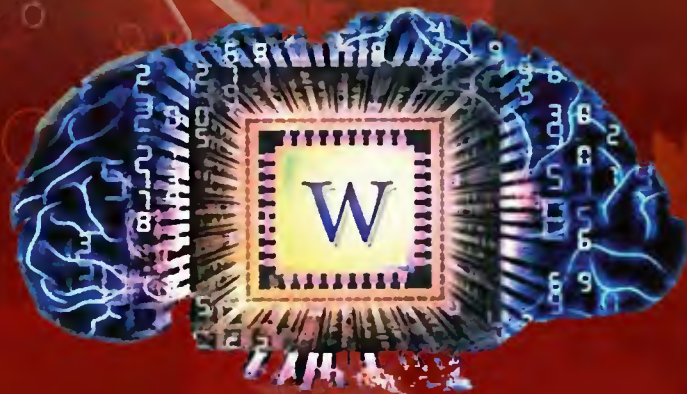


Department of ECE Saranathan College of Engineering

Proudly presents



WIZARD

UNRAVELING THE MYSTERIES OF ELECTRONICS

E- Magazine

From the HOD's Desk

I am very happy that our ECE department is releasing an “e-magazine” as a fore runner of the department activities for this semester. Hereafter, it is to be released every semester. A noteworthy point is that it is decided to be released on the eve of “Engineer’s day” celebrations. It not only marks the achievements of the department, but also acts as a technical platform to bring out the hidden talents of the students and the faculty.

To get better placements in core industries, it is not sufficient to learn fundamentals only. The students have to know recent developments in all the fields of Electronics and Communication Engineering. Now-a- days internet is paving the ways for acquiring knowledge in the latest developments in almost all the fields of engineering, technology, arts and sciences. E-magazines in general will help the faculty and students to know the latest developments in the fields of Electronics and Communication Engineering. It will surely help the students to improve their application skills, communication skills and organizational skills.

I owe my hearty appreciations to the faculty-in-charge and student volunteers for their sincere efforts to release the E-magazine on the “Engineer’s day” celebrations. I wish them “Success” in all their future endeavours.

Dr.A.Revathy
HOD/ECE

From the Editor's Desk

It gives us immense pleasure to launch the first issue of this e-magazine, which creates a new platform for exchange of information on all aspects of Electronics and Communication Technology. Forthcoming issues of this magazine will be published in each semester. At the outset, we express our gratitude to our HOD, Dr.A.Revathy for giving us this opportunity and Ms.S.A. Arunmozhi for guiding us in this venture. The staff and students came up with many interesting articles on recent trends like Intelligent radios, HVL, Biomimetics, PLC and SCADA, Nanomedicine, Rubberband Electronics etc.

Feedback can be mailed to us at electroeditor@googlegroups.com

The Editorial Team:

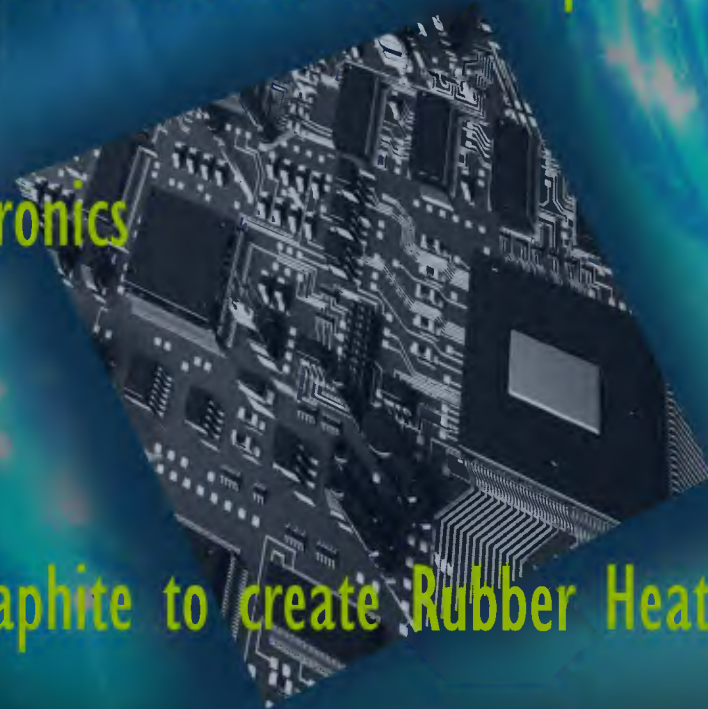
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Dr.Y.Venkataramani

- Implementing End-To-End Reliability and Energy Conservation Routing to Provide Quality of Service in Mobile Ad hoc Networks - European Journal of Scientific Research.
- Performance Comparison using AODV and AOMDV Protocols in Heterogeneous Hybrid Cluster Routing using Partial Authority Nodes in Mobile Ad hoc Networks - European Journal of Scientific Research.
- Implementation of Zone Routing Protocol for Heterogeneous Hybrid Cluster Routing to Support QoS in Mobile Ad hoc Networks - International Journal of Computer Applications.
- Counter hacking mechanism in clustered routing to provide quality of service in Mobile Ad hoc Networks - Journal of Theoretical and Applied Information Technology.

Dr.A.Revathy

- Speaker Independent Continuous Speech and Isolated Digit Recognition using VQ and HMM - 2011 IEEE International Conference on Communication and Signal Processing (ICCSP), NIT, Kerala.
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- Transcribing Deaf and hard of hearing Speech Using Hidden Markov Model - 2011 International Conference on Signal Processing, Communication, Computing and Networking Technologies, ICSCCN 2011, held at Noorul Islam Centre for Higher Education, Thuckalay.
- Comparison of MFCC and PLP in speaker identification - International Conference on Computing and Control Engineering, Dr.M.G.R Educational & Research Institute, Chennai.
- Comparison of features in building robust HMM model for hearing impaired speech recognition in Tamil - National Journal.

Ms.M.Shanthi

- Design and Implementation of Asynchronous WP DA FIR Filter using Online Clock Skew Scheme - International Journal of Design, Analysis and Tools for Integrated Circuits and Systems (IJDATICS).
- Performance analysis of pseudo 4-phase dual-rail asynchronous protocol - International Journal of Electronics, Taylor & Francis.
- Design and Implementation of Online Clock Skew Scheme based Asynchronous Wave-Pipelined Distributed Arithmetic Filters on FPGA - IETE Journal of Research.

Ms.M.Padmaa

- Stego on $2n : 1$ Platform for users and embedding - Information Technology Journal.
 - 2D sine wave representation for fingerprints - International Conference on Computing and Control Engineering.
 - Shadow removal in a still image - International Conference on Computing and Control Engineering
- Dr.M.G.R Educational & Research Institute, Chennai

Ms.S.A.Arunmozhi

- DDoS Attack and Defense Scheme in Wireless Ad hoc Networks - International Journal of Network Security & Its Applications (IJNSA).
- A new defense scheme against DDoS attack in Mobile Ad hoc Networks - First International Conference on Computer Science and Information Technology, COSIT 2011, held at Bangalore.
- Black Hole attack detection and performance improvement in Mobile Ad hoc Networks - Information Security Journal- A Global Perspective.
- Reduction of silent scheme against quality(RoQ) distributed denial of service attack in MANET - IJTACT journal on Communication Technology.
- Disruption of Low-rate DoS Attacks using Modified RED algorithm - International Conference on Computing and Control Engineering (ICCCE 2012), Dr.M.G.R Educational & Research Institute, Chennai.

Mr.V.Mohan

- Compression of iris images using DTCNN based Wavelet decomposition and Directional Filter Bank analysis - International Conference on Communications and Signal processing,(ICCSP), 2011 held at NIT, Kerala.
- Mammogram image compression based on multi wavelet transform and SPIHT algorithm - International Conference on Computing and Control Engineering, Dr.M.G.R Educational & Research Institute, Chennai.

Ms.P.Shanmugapriya

- Speaker verification using Adaptive Fuzzy Wavelet network - International Conference on Communications and Signal processing,(ICCSP), 2011 held at NIT, Kerala.

Ms.S.Parveen Banu

- An Efficient Hybrid Image Compression Scheme based on Correlation of Pixels for Storage and Transmission of Images - International Journal of Computer Applications.
- Performance improvements of Hybrid Image Coding using lifting Wavelet Transform and Contoured Decomposition - Third International Conference of ACEEE on advances in recent Technology and Communication held at Bangalore.

Mr.S.Hariprasath

- FPGA implementation of multilayer feed forward neural network architecture using VHDL - International Conference on Computing, Communication and Applications (ICCCA), 2012.
- Multimodal biometric recognition using iris feature extraction and palm print features - International Conference on Advances in Engineering, Science and Management (ICAESM), 2012.
- A Palm print texture feature recognition and matching based on hamming distance - International Conference on Recent Trends on Computer Science and Engineering , Chennai .

Ms.M.Baritha Begum

- LSB Based Audio Steganography Based On Text Compression - International Conference on Communication Technology & System Design- December 2011.
- An Efficient Text Compression for Massive Volume of Data - International Journal of Computer Applications.
- Level set method for segmentation of brain MRI images - International Conference on Recent Trends on Computer Science and Engineering , Chennai.
- Improved classification on handwritten characters pattern recognition using neural networks - International Conference on Recent Trends on Computer Science and Engineering , Chennai.
- Minutiae based fingerprint reconstruction - International Conference on Recent Trends on Computer Science and Engineering , Chennai .

Ms.S.Rajeswari

- Performance Comparison of Queuing Disciplines for AEERG Protocol in MANET - International Conference on Network Security & Applicatons (CNSA – 2011).
- Traffic Performance Analysis of MANET Routing Protocol - International Journal of Distributed and Parallel Systems.
- A New Routing Protocol For Mobile Ad hoc Networks - First International Conference on Computer Science and Information Technology (COSIT 2011) , January 2-4th at Bangalore, Karnataka.
- Congestion control and QoS Improvement for AEERG protocol in MANET - International Journal on Adhoc Networking Systems (IJANS).
- Enhanced energy minimizing MANET routing protocol - International Conference on Computing and Control Engineering (ICCE 2012), Dr.M.G.R Eduational & Research Institute, Chennai.

Ms.M.Rajeswari

- Face detection with canonical component based super resolution - International Conference on Recent Trends on Computer Science and Engineering , Chennai.

Achievements by the students during the year 2011-12

<i>Student Name</i>	<i>Innovation/Product design</i>	<i>Efforts & Achievements</i>
<i>S.Niveth Richard P.Pranav S.Praveen Kumar</i>	<i>Automobile collision Beacon</i>	<i>I prize in National open software Project Presentation, IIT, Kanpur</i>
<i>Niveth Richard.S</i>	<i>DTMF induced mobile pipeline Examiner</i>	<i>Best innovation award at Anna university of Technology, Trichy.</i>
<i>Arun kumar.M Vimal Raj.S Saravanan.P</i>	<i>Green House Controlling using PIC</i>	<i>I Prize in Chettinad college of Engineering and Technology, Karur</i>
<i>Vigneshwaran C. Rangarajan S.</i>	<i>Real time challenges and applications of wireless sensor networks in healthcare perspective</i>	<i>Participation in the COLLOQUIA ELECTRICAL IIT, Bubhaneswar.</i>
<i>Vimal Raj .S</i>	<i>Multi terrain & Pick and Place Robot</i>	<i>Participation in the National Students Space Challenge at IIT , Kharaghpur</i>

Achievements by the students during the year 2011-12

S.No.	Name	Institution	Events	Prizes won / Participation in Renowned Institutions
1.	S.Niveth Richard	St.Joseph's College, Trichy	US Embassy Elocution	I prize
2.	C.Vigneshwaran	MIT, Anna university, Chennai.	Mad Professor	II prize
3.	N.Kamali	NIT,Haryana	Project Presentation	I prize
4.	S.Kalai selvan M.Macrin smith G.Hariprasath M.Gururaj	Kongu college of Engineering, Erode	Robo fest	I prize
5.	M.Arunkumar S.Vimal Raj	Chettinad college of Engineering and Technology, Karur	One and Win	I prize
6.	N.Kamali M.Neeraj Narang	Chettinad college of Engineering and Technology, Karur	Map zone	I prize
7.	M.Arunkumar S.Vimal Raj P.Saravanan	Chettinad college of Engineering and Technology, Karur	Map zone	II prize
8.	N.Kamali	PSG College of Technology, Coimbatore	Paper presentation	III prize
9.	N.Kamali	BITS,PILANI	Paper Presentation	Participation
10.	S.Vimal Raj	IIT ,Kharagpur	Paper presentation	Participation in the National Students Space Challenge

Technical Programs conducted during the academic year 2011-12

<i>S.No</i>	<i>DATE</i>	<i>PROFESSIONAL ACTIVITIES</i>	<i>TOPIC /EVENT</i>
<i>1</i>	<i>19/03/2012</i>	<i>Technoquest</i>	<i>a) Paper Presentation</i> <i>b) Contraption</i> <i>c) Technical quiz</i> <i>d) Technical debate</i>
<i>2</i>	<i>25/09/2011 & 26/09/2011</i>	<i>PRUDENTIA -2011 Inter collegiate technical Symposium</i>	<i>a) Paper Presentation</i> <i>b) Robotic contest</i> <i>c) Technical quiz</i>
<i>3</i>	<i>15/09/2011</i>	<i>ELCOMM FEST 2KXI</i>	<i>a) Paper Presentation</i> <i>b) Mr. and Ms. Electronza</i> <i>c) Techwiz</i>
<i>4</i>	<i>06/08/2011</i>	<i>One day Workshop</i>	<i>PCB designing and Fabrication</i>
<i>5</i>	<i>05/08/2011</i>	<i>Inauguration of IETE & CHIP association</i>	<i>Technical Talk on "History of satellite communication "</i>
<i>6</i>	<i>05/04/2011</i>	<i>ISF Valedictory function</i>	<i>Technical Talk on "History of Evolution of electronic exchanges "</i>
<i>7</i>	<i>01/02/2011</i>	<i>IETE Students day</i>	<i>Special talk on "Rocketry in India"</i>
<i>8</i>	<i>29/01/2011</i>	<i>National Workshop</i>	<i>Networks and Network Simulators.</i>

Workshops conducted during the academic year 2011-12

Module Description	Any other contributory Inst./ Industry	Duration	Resource Persons
Workshop on "PCB designing"	Anand Electronics , Madurai	One day (6.10.2011)	Resource Persons from Anand Electronics, Madurai
National Workshop on "Advanced Signal Processing"	Sponsored by DRDO, New Delhi	2 days (6.1.2012 & 7.1.2012)	Experts from reputed institutions and industries.
National Seminar on "Recent Advances in VLSI Design"	Sponsored by CSIR, New Delhi	2 days (3.2.2012 & 4.2.2012)	Resource persons from reputed institutions and industries
Workshop on "Practical aspects of networking"	BSNL, Chennai	One day (17.03.2012)	Technical Staff from BSNL, Chennai
Third National Conference on Advanced Communication (NCACOM 2012)	Sponsored by DRDO, New Delhi	2 days (10.4.2012 & 11.4.2012)	Chair persons from NIT-Trichy and ECE Department
Workshop on "Introduction to Embedded Systems"	Front Line Electronics Ltd, Salem	2 days (18.06.2012 & 19.06.2012)	Resource Persons from department and Front line Electronics Ltd, Salem
Distinguished Visiting Professorship Scheme of INAE- AICTE	INAE- AICTE	One Year (July 2011 to June 2012)	Prof R.K Rajangam, Outstanding Scientist (Rtd), ISRO satellite centre, Bangalore

A REVIEW OF THE RECENT TRENDS IN COMMUNICATION

Intelligent Radios

Cognitive radio technology is a smarter, faster and more efficient way to have bidirectional communication between mobile and wireless communication devices. Cognitive radio is built on software defined technology. The parameters such as operating frequency, power output, antenna orientation/beam width, modulation and transmitter bandwidth are automatically adjusted to maintain the desired communication.

