

AVERA

(Association of Electrical and Electronics Engineering)



From the Editorial

The written world has never ceased to withdraw its influence over the educated community. A written word is a record of an event, which will exist forever, long after the grandeur of that event has subsided.

Presenting you PULSE— one such avatar of the written world, which eliminates the darkness of ignorance by spreading its rays of Knowledge!

PULSE is a Newsletter associated with AVERA— the association of the department of EEE. PULSE aims at spreading the word about the events organized by Team AVERA.

This year, Team AVERA has spilt its ink on productive data, for the benefit of the Readers. Flip through the next few pages to experience :

- ≈ The Dawn of a new era- Report of Events
- ≈ Annals of 2015 - Portfolio of achievements
- ≈ What's New? - Latest technologies from around the globe
- ≈ From the Negatives - Photo gallery
- ≈ Test your Grey Cells - Activities for the brain



The Team

With a new beginning comes new hopes. This year, the new team was inducted during the Inauguration on 31st August 2015. The new team has stepped into office with high hopes and ambitions. With an able guidance of Mr A.Nandha Kumar and Mr R.Muthubharathi and a strong leadership under Mr Surendra Prasad, final year, EEE, and an effective team, the future of this year looked quite uphill during the induction. With a clear cut plan of organizing guest lectures, alumni interactions, skill testing events and competitions, team AVERA had planned a vibrant year ahead.

The Dawn of A New Era

INAUGURATION

“Coming together is a beginning; Staying together is Success.”

The inaugural function and the induction ceremony of the new team of AVERA, the department association of EEE, included a guest lecture by Er. S.Sathish Kumar, Executive Engineer Operation & Maintenance branch of the 110/22KV Ankalakurichi SS campus.

The function was presided by Dr.M.Ramakrishnan, Principal, MCET & Dr.A.Senthil Kumar, HoD, EEE.

The president of the association was introduced by Mr A..Nandha Kumar, Faculty advisor of AVERA followed by this, the executive members of AVERA were introduced by B.Surendra Prasad – president of AVERA. The year plan was mentioned by B.Sudhagaran, Secretary, AVERA. In the guest lecture, Mr Sathish Kumar elaborated on power grids and his work experience.



AVERA 2015-2016



WORKSHOP ON ARDUINO PROGRAMMING



Installation, programming and interfacing procedures were explained practically. In the fore noon session of the workshop, a general introduction for ARDUINO tool was given. Simple programs such as interfacing LED, LCD were executed. Other real time applications of embedded system were also brainstormed.

With application based inputs, the workshop proved to be quite useful for the students.



“Embedded” reflects the fact that the component is an integral part of the system. Embedded Systems have become such an important part of all applications that their presence is far from obvious to the casual observer. Embedded application based projects never lose their shine.

Arduino is one such advanced micro-processor which eases the programmers off vigorous coding schedules.

An intra-departmental ARDUINO workshop was conducted for the benefit of III-year students by AVERA on 30.09.2015. About 30 students participated in the workshop. AVERA members from Final year EEE organized hands-on training, under the guidance of Mr Kannan, Assistant Professor, Department of EEE. The one-day workshop, held at the research lab was monitored by Mr.R.Muthubharathi, Assistant Professor, Department of EEE, Faculty Advisor, AVERA

WORKSHOP ON CADENCE EDA TOOL

This is the age where small is the new big. Processors, ICs and even gadgets are becoming more handy. IC design is one of those domains which has always seen an upward growth.

Cadence Design Systems, nc (NASDAQ: CDNS) is an American electronic design automation (EDA) software and engineering services company, founded in 1988 by the merger of SDA Systems and ECAD, Inc. The company produces software and hardware for designing integrated circuits, systems on chips .



A workshop on custom IC design using CADENCE Tool was conducted for 25 final year students. The session was handled by three assistant professors of EEE department namely Dr.K.N.Vijeyakumar, Ms.M.Sangeetha and Mrs.K.Saranya, Ms.S.Kalaiselvi. The major topics covered included- ASIC design flow, CMOS Realization of digital circuits, Technology Scaling & Transistor Sizing. This session was followed by Introduction to CADENCE EDA Tool & Schematic Entry. The participated students were provided with certificates.



