BHARAT INSTITUTE OF ENGINEERING AND TECHNOLOGY
Mangalpally (V), Ibrahimpatnam (M), Ranga Reddy Dist.-501510
Ph: 08414-252313/399/642/644, Fax: 08414-252647, E-mail: bietadmin@gmail.com, www.biet.ac.in

ELECSPIRE

ISSUE:MARCH, 2019

Dr Vikas Maheshwari
Chief Editor, ECE Dept

Chief Patrons

Sri Ch. VENUGOPAL REDDY
Chairman

Patrons

Prof. G. Kumara Swamy Rao
Senior Director, BIET

Dr. B. Prasada Rao
Director, Training & Placement, BIET

Dr R. Sree Hari Rao
Director, Centre of Excellence, BIET

Dr S.K. Chaudhuri
Director, R&D, BIET

Dr. M. Lakshinarayana
Adjunct Professor, BIET

Advisory Committee

Dr Rambabu V.
Principal

Editor

Dr Vikas Maheshwari
Associate Professor / ECE

Coordinators

Dr Naveen Rathee
Professor / ECE
Dr Satish Saini
Professor / ECE
Dr Neeraj Misra
Associate Professor/ECE
Mr D. Sankara Reddy
Assistant Professor / EEE
Mr Sathish Kumar
Associate Professor / ECE
Dr Kalyan Kasturi
Associate Professor / ECE

Student Coordinators

K. Vinay ECE-IVth Year
Nikhil Sagar ECE-IIIrd Year
B. Ajay ECE-IInd Year

Message from Chairman, Bharat Institutions

Sri Ch. VENUGOPAL REDDY
Chairman, Bharat Institutions

It is often said "Give me a copy of your department magazine, I will tell you about the quality of your department." I strongly believe in this statement. For, a magazine carries the contributions reflecting ethos and as-pirations of the students, faculty and other team members of an institution.

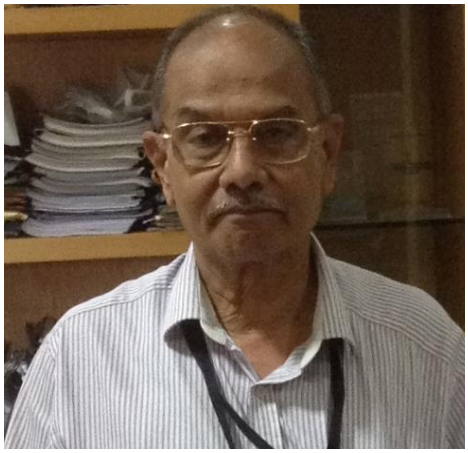
I am happy to know that ECE is bringing out its departmental magazine this year also. I went through the articles pub-lished in this magazine. They amply demonstrate the communica-tion skills, poetic prowess, imagination and creativity, humour and humanism, technical competence, and patriotism of the contributors. The role of a college magazine is there-fore vital in promoting what an institution offers. It brings out into the open things hitherto unrevealed. It brings to light the names of the unsung heroes and their mighty deeds.

I am happy that there is a dedicated team of staff and students who have brought out the magazine of ECE department. They have presented the stupendous achievements of BIETians in the fields of academics, research, sports and extra-cur-ricular activities, in a nice way.

that through these pages readers will get a bird's eye view of ECE and its wonders.

Message from Sr. Director, BIET

Prof. G. Kumara Swamy Rao
Senior Director, BIET



It is always a pleasure to be a part of a team which strives to bring out the talents of students and staff.

BIET has always been striving to keep itself ahead of the competition and the results are now for everyone to see.

The essential purpose of a department magazine is to inform, engage, inspire and entertain a diverse readership - including alumni, parents, students, faculty, staff and other friends of the college - by tell ing powerful stories that present a compelling, timely and honest portrait of the college and its extended family.

This magazine has made an earnest at-tempt in this direction and brought out certain aspects of the college to the eyes of the public so that they may understand and know the college even better.

I am sure the college will scale even greater heights in the years to come and serve many more millions in the society.

Message from Director, Centre of Excellence, BIET

Dr R. Sree Hari Rao
Director, Centre of Excellence, BIET

It is happiness unlimited to see BIET breaking barriers and moving forward confidently. The adage "Fortune favours the bold" is very true in the case of ECE.

There is nothing… absolutely nothing that stops the BIET juggernaut from rolling forward, going on boldly from one project to another… leaving the spectators spell-bound.

Everything that ECE touches turns into gold. All these things have been made possible by the extraordinary vision and the immaculate planning of our chairman, which when coupled with the skills of the staff have made the college scale new highs. This magazine brings out the notable achievements of ECE. I am sure that through these pages readers will get a bird's eye view of ECE and its wonders.

Message from Director, R&D, BIET

Dr S.K. Chaudhuri
Director, R&D, BIET

The pride of every student and staff would be in his/her college. A college may reach heights of glory but without materials like a department magazine, the outside world may not know of it.

The role of a college magazine is therefore vital in promoting what an institution offers. It brings out into the open things hitherto unrevealed. It brings to light the names of the unsung heroes and their mighty deeds.

I am happy that there is a dedicated team of staff and students who have brought out the first ever magazine of our college. They have presented the stupendous achievements of DCEians in the fields of academics, research, sports and extra-cur-ricular activities, in a nice way.

Principal's Message

Dr V. Rambabu
Principal, BIET

It is a great pleasure to see the creative ex-pressions of students who had contributed to Magzine.

ECE has grown abundantly in the recent past. It continues to sustain its growth. People reading this magazine will realize the tremendous changes that are happening in the BIET campus. The magazine is presenting a glimpse of the growth of the institution on many fronts.

The college has been simply unstoppable in its progress as it has been actively involved in various activities that have brought to light the hidden talents of the college students and staff.

Placement Director's Message

Dr. B. Prasada Rao
Director, Training & Placement,
BIET

This magazine has recorded achievements such as: conferences attended by staff members and students, competitions won by the hugely talented students, in-novative projects carried out by students with the guidance of staff, among others. They stand as a witness to the monumen-tal efforts taken by the management to make the college a centre of excellence in education and research.
I wish the management, staff and students of the college success in their future en-deavours.

Professor's Message

Dr. M. Lakshinarayana
Adjunct Professor, BIET

I am happy to see the amount of enthusiasm of eminent members of the college to contribute to the magazine. Not to be outdone, our students have devoted time and plunged into creating powerful sto ing powerful stories that present a compelling, timely and honest portrait of the college and its extended family. I stand awed by the sheer number of ar-ticles that have come pouring in for the magazine. This shows the positive and creative energy of faculty members and students present in the department. This magazine has made an earnest at-tempt in this direction and brought out certain aspects of the college to the eyes of the public so that they may understand and know the department even better.

From the Department of ECE

Congratulations to the editorial team for bringing out a quality college magazine.

Thanks for providing the readers with inspirational ar-ticles, vibrant drawings, mind-scintillating poems and updates of current trends.

We look forward to receiving many more magazines that give us information and interesting articles so that we can enrich our knowledge.

You are doing a great job…..Keep it up!”

INSTITUTE VISION:

To achieve the Autonomous and University status and spread universal education by inculcating discipline, character and knowledge into the young minds and mould them into enlightened citizens.

INSTITUTE MISSION:

Our mission is to impart high quality education, in a conductive ambience, as comprehensive as possible, with the support of all the modern technologies and make the students acquire the ability and passion to work wisely, creatively and effectively for the betterment of our society

VISION OF ELECTRONICS AND COMMUNICATION DEPARTMENT

The vision of the Department of Electronics and Communication Engineering is to effectively serve the educational needs of local and rural students within the core area of electronics and communication engineering and develop high quality engineers and responsible citizens.

MISSION OF ELECTRONICS AND COMMUNICATION DEPARTMEN

The mission of the Department of Electronics and Communication Engineering is to work closely with industry, research organizations to provide high quality education in both theoretical and practical applications of electronics and communication engineering.

Program Outcomes

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.
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.
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.

Program Specific Outcomes

PSO1:Professional Skills: An ability to understand the basic concepts in Electronics & Communication Engineering and to apply them to various areas, like Electronics, Communications, Signal processing, VLSI, Embedded systems etc., in the design and implementation of complex systems.
PSO2:Problem-Solving Skills: An ability to solve complex Electronics and communication Engineering problems, using latest hardware and software tools, along with analytical skills to arrive cost effective and appropriate solutions.
PSO3:Successful Career and Entrepreneurship: An understanding of social-awareness & environmental-wisdom along with ethical responsibility to have a successful career and to sustain passion and zeal for real-world applications using optimal resources as an Entrepreneur.