Recent advances in programmable integrated circuits have created an opportunity to develop a new class of intelligent or cognitive radios which can adapt to a wide variety of radio interference conditions. Cognitive radio networks are possible with developments taking place in cognitive radio software and hardware to establish a co-operative and collaborative communication.



Multiple Access Techniques

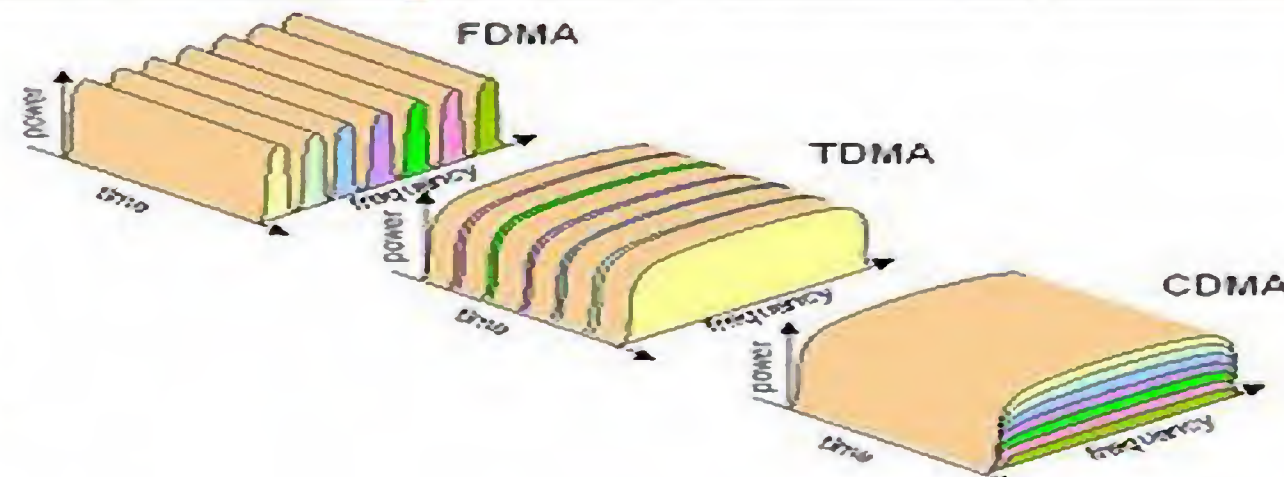
In wireless communication systems, radio resources must be provided in each cell to assure the interchange of data between the mobile terminals and base stations. Multiple access schemes are used to distinguish among different simultaneous transmissions.

FDMA - Different transmissions are differentiated for the frequency band.

TDMA - Different transmissions are distinguished on the basis of time frame.

CDMA - Different code is assigned to separate simultaneous transmissions.

In a cellular system, radio resources can be reused between sufficiently far cells, provided that the mutual interference level is at an acceptable level. Medium access protocol is used to regulate the access of different terminals to the resources of a cell.



Digital Voice Radio



Digital radio is the transmission and reception of sound that has been processed using technology comparable to that used in compact disc players. It processes the sounds into pattern of numbers, whereas, analog radio processes the sounds into patterns of electrical signals that resemble sound waves. It provides significantly clearer sounds than the conventional analog radio. It is more resistant to interference and removes many imperfections of analog transmission systems.

Transition to digital radio requires installation of new equipment. During the transition, broadcasters operate in a hybrid mode, broadcasting the same programmes using analog and digital signals within a single AM or FM channel. Many FM broadcasters now offer two or more digital channels, each with different programming. The new digital technology will not require allocation of additional spectrum and will have minimal impact on present broadcast services. Consumers will continue to receive their analog stations with minimal disruption



Digital radio offers a number of consumer advantages over traditional analog radio, including:

- Better audio quality, more robust signals and new auxiliary services, such as multiple audio programming channels, audio-on-demand services and interactive features;
- Enhanced radio designs with simplified functions. Simply select the station you want from the call letters or names displayed on the screen and the computer within the radio will do the rest;
- Potential to introduce new data and information services that will be displayed on the radio's screen. For example, a station could send background information about a band when that band's music is playing. Advertisers could send information about discounts and sales. Listeners could program their radios to receive customized weather reports, news or stock quotes.



identifier automatically and uses the corresponding encryption key to encrypt the message that will be transmitted. Radio (100) transmits the key identifier in an unencrypted format with the encrypted message in order to allow other radios to determine the encryption key used in encrypting the message. When receiving an encrypted message, radio (100) uses the predetermined process stored in the radio (100) to properly select the proper encryption key for use in decrypting the incoming message.

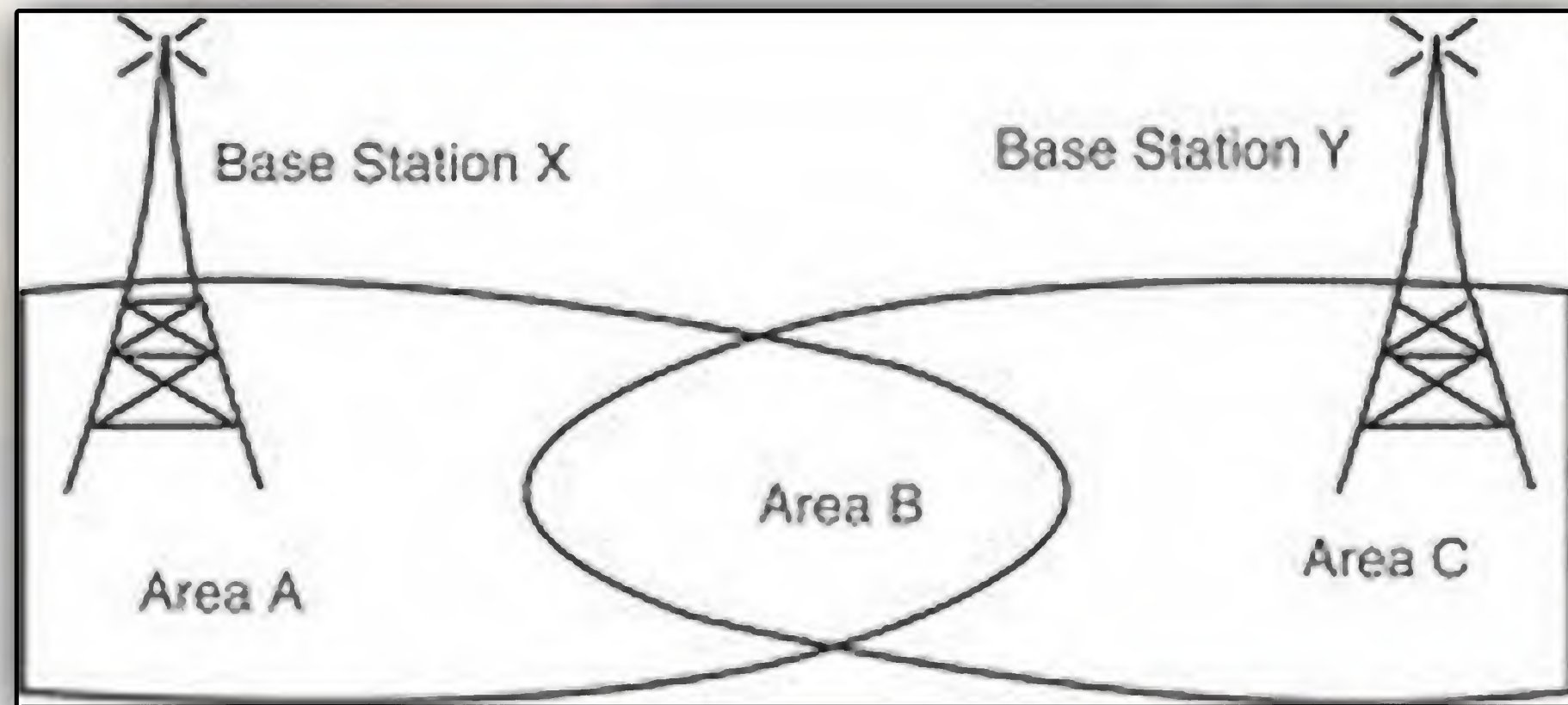
Encrypted radio

A radio (100) transmits and receives encrypted signals having unencrypted key identifiers, allowing other radios having the corresponding key identifiers and encryption keys to communicate with the radio (100). Prior to transmitting an encrypted message, radio (100) selects a unique key



Simulcast Transmission

"Talk-out" coverage can be greatly improved by simulcast transmission. Simulcast is the concatenation of two words "simultaneous" and "broadcast". It is the simultaneous transmission of audio on the same frequency from two or more sites. Wide area coverage is possible with multiple transmitters. Normally if two or more transmitters were to transmit the same signal, a receiver in the field would "lock" or "capture" the stronger of the signals. If the signals are within ± 10 dB of each other, the signals either constructively or destructively combine in the receiver. To ensure that they "constructively" add together requires complex "synchronizing" transmitter equipment such that the signals are transmitted at exactly the same time (within microseconds) of each other. A Transit and Public Safety system requires a robust land mobile radio communication system for its day-to-day operations as well as routine system maintenance. The system must meet the growing concerns for the homeland security and provide best service to its patrons. These challenges are achievable by careful design and implementation of a modern simulcast trunked radio system which provides seamless system-wide radio coverage.



**Dr.A.REVATHY ,
Professor and Head / ECE**

HVL - A programming paradigm in EDA industries

HVL is the language spoken in the testing engineer's World.

HVL is the new language paradigm used in EDA industries for testing designs which are targeted towards FPGAs and ASICs.

Introduction

HVL stands for Hardware Verification Language. This is the language used for verifying the logic of the chip. To describe in a simpler way, it is the language of testing engineers who often find the bugs in the operation of the synthesized design before it goes for die preparation.

Features of HVL:

- Features (Constructors, functions, ...) of a high-level programming language like C++ or Java.
- Easy bit-level manipulation (found in HDLs).
- Constrained random stimulus generation, functional coverage constructs to assist with complex hardware verification.
- Support for easy assertions writing.

Examples



OpenVera



E



SystemC



SystemVerilog

Open Vera

OpenVera is a Hardware Verification Language developed, and managed by Synopsys. OpenVera TM is an interoperable, open hardware verification language for test bench creation. It was the language upon which advanced verification features of SystemVerilog were built. OpenVera remains a widely adopted, evolving and well-supported hardware verification language till date.

OpenVera is a undemanding language developed by combining the features and strengths of HDLs, C++ and Java, with additional constructs targeted at functional verification making it as ideal language of Test benches. Designers create test benches and assertions using OpenVera and EDA vendors create tools that are automatically interoperable.

E

E is an AOP language developed in 1992 by Yoav Hollander and became a standard language in the year 1995 acquired by Synopsys. As an extension of OOP approach, E uses Aspect- Oriented Programming (AOP) approach.

A single E test bench will suffice to test C/C++ model, RTL model and a gate level model. Thus it is a Design Under Test (DUT) neutral language. It is one of the most mature and advanced HVL in the industry.

SystemC

SystemC is a system-level modeling language. It combines the features of C++ and HDL. It is a set of C++ classes and macros described in plain style of C++. With its support for event driven simulation, designers are able to simulate a concurrent process which is the computation used in Hardware design. SystemC is defined and promoted by OSCI, the Open SystemC Initiative, and has been approved by the IEEE Standards Association as IEEE 1666-2005.

The advantage of SystemC is Power/ energy estimation. By using SystemC a designer can measure the power/energy consumption of a design. Most of the EDA vendors support SystemC. The recent SystemC version is 2.0.

SystemVerilog

SystemVerilog is a language combination of HDL and HVL. It combines the rich features of VHDL, coding style of Verilog and verification functionality of OpenVera language.

SystemVerilog is maintained and developed by Accellera. In the year 2005 it was adopted as IEEE standard 1800-2005. The current version 1800-2009 which is merged with base Verilog remains the recent version.

SystemVerilog has greatly enhanced the classic features of Verilog. Functions in SystemVerilog can be declared as 'void' which return nothing, declaration of array variables, introduction of do while loop are to name a few.

Table shown below gives the summary of the languages:

S.No	Language	Extension	Current Standard	EDA Vendor	Programming Paradigm
1	OpenVera	.ov	Open standard	Synopsis	OOP
2	E	.e	IEEE 1647-2011	Cadence	AOP
3	SystemC	.sc	IEEE 1666-2011	OSC	OOP
4	SystemVerilog	.sv	IEEE 1800-2009	Accellera	Structured, OOP

Conclusion

HVL remains one of the emerging language paradigms of EDA industry. In the EDA industry the need for testing engineers with the knowledge of HVL will grow exponentially as years pass by. Hence for an engineer who aspires in excelling as a core engineer, the knowledge of HVL besides HDL remains indispensable.

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Work By

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Assistant Professor

Biomimetics

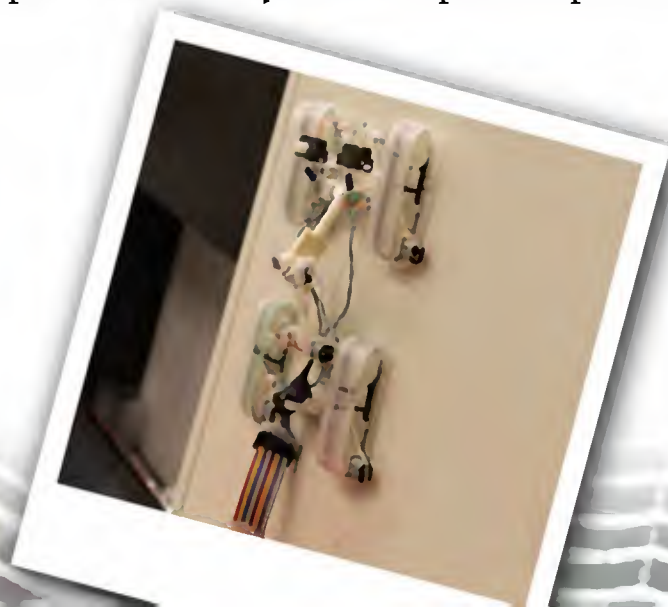
Art of imitating life and biological systems

Introduction



Biomimetics, the art of imitating life and biological systems, is one among the advanced technologies used in robotics. Greater improvement in performance is achieved by developing a new class of biologically inspired robots. Over the years, scientists have developed robots with the characteristics of terrestrial animals, aquatic organisms, aerial creatures, reptiles and also human beings. Mimicking gecko lizards, which are unique in their ability to scale walls, is of great use to reach areas that can't be reached by humans.

Many robots were developed with attachment techniques like suction adhesion and magnetic adhesion. Suction cup adhesion mechanism is limited to surfaces that are relatively smooth, nonporous and non-cracked. Magnetic attachment is useful only in specific environments where the surface is ferromagnetic. An advanced attachment technique that overcomes all these limitations is dry adhesion technique. This is mainly due to molecular forces like Van Der Waals forces. This adhesion is possible, due to the presence of large tiny fibers that are passive in nature. Using this adhesion technique, first a crawling robot with limbs was developed. But this crawling robot had a slow movement. To overcome this, TBCP II (Tailless timing Belt Climbing Platform) was developed by a group of researchers at Simon Fraser University Burnaby, Canada. TBCP II, a tank-like climbing robot, utilizes biomimetic adhesives with mushroom caps and does not require a tail to provide a preloading force.