ALUMNI INTERACTION

Interaction is an integral part of development. It paves the way for more effective idea sharing processes. To bridge the gap between the Industrial requirements and the students qualifications, an interaction with two of the alumni of the Department of EEE was arranged by Team AVERA for the benefit of the students of II and III year.



Mr.Gokul Sidharth, Project Engineer, Soliton Technologies Pvt. Ltd., Coimbatore, who spoke first elaborated his corporate experiences, explaining the importance of learning coding languages. His interview experience with Soliton was hilarious as well as thought-provoking.



Mr.S.Ashwin Project Engineer ,Tech Mahindra, Pune, gave a sneak peak into the corporate world, through his brief elaboration of his experiences at Tech Mahindra. He gave a new dimension of 'What after Engineering?' through various career choices and course suggestions.

Annals of 2015

Sr.no	Student's Name	Branch and Department	Name of the Award	Awarded by (Name of the Organization)	Purpose Of Award
1.	Murugan.M	BE & EEE(IV Yr)	Merit Scholar-Ship Award	MCET	CAMPUS DAY-7.9.15
2	Keerthana.R	BE & EEE(IV Yr)	Merit Scholar-Ship Award	MCET	CAMPUS DAY-7.9.15

Sr.no	Student's Name	Branch	Details Of Event And Prize If Any	Organizer and Place of program	Date Of the event
1	Sivablalakrishnan.M Siva Prasad.R	EEE	Project Expo	CIT college Coimbatore	11.9.2015

Sr.no	Student's Name	Year & Dept	Events Details	Awards / Medals (if any)	Date Of the event
1.	Siva prasad.R	III-EEE	Anna university zonal 10 cricket tournament	III	17.9.2015 to 18.9.2015

Sr.no	Student's Name	Branch and Department	Details of event	Organizer and Place of program	Date Of the event
1	Siva Prasad.R	III EEE BE	Workshop	EEE- AVERA Assosiation	30.09.15
2	Siva Balakrishnan.M				
3	Balaji.A				
4	Naveen Selva-kumar .C				
5	vishnupriya.S				
6	Keerthana.R				
7	Kaviya .R				
8	Steffi Josh.J				
9.	Kousika.S				
10	Pavithra.K.K				

Sr.no	Student's Name	Student Name	Branch and Department	Details of Event	Organizer and Place of program	Date Of the event
1	Balavenkateshwarn.C Ajay.J Arockiya Revanth.F Keerthiga.K Lavanya Gowri.S Monisha.M Nagaarjun.D Manoj Kumar.S NandhiniPriya.R Mythili.P Kamala Dharshini.D Selva Kumar Perumal Prathik P Rao Sowmiya K Prashanthkumar KRaghul.R Selva Krishna S S Shalini D Uthra Devi S	Udhaya Prakash D Vinoth Kumar Prakash S Suganthan S Santhosh Kumar I Vijayaragavan B Sridharan R Dineshkumar S Srivarshini G UdayaShankar S Sivakumar N Dharani Raja G Maheswari R Amutha A Sruthi K Sinvaranjini M Savolin S	BE.EEE	One Day Workshop on Custom IC Design using CADENCE EDA Tool	MCET	08.10.2015

Sr.no	Student's Name	Branch and Department	Details of Event	Organizer and place of program	Date Of the event
1.	Udhayashankar.S	BE & EEE(IV Yr)	Internship	Robert Bosch, Coimbatore	24.12.2015
2	Hema.P Moorthy.B Vinothkumar.K Jaivignesh S Danusa U Kamalahasan L	BE & EEE(IV Yr)	Internship	Swelect Energy System, Edappadi, Salem	15.12.2015 to 30.12.2015