Program Educational Objective

Program Educational Objective 1: (PEO1)

Graduates will be able to synthesize mathematics, science, engineering fundamentals, laboratory and work-based experiences to formulate and solve engineering problems in Electronics and Communication engineering domains and shall have proficiency in Computer-based engineering and the use of computational tools design of electronics systems.

Program Educational Objective 2: (PEO2)

Graduates will succeed in entry-level engineering positions within the core Electronics and Communication Engineering, computational or manufacturing firms in regional, national, or international industries and with government agencies.

Program Educational Objective 3: (PEO3)

Graduates will succeed in the pursuit of advanced degrees in Engineering or other fields where a solid foundation in mathematics, basic science, and engineering fundamentals is required.

Program Educational Objective 4: (PEO4)

Graduates will be prepared to communicate and work effectively on team based engineering projects and will practice the ethics of their profession consistent with a sense of social responsibility.

Program Educational Objective 5: (PEO5)

Graduates will be prepared to undertake Research and Development works in the areas of Electronics and Communication fields.

MEMS Technology

Magic Means Micro

Dr Naveen Rathee
Professor, ECE Dept

Micro-Electro-Mechanical Systems, or MEMS, is a technology that in its most general form can be defined as miniaturized mechanical and electro-mechanical elements that are made using the techniques of micro fabrication. The critical physical dimensions of MEMS devices can vary from well below one micron on the lower end of the dimensional spectrum, all the way to several millimeters.

The term used to define MEMS varies in different parts of the world. In the United States they are predominantly called MEMS, while in some other parts of the world they are called “Microsystems Technology” or “Micro Machined Devices”. While the functional elements of MEMS are miniaturized structures, sensors, actuators, and microelectronics, the most notable elements are the micro sensors and micro actuators. Micro sensors and micro actuators are appropriately categorized as “transducers”, which are defined as devices that convert energy from one form to another. In the case of micro sensors, the device typically converts a measured mechanical signal into an electrical signal.

The more complex levels of integration are the future trend of MEMS technology. The present state-of-the-art is more modest and usually involves a single discrete micro sensor, a single discrete mi-cro actuator, a single micro sensor integrated with electronics, a multiplicity of essentially identical micro sensors integrated with electronics and a single micro actuator integrated with electronics.

MEMS technology is sometimes cited as separate and distinct technology. In reality the distinction is not so clear-cut. The well-known Scanning Tunnel-ing-Tip Microscope (STM) which is used to detect individual atoms and molecules on the nanome-ter scale is a MEMS device. Similarly the Atomic Force Microscope (AFM) which is used to manipu-late the placement and position of individual atoms and molecules on the surface of a substrate is a MEMS device as well. In fact, a variety of MEMS technologies is required in order to interface with the nano-scale domain. Thus the MEMS is a technology of encompassing highly miniaturized things that cannot be seen with the human eye. The common benefits afforded by this technology, include: increased information capabilities, miniaturization of systems, new materials resulting from new science at miniature dimen-sional scales, and increased functionality and autonomy for systems.

When Signal Matters

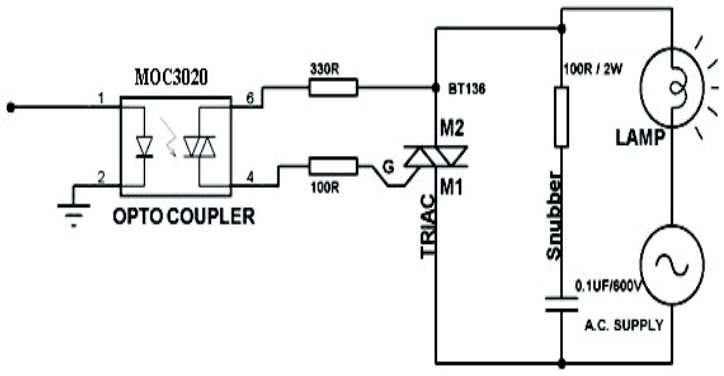
MOC3020 Opto-Coupler

Chandika Mohan Babu
Asst. Professor, ECE Dept

Many electronic equipments these days are using opto-coupler in the circuit. An opto-coupler or opto-isolator allows two circuits to exchange signals yet remain electrically isolated. The standard opto-coupler circuit configuration utilizes an LED and a photo-transistor; usually it is an NPN transistor. Opto-couplers are also fabricated in few modules like SCRs, photodiodes, TRIACs and other semicon-ductor switches as an incandescent lamp or other light source. This article briefs about an opto-coupler MOC3020.

Working principle of MOC3020:

The MOC3020 is designed for interfacing electronic controls and power TRIAC to control resistive and inductive loads for Vac operations. The principle used in opto-coupler is, MOC's are promptly available in integrated circuit form and don't require very complex circuitry to make them work. Simply give a small pulse at the right time to the LED in the package. The light produced by the LED activates the light sensitive properties of the DIAC and the power is switched on. The isolation between the low power and high power circuits in these optically connected devices is typically few thousand volts.The circuit is a typical circuit used for AC load control using microcontroller, external LED can be connected in series with MOC3020, to indicate a high level from micro controller to ensure that current flows in internal LED of the opto-coupler. The power lamp is activated by mains AC power supply and hence no ex-ternal power supply is required.

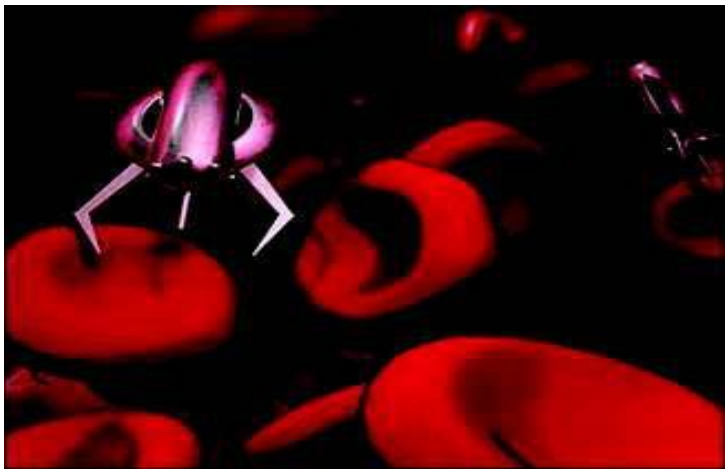


To switch the AC current to the lamp, we have to use an opto-coupled TRIAC, lamp and a DIAC. A TRIAC is an AC controlled switch. It has three terminals M1, M2 and gate. A TRIAC, lamp load and a supply voltage are connected in series. When power is on, at positive cycle the current flows through lamp, resistors, DIAC, and gate and reaches the supply and the lamp glows for that half cycle directly through the M2 and M1 terminal of the TRIAC. In negative half cycle the process repeats. Thus the lamp glows in both the cycles in a controlled manner depending upon the triggering pulses at the opto isolator. If this is applied to a motor instead of lamp, the power controls the speed of the motor.

Say Goodbye to Pills. Nano Robots Can Cure

G. Ashalatha
Asst. Professor, ECE Dept

Nano robots will be able to repair damaged or diseased tissues. The circulatory system is the natural path for these devices and the nano robots will pass through the blood stream to the area of defect. They attach themselves to specific cells, such as cancer cells and report the position and structure of these tissues. A creative methodology in the use of these devices to fight cancer involves using silicon nano machines with a thin coating of gold and light in the near infrared spectrum.



Light in the 700-1000 nanometer range will pass through the tissue and reaches the defective cell. When this infrared light strikes the particular type of nano robot, the device gets hot due to the oscillation of the metal's electrons in response to the light.

Using an MRI, the nano robot is specifically placed in the cancerous region, and then the light causes the devices to heat to 131 degrees Fahrenheit which destroys the cancerous cells but doesn't damage surrounding tissues. This is the new technology, without any draw-backs. These nano robots can cure any disease without affecting any other cells or tissues.

The future vision: Imagine going to the doctor to get treatment for a fever, instead of giving you a tablet the doctor implants a tiny robot into your bloodstream. The robot detects the cause of your fever, travels to the appropriate system and provides a dose of medi-cine directly to the infected area. This is going to happen in a few years of time from now. Each person is going to have a nano robot in his body which is going to monitor human body system. So the time arrives to enjoy with the robot within our self.

Radio-Frequency Demystified

B. Ajay Kumar
IInd Year, ECE Dept

Radio-frequency identification (RFID) is the wireless use of electromagnetic fields to transfer data, for the purposes of automatically identifying and tracking tags attached to objects. The tags contain elec-tronically stored information.

RFID is a technology to electronically record the presence of an object using radio signals. It is used for inventory control or timing sports event. RFID is a complement for distant reading of codes. The technology is used to identify a person, a package or an item automatically. To do this, it relies on RFID tags. These are small transponders. A transponder is the combination of radio receiver and transmitter. This will transmit information over a short distance. An RFID tag is an object that can be applied to or incorporated into a product, animal, or person for the purpose of identification and tracking using radio waves. Some tags can be read from several meters away and beyond the line of sight of the reader. Most tags carry a plain text inscription and a barcode.