Mechanical and Electronic design:

TBCP-II is a lightweight wall climbing robot that can transfer itself from horizontal to vertical or vertical to horizontal surfaces around both inside and outside corners. TBCP-II is composed of a front and rear module which in turn are composed of two wheel units. Each wheel unit is composed of wax parts printed on a rapid prototyping machine. The wheel units are composed of a rear drive wheel which is directly attached to a motor and a second guide wheel to guide the adhesive belts used during climbing.

The two modules are joined together by an active joint which is attached to the center of one of the aluminum bars on each module. The active joint connecting the front and rear modules was designed to utilize motors located on each module to assist with active preloading. A third motor located at the middle of the joint allows the center of the joint to be lifted or dropped to enable horizontal to vertical or vice versa transfer of the robot. The ability to lift the center of the joint enables the TBCP-II to perform 90 degrees outside corner transitions without the joint contacting the surface at the corner which could result in adhesive detachment. By lowering the middle of the joint and subsequently increasing the distance between the front and rear modules the steering angle of TBCP-II is improved and a smaller turning radius is achieved. Each joint motor is paired with a rotary potentiometer that is used to monitor the rotation and angle of each part of the joint.

TBCP-II utilizes a single drive motor on both the left and right sides of each module which are used to individually rotate and control each track wheel, resulting in a total of four drive motors. Each drive motor is paired with two rotary potentiometers which can be used to monitor the rotational speed and direction of each drive motor over a full 360 degree rotation. The feedback provided by the rotary potentiometers can be used by the microcontroller to improve cornering and ensure that TBCP-II travels along a straight trajectory. When approaching a wall to be climbed, it is important to ensure that TBCP-II is perpendicular to the wall for maximal adhesive attachment and ease of transfer. This is achieved by utilizing two wide range distance measuring infrared (IR) sensors which are mounted to the front module of the robot at a distance of 4 cm apart. To enable active preloading and determine when TBCP-II is beginning to lose contact with a climbing surface, three short range proximity sensors were incorporated into the design of both the front and rear modules. These sensors are directed towards the surface TBCP-II is travelling on and provide precise distance measurement feedback used for active preloading. In order for the climbing robot to successfully handle various obstacles and tasks, a digital

signal processor (DSP) was used to individually control the rate of speed and direction of rotation for each of the four drive motors and each of the three joint motors as well as read and respond appropriately to the input from all of the sensors. The DSP and a PC based custom Lab View graphical user interface (GUI) interact via a Zigbee wireless network composed of an onboard send/receive unit and a computer connected coordinator board including a Jennic JN5139 Zigbee module with built in microcontroller, LCD display, manual user interface and SMA antenna. The coordinator board is capable of scanning for multiple end devices and could be used to communicate with multiple robots in the future.

Climbing robots are being developed for many applications including the inspection and cleaning of ducting or pipes, aeroplanes, buildings, nuclear power plants as well as surveillance or security. Increasing the number of modules and reducing the length of each module gives more flexibility at the cost of increased complexity in the transitions. Such a flexible model can be even used to explore buildings in areas that are dangerous for humans, such as disaster or war zones.

*-S.K. Ganesh Raja
IV ECE*



CURIOSITY Rover

NASA's Mars Space Laboratory (MSL) successfully landed CURIOSITY, the car-sized, robotic rover to explore the Gale craters on Mars on August 6th 2012. So how exactly does the Curiosity Rover communicate with Earth?

Curiosity has three antennas that serve as both its "voice" and its "ears." They are located on the rover equipment deck (its "back"). Having multiple antennas provides back-up options just in case they are needed.

Curiosity will likely use its high-gain antenna to receive commands for the mission team back on Earth. The high-gain antenna can send a "beam" of information in a specific direction, and it is steerable, so the antenna can move to point itself directly to any antenna on Earth. The benefit of having a steerable antenna is that the entire rover doesn't necessarily have to change positions to talk to Earth. Like turning your neck to talk to someone beside you rather than turning your entire body, the rover can save energy by moving only the antenna.

Curiosity will likely use its low-gain antenna primarily for receiving signals. This antenna can send and receive information in every direction; that is, it is "omni-directional."

Curiosity performed a novel, complex landing routine

In the final seconds, the rocket stage hovered as cables delicately lowered the rover to the ground. After landing, it cut the cords and the rocket stage flew out of the way, crashing 610m from the landing site.

Speeding at 161km/hr, the high-speed impact kicked up a plume of dust - which showed up in Curiosity's field of view.

The Curiosity rover is a car-sized robotic rover exploring Gale Crater on Mars as part of NASA's Mars Science Laboratory mission (MSL).

OMG

Info Bytes

Curiosity can either communicate directly with Earth's Deep Space Network (DSN) antenna via an X band (8GHz) link, or it can use a UHF (300MHz-3GHz) transmitter to relay signals through the satellites "Mars Odyssey", "Mars Reconnaissance Orbiter" and the European satellite "Mars express". They orbit a few hundred miles above Curiosity. The latter is a better way because it's a lot cheaper for Curiosity to use UHF, and because the Mars Reconnaissance Orbiter has a very-high-speed 6Mbps X band antenna.

The NASA Deep Space Network (DSN) is an international network of antennas that provide the communication links between the scientists and engineers on Earth to the missions in space and on Mars. The DSN consists of three deep-space communication facilities placed approximately 120 degrees apart around the world: at Goldstone, in California's Mojave Desert; near Madrid, Spain; and near Canberra, Australia. This strategic placement permits constant observation of spacecraft as the Earth rotates on its own axis. An average of 14 minutes, 6 seconds will be required for signals to travel between Earth and Mars. Curiosity can communicate with Earth directly at speeds up to 32 kbit/s, but the bulk of the data transfer should be relayed through the Mars Reconnaissance Orbiter and Odyssey orbiter. Data transfer speeds between Curiosity and each orbiter may reach 2 Mbit/s and 256 kbit/s, respectively, but each orbiter is only able to communicate with Curiosity for about eight minutes per day.

As you can imagine, transmitting data over 250 million miles requires a lot of power. Curiosity generates 125 watts of electricity from a 2000-watt plutonium-based radioisotope thermoelectric generator. Waste heat is used to keep the MSL's systems at optimum temperature.

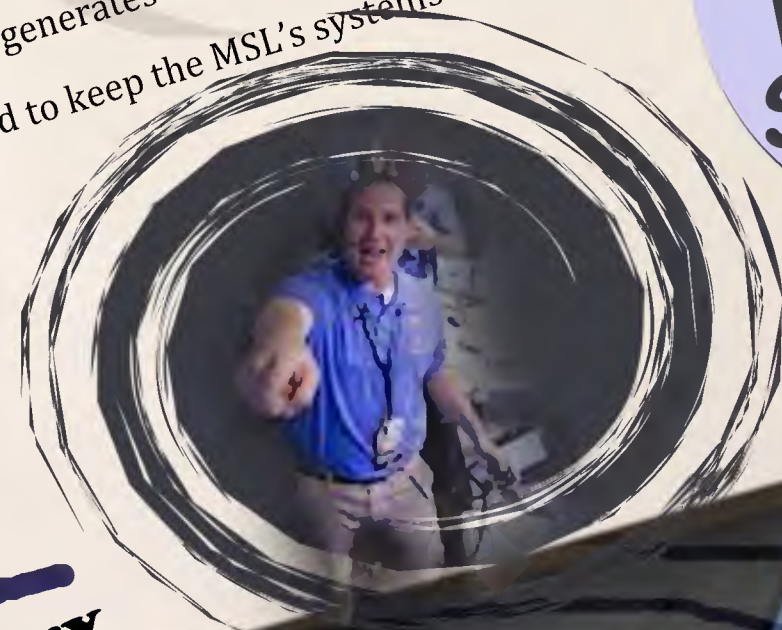
A Stepping
Stone

4

Future
Survival

Ezhilvani S
III ECE

Victory



A bizarre connection - Electronics and the Supernatural...

We are living in the age ruled by electronics and obviously we are very familiar with it. And what is supernatural.....? Literally this word denotes something beyond scientific understanding or the laws of nature. In popular culture, the word 'supernatural' usually denotes ghosts and demons (at times holy things as well). But what electronics has got to do with ghosts and demons. Yes, it has something to do with the paranormal things (don't think the ghosts have become a geek.....:D). Commonly electronics are used in detecting the presence of ghosts and few devices play their role in communicating with spirits (don't confuse with the ouija board). There are two notable ways in which the supernatural is connected to electronics. First, there is a connection believed to exist between electromagnetism and ghosts. Ghost hunters believe that ghosts create electromagnetic radiation or consist of electromagnetic energy. Second, a straight forward connection between electronic devices and the supernatural is often strongly accepted. The most common form of this claim is the so-called EVP (electronic voice phenomena). These occur when individuals claim that spirits of the departed, communicate through the static in electronic devices (but somehow the ghosts act as a techie) .Some modern day movies are based on our topic. 'One Missed Call' is a movie about a catty ghost that travels from cell phone to cell phone, killing each owner



and then moving on to another number listed on that phone (don't get chilled when your cell phone rings the next time.....).The connection between ghost and electronics is not new. There is an old story about Thomas Alva Edison trying to make an electric device to contact the dead, yeah!!!! (really he is a wizard by all means). These things denote that electronics is mingled with all areas that exist (also with those that are believed to exist)....



HARIHARAN V.R
IV ECE

PLC & SCADA



Why PLCs in Automation?

They can replace the hardwired networks of relays, timers and counters.
They have a unique feature of a distributed, modular, fault-tolerant and robust design.
This delivers precisely controlled action, which keeps required industrial processes under control..
Programming and expansion capability of PLC provide a lot of flexibility in control system design.

PLC IN ROBOTICS FIELD

In food industry the products should not be touched by humans. The palletizing is done with the help of PLC operation combined with the robot arm to move the object. Here it consists of a robot called pick and place robot that moves the object from one conveyor to the other. When the Start button is ON the conveyor starts, the robot arm is powered and the speed of the robot and the speed of conveyor match each other. The robot arm works with PLC Operation and places the object in the packing conveyor. The speed is about 3600 picks per hour.



SCADA:

SCADA (Supervisory Control And Data Acquisition) generally refers to an industrial control system: a computer system monitoring and controlling a process. The process can be industrial, infrastructural or facility based as described below. Most controlled actions of a SCADA system are performed by the PLCs.

A SCADA System usually consists of the following subsystems:

- Human-Machine Interface (HMI).
- Supervisory system.
- Remote Terminal Units (RTU).
- Communication infrastructure.



INTRODUCTION:

First of all in early days, process control and automation were done through manual operations. As time progressed, control with logic gates and timers were used. There had been some drawback in these controls and this led to the introduction of Programmable Logic Control (PLC). It performs relay switching and also other operations like counting, comparing, calculations, processing of analog signals. The PLC control is flexible. Fault finding is easy and it consumes less time. Programmable computer is a special computer designed to perform a special function. Today all manufacturing industries use PLC technology to carry their operations.

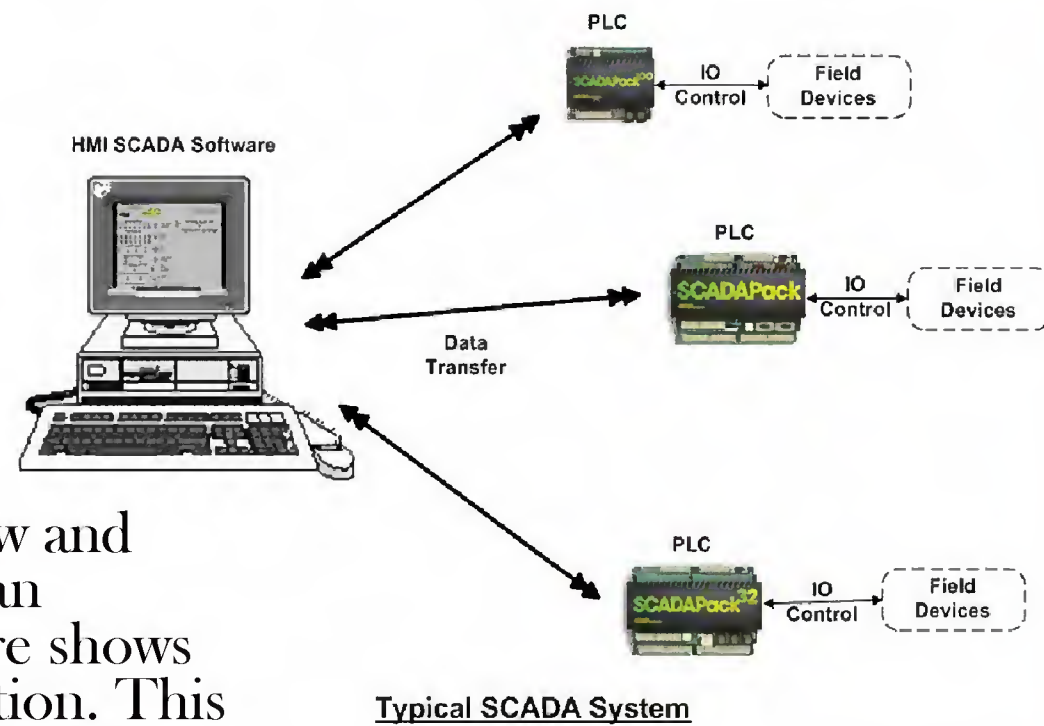
A PLC is a digitally operating electronics apparatus which uses a programmable memory for the internal storage of instructions for implementing specific functions such as logic, sequencing, timing, counting and arithmetic to control various types of machines or processes through digital or analog I/O modules.

