it, rather than letting the air flow around it. Since the tube would be hundreds of miles long, this effect would immensely throttle maximum pod speed. The top speed for a pod given a certain tube to pod cross-sectional area ratio is called the Kantrowitz limit.

To overcome this problem, the ideal pod will be engineered with an electric compressor fan on the nose of the pod. This will function to pump high-pressure air from in front of the pod to behind the pod. By pumping air underneath the pod, this would serve the dual purpose of providing the "air hockey table" air-cushion suspension effect.

A.ASIK BABU (ECE A,III yr)

Mobile IP

We want to keep our IP addresses wherever we are, but a traditional IP design does not support mobility. So, whenever we change our location, we also need new IP addresses. Changing IP addresses is undesirable
for several reasons. As we know, most Internet traffic is TCP, and changing the IP address forces TCP to establish a new connection.

As a result, packets might get lost during this change.. Mobile devices have IP addresses that are associated with one network and moving to another network means changing IP address.
Using the mobile IP system will allow users to achieve this and at the same time make the underlying process transparent for a user.. Cell phones allow users freedom of movement and Personal Digital Assistant “PDA” offers users to access email in any location. Global Positioning System (GPS) has the capability to pinpoint the location of the device anywhere in the world. Mobile IP is scalable for large number of users, and users can be confident that no one can read their messages or use their resources.

I. MOBILE IP ENTITIES

Mobile Node (MN): This corresponds to the node which moves from the home network to the foreign network. This node is assigned a permanent IP address to which the packets are always sent.

Home Network (HN): This is the network to which the mobile node is permanently connected.

Home Agent (HA): The Home Agent forwards the packets to the mobile node when it away from its home network.

Foreign Network (FN): This is the network to which the mobile node attaches itself after moving from the home network.

Foreign Agent (FA): Foreign Agent is a router located in the mobile node visited network. It receive and forward the packet for the mobile node.

Care-of-Address (COA): This is the address that the mobile node uses for communication when it is not present in its home network. This can either be foreign agent care-of-address or a collocated care-of-address.

Foreign Agent Care-of-Address (FA COA): The mobile node uses foreign agent's IP address as its care-of-address.

Collocated Care-of-Address (CO COA): The network interface of the mobile node is temporarily assigned an IP number on the foreign network.

Correspondent Node (CN): The node which communicates with the mobile node. This node can be located in any network and routes the packets to the home network of the mobile node.

MECHANISM OF MOBILE IP

A. Agent Discovery

The agent discovery procedure used in Mobile IP is based on the Internet Control Message Protocol (ICMP) router advertisement standard protocol. It allows the mobile node to determine whether it is connected to the home network or foreign network. A special message called agent advertisement periodically broadcasted by the home agent or foreign agent to advertises their availability or services. The mobile node listen these advertisement and compare the network portion to its home address network portion. If it matches then it is home agent otherwise it is foreign agent. Then it acquires an care of address when the mobile agent does not receive any advertisement message it generate agent solicitation message when it is looking for a foreign agent.

B. Registration

When a mobile node is away from home its registers its care-of-address with its home agent. Registration process can perform directly from the mobile node when the care-of-address is dynamically generated or registration process can be perform by the foreign agent by the following steps:

Step1: The mobile node registers with the foreign agent giving its home address, current data link address and some security information.

Step2: The foreign agent contact the mobile host home agent.

Step3: the home agent examines the security information which contains a time stamp to prove that it is generated within the past few sec. if it is happy it tells the foreign agent to proceed.

Step4: When the foreign agent gets the acknowledge from home agent its makes an entry in its tables and inform the mobile host that it is registered.

C. Tunneling

When the mobile device register itself the home agent will be able to intercept the IP packet that sends to the mobile node home address. Tunneling has two function encapsulating the packet to reach to the tunnel end point and decapsulates the packet when the packet reach to the tunnel end point. When a packet reach to the mobile node home address it encapsulates the original packet within a new packet placing the mobile node care of address as the destination address. When the foreign agent receive the packet It decapsulate the packet and forward it to the mobile node. Tunneling can be two types IP within IP and minimal encapsulation. In IP within IP the original packet becomes the payload and in the minimal encapsulation only the header part is added which is different from the original header.

V. SECURITY ISSUES IN MOBILE IP

Security is always concern in any internetworking environment these days, but it is especially important in mobile ip. Because it has a number of risks due to it using a registration system and then forwarding datagrams across an unsecured network.

-By P.Karthi Vaidya(ECE-A section 3rd year)

NANOTECH

NANOTECH

Nanoelectronics – Nanotechnology in electronics
This article explains the basics of Nanoelectronics and its concept. The different approaches are also explained in detail.