Sr.no	Student's Name	Branch and Department	Title of Paper Presented	Organizer and Place of program	Date Of the event
1	Guna Sundari.B	BE EEE	License Plate Recognition system using DIP	Sri Sakthi Institute of Technology CBE	11-10-2014
2	Annie Marit Vijila.N.P Elamathi.S	BE EEE	Solar Tree	Sri Sakthi Institute of Technology CBE	11-10-2014
3	Elakkiah.C Cheralathan.V	BE EEE	Automatic Way Bridge opening security system	BIT Sathy	9-10-2014

Staff Development Programs

Dept.	Name of the Coordinator(s) with Designation	Title	Conducted at (Venue)	Sponsored by	No. of Participants attended	Date(s)
EEE	Mr. R.Muthubharathi AP/EEE Mr. C.Kannan AP/EEE Mr. B.Vigneshkumar AP/EEE Ms.K.Durgalakshmi AP/EEE	Two-Day Workshop On Embedded Robotics using Advanced Microcontroller	Hall NO. C 207, EEE Department	Dr.MCET	46	10.09.2015 to 11.09.2015
EEE	Dr..K.N.Vijeyakumar Associate Prof/EEE Mrs.K.Saranya AP/EEE Ms.M.Sangeetha AP/EEE	One Day Workshop on Custom IC Design using CA-DENCE EDA Tool	Hall NO. C 322 EEE Department	Dr.MCET	31	28.09.2015

Dept.	Name of the Faculty with Designation	Details of Program	Place of Program	Date
EEE	Mr.Gnanaprakasam AP/EEE Mr.Muthuvel AP/EEE	Short Term Training Program on "PLC & HMI" organized by MCET – BOSCH REXORTH (Regional Centre of competence in Industrial Automation Technologies	Dr.MCET, Department of ICE	21.09.2015 to 23.09.2015

Dept.	Co-ordinator / Co-ordinator with Designation	Details of Program	Date
EEE	Mr. Nandhakumar AP/SS/EEE Mr.R.Muthubharathi AP/EEE	Alumni Interaction with 3 rd and 2 nd year Students	09.09.2015
EEE	Mr. R.Muthubharathi AP/EEE Mr.C.Kannan AP/EEE	One Day workshop on ARDUINO Programming for 3 rd year Students	30.09.2015

Dept.	Name of the Coordinator(s) with Designation	Title	Conducted at (Venue)	Sponsored by	No. of Participants attended	Date(s)
EEE	Dr.K.N.Vijeyakumar Associate Prof./EEE Mrs.K.Saranya AP/EEE Ms.M.Sangeetha AP/EEE Mr.A.Nandha Kumar/AP/ SS(AVERA co-ordinator) Mr.R.Muthubharathi AP/ EEE(AVERA co-ordinator)	One Day Workshop on Custom IC Design using Cadence EDA Tool	Hall NO. C 322 EEE Department	Dr.MCET	33	08.10.2015

Dept.	Name of the Faculty with Designation	Details of Program	Place of Program	Date
EEE	Mr.M.Mohanasundaram AP/EEE	Two Weeks workshop on Technical Communication	Dr.MCET	08.10.2015
EEE	Mr. R.Muthubharathi AP/EEE	Two Weeks workshop on Technical Communication	Dr.MCET	08.10.2015

Dept	Name of the Author(s) with Designation	Title of the Paper Presented	Title of the Conference / Seminar	Conducted by	Conducted at (Venue)	Date(s) of Paper Presented
EEE	Mrs.L.Chitra AP(SS)/EEE Ms.K.Saranyadevi PG Scholar/EEE	Modelling & Simulation of Modified Multiple Input Converter Based Grid Tied Inverter for Hybrid Wind/Solar/Battery System	International Conference on Modelling, Simulation and Control [ICMS – 2015]	Karpagam College of Engineering	Karpagam College of Engineering	15.10.2015 to 16.10.2015



“Renewable Energy and Sustainable Environment”, a four-day conference in collaboration with the Department of Science and Technology, Government of India, the IEEE and Cape Breton University, Canada. MCET and CBU have a 15 year old MoU, which culminated in the organization of this conference. This conference is a result of two summits which were held in the past four years, one at Canada (2011) and the other at MCET(2013).