FLOW AND LEVEL CONTROL:

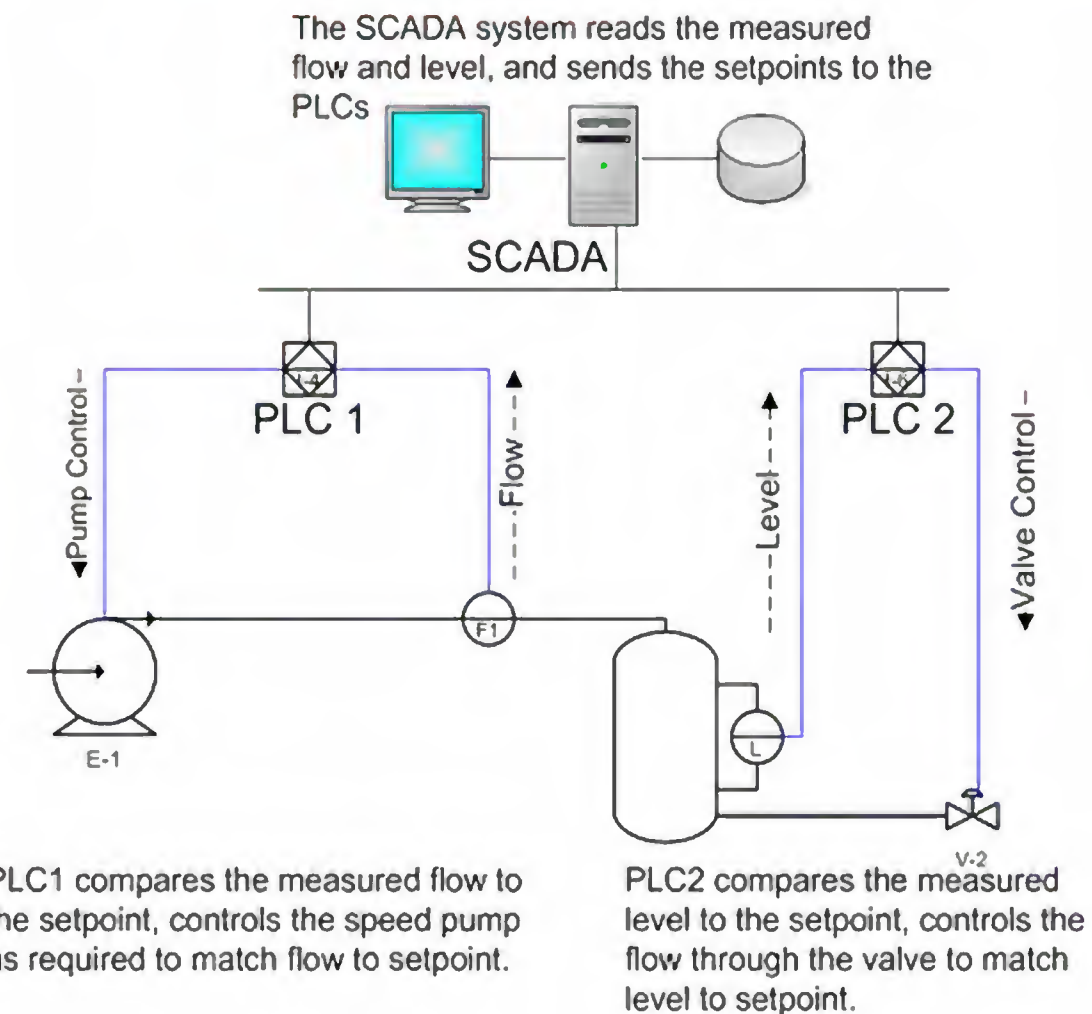
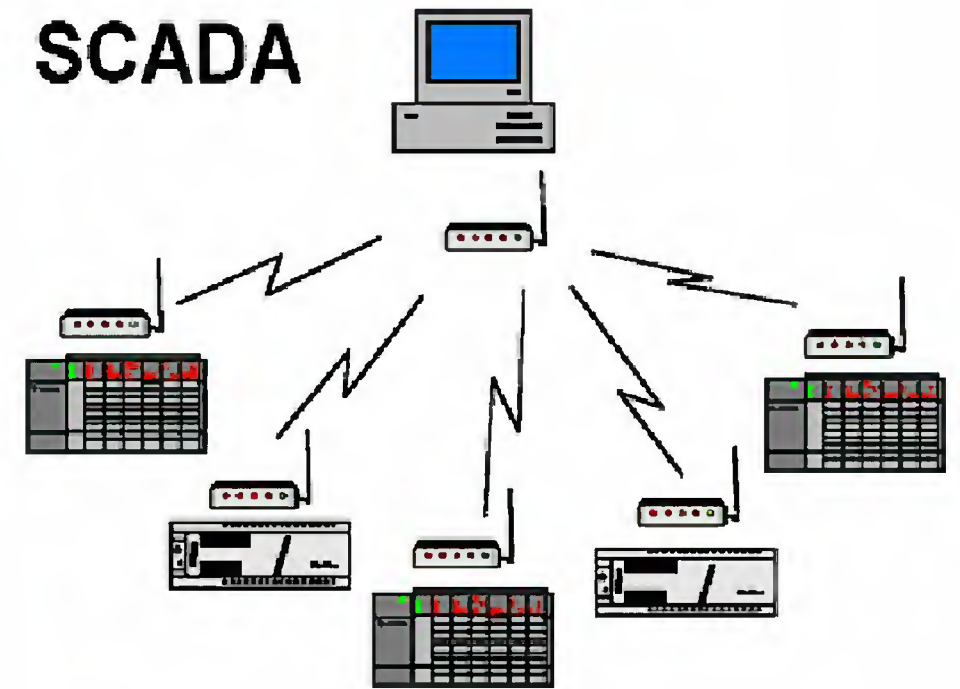
One of other application is the flow and level control of a liquid in a tank in an automated industry. The above figure shows the components used in this application. This system uses the liquid tank in which the flow and level is to be maintained, PLCs for various controlling process, valve for the output to be drawn from the tank, and the SCADA system to monitor and control the various operations going on.

In this the PLC 1 is used to control the speed of the motor and PLC 2 is used to control the level of the liquid in the tank. The human (supervisor) can have an overview of the operation taking place even in a remote area with the help of Supervisory Control And Data Acquisition system.

HMI, a component used in the SCADA system is very useful to view the various types of operations taking place in various parts and control them remotely in an industry.



SCADA

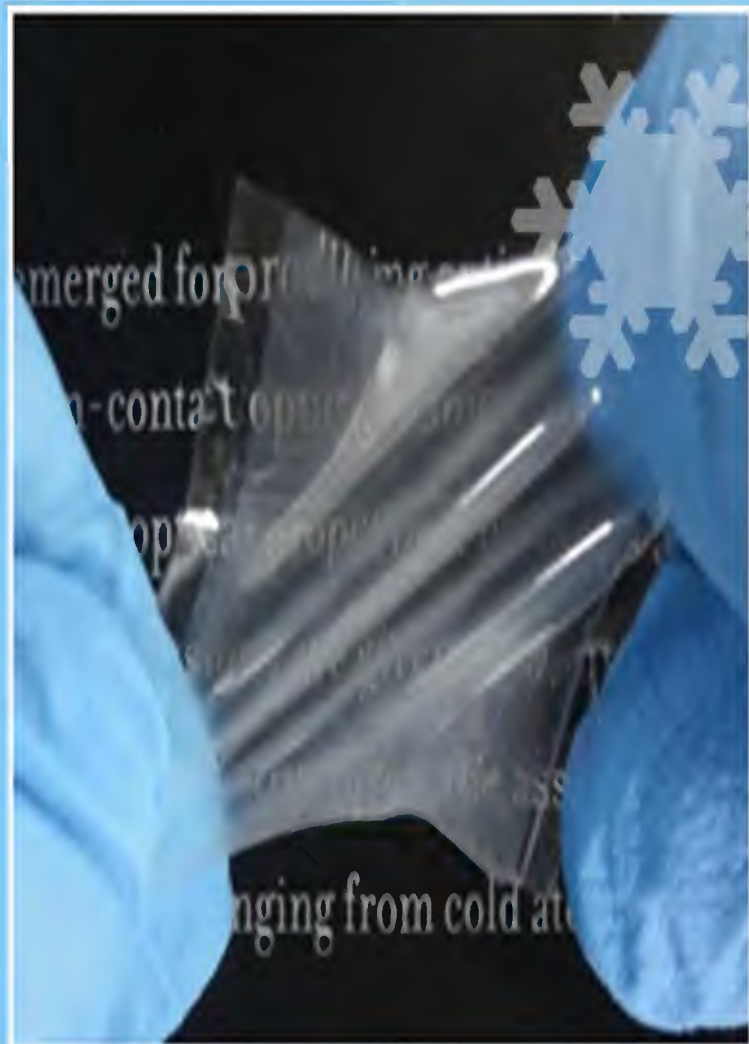


ARUN KUMAR M
IV ECE

RUBBER BAND ELECTRONICS

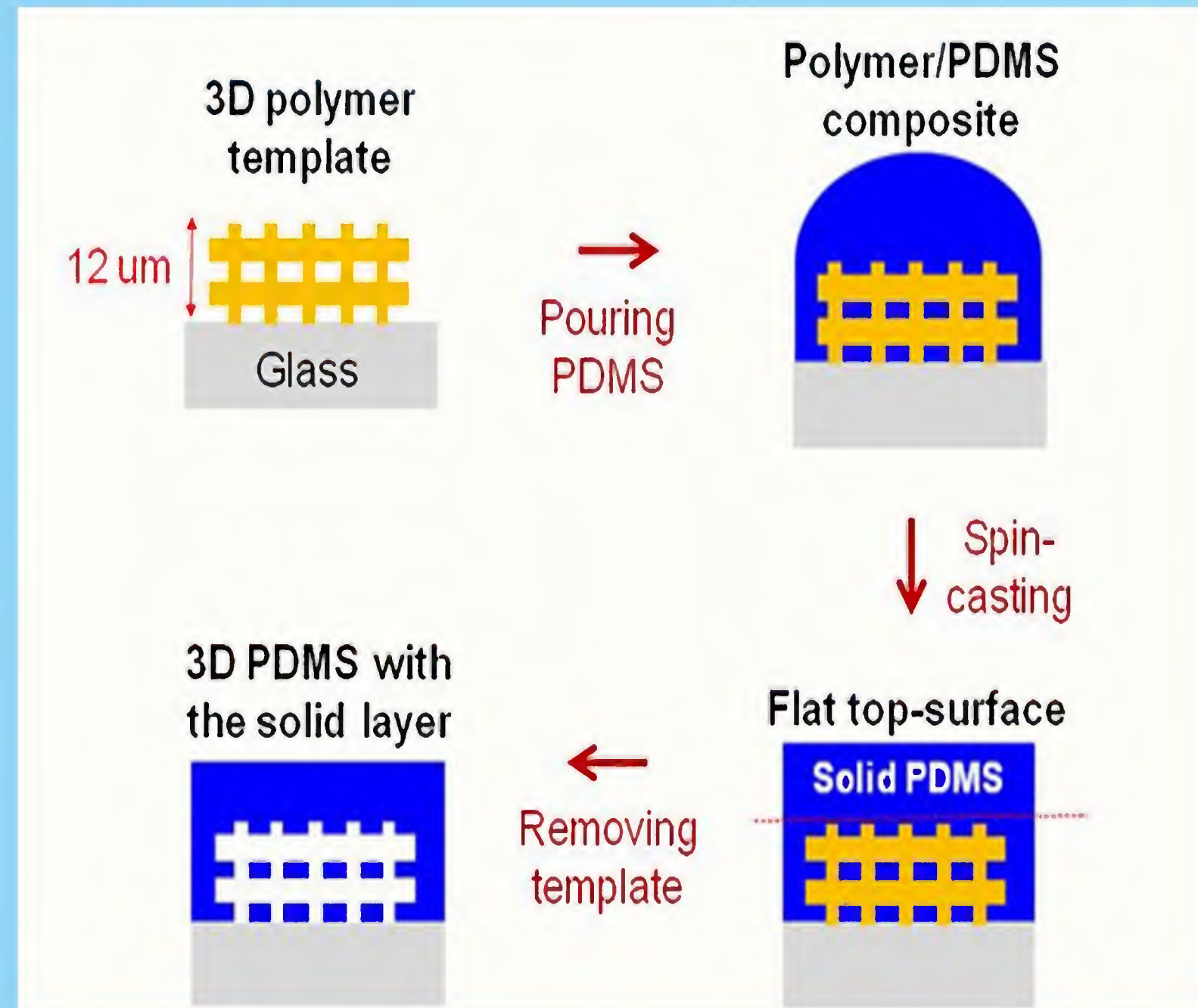
Imagine your mobile phone falls down and bounces back to you or your laptop is safe even after run over by a tank... This is possible by using the rubber band electronics on which papers were proposed recently.

This form of electronics offers high stretchability and twistability like stretchable LED arrays (an implantable device) for measuring the heart's electrical output and an electrode array that melts on to the surface of the brain. They stretch to a small amount and potential application requires a device to stretch like a rubber band. Then medical devices can be integrated into the human body.



Recently, a porous polymer and liquid metal that bends and stretches to more than 200% of their original size has been found. It consists of a highly porous 3D structure using poly dimethylsiloxane (PDMS) which stretches to 3 times its original size and a liquid metal (EGaIn) inside the pores that allowed electricity to flow consistently through the material, even when stretched excessively. It can be stretched and released 10,000 times without losing any conductivity at all.

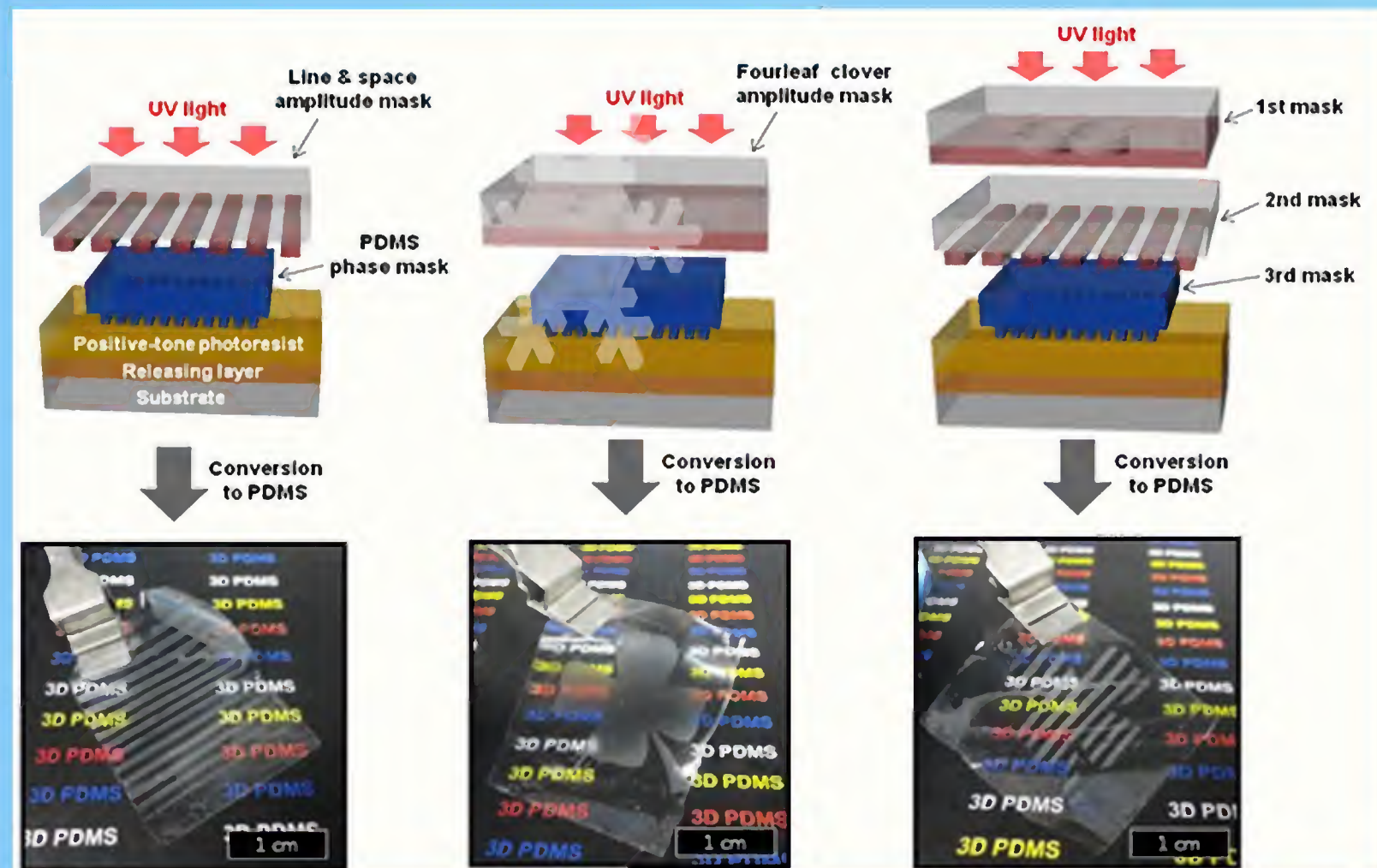
PREPARATION OF 3D PDMS:



