YEAR 2015-2016

VOLUME - 2

ELECTROMAG

MAGAZINE

DEPARTMENT OF ECE

EDUCATE

EMPOWER

EXCEL

Manakula Vinayagar Institute of Technology
(A Unit of Sri Manakula Vinayagar Group of Educational Institutions)

DEPARTMENT OF ELECTRONICS AND COMMUNUCATION ENGINEERING

ABOUT THE DEPARTMENT

Electronics and Communication Engineering is gaining increasing importance in all works of life. The advancements and technological innovations in electronics are felt in area as diverse as commercial communications, medicine, defense and day today common man activities. The department places strong emphasis on fundamentals, so that the student is introduced to complex subjects in an interesting and easy manner. The Department imparts technical knowledge in the areas of Semiconductor devices, Design of Electronic circuits, Communication engineering and its applications. To meet the nation's interest in developing the manufacturing electronics industries, the department offers training in various domains to develop an employable engineer.

The Department of Electronics and Communication Engineering which was started in the year 2008 offers a UG Programme (B.Tech) in Electronics and Communication Engineering. The B.Tech Electronics and Communication Engineering Programmehas been accredited by AICTE and is affiliated to Pondicherry university. The department has a team of committed faculty members who are not only well qualified but are also backed by rich industrial / research / teaching experience. The development of competency of our students are of utmost importance and various activities are done to enrich the students.

Vision

The department aspires to produce dexterous professionals, competent Researchers and entrepreneurial leaders for the benevolence of the society.

Mission

Higher Order Thinking: To invoke higher order thinking among the students by means of comprehensive teaching and learning process.

Competency: To provide training on cutting-edge technologies to improve the competency of the students.

Continuous learning: To promote innovation through providing state of-art facilities and active industry institute interaction.

Entrepreneurship: To facilitate the students to improve their leadership and entrepreneurship skills with ethical values.

Dream is not what you see in sleep,Dream is something which doesn't let you to sleep

-A.P.J Abdul Kalam

PEOs POs PSOs

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1: Employability: Our Graduates shall be suitably employed in allied industries/services with professional competency and knowledge of modern tools.
PEO2:Higher Education: Our Graduates shall be capable to pursue higher studies/research in the field of engineering and management.
PEO3: Entrepreneurship: Our Graduates shall be prepared for a successful career bymeeting ever increasing demands required by Electronics and communication profession and enable them to become an entrepreneur. PEO4: Ethical: Our Graduates cultivate professional and ethical attitudes with effective communication skills, team work and multidisciplinary approach related to engineering issues.

PROGRAMME OUTCOMES (POs)

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2: 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.
PO3: 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.
PO4: 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.
PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6: 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.
PO7: 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.
PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10: 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.
PO11: 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.
PO12: 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.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: Product Development: Use modern tools to desig n subsystems for simple applications in Embedded Systems and VLSI.
PSO2: Design Thinking: Apply engineering concepts to find solutions in the fields of Communications, Signal/Image Processing.

INTRODUCTION:

In the manufacturing area a new technology has proven to be very promising and is called rapid prototyping also called as additive manufacturing technology. This technology has been substantially improved and has evolved into a useful tool for many fields like researchers, manufacturers, designers, engineers and scientists. Collaborating different fields in single package formed 3D printer as it includes Design, manufacturing, electronics, materials and business .3D printing is the process of creating an object with material layer by layer in three dimension formations. The difference between traditional manufacturing and 3D printing is that the 3d printer involves additive approach but most of the traditional manufacturing processes involve subtractive approach that includes a combination of grinding, bending, forging, moulding, cutting, gluing, welding and assembling. At the beginning 3D printing was mostly seen as a tool to shape and bring it to the artistic or different designs, but in the last few years this technology is developing to a point where mechanical components and some required parts can be printed. It completely change not only the industrial/manufacturing field, but also our entire way of life in the future as 3D printer makes possible to complete model in a single process. For consumer level additive manufacturing, currently two main techniques to 3D print objects: Fused Deposition Modelling and Stereo lithography. Both processes add material, layer by layer, to create an object's. Stereo lithography (SLA) uses a Ultra-Violet light source to particular cure resin while Fused Deposition Modelling (FDM) extrudes semi-liquid plastic in a required layout to create objects. The fast growth of this technology has allowed great inventions and 3D printing (mainly Fused Deposition Modelling or FDM technique) reduced the cost of manufacturing, the build time, and the weight of the object, reduction of waste compared to some traditional manufacturing processes therefore making 3D printings attainable to the average consumer shows the graph of manufacturing cost reduction and days consumption in 3D printer comparison to the traditional manufacturing techniques.