IMPLICATIONS OF NANOTECHNOLOGY

Nano electronics is based on the application of nanotechnology in the field of electronics and electronic components. Although the term Nanoelectronics may generally mean all the electronic components, special attention is given in the case of transistors. These transistors have a size lesser than 100 nanometres. Visibly, they are very small that separate studies have to be made for knowing the quantum mechanical properties and inter-atomic design. As a result, though the transistors appear in the nanometre range, they are designed through nanotechnology. Their design is also very much different from the traditional transistors and usually falls in the category of one-dimensional nanotubes/nanowires, hybrid molecular electronics, or advanced molecular electronics.

hybrid molecular electronics, or advanced molecular electronics. This technology is said to be the next future, but its practicality is near to impossible even now that they may be difficult to emerge soon. Although a nanoelectronics device can be made fully functional, the workload it can do is restricted to its size . The basic principle is that the power of a machine will increase according to the increase in volume , but the amount of friction that the machine 's bearings hold will depend on the surface area of the machine. For the small size of the nanoelectronics device cannot be used for the moving of heavy load like a mechanical device. If such a task is tried, it will fail as the available power will be easily overcome by the frictional forces . So, it is sure that these devices have limitations in real world applications.

Different Approaches to Nanoelectronics

Nanofabrication

This method is used to design arrays or layers of nanoelectronics device to work for a single operation. Nanoelectromechanical systems are also a part of nanofabrication.

Nanomaterials electronics

In Nanoelectronics , the transistors are packed as arrays on to a single chip. Thus they remain in a uniform manner and symmetrical in nature. Thus they are known to have a more speedy movement of electrons in the material . The dielectric constant of the device also increases and the electron or hole characteristics also become symmetrical in nature.

Applications of Nanoelectronics

Some of the devices that have been developed with the help of Nanoelectronics
and its future applications are listed below

- Nano radio
- Nano computers

The conventional computers with a big processor will be replaced with Nano computers with nano processors that will have higher performance and speed than the conventional computers .

-By P.Iniyaan(ECE-A section 3rd year)

HEAT SINKS

Nowadays we are utilizing the electrical and electronic devices for our comfort. Actually these devices surely generate some heat because these appliances work with the provision of power supply. Typically high power semiconductor components generate heat in considerable amounts but these components are unable to dissipate heat as their dissipation capability is significantly low.

Due to this heat generation in these components, the circuit may get heated up and spoil the entire setup. This causes the premature failure of the circuit. In order to avoid this, heat sinks are provided for cooling purposes which disperses the heat.

Heat sink is an electronic component of an electric circuit used for cooling purpose and disperse heat from other components into the surrounding medium. Due to the incorporation of heat sinks in the circuit, it improves performance and reliability.

The principle involved in heat sink is that the heat sink transfers the heat or thermal energy from a high temperature component to a low temperature medium. Mostly air is used as low temperature medium. If water is used as a medium , it is known as cold plate.

The most common heat sink material is Aluminium alloys which has higher thermal conductivity but it is mechanically soft. Copper has excellent heat sink properties such as thermal conductivity, corrosion resistance, biofouling resistance, and antimicrobial resistance. Copper has around twice the thermal conductivity of aluminium. Its main applications are in industrial facilities, power plants, solar thermal water systems, gas water heaters, forced air heating and cooling systems, geothermal heating and cooling, and electronic systems. Copper is three times as dense and more expensive than aluminium but Copper is less ductile than aluminium, so it cannot be extruded into heat sinks. The major types of heat sinks are active heat sinks and passive heat sinks. Active heat sinks utilize computer’s power supply and is referred as heat sink and fan.

It is also known as liquid cooling and fan. It has ball bearing type and sleeve bearing type. Ball bearing type is more preferable because they are cheaper and working span is longer.

Passive heat sinks are those that have no mechanical components. They are made of an aluminium finned radiator. These dissipate heat or thermal energy by using convection process. Passive heat sinks are more reliable than active heat sinks. Other types of heat sinks are aluminium heat sinks, stamped heat sinks, machining heat sinks, bonded fin heat sinks, folded fin heat sinks, skived heat sinks, forged heat sinks, single fin assembly heat sinks, swaged heat sinks.

In engineering applications heat sinks are employed as microprocessor cooling, light emitting diode cooling, in soldering circuits and in electronic and electrical devices.