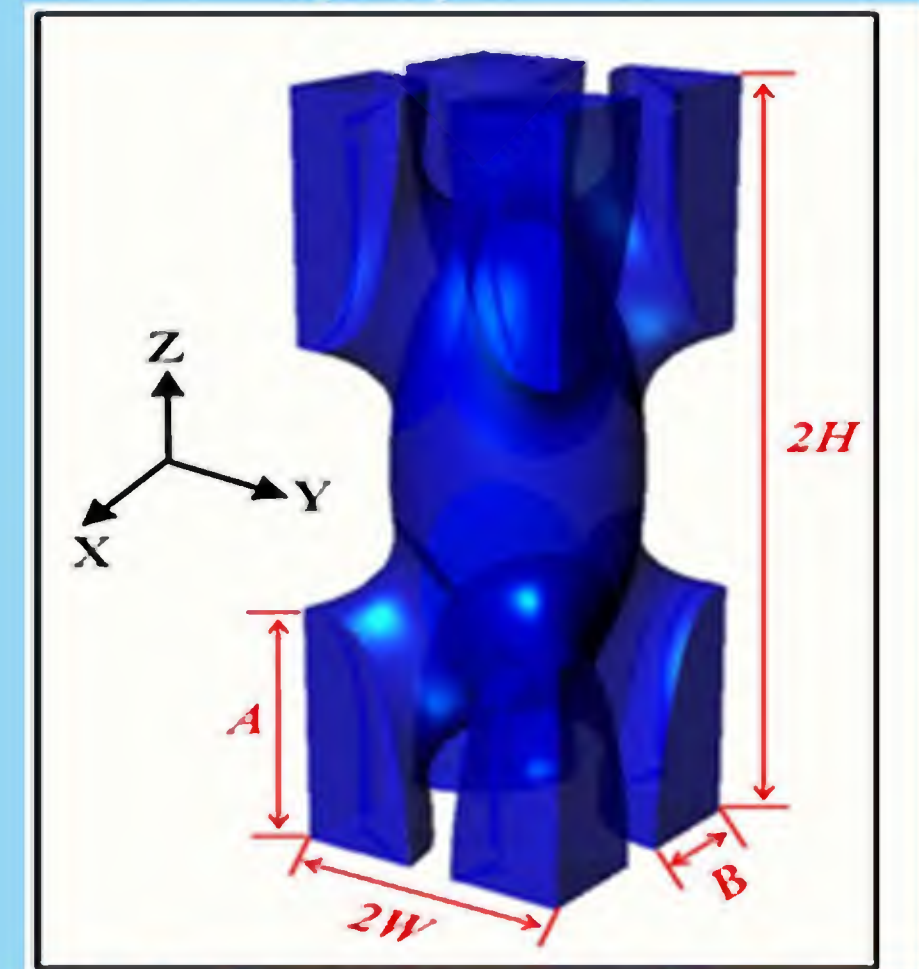
The PDMS is poured onto an oxygen plasma treated 3D template. Spin casting with various spin speeds ranging from 1000 to 7000 rpm enables control over the thickness of the upper residual layer of the solid PDMS. As the spin speed increases, the thickness of the layer decreases.

After the full curing, the template is removed by the developer using acetone or N-Methyl-2 pyrrolidone (NMP).

The 3D structure can be patterned into arbitrary forms using the additional amplitude masks. The images show the 3D images structured into a series of lines, a flour leaf clover and the last one is the combination of the above two.



The Unit Cell is as follows:

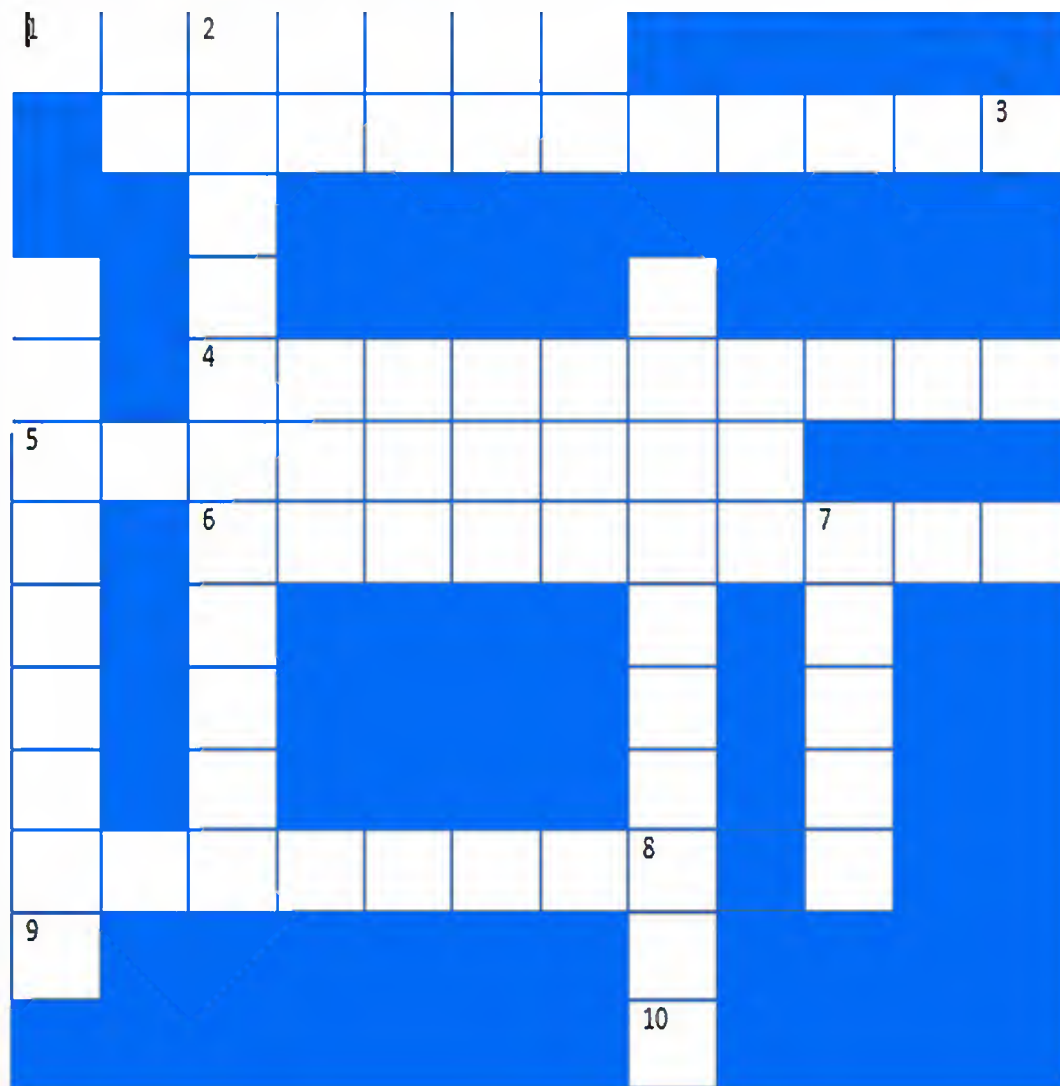


APPLICATIONS:

- It can be used in bendable consumer devices like laptops, smartphones and tablets.
- It can be used to take heart tests at home, car or workplace that tracks and transmits the vital signals to the doctor.

Word play

....a crossword on Electronic devices



Across

1. Voltage variable capacitor diode (7)
3. Blocks a band of signal frequencies (11)
4. A two terminal negative resistance device (10)
5. Accelerates particles in a spiral path (9)
6. Applied for measurement and control of temperature (10)
8. Used to generate a single output pulse of a specified width (7)

Top to Bottom

2. A type of LCD (10)
7. A bidirectional version of SCR (5)

Bottom to Top

9. A form of electric current multiplication (9)
10. Sensitive to illumination (10)

Answers:

1. Varicap
2. Reflective
3. Notch filter
4. Esaki diode
5. Cyclotron
6. Thermistor
7. Triac
8. One shot
9. Avalanche
10. Photodiode

Just Play

ISHWERYA P
IV ECE

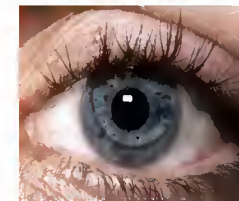


NanoMedicine

DHIVIYA B

IV ECE

Nanomedicine is the medical application of nanotechnology ranging from the medical applications of nanomaterials to nanoelectronic biosensors and even possible future applications of molecular nanotechnology. Nanomedicine seeks to deliver a valuable set of research tools and clinically useful devices in the near future. One nanometer is one-millionth of a millimeter. One of the Advanced Application is "Color-Changing Contact Lenses which Help Diabetics Keep track of their Glucose Levels"



A biochemical engineer at the University of Western Ontario has developed contact lenses that change color in response to spikes and dips in the wearer's glucose levels. The secret is Ultra-teeny nanoparticles that react chemically with glucose molecules in tears to produce a shift in hue. The nanocomposite hydrogel lenses, which could render those pesky e-waste-generating blood-glucose meters obsolete, will allow diabetics to monitor potentially life-threatening variations in their sugar levels without missing a thing.

Tattoos may no longer be the sole province of people looking to express themselves. According to scientists at Draper Laboratory, doctors may soon be prescribing semi-permanent medical tattoos as a noninvasive way for diabetics to keep track of their glucose levels. The prescriptive ink, composed of nanoparticles that are injected into the skin, responds to glucose in the bloodstream by fluorescing under infrared light.

A person with diabetes can then determine if an insulin shot is necessary. Unlike a session at your local tattoo parlor, getting medically tattooed involves using a long, hollow needle to stain the shallow layers of your skin with yellow-orange suspension of nanosensors that sloughs off with time. Each sensor, which measures roughly 100 nanometers across, is made up of various chemical-sensing agents within a plasticized, fluorescent polymer bead.

As the concentration of glucose increases, so does the "tattoo's" level of fluorescence. Once inside the skin, the sensor molecule binds to the target chemical (in this case, glucose) and lights up. As the concentration of glucose increases, so does the level of fluorescence, which can be picked up with a handheld reader.

Panasonic Uses Graphite to create Rubber Heat Sink

Why Heat Sinks??

In electronic systems, a heat sink is a passive component that cools a device by dissipating heat into the surrounding air. Heat sinks are used to cool electronic components such as high-power semiconductor devices, and optoelectronic devices such as higher-power lasers and light emitting diodes (LEDs). Heat sinks are heat exchangers such as those used in refrigeration and air conditioning systems, or the radiator in an automobile.

Open up any PC and inside you'll see some form of metal block (heat sink) covering the CPU. In the majority of cases a fan will be attached to that block as an extra measure to dissipate heat. The block and fan are necessary due to the amount of heat processors generate under load, and without them a chip would melt.

Do you know?

High quality aluminum heat sinks intended for use on Xbox 360 RAM memory chips are HANA/ANA, and Southbridge chips.



XBOX 360

The same heat issues exist in other forms of electronics, and one area in particular has two problems to solve. Electric cars use an increasing array of electronics to ensure efficient use of power during travel. Those electronics produce heat, but also need to be protected from vibration so as not to malfunction.

Why is graphite a conductor of electricity but diamond an insulator?

In graphite, the carbon atoms are amorphous and the electrons are not tightly bound to a 'sea' of other carbon atoms, so the outer electrons are available to conduct current.

In diamond, the electrons in each carbon atom are tightly bound to the ones around it in the crystal lattice, so they are not available to conduct current.

Car manufacturers have solved both these problems by using a combination of copper or aluminum for heat dissipation, and rubber to minimize vibration. Such a solution works well, but adds a lot of weight to components due to the metal required. However, Panasonic has found a way to remove the need for metal heat sinks by developing a new coating for rubber.

What do you know?

Graphite may be considered the highest grade of coal, just above anthracite and alternatively called meta-anthracite, although it is not normally used as fuel because it is difficult to ignite.

Instead of requiring a material like copper to pull heat away from an electronic component, Panasonic added a graphite coating to rubber and in doing so increased its thermal conductivity up to 300 degree. Where as rubber typically has a thermal conductivity rating of 0.1W/m.K, the graphite-coated version increases that to 20W/mK.

The fanless spinning heatsink: more efficient and immune to dust

Well, believe it or not, rotating the heat exchanger obliterates the boundary layer, removes the need for a fan, and it's so efficient that it can operate at low and very quiet speeds. This new technique is so efficient that if these heat exchangers can find widespread adoption in computers and air conditioning units, Koplow estimates that the total US electricity consumption could drop by 7%.

What this means is, many of the systems used in an electric vehicle can potentially have any heat dissipating metal component removed and replaced with this new rubber. This not only decreases the weight of each component significantly, but reduces the cost too. Less weight means more miles before you need a recharge. Less cost means cheaper electric cars.

Even with the new coating, rubber's thermal conductivity pales in comparison to aluminum (250W/m.K) or copper (401W/m.K). But such high levels of conductivity are only required for certain types of electronics such as CPUs. There is also nothing to stop Panasonic developing new coatings and increasing the thermal conductivity of rubber even further. Who knows, one day we may see rubber heat sinks used inside our PCs and laptops.

An Insight To Fibonacci Series

Around 1200 AD, a man named Leonardo Pisano better known as Fibonacci , discovered a sequence of numbers that created a very interesting patterns.

The sequence begins with the numbers (1,1,2,3,5,8,13,21,34,..... and continues indefinitely) and each number is obtained by adding the last two digits together . The best thing of Fibonacci series is that a Rectangle with the length and width of any two numbers of this sequence, forms what is known as 'The Golden Rectangle' a perfect rectangle. A Golden Rectangle can be broken down into squares of next Fibonacci numbers down. If we were to take a Perfect or Golden Rectangle and split it up into smaller squares down the Fibonacci series, and divide each with an arch ,the pattern begins to take shape ,where we get a " Fibonacci Spiral" .



The importance of the Fibonacci spiral is ,where we find it, take for e.g., a sunflower – the display of its florets are in perfect spiral of (55, 34, 21...) the sequence of Fibonacci series. From currents in the ocean to the spiral of the galaxy is designed in the exact, same blue print of the ‘Fibonacci spiral’. This blue print can be seen around us on small scale everyday i.e., from nautilus shell, to the fruitlets of the pineapple. There are nearly 6.5 billion people on the phase of the earth and no two fingerprints are the same. These Fingerprints are also formed from the exact blue print of the “Fibonacci Spiral”. So the very complex galaxies and fingerprints are patterned by the very simple “FIBONACCI SERIES”.

RESHMA R

III ECE



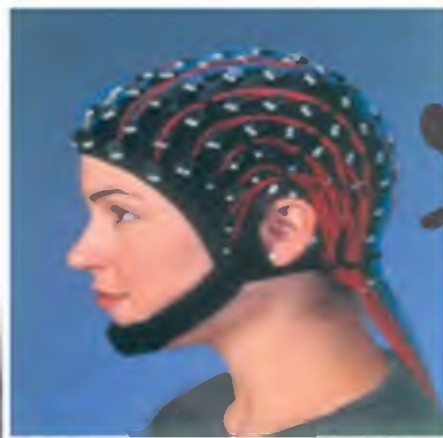
IS IT POSSIBLE TO CONTROL YOUR CAR WITH YOUR OWN MIND??

What will happen if you can control your car with your own mind? Is it possible? The answer to the question is **yes!**

Cars in olden days were controlled by a tedious steering system where everything was mechanical. But now cars are controlled by power steering where a slight force is amplified to turn the car.

Every human has unique brain waves just like they have finger print and DNA. These brain waves can be used to control the steering of the car. Not only that, it can also be used to start the car, switch on the audio player, view map etc.,.