Most RFID tags contain two parts.

- One is an integrated circuit for storing and processing information, modulating and de-modulating a radio frequency (RF) signal.
- The other is an antenna for receiving and transmitting the signal.

There are generally two types of RFID tags:

- Active RFID tags, which contain a battery, and
- Passive RFID tags, which do not contain a battery.

RFID applications:

- In manufacturing and processing areas, RFID is used for inventory and production process monitoring and ware house order fulfilment.
- In supply chain management its uses include inventory tracking systems and logistics management.
- In security, it is used for access controlling, counterfeiting and theft control /prevention, tracking of devices(location).

No Defence Without Talon

Sindhuri

II[nd] Year ECE Dept

TALON is a powerful, lightweight, versatile robot designed for missions ranging from reconnaissance to weapons delivery. Its large, quick release cargo bay accommodates a variety of sensor payloads. Built with all weather, day/night and amphibious capabilities standard TALON can operate under the most adverse conditions to overcome almost any terrain.

The suitcase portable robot is controlled through a two-way RF/F/O line from a portable or Wearable Operator Control Unit (OCU) that provides continuous data and video feed-back for precise vehicle positioning.

TALON payload and sensor include multiple cameras, a two stage arm, NBC sensors, radiation sensors, communication equipment. The TALON robot is used for bomb disposal. It is operated by radio frequency and equipped with four video cameras.The TALON began helping with military operations in Bos-nia in 2000. TALON robots had been used in about 20,000 missions in Iran and Iraq. Soldiers operate the swords by remote control from up to 1,000 meters away.

"Skyrmions" For Data Storage

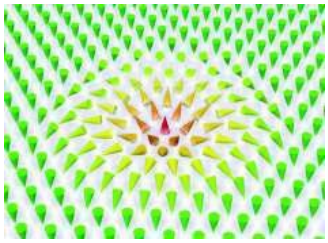
M. Kiran Sai

III[rd] Year ECE Dept

Researchers in Germany have used skyrmion tiny magnetic vortices that can be imagined as two di-mensional knots in which the magnetic moment rotates about 3600 degrees within a plane for the first time to store data. This technology could be used to create hard disk with higher densities and faster data transfer speeds.

What Are Skyrmions?

Skyrmions that consist of a small number of atoms were first identified about 80 years ago and have been the object of intensive research in recent years. They are named after a British particle Physicist, Tony Skyrme. This meant the existence or non-existence of a skyrmion could be assigned the digital bit states "1" and "0", the basis for information technology.



In a Gist:

In their experiment, the researchers used a two atomic layer thick film of palladium and iron on an iridium crystal. They observed the skyrmions, with a diameter of a few nanome-ters, with a scanning tunneling microscope. The skyrmions were then manipulated with a small spin polarized current from the tip of the micro-scope. The research team has demonstrated the feasibility of skyrmions in data storage. This new tech-nology can also be introduced in computers, tablets and smart phones.

Organic Solar Cell

New Light on Sustainability

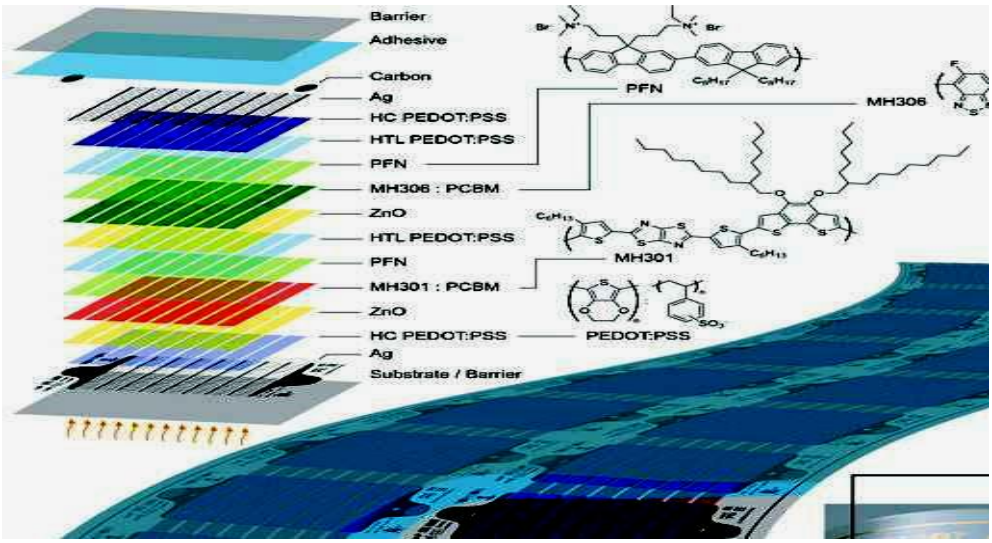
Dr K.S. Balamurgan

Associate Professor, ECE Dept

In an impressive feat of engineering, scientists in Denmark have devised a rapid, scalable and indus-trially viable way to manufacture large sheets of flexible organic tandem solar cells. Their successful application of roll-to-roll processing is a significant achievement for this emerging renewable technol-ogy. An Organic PhotoVoltaic(OPV) solar cell is a polymer-based thin film solar cell. OPV solar cells have been the focus of much research as they are lightweight, flexible, inexpensive, highly tuneable and potentially disposable. They are also unparalleled in the number of times that they can pay back the ene rgy used in their manufacture.

In the quest to improve the efficiency of OPVs, which, in addition to operational lifetime, is current-ly their key limitation, various new materials, processing methods and device architectures have been thoroughly investigated. Among these is the tandem cell, where multiple junctions are stacked upon one another. This can in-crease the efficiency of the cell by not only increasing the number of junctions, but, along with careful selection of complementary materials, can make it possible to harvest photons from a broader region of the spectrum. However, this more complicated architecture renders their manufacture significantly more challenging.

Frederik Krebs and his research team at the Technical University of Denmark are specialists in renew-able energy technologies, particularly OPVs. For the first time they have demonstrated the successful roll-to-roll manufacture of tandem OPV modules, each comprised of a stack of 14 discrete layers, which are rapidly printed, coated or deposited one on top of another by a machine reminiscent of a printing press. The experiment was carried out in simple conditions and is extremely fast, with a single solar cell



module being printed onto blank foil each second. Most importantly, the process is relatively cheap and completely scalable, with a high technical yield. 'If I have made a kilometre of solar cells, then I am not interested if one module has an efficiency of 10% and the rest are 2% – I think what is important is what you can make for the public,' says Krebs. 'I am the guy that makes a lot of it and tries to look for the average and what is practical, and then there are the other guys that look at what is obtainable. Everybody has their role to play and hopefully we will meet some day, probably somewhere in the middle.' 'The performance from these fabricated devices has a long way to go to achieve commercial viability,' states Seth Darling, an expert in solar energy conversion at Argonne National Laboratory, US, 'but this work clearly shows that the process itself is feasible and has the potential for genuine market impact.' The future direction of this research now lies in materials development, and in the optimisation of each layer for the manufacturing process.

Designing Networks Made Easy

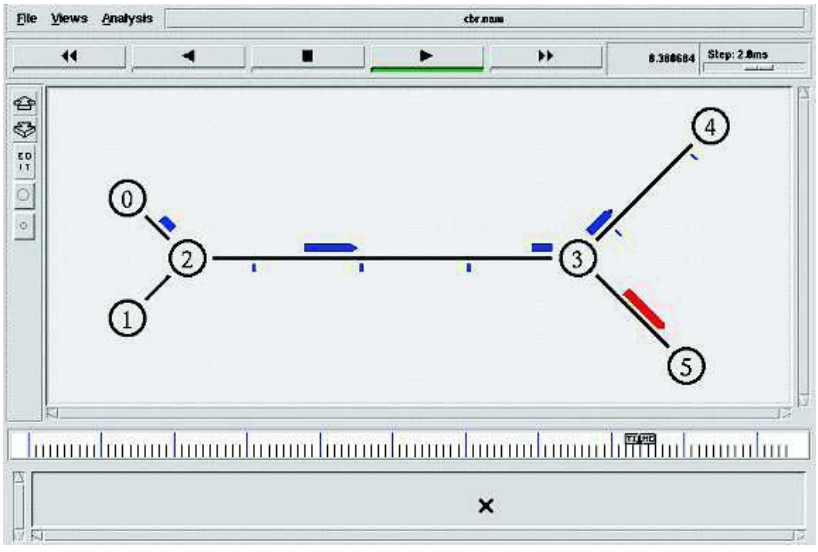
D. Sankara Reddy
Asst. Professor, ECE Dept

In communication and computer network research, network simulation is a technique where a program models the behavior of a network either by calculating the interaction between the different network entities (hosts/packets, etc.) using mathematical formulae, or actually capturing and playing back obser-vations from a produced network. A network simulator is software or hardware that predicts the behavior of a computer network without an actual network being present. In simulators, the computer network is typically modeled with devices, traffic, etc. and the performance of the network is analysed. Typically, users can then customize the simulator to fulfill their specific analy-sis needs. Simulators typically come with support for the most popular protocols and networks in use today, such as WLAN (Wireless Local Area Network), WIMAX, TCP (Transmission Control Protocol), WSN (Wireless Sensor Network), cognitive radio, etc.