BRIEFING ON 3D PRINTING TECHNOLOGIES:

In 3D printing technologies, the process involves certain steps which are firstly a CAD based model is created and then G-Code converted to a Stereo-lithographic file which is in (.STL) .This files breaks down the surface into logical series of triangles which represents a part of the surface of a 3D model that is then used for the slicing algorithm.

NANDHA.G 3rd Year

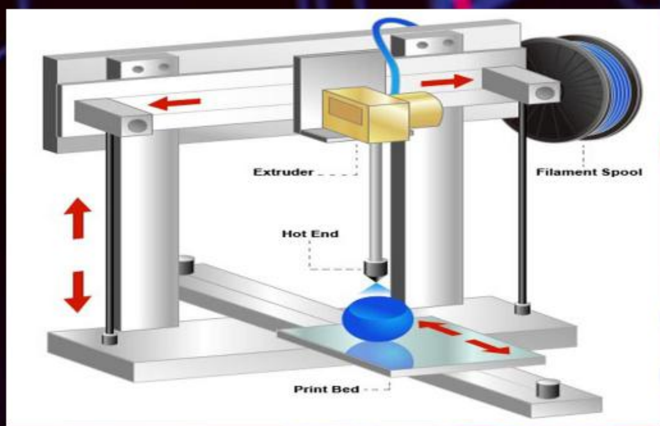
The STL file slices the model into thin cross-sectional layers that allowed the required model to be 3D printed.

3D printing technologies falls under 7 broad classes, which are listed below:

A. Binder Jetting
B. Material Jetting
C. Direct Energy Deposition
D. Powder Bed Fusion
E.Sheet Lamination:
F.Light Photopolymerization
G. Extrusion

The materials that are generally used for realizing this technology are given below:

A. Wire filament materials
B. Powder materials
C. Printable waxes
D. Liquid materials



MERITS AND DEMERITS OF THIS TECHNOLOGY:

Merits:

A. Layer by layer production allows for much greater flexibility and creativity in the design process. No longer do designers have to design for manufacture, but instead they can create a part that is lighter and stronger by means of better design. Parts can be completely re-designed so that they are stronger in the areas that they need to be and lighter overall.

B. 3D Printing significantly speeds up the design and prototyping process. There is no problem with creating one part at a time, and changing the design each time it is produced. Parts can be created within hours. Bringing the design cycle down to a matter of days or weeks compared to months. Also, since the price of 3D printers has decreased over the years, some 3D printers are now within financial reach of the ordinary consumer or small company.

Demerits:

A. The limitations of 3D printing in general include expensive hardware and expensive materials. This leads to expensive parts, thus making it hard if you were to compete with mass production. It also requires a CAD designer to create what the customer has in mind, and can be expensive if the part is very intricate.
B. 3D Printing is not the answer to every type of production method; however its advancement is helping accelerate design and engineering more than ever before. Through the use of 3D printers designers are able to create one of a kind piece of art, intricate building and product designs and also make parts while in space!

CONCLUSION:

We are beginning to see the impact of 3D printing in many industries. There have been articles saying that 3D printing will bring about the next industrial revolution, by returning a means of production back within reach of the designer or the consumer. However this article presents the concept of 3D printing technology in an encapsulated way.

DIGITAL IMAGE PROCESSING

SRIRAM.S
FINAL YEAR

Enhancement of noisy image data is a very challenging issue in many research and application areas. In the last few years, non-linear filters, feature extraction, high dynamic range imaging methods based on soft computing models have been shown to be very effective in removing noise without destroying the useful information contained in the image data. In this paper new image processing techniques are introduced in the above mentioned fields, thus contributing to the variety of advantageous possibilities to be applied. The main intentions of the presented algorithms are to improve the quality of the image from the point of view of the aim of the processing, to support the performance, and parallel with it to decrease the complexity of further processing using the results of the image processing phase.