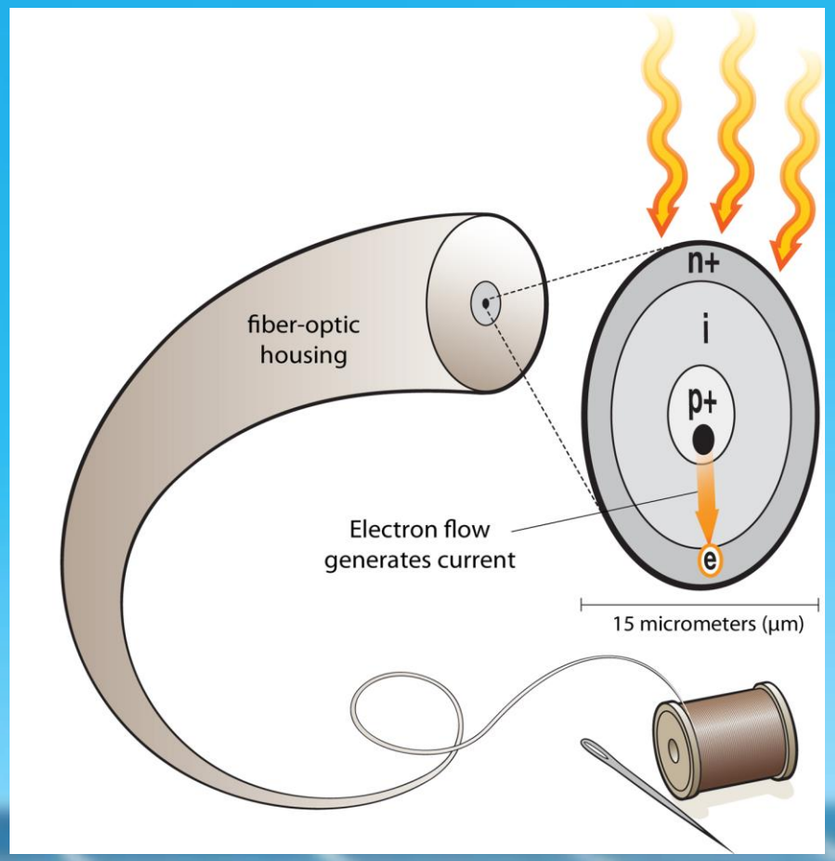
K.VANITHA III-ECE B

Wearable solar cells

One day you may be able to recharge your phone by plugging it Into your clothes.

A drained smartphone battery often sends us hunting for the nearest outlet, if there even are any but within a decade, we might be wearing the outlet.

In a word of fabrics infused with the power of sun, recharging could be as simple as plugging devices into our clothes.



How it works,

Light particles pass through the outer layer, freeing a cascade of electrons through the material.

The movement of free electron and the gaps created by those loosed particles generate an electric current.

Electrodes to transfer the power are attached to the solar cell.

It is a new way of creating that semi conducting sandwich by starting with a flexible, hollow fiber - optic thread; inner and outer walls of the thread correspond to the positive and negative layers of the common solar cell.

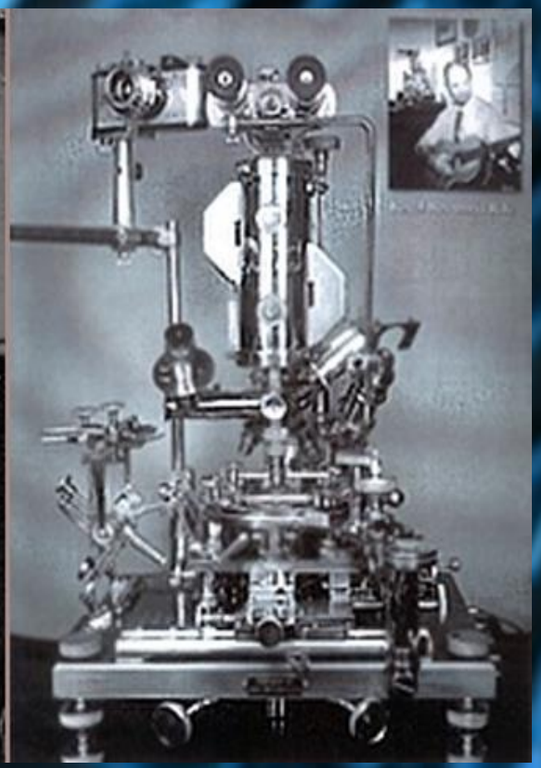
The potential applications for solar threads include flexible garments that could draw power from the sun and allow people to recharge the phone and other devices. The one of the first part is to get in line for such a versatile and powerful material would be the Indian military, to weave into soldier's uniforms and tents.