There are many open-source and commercial network simulators. There are a wide variety of network simulators, ranging from the very simple to the very complex. Minimally, a network simulator must enable a user to represent a network topology, specifying the nodes on the network, the links between those nodes and the traffic between the nodes. More complicated systems may allow the user to specify everything about the protocols used to handle traffic in a network. Graphical applications allow users to easily visualize the workings of their simulated environment. Text-based applications may provide a less intuitive interface, but may permit more advanced forms of cus-tomization. Most of the commercial simulators are GUI (Graphical User Interface) driven, while some network simu-lators are CLI (Command Line Interface) driven. The network model / configuration describes the state of the network (nodes, routers, switches, links) and the events (data transmissions, packet error, etc.). An important output of simulations is the trace files. Trace files log every packet, every event that occurred in the simulation and are used for analysis. Network simulators can also provide other tools to facilitate visual analysis of trends and potential trouble spots.

Most network simulators use discrete event simulation, in which a list of pending “events” is stored, and those events are pro-cessed in order, with some events triggering future events—such as the event of the ar-rival of a packet at one node triggering the event of the arrival of that packet at a down-stream node. Examples of notable network simulation software are:

- NS (open source) – NS2 and NS3
- OMNeT++ (open source)
- Glomosim (open source)
- OPNET (proprietary software)
- NetSim (proprietary software)
- QualNet (proprietary software)



Amongst all simulators, nearly 80% of researches in world are utilizing NS2. In 1996-97, NS version 2 (NS2) was initiated based on a refactoring by Steve McCanne. Simulation scripts are written in the OTCL (Object Tool Command Language) language, an extension of the TCL scripting language. The core of ns-2 is also written in C++, but the C++ simulation objects are linked to shadow objects in OTCL and variables can be linked between both language realms. Presently, ns-2 consists of over 300,000 lines of source code, and there is probably a comparable amount of contributed code that is not integrated directly into the main distribution. Network simulators serve a variety of needs. They allow engineers, researchers to test scenarios that might be particularly difficult or expensive to emulate using real hardware - for instance, simulating a scenario with several nodes or experimenting with a new protocol in the network. Network simulators are particularly useful in allowing researchers to test new networking protocols or changes to existing protocols in a controlled and reproducible environment. A typical network simulator encompasses a wide range of networking technologies and can help the users to build complex networks from basic building blocks such as a variety of nodes and links. With the help of simulators, one can design hierarchical networks using various types of nodes like computers, hubs, bridges, routers, switches, links, mobile units, etc.

Piezoelectric Haptics

R. Sathish Kumar
Asst. Professor, ECE Dept

Last month the Canadian company, Boréas Technologies, unveiled an ultra-low-power haptic technology that combined high-definition haptic feedback with low-power, making it suitable for wearables and other battery-powered consumer devices. The key challenge for device designers is balancing the performance requirements with the hefty power demands associated with haptic technologies. Boréas Technologies' solution is based on piezoelectric ceramic units but it is not the only solution to have emerged in this space. Other technologies include shape memory alloys that use carefully controlled, miniature nitinol wires; layered electroactive polymer films that can be integrated onto the surface of devices to provide completely localised haptic feedback and electromagnetic actuators, that are able to offer customised and varied sensations. One of the key problems with actuators is that they need a high driving voltage – in the region of 50-200 volts – which can give rise to issues with efficiency or distortion. These problems can then lead to poor power consumption, noise and other challenges.Those issues have meant that actuators haven't been able to penetrate the larger main-stream markets in haptics. This device, however, has been designed to operate in the 3-5.5 V range, and that's been achieved by building this device from the ground up. As a result, we've delivered efficiency and a piezoelectric actuator with very low distortion. Boreas' CapDrive technology platform is a proprietary scalable piezoelectric driver architecture on which its haptic driver ICs are based. It not only provides greater energy efficiency, but both low heat dissipation and rapid response times.

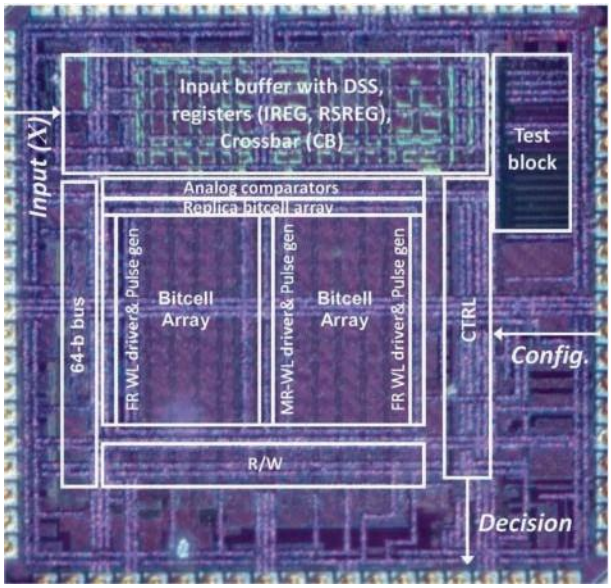
According to BCC Research, the global haptic actuator and driver IC market could be worth upwards of $26billion by 2022 and Boréas is looking to tap the fastest-growing segment for haptic interface technologies.Its piezoelectric haptic components are expected to outpace legacy architectures, such as eccentric rotating mass (ERM) motors and linear resonant actuators (LRAs), which have tended to be limited by higher power consumption, large size, and slower response times.Unlike ERMs and LRAs, piezoelectric haptic components can be used for both output (haptic) and input (e.g., button) in a system, helping to reduce the complexity, size and cost of interactive devices. While the market for haptics has been somewhat 'moribund' over the past few years, there does seem to be growing interest in the technology and a growing number of new players have entered the market, from large OEMs to a host of new start-ups – Boreas being one of them. Having now gained validation from various partners, Boréas Technologies is now making available development kits for testing, so allowing a wider community to join their alpha test group in experimenting with this technology. The opportunities for HD haptic feedback are "diverse",

The use of the technology in consumer goods and in VR/AR gaming, where it will be able to add to audio and video, offering "realistic sensations, for users." The next step is likely to involve the development of virtual buttons or virtual keyboards. Used on a large display, in a vehicle for example, a driver would be able to feel their way over their screen. For Boréas Technologies, replacing mechanical buttons is the next logical step going forward,

Mixed Signals for Machine Learning

Dr Vikas Maheshwari
Associate Professor, ECE Dept

Multiple technological winters have stymied the development of machine learning. But now that smart speakers have invaded the home and Amazon has decided the time is ripe for a $60 microwave that can take orders from Alexa, maybe AI-enabled systems are finally here to stay. The problem that continues to face embedded applications of AI is the cost of computation. Much of the work has to be performed using high-speed digital processors, often in the cloud because the battery will not sustain local processing. Developers are looking to methods to cut the energy bill. Processing in the analogue domain is one possibility. If you look at the gate count of a high-speed multiplier, a fundamental building block for most AI algorithms used today, it is easy to believe a simple analogue equivalent would be more energy efficient. At the SysML conference earlier this year, nVidia chief scientist Bill Dally talked of running SPICE simulations to work out whether analogue is a viable approach when it comes to performing machine learning. But he quickly saw problems emerge. One is the issue of matching analogue devices to the required level of accuracy though this is not the primary concern. One big difference between computation for machine learning and conventional signal processing is that systems such as neural networks are highly tolerant of errors. This has led companies pursuing embedded machine learning, such as IBM, to look at techniques such as approximate computing. This may involve letting arithmetic units make mistakes as long as they are not significant. This could let circuits operate very close to their voltage limits, which will help to save power. If an operation does not complete in time because it is voltage starved, it does not matter much to the overall answer. Another approach is simply limited precision.