Introduction

With the continued growth of multimedia and communication systems, the instrumentation and measurement fields have seen a steady increase in the focus on image data. Images contain measurement information of key interest for a variety of research and application areas such as astronomy, remote sensing, biology, medical sciences, particle physics, science of materials, etc. Developing tools and techniques to enhance the quality of image data plays, in any case, a very relevant role. Enhancement of noisy images, however, is not a trivial task. The filtering action should distinguish between unwanted noise (to be removed) and image details (to be preserved or possibly enhance).

Soft computing, and especially evolutionary and fuzzy systems based methods can effectively complete this task outperforming conventional methods . Indeed, genetic algorithms and evolutionary methods proved to be very advantageous in image analysis, search, and optimization while fuzzy reasoning is very well suited to model uncertainty that typically occurs when both noise cancellation and detail preservation (enhancement) represent very critical issues. As a result, the number of different approaches to evolutionary and fuzzy image processing has been progressively increasing . In this paper we deal with different areas of image processing and introduce new soft computing (fuzzy) supported methods. In Sect. 2 corner detection is addressed. Section 3 deals with useful information extraction. "Useful" information means that the information is important from the further processing point of view and the, from this aspect non-important (in other situations possibly significant) image information is handled as noise, i.e. is filtered out. In this section, we present a method for separating the primary and non-primary edges in the images. Sections 4 and 5 are devoted to high dynamic range (HDR) imaging. Novel approaches are detailed for reproduction of images distorted by the HDR of illumination. Finally, Sect. 6 shows illustrative exam.

Corner detection :

Recently, the significance of feature extraction, e.g. corner detection has increased in computer vision, as well in related reconstruction of schemes. 2.1 Introduction Corner detection plays an important role in computer vision, pattern recognition , in shape and motion analysis as well as in 3D reconstruction of a scene. Motion is ambiguous along an edge and unambiguous at a corner. In most cases, shapes can approximately be reconstructed from their corners. 3D reconstruction from images is a common issue of several research domains. More and more applications are using computer generated models.

In many cases, models of existing scenes or objects are desired. Creating photorealistic 3D models of a scene from multiple photographs is a fundamental problem in computer vision and in image based modeling. The emphasis for most computer vision algorithms is on automatic reconstruction of the scene with little or no user interaction. The basic idea behind 3D model reconstruction, from a sequence of uncalibrated images, can be defined in several steps: first, we need to relate the images in the whole sequence then extract information based on pixel correspondences to be able to apply methods of epipolar geometry. In real-life image sequences, certain points are much better suited for automated matching than others. A possible approach to select points of interest is corner detection. Corners in a scene are the end points of the edges. As we know, edges represent object boundaries and are very useful in 3D reconstruction of a scene. There are two important requirements for the selection of interesting points. First, points corresponding to the same scene point should be extracted consistently over the different views. Secondly, there should be enough information in the environment of the points, to be able to automatically match the corresponding points. , to be able to automatically match the corresponding points. Corner points are good candidates from both points of view, because they are usually "easily" detectable and identifiable and, furthermore, may have a "characteristic" environment, which all increase the chances for matching the corresponding points in other images .

There are several known corner detection algorithms for the estimation of the corner points. These detectors are bas ed on different algorithm-specific principles. It is known that there are corner detectors, whose functionality is based on a so-called feature orientation matrix L(x, y), which utilizes the local structure matrix Ls (x, y) consisting of the first partial derivatives of the intensity function.where G(x, y) corresponds to the a Gaussian smoothing function and * stands for the convolution operation. (The idea behind is that corners are local image features characterized by locations where the variations of the intensity function I(x, y) are high both in directions x and y (i.e. both partial derivatives Ix and Iy are large) anyhow the main axes of the coordinate system are chosen. Examples of it are the Harris feature point detector and Förstner's method . Harris' method evaluates a comparison: the measure of the corner strength RH = det(L(x, y) − k(trace(L(x, y))), (2) is compared to an appropriately chosen constant threshold. If RH exceeds the threshold, the point is taken as a corner. Here, trace (L(x, y)) = λ1 + λ2, λ1, λ2 stand for the eigenvalues of matrix L(x, y), and k denotes a parameter effecting the sensitivity of the method (typical values for k are k ⊠ [0.04– 0.2]). Förstner determines the corners as the local maxima of the beneficial function .