A. SHARON FRANCIS
ECE 3rd YEAR B

Curing Cancer With Frequencies

THE RIFE MACHINE

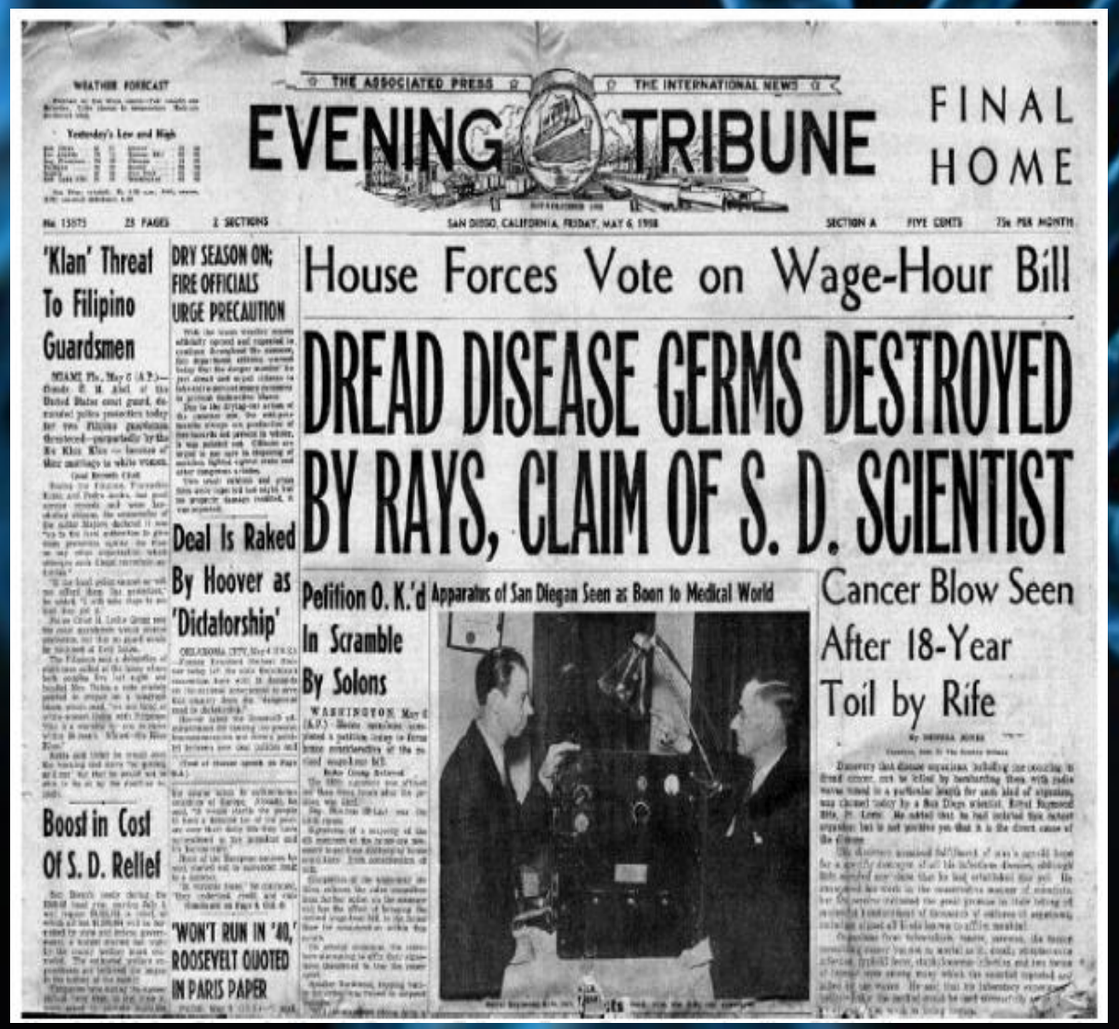
Dr. Royal Rife is considered one of the greatest scientific minds of the 20th Century. He is credited in the book, "The Cancer Cure That Worked", as the man who discovered a cure for cancer and many other diseases... *simply by using* ***vibrational energy***.



A "Rife machine" works on the principle of sympathetic vibration and resonance, which states that if there are two similar objects and one of them is vibrating, the other will begin to vibrate as well, even if they are not touching.

Rife learned that *different species of life have their own electromagnetic 'signature',* or *pattern of oscillation* (frequency) based on its individual genetic chemical blueprint. It's different for all.

Dr. Rife discovered that viruses, bacteria, and parasites are particularly sensitive to their own specific 'bio frequencies' and could be destroyed by intensifying those frequencies until chemical changes occur within the pathogen and it would devitalize and die. Sometimes they could see them literally explode... like an intense musical note that can shatter a wine glass.