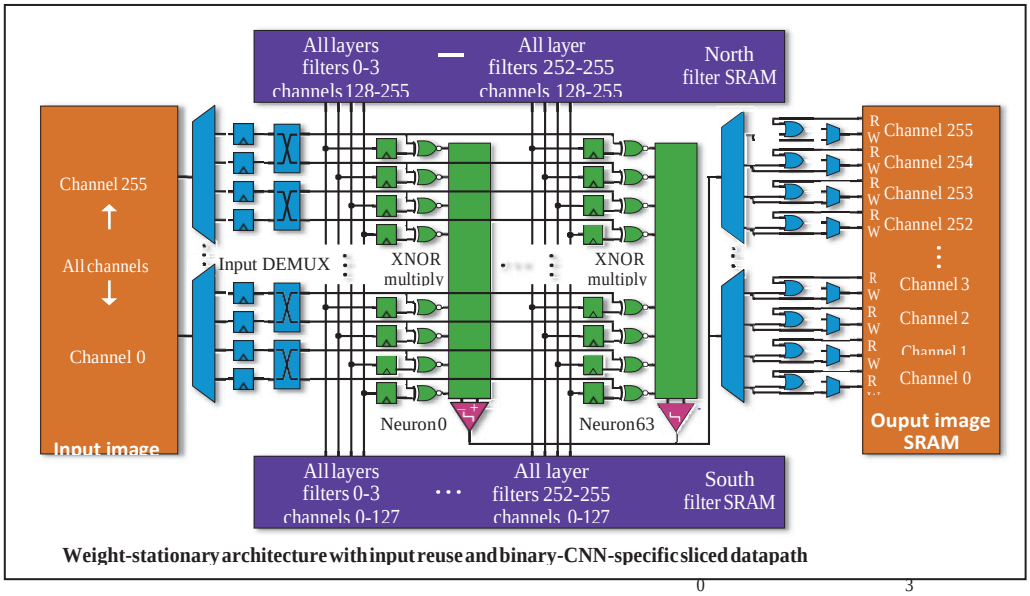
Limited precision

Low-precision is a problem for training neural networks. But researchers have been surprised by how low the precision can go during the inferencing phase when the network is comparing real-world data to the model on which it was trained. The precision came down quickly from full double-precision floating point to 16bit and then to 8bit. This makes neural networks fit well on SIMD pipelines. But some proposals have gone further to binary and ternary resolution with little adverse effect on performance in some applications. Low-quality analogue should have little difficulty keeping up with those levels of accuracy and, in principle replace the high-speed multipliers with circuits that could be as simple as voltage-controlled amplifiers. But Dally noticed that a comparison of the energy each operation needs at the same level of precision, digital works out better because it is quicker. “If you look at things like the fact that these circuits are leaking over the 10 microseconds it takes to do the computation it’s actually way higher energy to do it in analogue if you take the leakage into account,” “Digital CMOS logic is amazingly efficient especially at very low precision. If I’m doing 2 or 3 bit operations the arithmetic is actually almost in the noise and then it’s leakage that dominates.” Digital processing has the advantage of being able to cut leakage by turning unused elements off. This is much harder with analogue techniques. But analogue machine learning is not dead. Although digital processing makes it easier to control leakage, there are

many situations in system design where leakage is inevitable. So, you might as well take advantage of it. Researchers such as Boris Murmann of Stanford University have been focusing their effort on hybrid systems that use analogue where it does turn out to be more efficient. One area is preprocessing.

Preprocessing

Security cameras and smart speakers are systems that need to maintain a low level of activity almost constantly simply to work out whether something important is happening nearby. “It makes sense to have a wakeup algorithm. For it, you may sacrifice programmability for extreme energy efficiency. If I only want to wake up when I see a face I don’t necessarily need a very sophisticated deep learning-based algorithm,” Murmann explained at a workshop on machine learning at the VLSI Circuit Symposium in Honolulu. ”I’m not trying to do a humungous calculation. I’m just trying to work out what is in the field of view and decide: should I wake up my big brother?” Processing in the analogue domain makes it possible to work at comparatively low resolution because it can support a high dynamic range. “When analogue people hear ‘dynamic range’ they know what to do,” Murmann says. High dynamic range makes it easier to deal with images that may contain strong shadows that might otherwise disrupt object-recognition models. “With optimal exposure, I can reliably detect objects even with 2bit resolution,” Murmann says. Real-time threshold adjustments coupled with logarithmic processing in the analogue domain makes it possible to reduce the effects of shadows massively. “These analogue circuits are a bit tricky and require a lot of analysis,” Murmann says, but the team has sent test silicon to the fab. The result of using the front-end is a 20-fold reduction in the data that passes into the next stage compared with conventional sensor interfaces. The next step is to work out where to put analogue circuitry in the machine-learning cores. MIT associate professor Vivienne Sze points out that the energy consumption of most AI algorithms is dominated by the shifting of data to and from memory. She says there is a threefold increase in memory transactions for even a relatively simple deep-learning system such as AlexNet compared to what was needed for traditional image-recognition algorithms such as histogram of oriented gradients (HOG). To overcome the high cost of off-chip accesses to main memory, digital implementations try to cache as much data as possible. This works reasonably well for the convolutional layers in deep neural networks. Fully connected layers are more troublesome for caching strategies but convolutional layers tend to dominate the processing in these systems. For front-end processing, the amount of data that needs to held for neuron weights and for the preprocessed source image is relatively small: it should fit into local memory, which reduces the power overhead. But with analogue processing, it is possible to go further. Professor Naresh Shanbhag of the University of Illinois says: “With conventional digital design, the memory read is highly curated. That hurts energy efficiency.” The group’s approach is to avoid needlessly converting the charge levels stored in SRAM into digital ones and zeros and simply process them directly in the analogue domain. “The computation wraps its arm around the bitcell array. We don’t touch the bitcell itself: everything we do stays on the periphery. The computational signal-to-noise ratio drops but we can take advantage of the error tolerance of machine-learning algorithms,” Shanbhag explains.



Weight-stationary architecture with input reuse and binary-CNN-specific sliced datapath

The first test devices used SRAM but Shanbhag says the team is working with memory maker Micron Technology to develop a flash-compatible version, which would reduce leakage energy for always-on systems. The regular nature of the design lends itself to the compilation and synthesis techniques used by SoC designers to generate on-chip memory arrays, he adds. Murmann’s group has taken a similar approach, developing an architecture that looks like a memory turned inside-out. Data from the image is passed through a network of demultiplexers and into XNOR gates that act as analogue multipliers. These low-resolution multipliers process each input against a set of weights with the results forwarded to an analogue summing bus. The final stage is through a second mux network to the output memory.

Although analogue computation is not going to revolutionise machine learning for embedded systems, work on hybrid architectures could provide a way to bring AI to always-on devices.

All Is In The Mind!

Dr. B. Prasada Rao

Director of Training & Placements, Industry Interface

There was a man who worked for the railroad. One day, he went into the freezer compartment to do his routine work. The door accidentally closed and he found himself trapped in the compartment. He shouted for help but no one heard him since it was midnight.
He tried to break down the door but he could not. As he lay in the freezer compartment, he began to feel colder and colder. Then he began to feel weaker and weaker, and he wrote on the wall of the compart-ment, "I am feeling colder and colder; and I am getting weaker and weaker. I am dying, and this may be my last words".

In the morning when the other workers opened up the compartment they found him dead. The sad twist to the above story is that the freezing apparatus there had broken down a few days ago. The poor worker did not know about it and in his mind the freezing apparatus was working perfectly. He felt cold, got weaker and literally willed himself to die.

Moral

Our sub-conscious mind can be cheated. The **s**ub-conscious mind can only accept and act on information passed to it by the conscious mind. It has no capacity to **rej**ect or decline any instruction or infor-mation passed to it by the conscious mind. In the case of the poor worker, he consciously thought that he was getting colder, weak-er and dying and the sub-conscious mind accepted the above instructions and affected his physical body. That was how he willed **him**self to die.

Fear Offers Two Choices

P. Sowmya
II[nd] Year ECE

First, let us evaluate your self-desire of how you want to represent yourselves to this world. Remember, this is a game and the individual with the highest score wins! So, here goes the question – Is the figure below concave or convex?

Examine the figure carefully… Be patient, pause your reading and come up with the most appropriate answer that you are satisfied with. So, now let us see how you want to represent yourselves to this world. Please, allot a mark of 1 to your score card if you have diagnosed this figure as either a concave or convex. If you are in a confusion as you have diagnosed the figure as either of them, then, feel free to assign yourselves a highest mark of 2.