A further well-known corner detector is the SUSAN (Smallest Univalue Segment Assimilating Nucleus) detector based on brightness comparison . The algorithm does not depend on image derivatives; it uses the brightness values of the pixels. The first step of the algorithm is to place a circular mask around the pixel in question (the nucleus). After this, the method calculates the number of pixels within the circular mask which have similar brightness values to the nucleus. (These pixels define the so-called USAN.). The next step is to produce the corner strength image by subtracting the USAN size from a given geometric threshold. The possible false positives can be neglected by finding the USAN's centroid and its contiguity. The so called USAN area reaches a minimum (SUSAN), when the nucleus lies on a corner point. This method is more resistant to image noise than the previous ones.

RIDDLES

Try to solve it

1.You can drop me from the tallest building and I'll be fine ,but if you drop me in water I'll die .What am I?
2. What kind of room has no doors or windows ?
3. Which word in a dictionary is spelled incorrectly ?
4. 16 , 06, 68, 88, ?, 98. Find the missing number ?
5. If an electric train is travelling south, which way is the smoke going?
6. What is the letter next in the sequence J,F,M,A,M,J,J,A,S,O,M,?
7. Name three days consequently where none of the seven days of the week appear?
8. Suproliglicatiouspenuvaliancia- how do you spell IT?
9. I'm tall when I'm young and I'm short when I'm old,what am I?
10. What inventions let's you look right through a wall?
11. Why can't a man like in USA be buried in Canada?
12.Why do Chinese men eat more rice than Japanese men do?
13. Tear one off and scratch my head what was red is black instead?
14. Paul's height is six feet, he's an assistant at a butcher's shop, and wears size 9 shoes. What does he weigh?
15. There was a green house. Inside the green house there was a white house. Inside the white house there was a red house. Inside the red house there were lots of babies. What is it?