The technology can be developed using EEG (electro-encephalogram) which is a device used to read brain waves in neurology. This device has numerous electrodes which are inserted on our heads to read the brain waves. But this device is tedious to wear and it also uses conductive gel. In order to overcome this, a new EEG device which resembled a headset was developed by Emotiv called Epoc neuroheadset. This device is capable of reading one's mind. This technology is now used for virtual gaming, to create smart homes etc.,.



In near future there won't be any touch pads, speech recognition and gesture sensor. Everything can be controlled by your mind.

MACRIN SMITH M
III ECE

A friend's Greeting !

I'd like to be the sort of friend that you have been to me;
I'd like to be the help that you've been always glad to be;
I'd like to mean as much to you each minute of the day;
As you have meant , old friend of mine, to me along the way.

I'd like to do the big things and the splendid things for you,
To brush the gray from out the skies and leave them only blue.
I'd like to say the kindly things that I so oft have heard,
And feel that I could rouse your soul the way that mine
you've stirred.



A friend is one that knows you as you are, understands where you have been, accepts what you have become, and still, gently allows you to grow."

William Shakespeare

I'd like to give you back the joy that you have given me,
Yet that were wishing you a need I hope will never be.
I'd like to make you feel as rich as I, who travel on
Undaunted in the darkest hours with you to lean upon.



I'm wishing at this time that I could but repay
A portion of the gladness that you've strewn along my way;
And could I have one wish this year, this only would it be;
I'd like to be the sort of friend that you have been to me!!

**B.Reshma Jasmine,
III ECE**

Realize The Real Taste of 'Apple'

Right from the beginning, people were craving to possess a mobile of their own. Apple's iconic co-founder, Steve Jobs made it an iconic company. Development of what was to become the iPhone began in 2004, when Apple started to gather a team of 1000 employees to work on the highly confidential "Project Purple". Jobs unveiled the first iPhone to the public on January 9, 2007. Famously Steve Jobs described the iPhone as **"A revolutionary and magical product"** that was literally five years ahead of any other mobile phone.

The most revolutionary thing that the iPhone brought us in 2008 was the launch of the iTunes App Store. The phone had an advanced technical capability of LTE (Long Term Evolution) wireless network that gave all phone carriers a chance to sell their fastest data services to Apple's base of iPhone customers. On July 11, 2008, Apple released the iPhone 3G in twenty-two countries. The iPhone was available exclusively with AT&T voice/data plans, and was limited to EDGE-based network access, rather than the faster 3G wireless networking standard. This was mitigated somewhat by an integrated 802.11g WiFi chipset, which allowed for faster browsing on any available WiFi network.

After this marvellous invention, the iPhone 3GS was built partly to capitalise on this. The handset itself didn't look much different, but by moving from 90nm to 60nm manufacturing and switching from a 400MHz ARM 11 processor to a 600MHz ARM A8 with a PowerVR SGX 535 GPU, the iPhone 3GS could offer up to four times the speed of the iPhone 3G in OpenGL ES games. It was this that opened the way for Epic's port of the Unreal Engine 3 to iOS, so taking us from Rolando to Infinity Blade within the space of just two years.

By June 2010 the iPhone was no longer on its own at the top of the smartphone market. Android was rapidly becoming a credible alternative to iOS. The iPhone sold one million units with 74 days, instantly establishing Apple as a major player in a smartphone market. The 5-megapixel camera and A4 processor saw photography and gaming get another boost. The killer feature of the iPhone



was, however, without doubt its retina display. By going from a 320 x 240 resolution LCD to a 960 x 640 IPS display, the iPhone 4 gave us the sharpest and most beautiful screen of any mobile device on the planet.

Announced on 4 October 2011, the iPhone 4S followed the design of the iPhone 4, is pushed forward in three key areas. First, the dual core A5 processor, as used in the second-generation iPad, meant a dramatic improvement in performance, with a claimed sevenfold increase in GPU speeds. Second, a new 8-megapixel camera with a CMOS back-illuminated sensor and a fast f/2.4 lens made the iPhone 4S a viable photographic tool, a fact backed up by legendary portrait photographer Annie Liebovitz's description of it on US TV as **"the snapshot camera of today."**

The iPhone 4 and its predecessors are more than just fancy cell phones. With their range of features from phone to web browser, from iPod to mobile game device – the iPhone is more like a computer that fits in your pocket and your hand than any cell phone.

Finally the next generation of iPhones - the iPhone 5. The main feature is its 4G LTE networking. Apple originally prototyped a 3.5-inch and at least one 4-inch designs for this 2012 iPhone. Apple planned to ditch the traditional Dock connector to go with something smaller. Here the technology LTE 4G networking needs every millimeter and milliamp of battery they can get, while AirPlay and Wi-Fi sync are reducing the need for physical cables.

Undoubtedly, Apple is going to face a lot of competition in the coming months. Amazon is coming out with a phone and a new version of its tablet. Even though many controversies arise whenever the new iPhone is launched, people are still fond of it rather than other smartphones. It blatantly tells the fact that “The Fresh Apple is always Good to Taste”.



AISHWARYA K
IV ECE

Windmills all over the world go counter-clockwise but the one in Ireland goes clockwise. It is true and that is a **fact**.

Richard T. James, An airplanemechanic invented **Slinky** while he was playing with engine parts and realized the possible secondary use for the springs.

First four countries to have **television**: England, the U.S., the U.S.S.R., and Brazil.

By **recycling just one glass bottle**, the amount of energy that is being saved is enough to light a 100 watt bulb for four hours

A normal car creates **one pound of pollution** for each 25 miles.

The **first photo camera** took **8 hours** to take a photo, during which you would need to remain still.

Interesting Facts

The **Apple II** had a hard drive of only **5 megabytes** when it was launched.

Who replaced Steve Jobs? After the death of Steve Jobs on October 5th 2011, Apple Inc. appointed **Arther Levinson** as its non-executive chairman.

The world has only **fourteen blimps** (airship without wings)

Although first invented in 1827, **Contact lenses** were first manufactured in 1887.



RECYCLE THE CLOCK

The clock is the “beating heart” of every chip. Like the heart in the human body, the clock inside the IC is what makes it tick. Every digital semiconductor relies on a highly accurate, cyclical clock to orchestrate all the data movement and processing being done by the various functional blocks on the chip.

IC designers have traditionally used “trees” to distribute clock signals. But for chips which operate at speeds of about 2GHz and above, slight variations in wire lengths, transistor properties and power supply can significantly alter the time it takes for a clock signal to reach two different spots on a chip. To prevent such timing violations, the chips are run at lesser speeds.

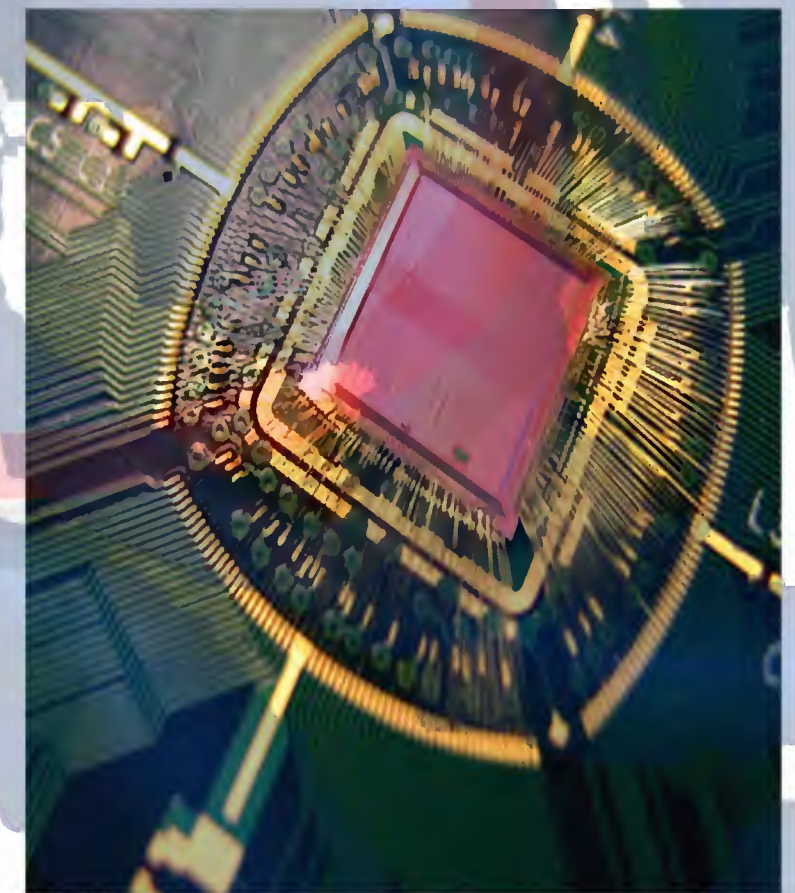
Ultra high performance microprocessor design engineers have largely solved this problem by adding a wire grid – called a clock mesh. This clock mesh is driven evenly by multiple drivers spread out across an interconnected grid of metal wires. The output of all the drivers are thus shorted together by the metal grid,

ensuring that the entire clock mesh oscillates as a single entity. But these clock meshes which are essentially large capacitors consume a lot of power.

The power consumed by the clock tree is about 30% of the total power consumed by a chip. In order to improve the power performance of the next generation MID devices, this power consumed by clock buffers should be reduced. One simple and reliable solution is to use the resonant clocking technology. Taking a cue from the pendulum, the technology uses inductors to periodically store and release the energy that would ordinarily be dissipated through the clock distribution network on a chip.

A tank circuit exhibits simple harmonic motion (resonance) like a mechanical pendulum. When a charged capacitor is connected in parallel with an inductor, a magnetic field is formed around the inductor and charge begins to flow through the inductor. The voltage across the capacitor is reduced and eventually becomes zero. Since the inductor resists changes in current, the current continues to flow. The energy to keep

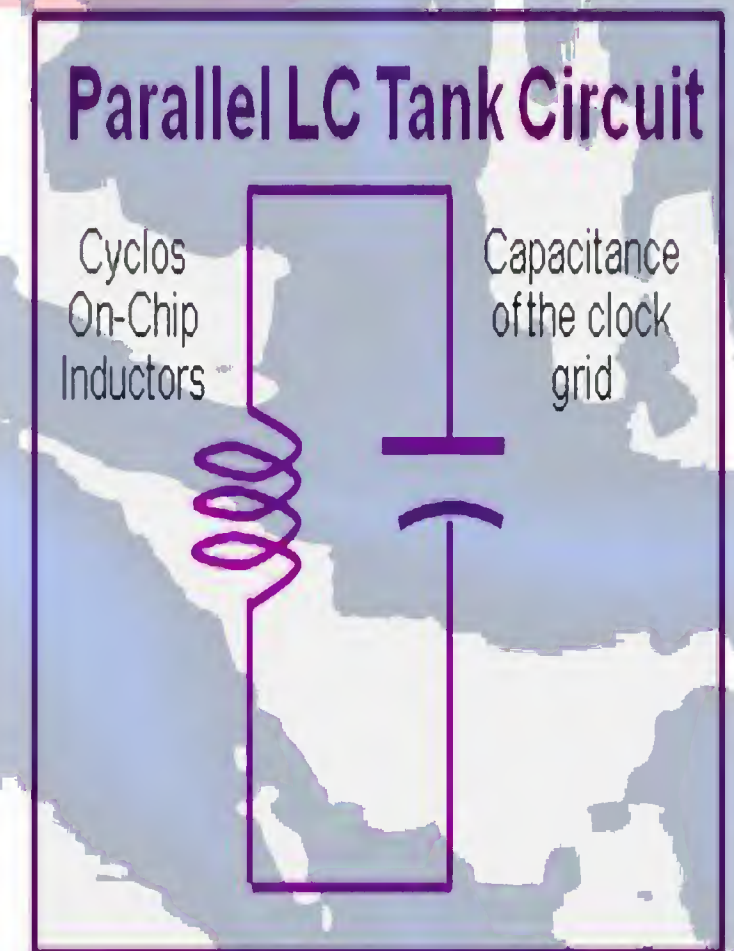
the current flowing comes from the magnetic field formed around the inductor, which declines as the capacitor charges. When the magnetic field is completely dissipated, the current will stop and the charge will again be stored in the capacitor, but with opposite polarity.



RECYCLE THE CLOCK

The cycle begins again with the current flowing in the opposite direction through the inductor. The result is a circuit where the energy continues to flow back and forth from the capacitor and inductor, creating an electric pendulum that provides a nifty clock signal. If perpetual motion was more than a pipe dream, no energy would be required to keep the tank circuit oscillating. In reality, a small “nudge” is required, like with a mechanical pendulum, to keep the tank circuit in continual motion due to resistance ... but it's much less energy compared to what it takes to drive a clock tree or clock mesh. Measurements in silicon have shown clock power can be reduced significantly using resonant clock meshes, which reduces total power by up to 30%.

Cyclos Semiconductor has brought this technology into implementation in its AMD A10-4600M processor and is now shipping in desktop and laptop computers. Resonant clock meshes have been silicon proven to be very effective in reducing power consumption, increasing performance, and are scalable for advanced IC design implementation and manufacturing. As mobile consumers demand more performance and longer battery life from their handheld devices, resonant clock meshes provide the ideal solution and thus are being deployed by semiconductor vendors in 2011. As cloud computing becomes more pervasive, data center vendors will also be taking actions to reduce their power consumption and cooling costs. Once again, resonant clock meshes are an ideal solution and they will soon be deployed in networking devices that enable the Internet. Other design applications for resonant clock meshes are plentiful too ... There is no shortage of IC designers who need to reduce power consumption and increase performance. With a novel IC design solution to the power-performance conundrum provided by Cyclos, SoC vendors are going to benefit greatly.



FUN WITH ANAGRAMS

Try solving the following technical anagrams with the help of the given hints...

- ➔ **LANDING AIRPORT**
(A compound structure consisting of two bipolar transistors - either integrated or separated)
- ➔ **STORE SIR**
(A passive two terminal electrical component)
- ➔ **CORE NUT**
(A device which stores the number of times a particular event or process occurred)
- ➔ **A BAR FICTION**
(A process that is used to create the integrated circuit)
- ➔ **CIRCLE TONES**
(It deals with electrical circuits)
- ➔ **SOFTWARE PILLS**
(An electronic filter that passes low frequency signals)
- ➔ **UNICORN TITS**
(A single operation of a processor)
- ➔ **WARM VOICE**
(Radio waves with frequency between 300MHz and 300GHz)
- ➔ **COOL PORT**
(A set of rules that governs a system)
- ➔ **BOIL ME**
(A portable communication device)

Answers
☒ Darlington pair
☒ Resistor
☒ Counter
☒ Fabrication
☒ Electronics
☒ Low pass filter
☒ Instruction
☒ Microwave
☒ Protocol
☒ Mobile

HOW TO SAVE A CELLPHONE THAT IS BEEN DROPPED IN WATER

Dropping a cell phone replacement. But a wet cell phone from an early

retirement. Here's what you should do. in the water is a cause of panic, because it might mean an expensive repair or cell phone doesn't always equate to a damaged system. In fact, if you act fast, you can save a wet

Retrieve the cell phone. The longer it is immersed in the water, the more damages the cell phone can incur. So as soon as you can, salvage it from the water source. This is easy if the cell phone was dropped in a glass or pail of water. But if you accidentally dropped it in the toilet bowl or in a pool, make sure to use implements to remove it out. Remember to never put your health or safety on the line just to retrieve a cell phone.

Disconnect the battery: The battery is a source of power, which, if attached to a wet cell phone, can cause serious damages. So remove it as fast as you can. Dry it with paper towels and set aside. Remove the SIM card and dry it completely as well. In general cases, SIM card has a good chance of survival.