Finally, the results have been declared that the individual with the score of zero wins the game. So, the highest appraisals and the prestigious title of "Winner" goes to that person who have showed up suddenly from nowhere. End of competition. From this competition, I have showed you how this world has changed drastically from a truthful vintage to a corrupted young age. As a citizen of this once beautiful economy, we never have tried to face our day to day chances with utmost courage and determination. We know our strength but fail to be confident about it. We dream of a safe future and live for someone else's life. We see an act of arrogance and marvel at ourselves about our escape from them. We have a passion but we hide it with our dull looking resume. Finally, we get a job and lead a mechanical life. Just ask yourselves, "Is this the life which you are destined to live?" If your answer is yes, then, you can surely win with almost nil passion and nil interest. If you say no, then, you surely are a 'LEGEND'! The above game might have come up with two end points. One is acceptance and the other is back talks. Let us first analyze the scene in terms of back talks. Just consider a competition is being held like this and you are one of the competitors. If you have entered this competition with the main motto of winning, then, you would have started to doubt your skills after the announcement of the results. Fear would have enveloped your mind and you would be subjected to constant disappointment. This might lead you to hide your identity in that competition and would also have made you have back talks about the conspiracy that happened during the finals. Now, what might have been the state of your mind if you had accepted the result of the competition? Just one thing, your inner voice would never have got down, no matter what happens. The factor that made your mind to accept or deny the result was the belief which you had on yourselves. In turn, this whole thought would have been from the source so-called FEAR. Fear was the outcome of that competition but your belief has changed the state of your mind. It is all again your choice.

If you face constant failures in your life, just learn the mistakes from them and wait for the even more beautiful future you are destined to live in. A person who wants to be a winner, learns less and wins his/ her life in the first attempt. But a person who is LEGENDARY tries with many attempts to succeed while learning many valuable things and finally wins in his last attempt. A winner is just a HISTORY who wins his life; while a LEGEND is beyond history who wins the world.

FEAR has two meanings. The choice is yours…
Choice 1 – Forget Everything And Runforward to be a winner.
Choice 2 – Face Everything And Rise, accepting all your defeats, to be a legend.

Sharpen Your Axe

A Sravani

IVth Year ECE Dept

John, a woodcutter, worked for a company for five years but never got a raise. The company hired Bill and within a year he got a raise. Then John resented Bill's getting a raise after only one year and went to his boss to talk about it. The boss said, "You still cut the same number of trees you were cutting five years ago. We are a result-oriented company and would be happy to give you a raise if your productivity goes up". John went back and started hitting harder and putting in longer hours but he still wasn't able to cut more trees! He went back to his boss and told him his dilemma. The boss told John to go talk to Bill."Maybe there is something Bill knows that you and I don't." John asked Bill how he managed to cut more trees. Bill answered, "After every tree I cut, I take a break for two minutes and sharpen my axe. When was the last time you sharpened your axe?"

When was the last time you sharpened your axe? Past glory and education don't count much. We have to continuously sharpen the brain.

The Science of Happiness

B. Poojitha

IVth Year ECE Dept

As far as possible without surrender, be on good terms with all persons. Speak the truth quietly and clearly and listen to others, even the dull and ignorant; they too have their story. Avoid loud and aggressive persons, they are vexations to the spirit. If you compare yourself to others you may become vain and bitter, for always there will be greater and lesser persons than yourself. Enjoy your achievements as well as your plans. Keep interested in your career however humble; it is a real possession in the changing fortune of time. Exercise caution in your business affairs, for the world is full of trickery. But let this not blind you from what virtue there is. Many persons strive for high ideals and everywhere life is full of heroism. Be yourself, especially do not feign affection. Neither be cynical about love; for in the face of all arid-ity and disenchantment, it is as perennial as the grass. Take kindly the counsel of the years, gracefully surrendering the things of youth. Nurture the strength of spirit of shield in sudden misfortune. But do not distress yourself with imagination. Many fears are born of fatigue and loneliness.

Beyond a wholesome discipline, be gentle with yourself. You're a child of the Universe, no less than the trees and the stars; you have right to be here. And whether or not it is clear to you, no doubt the Universe is unfolding as it should be. Therefore be at peace with God, whatever you conceive him to be and whatever labours and aspirations, in the noisy confusion of life, keep peace with your soul. With all it shams, drudgery and broken dreams, it is still A BEAUTIFUL WORLD.

BE CHEERFUL. STRIVE TO BE HAPPY.

Things to Do for Self Improvement

Govardhanam Pattabhi Ramamacharyulu

Asst. Professor, ECE Dept

- To improve yourself you have to be courageous!
- Self- improvement is when you change yourself to the better. Nobody is perfect. Every individual has to change from time to time accordingly in order to improve themselves from their origin.
- We can improve our skills such as, leadership skills, goals, organizational skills, communication skills and all our values within ourselves to make us a better person. It is bogus that everybody is successful. But in order to be successful we need to improve ourselves or else we will be stuck inside the same zone.
- Self – improvement deals with inner change, throw-ing away our negative habits and absorbing all the positive ones.
- Self- improvement is a generic label and can be applied in various phases of life. This is also otherwise referred to as personal development.

Express Your Gratitude After Waking Up From Sleep

- After waking up in the morning, sit up in your bed and be thankful for all the things that you are obliged for. List about 5 things that you wish to be grateful for.
- It may be for getting such wonderful parents, sweet siblings, blessed life and so on, it depends in accor-dance to the priorities and desires of each individual.
- This may eventually kick things up and offers a mo-mentum for the beginning of a good and successful day. Especially when compared to the other days where you wake up lazy, groggy and pushing yourself to start your day of work.

Meditate

- Meditation is not just an act of sitting in a still position, crossing your legs and closing your eyes. It is the art of giving peace to the mind, letting out all the negative thoughts and taking in all the positive thoughts and vibrations; most of which prove to be profound with some obvious surprises within you.
- It must be included in our everyday routine which is better than any work that you do to keep your mind and soul free.
- It will simply push out all the stress and depressions away and helps you prevent them by meditating every day or perhaps every time you feel like doing it.
- Every time you feel like you are broken down or when you go nuts about something or when you feel like you need a break from all the pressure, then, the best way to relieve yourself from the stress is by getting yourself a private space and start quieting your mind.
- Meditation is highly recommended for people between the ages of 18-60 and is proven to be the best treatment for everybody playing a role in this chaotic stressful society.

Break Your Routine

- Routines can make your life systematic. That is never a good idea to draft your life. On the other hand it is never possible to drastically change your routine, it can gradually begin with small changes and shifts in your regular routine.
- Keep trying something new every day, no matter how insane you think it is. Try going to a new restaurant instead of your usual one. Listen to a different playlist on your phone.
- Try a different cuisine for lunch or dinner. Something that makes some changes in your routine ought to make you feel different and happy.
- Changes in your routine will automatically help you upraise your level of life.

Exercise And Healthy Diet

- Exercise has abundant benefits, especially when it comes to self- improvement, this can be the best way to keep your life hale and healthy.
- It improvises your strength and helps to improve your body‘s immune system. Most importantly exercise keeps you in good shape, physically and mentally.
- Exercises have 101 benefits which are associated with an esteem of immense benefits and values. If self- im-provement is your ultimate target, then exercise with no doubts will b e a part of your habit.
- It is very important to be conscious on what you con-sume. A proper diet is a very important issue to be considered in our day- to- day life.
- It is also important that you maintain a balanced diet with sufficient nutrients and proteins to help manage your immune system and supply you with the neces-sary energy.
- A self- sufficient diet and an hour of exercise would be the perfect thing for self- improvement as it keeps you in good shape and health.

Spend Some Time Reading

- Though this habit is overshadowed by all the other habits, it is indeed a useful and intellective part of time you will be investing on it.
- Reading is a special habit which improves our knowl-edge and language and helps develop a good grade of communication and also helps build confidence within an individual.
- Most of us are lazy to just get a book and sit in the same place like a couch potato. This would definitely create boredom and may even lead you to lose the in-terest on reading. Instead, you can prefer reading any blogs or magazines. Real time articles are more inter-esting to read and it ought to keep you occupied for hours together once you start reading them.

The Bottom Line

- Self- improvement can be absolutely fun and reward-ing. Simply look at all the people around you. Try to observe the way they behave. If you find out some negative qualities in some one, examine it with yours. If you find out that you have that quality then it will be appropriate for you to change it.
- It is something that teaches us to turn the negatives into positive affirmatives. It enables a person to attain full potential. Through this we intend to understand ourselves better and make positive changes inside our world. Keep motivating yourself to make all the changes without any hesitations. This will help you face all circumstances of life.
- Self- improvement gathers abundant confidence with-in an individual which helps invade the best position in the society. By improving yourself in accordance with every situation you face in life, you could lead a peaceful, happy and indeed a long life.