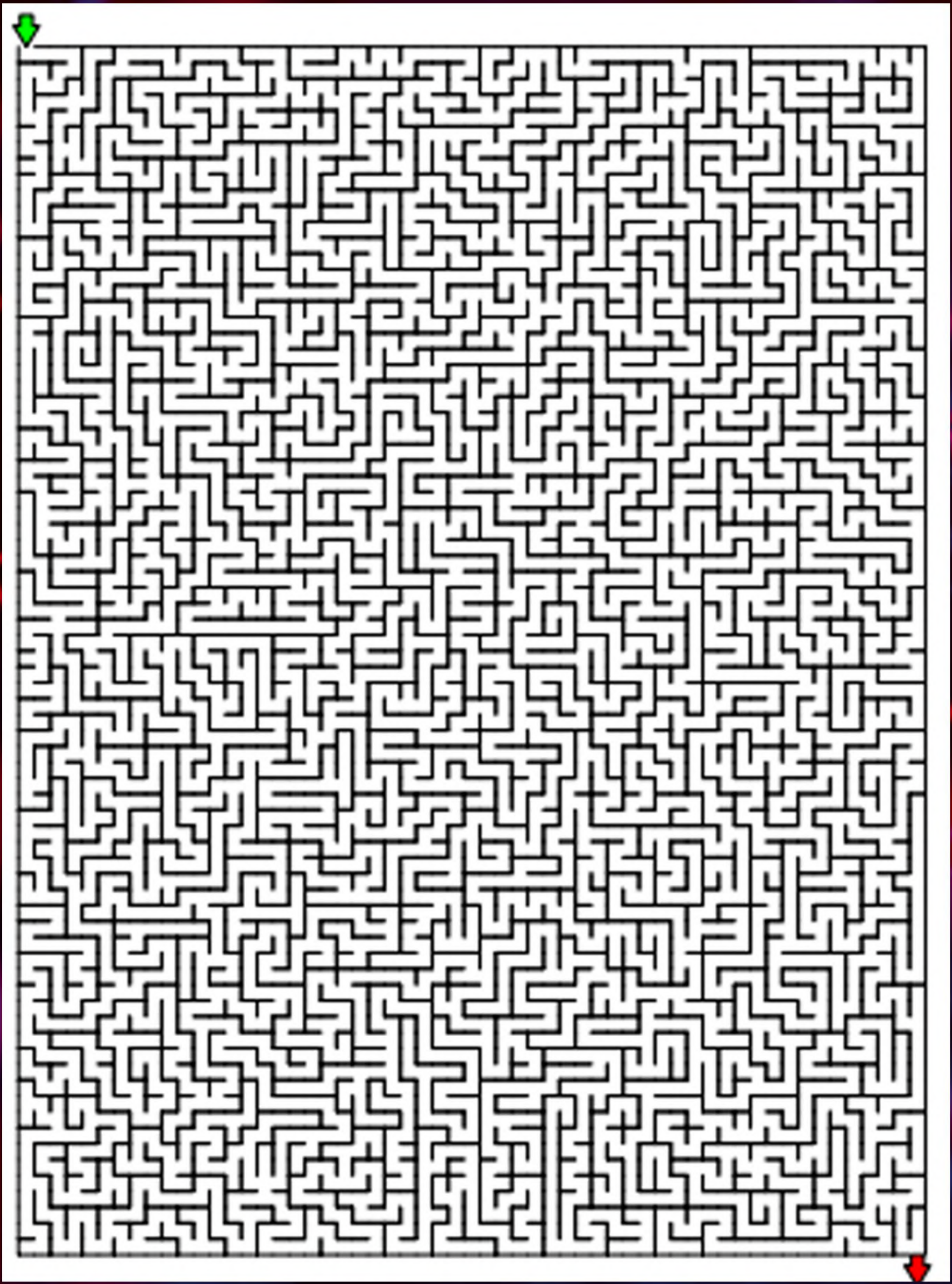
QUOTES

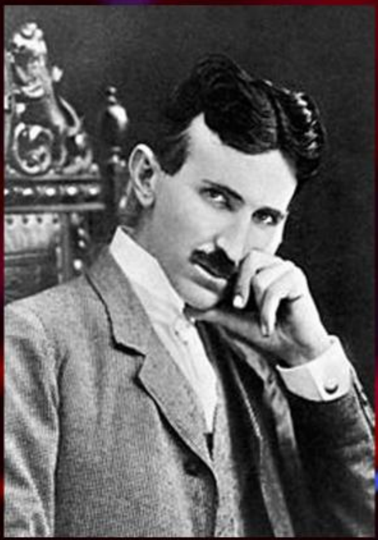
As **Engineers**, we were going to be in a position to change the world – not just study it."