THE ASSOCIATED PRESS — THE INTERNATIONAL NEWS

EVENING TRIBUNE

FINAL HOME

SAN DIEGO, CALIFORNIA, FRIDAY, MAY 6, 1938 — SECTION A — FIVE CENTS

'Klan' Threat To Filipino Guardsmen

DRY SEASON ON; FIRE OFFICIALS URGE PRECAUTION

House Forces Vote on Wage-Hour Bill

DREAD DISEASE GERMS DESTROYED BY RAYS, CLAIM OF S. D. SCIENTIST

Deal Is Raked By Hoover as 'Dictatorship'

Petition O. K.'d In Scramble By Solons

Apparatus of San Diegan Seen as Boon to Medical World

Cancer Blow Seen After 18-Year Toil by Rife

Boost in Cost Of S. D. Relief

'WON'T RUN IN '40,' ROOSEVELT QUOTED IN PARIS PAPER

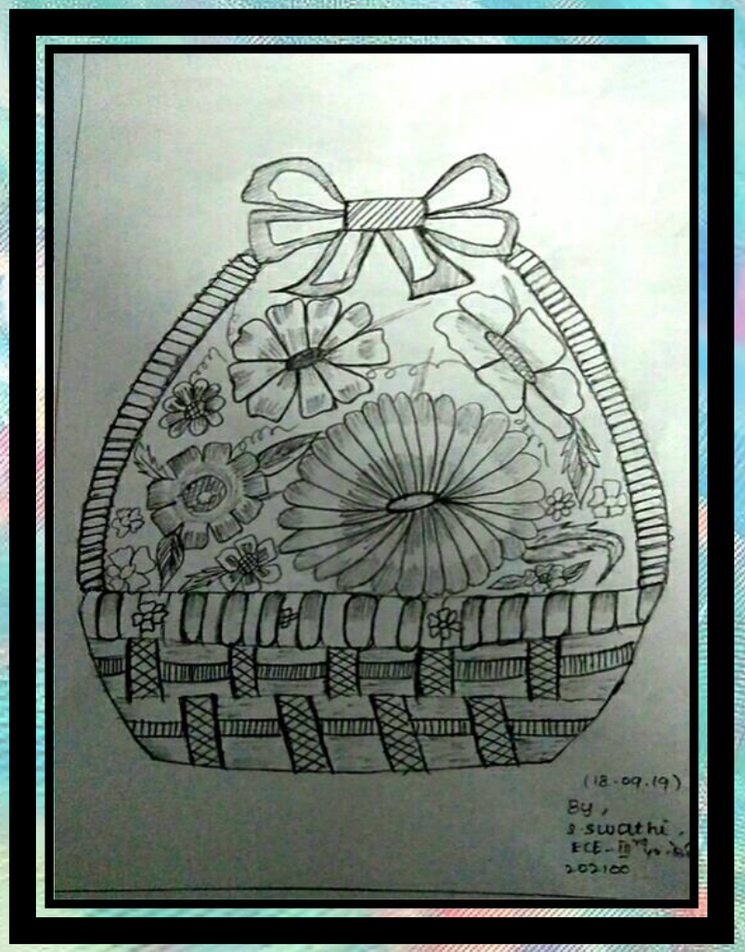
As Christopher Bird reported in the New Age article, regarding bacterium/viruses, *"...many lethal those of tuberculosis, typhoid, leprosy . . . appeared to disintegrate or 'blow up' in the field of his microscope."*

B.MOOHAMMED SATTAR III ECE A


SUWALLS
ARTS

How you draw is a reflection of how you feel about the world. You're not capturing it, you're interpreting it.

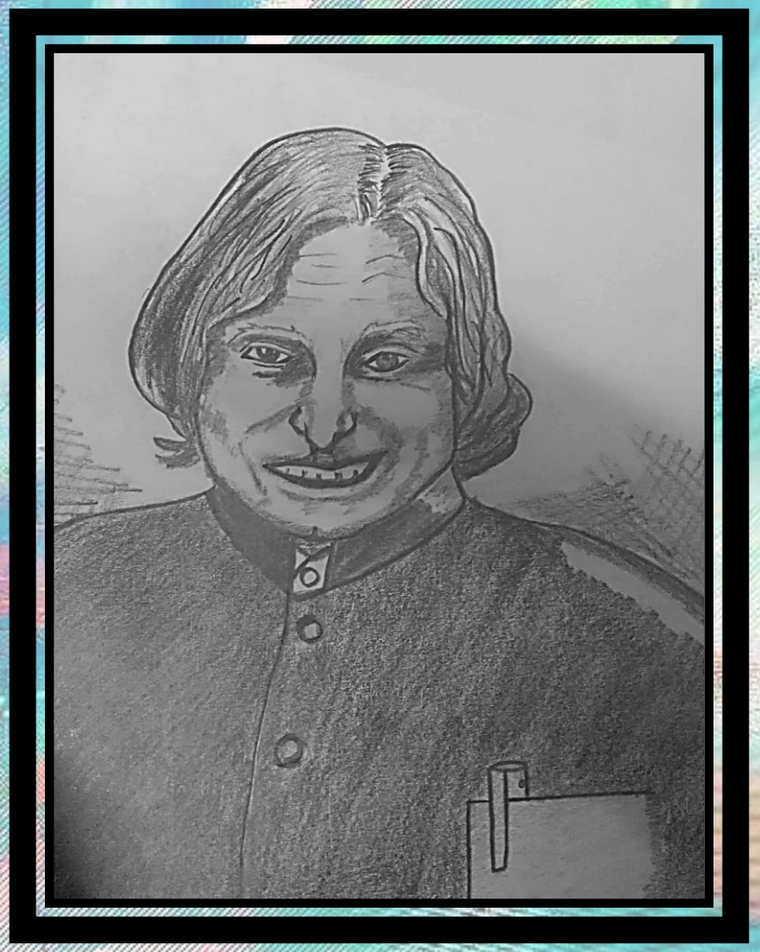
By P.Pavithra
(ECE B, IV yr)