The Value of Time Management Is a Symbol Of Genius

Yadraj Shinde

II[nd] Year ECE

To realize the value of ONE YEAR, ask a student who failed a grade.
To realize the value of ONE MONTH, ask a mother who gave birth to a premature baby.
To realize the value of ONE WEEK, ask the editor of a weekly newspaper,
To realize the value of ONE HOUR, ask the lovers who are waiting to meet.
To realize the value of ONE MINUTE, ask a person who missed the train.
To realize the value of ONE SECOND, ask a person who just avoided an accident.
$A minute now is better than a minute later! Treasure every moment!
Yesterday is history. Tomorrow is mystery!
Today is a gift. That‘s why it‘s called the present.
KNOWING IS NOT ENOUGH; WE MUST APPLY
WILLING IS NOT ENOUGH ; WE MUST DO.
Watch your thoughts, for they become words,
Watch your words, for they become actions,
Watch your actions, for they become habits,
Watch your habits, for they become character,
Watch your character, for it becomes your destiny.
Don‘t wait. The time will never be just right.
TAKE TIME TO DELIBERATE;
BUT WHEN THE TIME FOR ACTIONS ARRIVES,
STOP THINKING AND GO IN!
WINNING IS NOT EVERYTHING,
BUT THE WILL TO WIN IS EVERYTHING.
$If winning isn‘t everything, why do they keep score?
Strength does not come from winning.
Your struggles develop your strengths,
When you go through hardships and decide
Not to surrender, that is strength.
Life is a constant struggle, a fight within itself,
With new challenges every day,
If we have a strong will power and courage
To face everything, we can win easily.
WIN AS IF YOU WERE USED TO IT,
LOSE AS IF YOU ENJOYED IT FOR A CHANGE.

A Sibling

N. Sai Krishna
IVth Year ECE Dept

“Thicker than water” is the term used to describe the relationship of a sibling.

A sibling relationship is potentially one of life’s most sig-nificant connections. The relationship between two sib-lings, which begins with the birth of the younger and can continue until a sibling dies, is often the longest lasting relationship that a person can experience. I am always baffled when I hear my friends call their sib-lings as brats, pests and suck-ups. In my opinion, having a sibling for your own is the best way your life can ever be designed. As far as my life is concerned, it has been designed for me to be a solo artist, so in many cases I con-flict to their comments. Strong bonds between siblings can develop remarkably early in life.
The emotional importance of the sibling relationship can motivate even very small children to understand their siblings extremely well. I confess, a sibling, especially a younger bro/sis can be an absolute menace in your life, but it is truly inequitable if as adults you cannot understand that they are after all “children”. Admit it! You have also been notorious in your childhood, haven’t you? It is impossible for people with such opinions about their siblings to understand the life of an only child. Bound by blood, but not always by love, a sibling can be a friend or rival, defender or detractor sometimes simultane-ously!

A sibling is the only relationship that accompanies, protects, secures, offends, defends, prosecutes for, and of-course loves you the way you are. Yes! For all the relation-ships you possess, parents, friends, relations, partners, a sibling is the only person who accepts and protects for who you really are! Siblings who grow up together accumulate a store of shared memories and experiences that can shape each sib-ling individually and establish a foundation for their life-long relationships with each other. My innermost concerns to people who are by whatever reason, a single child in the family. Not being offensive but I’m sure we missed and is still missing the warm company of a sibling. They can most of the times be annoying but when they find you in some kind of grieve they will be the first to help you get out of it. In many ways a sibling assures to secure you from all your misfortunes, your failures and your worries. Though we solo artists are fortunate enough to get toys, clothes, candy and other comforts all for ourselves, we are not fortunate enough to get the cunning pleasure of fight-ing and conquering it from our siblings. It is always an indelible feeling to not have a sibling in our lives. The best way to love is to share it with our loved ones. Only with love and nobody to share it with, is deliberately brutal. It is extremely indescribable to express the gut feel-ing of loneliness. If not for now, in your dotage you will feel blessed for having such a blissful relationship in your life that you can never regret for.

A sibling relationship can last for decades longer than the relationship between a parent and a child.

Elderly siblings who have not maintained affectionate relationships with their bro/sis often identify this absence as a source of tremendous regret and loss. So don’t lose them; love them, for you are blessed!

Who Are Gen-Y?

I Ravi Kumar
Associate Professor ECE Dept

Hi Everybody,

Whenever I was asked for an article for a department magazine, I used to give a technical write up. As I had the pleasure of working in BIET for the last three years, my thinking horizon has extended. So, I would like to share a few of my thoughts. This article is about the young generation of our mother nation, India. When I was in my third grade, I read a joke in a Telugu Magazine (Most probably Kumudam). The joke goes like this.

Father : Son,
Why are you
leisurely sitting? At
your age you've to
study hard.

Son : What for?

Father : To score good
marks.

Son : What for?

Father : You can get into good
college.

Son : What for?

Father : So that you can get a good
job.

Son : What for?

Father : So that you can
earn well.

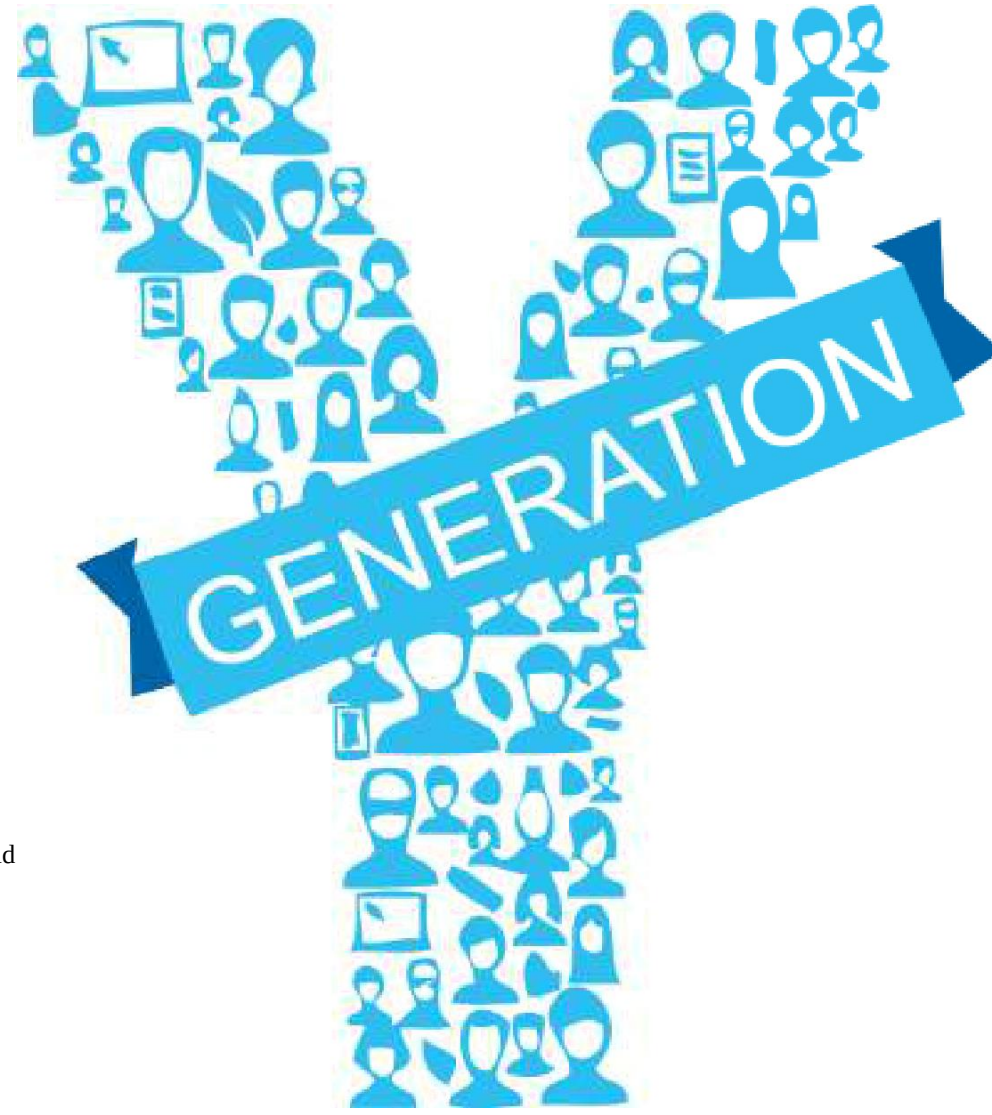
Son : What for?

Father : You can save the money.

Son : What for?

Father : So that you can leisurely enjoy your old
life.

Son : That is what I am doing now.



Old Sayings	Present Day Sayings
Haste makes waste.	The early bird gets the worm.
He who lives by the sword dies by the sword.	Attack is the best form of defense.
Clothes make the man.	You cannot judge a book by its cover.
Home is where the heart is.	Familiarity breeds contempt.
Money is the root of all evil.	Money makes the world go around.
Absence makes the heart grow fonder.	Out of sight, out of mind.
Good things come to those who wait.	He who hesitates is lost.
Stop and smell the roses.	Make hay while the sun shines.
Hard work pays.	Smart work pays.
Many hands make light work.	Too many cooks spoil the broth.
You get what you pay for.	The best things in life are free.
Nothing ventured, nothing gained.	Better safe than sorry.
The more, the merrier.	Two‘s company; three‘s a crowd.
Early to bed, early to rise, makes a man healthy,wealthy and wise.	Eat, drink, and be merry for tomorrow we die.