-Henry Petroski

RAAJASRI G — 2nd Year

NAVEENHAA.B — Final Year



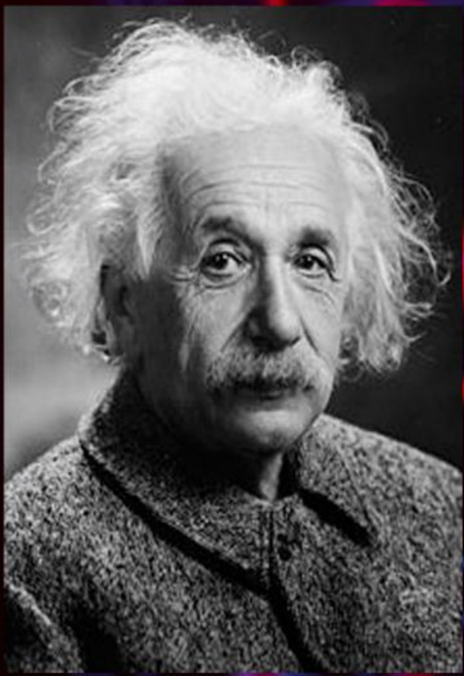


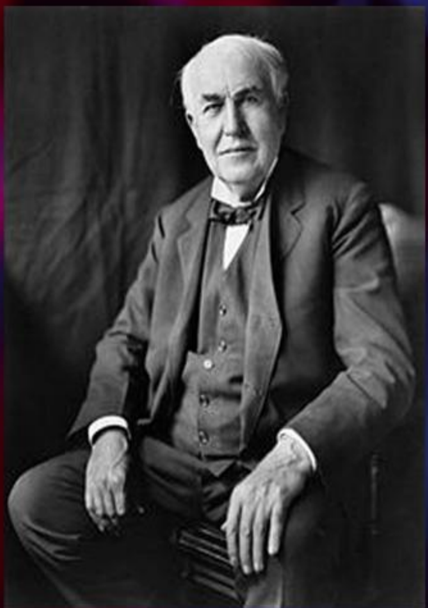
The present is theirs; the future, for which I really worked, is mine.

-Nicola Tesla

There are only two ways to live your life. One is as though nothing is a miracle. The other is as though everything is a miracle.

-Albert Einstein





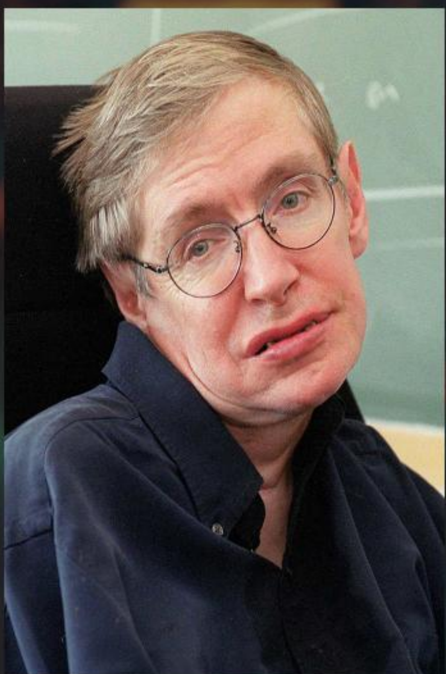
Many of life's failures are people who did not realize how close they were to success when they gave up.

- Thomas Edison

GUEST LECTURE

A guest lecture on "Electromagnetics" was conducted for second year ECE students on 22nd August 2015. The resource person was Dr. Gunasekaran, Dean, Rajalakshmi Engineering College, Chennai.

Dr.Gunasekaran delivered lecture for II ECE A & B



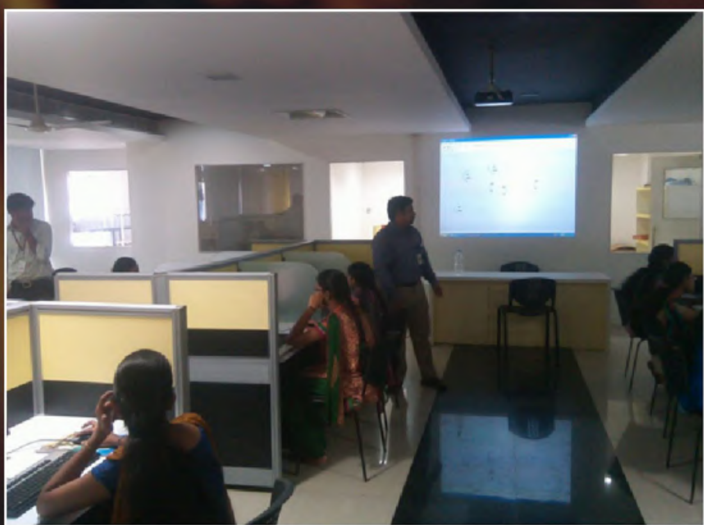
We are just an advanced breed of monkeys on a minor planet of a very average star. But we can understand the universe.

-Stephen Hawking

A Workshop on "BASIC ELECTRONICS" was organized for II year students on 20th July 2015.

III ECE students organized "BASIC ELECTRONICS" Workshop

A IETE sponsored workshop on "LTSPICE " was organized for II year students on 8th August 2015.



A guest lecture on "Cancer Awareness"