by S.Swathi (ECE B, III yr)

by G.Subramani (ECE B, III yr.)

-- Sri Swarna (ECE B, III yr)



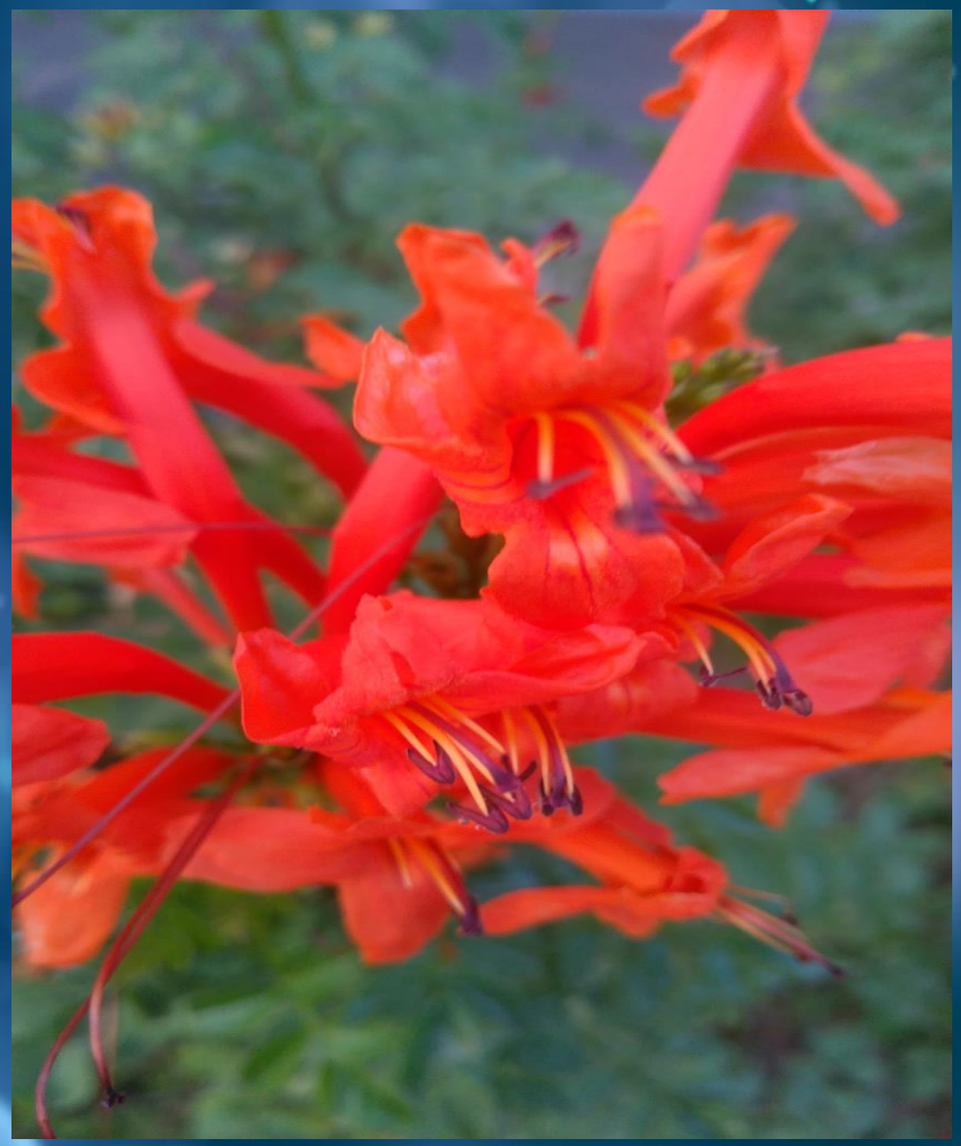
-- B. Sujitha (ECE B, III yr)