This was considered as a joke at the time. Has it not become the hard reality of today? When we blame today‘s youth as lazy, self-centered lacking not only discipline but also creativity, are we right? Should we not blame the society? We keep our kids locked up inside and make sure that they never get the chance to see the outside world on their own. Many of the parents get everything their children desire. The hard work and the time spent by the parents to earn the money for buying those things are not revealed to their kids. The behavior of this generation makes us wonder whether any moral values been taught to them? Ironically, I find that they are taught values in life, but they differ from what we have been taught. I have quoted few examples above.
I would like the parents and teachers to teach the kids the principles and morals which are of wider perspective which will lead to unselfish goals. Finally I would like to emphasize that the inculcation of proper social values and proper socialization in the minds of the younger generation in the right path is very essential for the peace and the growth of our society.

PUZZLE: TIME FOR LEFT BRAIN

Generating 1‘s Triangle

$1x1^0 + 0x9 + 1x0 = 1$
$1x2^0 + 1x9 + 1x1 = 11$
$1x3^0 + 12x9 + 1x2 = 111$
$1x4^0 + 123x9 + 1x3 = 1111$
$1x5^0 + 1234x9 + 1x4 = 11111$
$1x6^0 + 12345x9 + 1x5 = 111111$
$1x7^0 + 123456x9 + 1x6 = 1111111$
$1x8^0 + 1234567x9 + 1x7 = 11111111$
$1x9^0 + 12345678x9 + 1x8 = 111111111$
$1x10^0 + 123456789x9 + 1x9 = 1111111111$

FANCY NUMBERS

12345679*9=111111111
12345679*18=222222222
12345679*27=333333333
12345679*36=444444444
12345679*45=555555555
12345679*54=666666666
12345679*63=777777777
12345679*72=888888888
12345679*81=999999999

Into the Shoes of a Computer Engineer

Amit Kumar Gupta

IVth Year ECE Dept

Life of a computer engineer is filled with equal amounts of bliss and grief. As I stepped into college, like any first year of other departments, I spent my days finding friends. My concentration was focused on how to act as someone who is out of school. The more I tried inculcating this attitude, the more I failed. Subjects like PHYSICS, CHEMISTRY, ENGLISH, and MATHEMATICS did give me a hope that I can survive 4 years of under-graduation. But ENGINEERING GRAPHICS and ELECTRONIC DEVICES AND CIRCUITS were nightmares of their own making. Once the brains used to concentrate on projec-tions of various solids, as time passed on it was filled with Kirchhoff's Laws. After about three weeks, I settled down as a college student: handling problem as a professional, finding out rules of the college one by one upon break-ing those LABSESSION were slow poisons, RECORD corrections grades happened for the one last time But ENGINEERING GRAPHICS and ELECTRONIC DEVICES AND CIRCUITS were nightmares of their own making. Once the brains used to concentrate on projec-tions of various solids, as time passed on it was filled with Kirchhoff's Laws. After about three weeks, I settled down as a college student: handling problem as a professional, finding out rules of the college one by one upon break-ing those LABSESSION were slow poisons, RECORD corrections were equal to TRIUMPH. Discussing results amongst friends and brooding upon grades happened for the one last time. SECOND YEAR started with the ecstasy of entering the department. Little did I realize that this joy was short lived. My WAYNE THOMASI was the main VILLAIN of my picture. DATA STRUCTURES joined OOPS to give sol-ace. ENVIRONMENT ENGINEERING was the "SUPER MAN" who saved me from the clutches of ELECTRON ICS PAPER (DEMONS). God didn't stop His plays even after this!! He produced subjects like MICROPROCES-SOR AND MICROCONTROLLERS to share our minds. This subject gave me and my class mates the least hope that we will complete our 4th semester without ARREARS.

To add ghee to the fire, Mr.PQT plotted his own plans against us. OPERATIONS SYSTEMS one side was filled with tonic ire., problems and direct questions. DBMS on the other hand gave us a feel of walking on a sword. COM-PUTER ARCHITECTURE wounded us with its WHIP' IDAA is the secret of success!

I came to a conclusion that I don't even stand a chance of survival which is the CONTRADICTION of my previous assumption. This sentence is typical DISCRETE MATHS style. Now in year 3, my day starts with NFA's & DFA's who are not at all responsive even if it's a small problem. It continues with COMPUTER NETWORKS just twisting around me and SYSTEM SOFTWARE algorithms swiding in my head. Requirement analysis, mapping, coding, test-ing, feedback: 5 KEYWORDS OF MY LIFE which decide whether I can depend upon SOFTWARE ENGINEEIRNG for FUTURE. Thanks to BUSINESS ENGLISH COMMU-NICATION classes, the only time myself and my friends RELAXXXXXX.

To add to our worries from this year INTERNALS are into ANNA UNIVERSITY'S HANDS!! Why, why only for us??? My experience will continue for some more months. So I salute my SENIORS who have already crossed these hurdles. HENRY VAN DYKE correctly said

"TIME IS TOO SLOW FOR THOSE WHO WAIT, TIME IS TOO SWIFT FOR THOSE WHO FEAR, TIME IS TOO LONG FOR THOSE WHO GRIEVE, And TIME IS TOO SHORT FOR THOSE WHO RE-JOICE."

Now, can somebody HELP ME find which category I fall into.....

With Nature And History

Joy Sangeeth Raj

Asst. Professor, ECE Dept

Hello dear readers, I'm a fellow student who wishes to recollect a part of my life that I shall forever remember and cherish. A magical trekking expedition to the Har-Ki-Dun valley alongside 20 wonder-ful people which filled my heart with infinite love for the Himalayas and the India spirit.

My tale begins in the heart of the Uttarakhand state. 250 kms north of the bustling town of Dehradun is the small yet content town of Sankri which serves as the base camp for two treks that go through it . Having already seen the beautiful scenic road to sankri my excitement was little contained when I got what was possibly a tiny glimpse of icy peaks shying away behind the evening fog . That night shiver-ing with cold we had the first official introduction with our fellow trekkers and our super awesome trek lead who I would go on to think of as a role model . After stuffing our bellies with the oh so satisfying dinner I had what was probably the most sound sleep a city dweller like me could hope to get. The next day to our surprise we witnessed the virgin snowfall of the season that makes the snow craving child within us jump with joy. We witnessed one of the most amazing transformations that slowly turns the multicoloured valleys and peaks into a panoramic view of monochrome . This snowfall followed us till the third day of our trek making the view picture perfect and the trek a challenge. Even as we toil through the snow there is little feeling of fatigue as the group seems to be like a wolf pack, together at all times.

Day by day we cruised through breathtaking valleys, heart warming villages and snow covered peaks which looked even more beautiful as every minute passed. The first four days we toiled at a steady pace passing through Taluka, Gangar, and Kallkattidar to reach our destination the Har-Ki-Dun valley. The har-ki-dun valley holds a special place among the locals and the religious as it facilitates the whole and undisturbed view of the 5 swargarohini peaks which are known to be the start point for the Pan-davas journey to heaven . The valley had a certain mystical draw which could be attributed to the rich history, the amazing company of new friends and the obvious yet unbelievable beauty. Even now in the comfort of my home I get teleported to the valley every time I revisit the memory or see a photograph.

The next day we did something none of us could have imagined in our wildest dreams , we covered the distance between two camps in a single go and reached the mighty village of Osla.

I say mighty not because of the size of the village but because of the culturally rich, proud, majestic and extremely hospitable inhabitants of the osla village. I was further amazed and humbled when I was told that they are the direct descendants of the Pandavas themselves. As we spent some time with the locals we realised that they faced lots of problems due to the geographical isolation and we swore we would do all that we could for them .That night we shared a great hearty meal with the villagers and then burst out singing and dancing . We got a rare opportunity to listen to a village elder sing the songs of his ancestors which cemented the foundation of the connection that I now felt for the mountains. The next day we woke up early looking at the stars that still hung and with a heavy heart and teary eyes we left for our last trek to the base camp. A sense of accomplishment filled us to the brim and yet we all felt like something was being taken away from us. This, one of a kind journey to the har ki dun valley, instilled in me a new sense of responsibility, won-drous awe, a heart full of joy and a new set of oxygen cylinders. With a new perspective on life, 20 or more friends, inner peace and a stunningly fit upper body I returned to my home. I wish to end by say-ing that we miss out a lot in life when we forgo pleasures like these in pursuit of materialistic dreams. As I look back I remember feeling my lungs inflate with the onrush of scenery—air, mountains, trees, people and I think, “This is what it is to be happy”.

One Universe

Feather Touch

Majestic Look