Remove as much liquid as you can: You can do this in two ways. First, dry the cell phone with paper towels. Make sure to reach all the parts. You can use Q-tips for the holes, corners, and hard-to-reach areas. Second, shake the water off the cell phone. But make sure not to shake vigorously to prevent the remaining water to seep into the other parts. When there is no more water coming out of the phone, proceed to the next step.

Use a vacuum: The vacuum will help wick away the moisture, but make sure to keep it several inches from the cell phone. Vacuum the cell phone for around 20 minutes or longer if it is submerged in water for a longer period. Remember not to use a blow dryer, as it allows the moisture to leak into other parts of the cell phone which can cause more damages.

Put the phone in a bowl of uncooked rice: Uncooked rice can dry the moisture that remains inside the cell phone. To use, simply put the cell phone in a bowl and cover it with uncooked rice. Let it sit there for at least 12 hours. You can also use desiccants in place of uncooked rice. Put desiccants in a bag together with the cell phone. Just the same, leave the cell phone in the bag for 12 hours. Desiccants can be found in medicine bottles, shoe boxes and food packages.

Dry the cell phone for as long as it is necessary: If the phone was severely wet, dry it for more than 12 hours. When you are sure that the internal parts are already dry, attach the battery and turn the cell phone on. It should work again after drying. If it doesn't, let a professional take a look at it. Never try to open up and fix the cell phone by yourself, unless of course you very well know how to do it.



TAKE TIME TO.....



Take time to work: It is the price of success.

Take time to think: It is the source of power.

Take time to play : It is the secret of perpetual youth.

Take time to read: It is the foundation of wisdom.

Take time to be friendly: It is the road to happiness.

Take time to dream: It is hitching your wagon to the star.

Take time to look around : The day is too short to be self-centred.

Take time to laugh : It is the music of the soul.

Take time to read god's holy word: It is the bread of life.

Take time to pray: It is the only way to hear his voice.

Take time to be holy: The world rushes on....

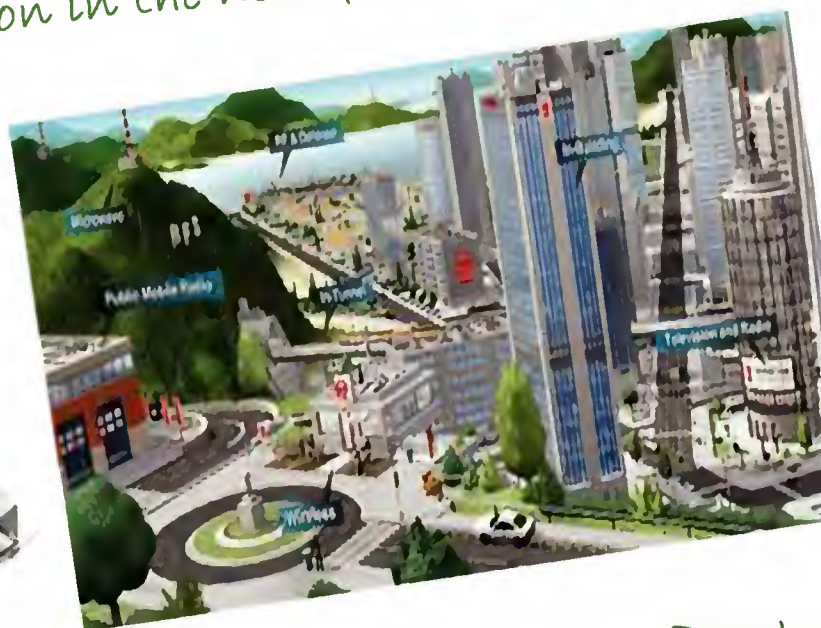


KEERTHANA R

II ECE

WIRELESS POWER TRANSMISSION

One of the major issues in power system is the losses occurring during the transmission and distribution of power. As demand increases day by day, the power generation increases and so does the loss in power due to transmission and distribution. The percentage of loss due to this is estimated as 26% and India's electricity grid has the highest transmission and distribution loss in the world – a whopping 27%. This problem can be overcome by an alternative option for power transmission which could provide higher efficiency, low transmission cost and avoid power theft. Microwave Power Transmission is one of the promising technologies which maybe the righteous alternative for efficient power transmission. In this method of power transmission, microwaves are used instead of wires. Nikola Tesla, known as the "Father of Wireless", was the first one to conceive the idea of wireless power transmission and he even demonstrated by designing and constructing a tower known as the Tesla Tower or Wardencliff Tower mainly for this purpose. There are a lot of advantages associated with WPT. It could completely eliminate the existing high tension power transmission line cables, towers and sub stations between the generating towers and consumers. Power could be transmitted to areas where wired transmission is not possible. Loss of transmission is negligible. Thus, if India can adapt such an efficient way of transmission, it will become an economically stable nation in the near future.



Prashanthi C
III ECE



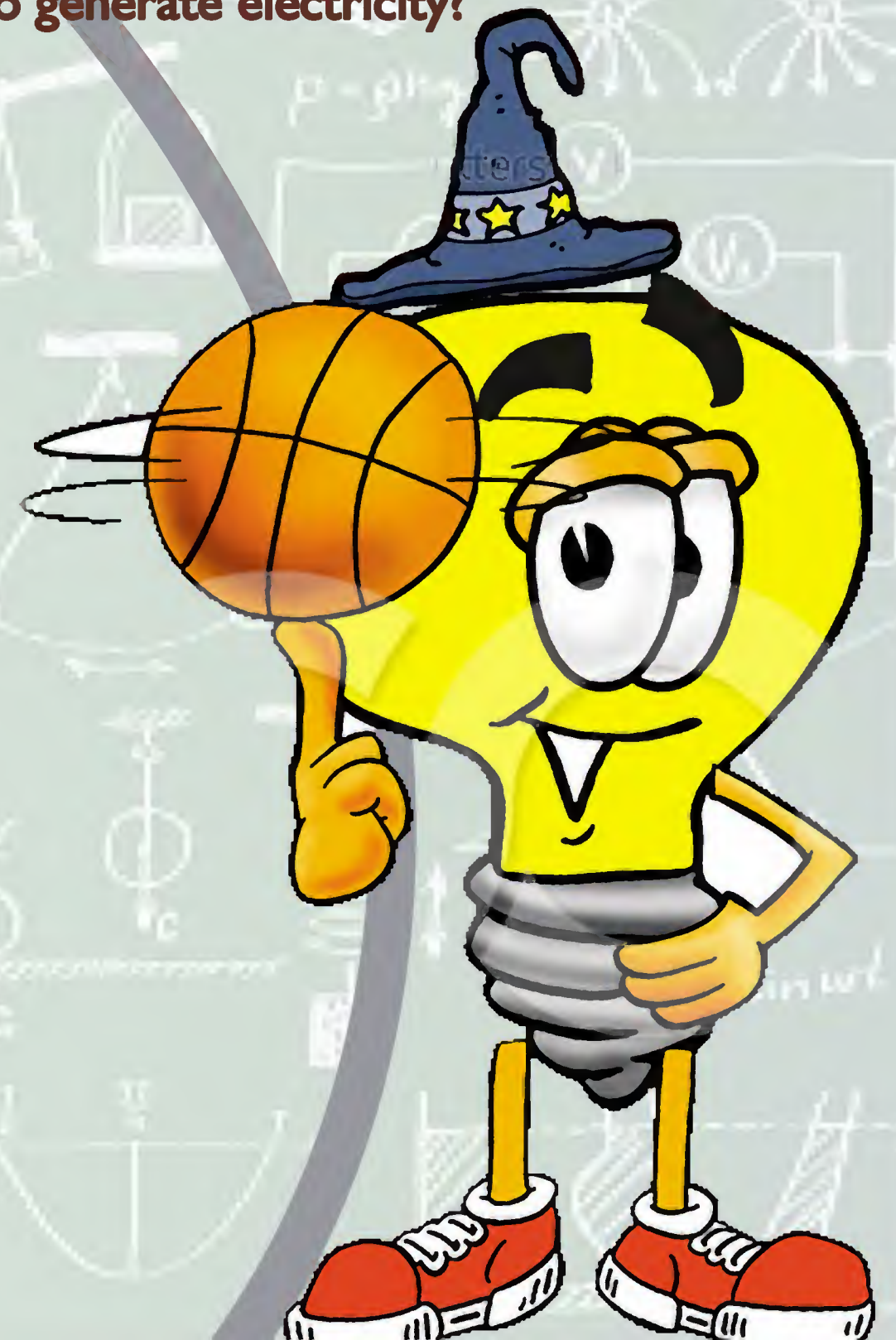
Why is Technology Important?

Places far away have come closer, thanks to technology. The pace of life has increased, thanks to technology. Communication is quick, travel is fast, movement is easy, action is quick, interaction has speed up and so has life. Things that once took hours to complete, can be done in seconds. The world is smaller and life is fast. Courtesy - technology.

Lights

The discovery of electricity drove all the darkness away and the world lit up. If not for the use of technology, we wouldn't have been able to produce electric power or harness it. Today, it can be generated through various means because of technology. It has been channeled to every small household in the farthest of world's corners, thanks to technology. What made it possible to use

renewable sources like hydropower or solar and wind energy to generate electricity?



Why is Technology Important?

Education

Satellite and radio communication have changed the entertainment industry. Channels from all over the world are now available on your TV set, thanks to technology. Television shows and films can reach the masses within minutes after their release. Radio communication has made it possible to broadcast programs to the remotest of locations.

The role of computers and Internet in education cannot be ignored. The use of computers in teaching has made learning more interesting. Computers enable better storage and presentation of information, thus making the process of teaching easier and more effective. Educational CDs are available everywhere. Lectures/lessons can be uploaded on websites, as PDFs or even as videos. This has made information more easily accessible and provides better ways of knowledge sharing. Online degrees and training courses have led to



spread of education. Today, people can continue learning even while managing their jobs, because online education gives them the flexibility to do so. And all the information in the world is so widely available, thanks to the world wide web.

Why is Technology Important?

Communication

Technology has changed the way people communicate. Communication systems have evolved from pigeons carrying messages to emails and instant messages that travel long distances in seconds. Cellular technology and satellite communication have increased communication speeds and made 'connecting' easier. The Internet has enabled easy exchange of information over long distances. Even now, you could be accessing this page from a web server in some far-off country. Just a few clicks of your computer mouse can take you anywhere on the Internet. You enter an all new world without even realizing it!

Business

Business, small and big, need technology to thrive. They are growing and expanding across countries owing to technological advancements. It is technology that gives organizations the strength to spread their wings. If not for technology, how would complex industrial processes be carried out? If not for machines, how would large-scale production of goods be possible? If not for computers, how would the software industry have grown? Growing business create employment opportunities for people and technology plays a big role in business growth. That's how technology is important.

Why is Technology Important?

Research

Technology is as important in the healthcare industry as in any other. Right from easy communication between healthcare professionals and patients to computer-assisted medical procedures, it is technology everywhere. In the working of patient-monitoring equipment and surgical instruments, there's technology. In various diagnostic procedures from scans to complex therapies, technology has a vital role to play. Many medical procedures are mechanized. Even surgeries are simulated on and assisted by machines.

Technological development has never stopped. Nanotechnology has gone on to understand things at their nano level. Space exploration has gone on to explore extraterrestrial life. Genetic research has revealed how various traits or even hereditary diseases are transferred across generations. Processes like cloning and genetic engineering are attempting to alter traits in individuals. Artificial intelligence can

make machines learn, thus developing intelligence in them. Fourth generation technologies in mobile communication have achieved amazing speeds in voice and video communication on cellular networks. Things we would never have imagined have come into reality due to application of technology.

At the heart of every piece of technology is automation. Technology automates the most complex of processes, be it in communication, education, medicine or any other industry. With the application of technology, critical and time-consuming processes can be executed with ease and in less time. Laborious and repetitive tasks are best done by machines (without getting bored!). People do not have to slog as much as they would have had to, if not for technology. With automation comes efficiency and speed. They save human effort and time to a great extent and make life easy and comfortable. Nothing else has changed the way technology has. And that is exactly why technology is so important today.

1. During a family meeting; the following people were present: Father, Mother, Son, Daughter, Aunt, Uncle, Niece, Cousin, and Nephew. But, only four people were present.

How is this possible?

2. The more you have of it, the less you see. **What is it?**

3. If you have it, you want to share it. If you share it, you don't have it.

What is it?

4. **What** has to be broken before it can be used?

5. **What** is the question you can ask all day, and no matter what the answers are, they would still be valid questions and correct?

6. I can sizzle like bacon,
I have plenty of backbone,
But lack a good leg,
I am made with an egg,
I peel layers like onions,
But still remain whole,
I can be long like a flagpole,
Yet fit in a hole.

What am I?

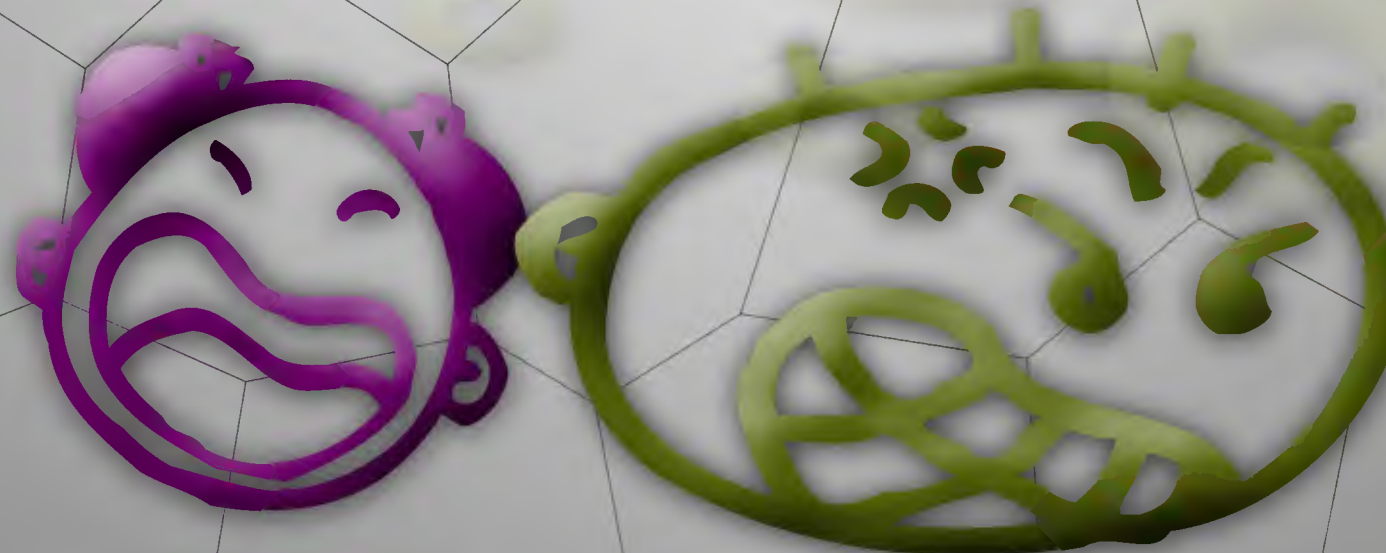
7. I have many feathers to help me fly
I have a body & head, but i am not alive
It is your strength which determines how far i go.
You can hold me in your hand, but i am never thrown.

What am i?

8. If you look at me
I will look at you
If you grin at me
I will grin at you
If you dance
I will also dance
But if you shout,
Sorry, i can't.

Who am i ?