By R.Hemachanthrika (ECE A, III yr)

By Jayani (ECE A, III yr)

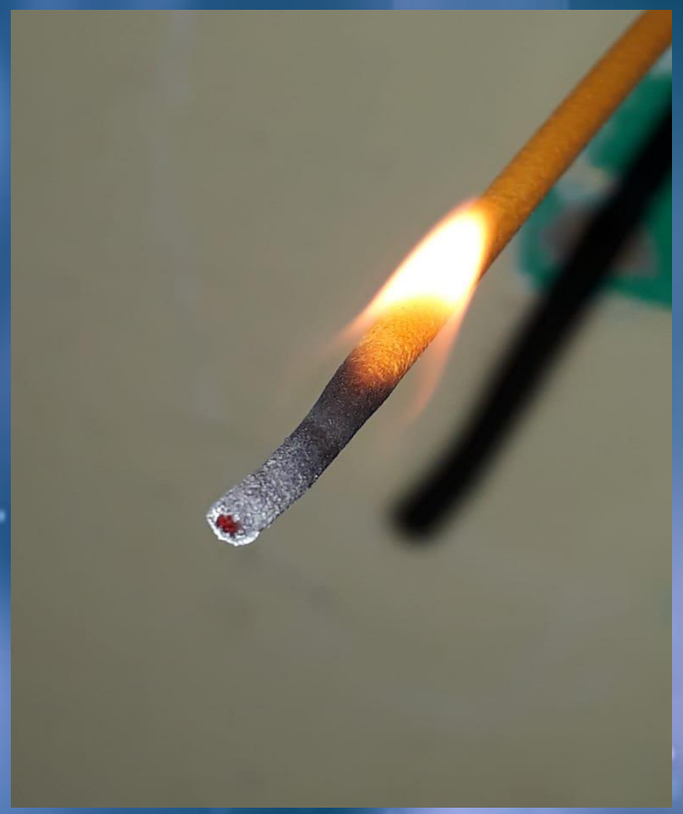
Photography

"Life is the flower for which love is the honey"



G.Nithya(ECE-3rd year a section)

"No flame too high"



By A.Asik Babu (ECE-A sec 3rd yr)

"Sunsets are proof that endings can often be beautiful too."

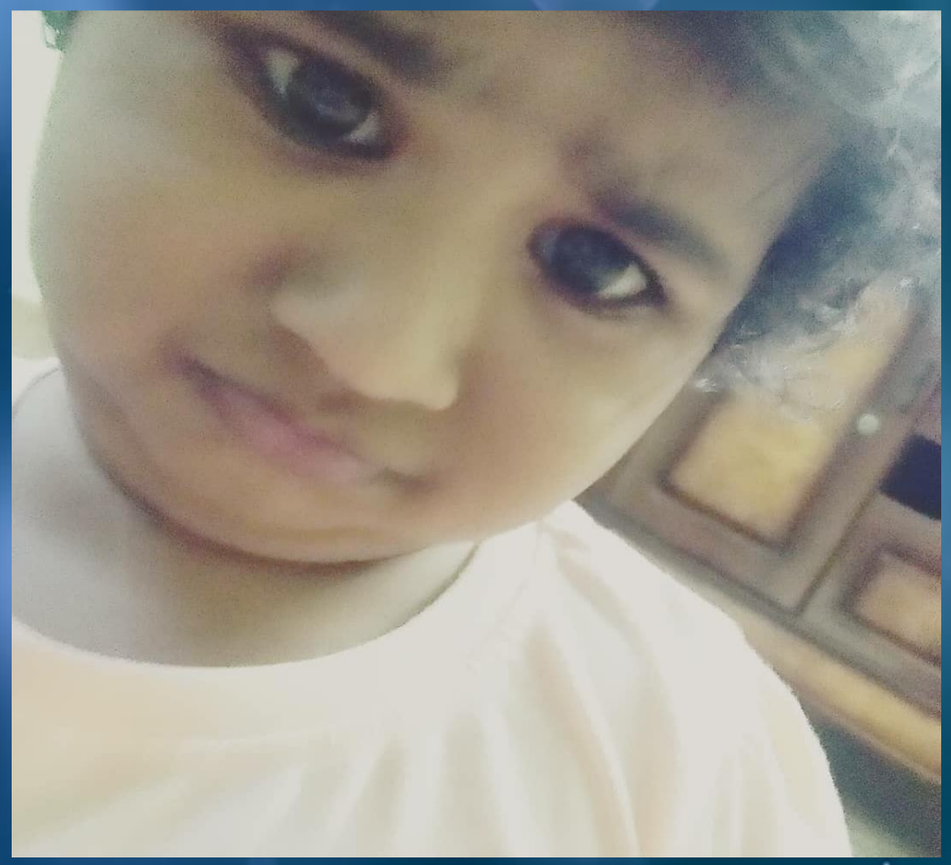
"Teamwork divides the task and multiplies the success"

By A.Asik Babu(ECE-A section 3rd yr)

"Through hard work, perseverance and a faith in God, you can live your dreams"

by A.Asik Babu(ECE-A section 3rd year)

"Like stars are to the sky, so are the children to our world. They deserve to shine!"



By Hari Janani(ECE-A section 3rd year)

"Some leaves hang on longer but eventually they all fall."

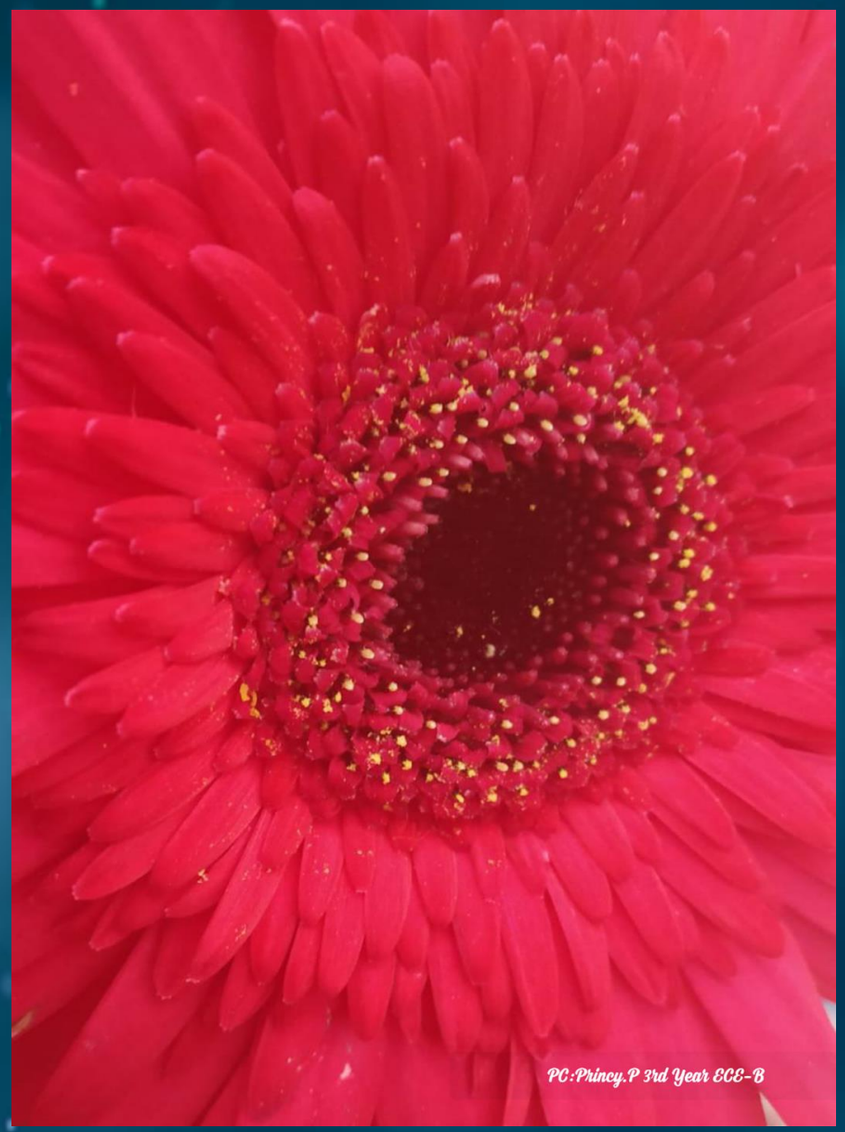
By Victoria Josy (Ece-A section 3rd year)

In nature light creates the colour and in picture, colour creates the light

By Vaishali T
of ECE B , III yr

A photograph is a secret about a secret. The more it tells you, the less you know.

-- Diane Arbus



By Princy P
of ECE B, III yr.

From the editorial board again,

Truth be told, a huge sigh of relief after completing the work. But it has been a wonderful experience compiling this magazine for our department. We feel privileged to have accomplished this job successfully. If given the opportunity again, we will try and do a better job. Looking forward to many more opportunities such as these. This venture has helped us realize new talents in us.

Thank you 😊