Fun Riddles



FINALLY PUZZLES

DON'T SEE:

1. The meeting was a group of a Brother (with his Son or Daughter) & a Sister (with her Daughter or Son)
2. Darkness
3. A Secret
4. An Egg
5. What time is it?
6. A Snake
7. An Arrow
8. Mirror
9. Charcoal
10. Fire
11. Wheat
12. Eat 15 candies and return the 15 wrappers ,you get 5 more candies. eat 3 more candies and return 3 more wrappers from the 5 new candies and get 1 more candy. Now you have total 2+1 candies left. ...eat them and return their wrapper s and get one more candy..... so 22 candies in TOTAL

9. What is black when you buy it,
Red when you are using it,
And grey when you throw it away?

10. Every thing I swallow is Digested in Full

But,

If I Drink Water,

I will Die Soon.

Guess **What is It ?**

11. I **am a word of five letters!**

People eat me!

If you remove my 1 letter i will be a form

Of energy!

If you remove my first 2 letters i will be needed 4 living.

If you remove my first 3 letters i will be near you.

If you remove my first 4 letters i will be a drink 4 you.

12. A shop is selling candies at Rs. 1 for each candy, plus it is giving a free candy for 3 empty candy wrappers. You have only Rs. 15.

How many candies can you buy?

NANDHINI V, II ECE

Affective Intelligent Driving Agent(AIDA)

MIT researchers and designers in collaboration with **VOLKSWAGEN** are developing the Affective Intelligent Driving Agent (AIDA) - a new in-car personal robot that aims to change the way we interact with our car.

If you think you've seen this idea before in science fiction, you're right. I'll give you a hint and call AIDA a "dashboard droid" ;)

With the ubiquity of sensors and mobile computers, information about our surroundings is ever abundant. AIDA embodies a new effort to make sense of these great amounts of data, harnessing our personal electronic devices as tools for behavioral support. AIDA is a system that would offer the same kind of guidance as an informed and friendly companion.

AIDA communicates with the driver through a small robot embedded in the dashboard. AIDA reads the driver's mood from facial expressions and other clues and responds in a socially appropriate and informative way. AIDA communicates in a very immediate way (ie) with the seamlessness of a smile or the blink of an eye. Over time, the project envisions that a kind of symbiotic relationship develops between the driver and AIDA, whereby both parties learn from each other and establish an affective bond.

To identify the set of goals the driver would like to achieve, AIDA analyses the driver's mobility patterns, keeping track of common routes and destinations. AIDA draws on an understanding of the city beyond what can be seen through the windshield, incorporating real-time event information and knowledge of environmental conditions, as well as commercial activity, tourist attractions and residential areas. When it merges knowledge about the city with an understanding of the driver's priorities and needs, AIDA can make important inferences. Within a week AIDA will have figured out the location of home and work place. Soon afterwards the system will be able to direct the preferred grocery store, suggesting a route that avoids a street fair-induced traffic jam. On the way AIDA might recommend a stop to fill up fuel tank, upon noticing that it is getting low on gas. AIDA can also give us feedback on our driving, helping us to achieve more energy efficiency and safer behavior.

YUVA PRIYA S, III ECE



Voice Recognition



As soon as the idea for voice recognition was developed, attempts were made for handsfree operation of the PC. Software solutions have been developed by various companies since 1939.

AT&T's Bell Labs produced the first electronic speech synthesizer called the Voder (Dudley, Riesz and Watkins). This machine was demonstrated in the 1939 World Fairs by experts and it used a keyboard and foot pedals to play the machine and emit speech.

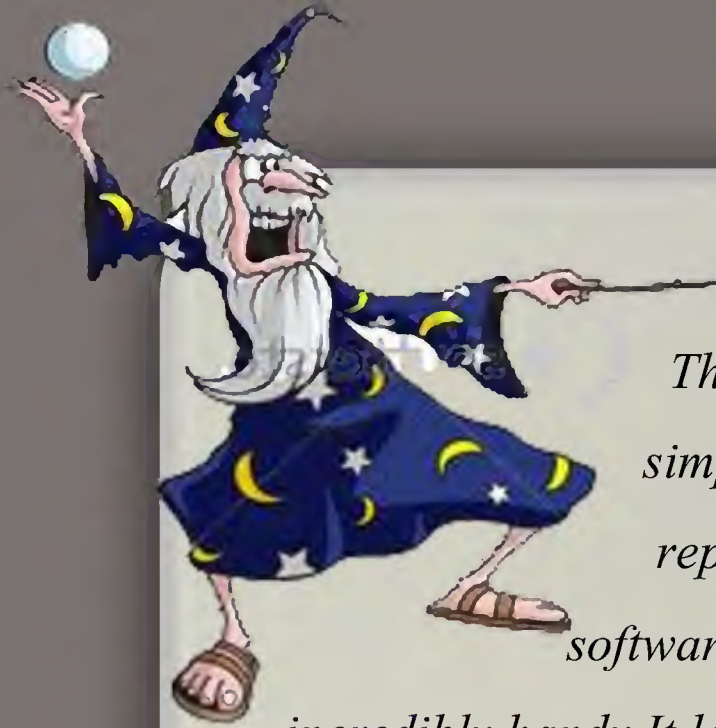


The first company to launch a commercial product based on voice recognition was Covox in 1982. Covox brought digital sound (via The Voice Master, Sound Master and The Speech Thing) to the Commodore 64, Atari 400/800, and finally to the IBM PC in the mid '80s. Along with this introduction of sound to computers, came Speech Recognition.

Dragon systems, which was founded in 1982 is the leader in the voice recognition market. Dragon speech recognition software makes it easy for anyone to use a computer. You talk, and it types. Use your voice to create and edit documents or emails, launch applications, open files, control your mouse, and more. Quickly and easily capture your thoughts and ideas while Dragon helps you get more done faster.

An even more userfriendly software, Siri on iPhone 4S lets the user to use their voice to send messages, schedule meetings, place phone calls, and more. Users can ask Siri to do things just by talking the way they talk. Siri understands what they say, knows what they mean, and even talks back. Siri is so easy to use and does so much.





The Software which comes after Dragon System's software in the 2012 rating is Talking Desktop. It simply seems to be a software designed to help people improve productivity. It seems to aim at being a replacement desktop as well as voice recognition.

software. It pulls in information about news, weather and the favourite websites into one location, which sounds incredibly handy. It looks great when shown as a demonstration, but when users try to use it on a regular basis as a command and dictation voice recognition platform, it quickly becomes inadequate. It's controls are limited and its reaction is slow.

On the other hand, the iPhone software which currently hits the screen is LADIDA. Unlike the ordinary voice recognition softwares, LADIDA is a reverse karaoke app that uses artificial intelligence to help users sound like a professional singer. You SING or RAP into the phone, and LADIDA will analyze your voice and compose music to match and also works on melodic instruments such as Guitar. Even though many opposed this software, it is being tried to be implemented with more features in Android mobiles.

But the disadvantages of using Voice Recognition Software is that it cannot understand all the words we speak even after hours of training. Let us wait for software to overcome this issue too. Who knows?? There is also a chance for software to speak exactly what humans and animals think.



AISHWARYA K
IV ECE



Electrical Brain Stimulation Treatment for Epilepsy

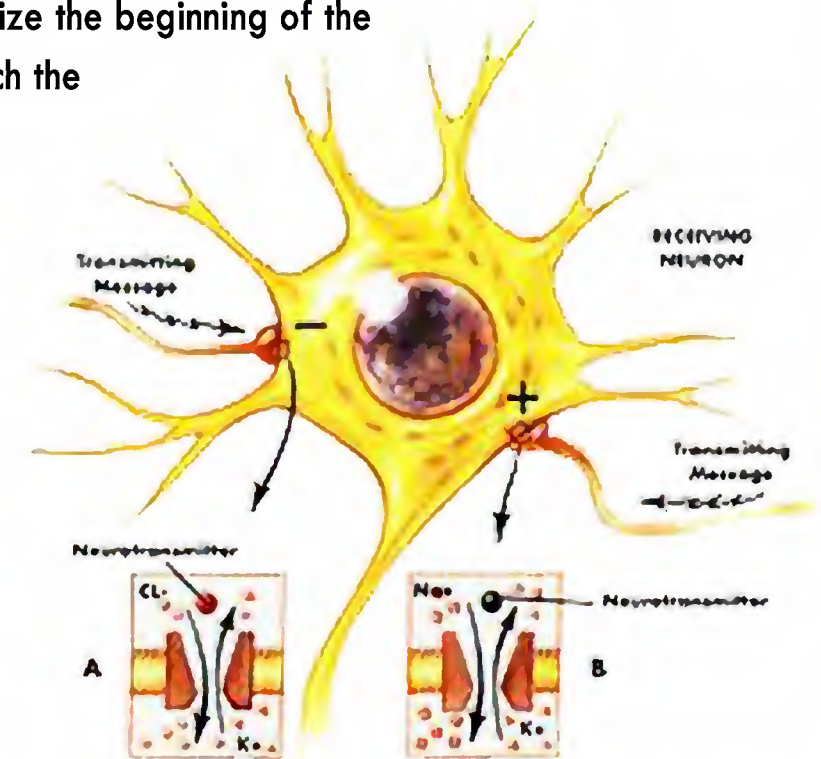


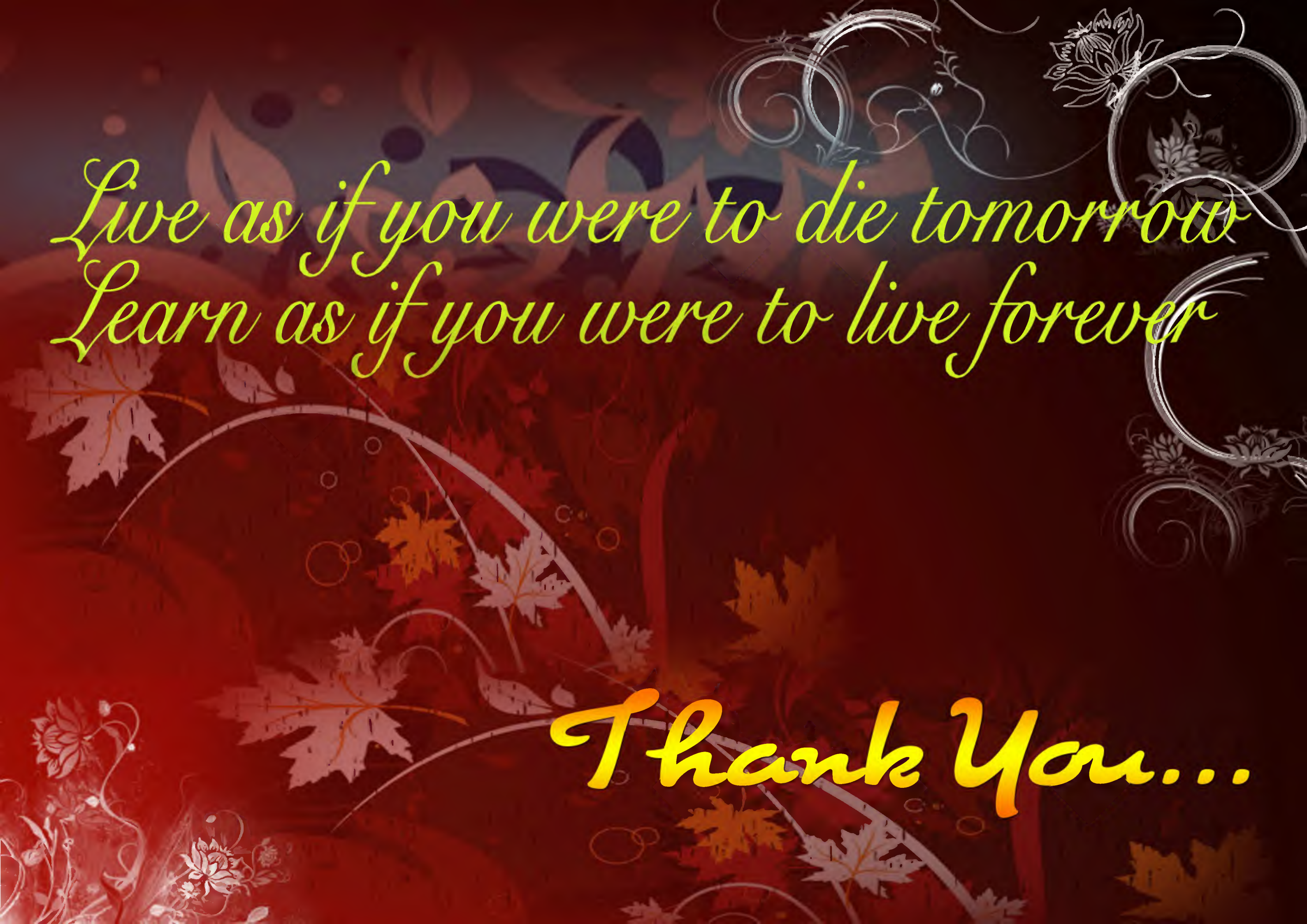
New Electronic Devices provide options for difficult-to-control epilepsy. According to epilepsy expert Dr. Michael C, new and innovative electronic techniques provide experimental new treatment for epilepsy. This was discussed at the American Medical Association media while briefing advances in neurology in New York. Nine new medications for epilepsy have been introduced in the last 10 years, greatly improving the physician's armamentarium against the disease according to Smith, director of the Epilepsy Center of Rush University Medical center in Chicago. But there remains a large population of patients with hard-to-control epilepsy. Medical centers have begun recruiting patients for two new FDA- approved trials of direct electrical stimulation of the brain designed to control seizures in patients whose epilepsy can't be controlled with medication. For these patients, vagal nerve stimulation has been another option. In vagal nerve stimulation, a pulse generator, similar to a heart pacemaker is linked via an under-the skin cable to an electrode inserted into an opening at the side of the neck. This electrode is then fitted around the vagal nerve in the neck, one of the many nerves that carry messages to and from the brain. The new trial treatments take advantage of technical innovations in miniaturization and computer technology to place electrodes directly into the brain. These electrodes actually act much like the heart defibrillator implanted in Vice president, Dick Cheney keeping the heart beating in a normal rhythm and shaking it when it goes out of sync. While the rhythm of the brain is much more complicated than a heartbeat, we have become very sophisticated in our ability to read complicated EEG (Electroencephalogram- a graphical representation of the electrical activity in the brain) patterns, distinguishing normal brain rhythms from the abnormal rhythms of a seizure. In perhaps the most technically exciting trial, the area in the brain where the seizures originate is identified and both recording and stimulating electrode are then implanted. These electrodes are connected to a computer chip that can actually read the EEG, recognize the beginning of the seizure and then send a shock that will restore the normal brain rhythm. The computer chip and battery together approach the size of a hearing aid and are implanted behind the ear.

Physicians are often able to determine the location in the brain where seizures originate using EEG's, improved neuro-imaging and clinical signs. For example, if we had a patient who always heard an advertising jingle before the seizure. It turned out the seizures were occurring in a portion of the brain responsible for hearing.

But some patients have difficulty in identifying seizure center or have multi-focal epilepsy with seizure originating in several areas. In the other new trial, stimulation of the brain will be delivered to a relay station in the brain, the thalamus, where it is hoped, it will be able to keep brain rhythms normal by delivering pulsed, on and off, brief stimulation, much like a heart pacemaker. It is very important to continue to look for more and better treatments for epilepsy and electronics has lent a helping hand. These targeted electronic therapies may prove very valuable. Medications that affect the brain are particularly likely to have unwanted side effects.

With Electronic stimulation, we aren't affecting the whole brain all the time, as we may be with medications. And, because the brain cannot feel electronic stimulation, it is likely to be very well tolerated.





*Live as if you were to die tomorrow
Learn as if you were to live forever*

Thank You...