The conference aims to provide a platform for scientists and engineers from industries, governmental/non-governmental organizations, and educational institutions from around the world to exchange their proficiency and perceptions on this vital and most relevant topic, Sustainable development. The expositions will revolve around tackling the challenges and recognizing opportunities in the renewable energy sector, the means to fulfill the needs of power on an economical scale without compensating on the ability for the future generations to meet their requirements .

PLACEMENT DETAILS



Surendra Prasad.B



**Selvakumar Perumal
Udhayaprakash D
Om Prakash.R
Tamarai Selvan.T**



**Alousiys Richard Rozario.E
Dhivya.R
Elakkiah.C
Keerthana.K
Nandhini priya.R
Balavenkateshwaran.C
Priya.R.M
Sabthagirivasan A
Shalini D
Sivaranjani M
Sowmiya K**



Sruthi.K



**Sairanjith K
Anisha Nazrin.K
Annie Marit Vi-
jila.N.P**



**Syed Mohammed
Ashik A**



**Shibu Chakravarthi S
Valli Pavithra N**



Udhayaprakash D

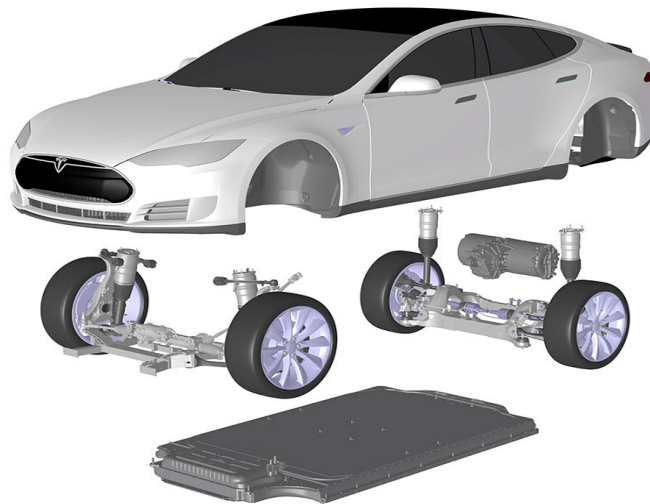


**Aarthi N
Ajay J
Arockia Revanth F
Gunasundari B
Jayalakshmi V
Kamaladharshini D
Kanimozhi S
Karthika M
Keerthiga K
Udayashankar S
Lavanyagowri S
Manoj Kumar S
Nivetha S
Ponsankari S
Prabakaran N
Prasanth B
Praveen Kumar R
Rajkumar T
Shilpa V M
Sivakumar N
Sridharan R
Suburaman M
Sudhakaran B
Sukanya K
Sumrudhah I
Syed Yusuf G
Udayashankar S**

TESLA MODEL S (FUTURE OF AUTOMOBILE)

The Tesla Model S is a fully electric, 4-door sedan with a rear hatchback. All Model S sedans are rear-wheel drive, with all-wheel drive unavailable. The sedan's rear hatch opens to reveal a cargo area or two optional rear-facing seats that increase its seating capacity to seven.

The base-level Tesla Model S is powered by a 362-horsepower version of the sedan's electric motor. The Model S Performance has 416 hp. Also available is an



Powertrain:

Model S is an electric vehicle available in both rear wheel and all-wheel drive configurations. The liquid-cooled powertrain includes the battery and one or more motors, drive inverters and gear boxes. 70 kWh or 85 kWh microprocessor controlled, lithium-ion battery. Three phase, four pole AC induction motor with copper rotor. Drive inverter with variable frequency drive and regenerative

Tesla's commitment to developing and refining the technologies to enable self-driving capability is a core part of our mission. We started equipping Model S with hardware to allow for the incremental introduction of self-driving technology: a forward radar, a forward-looking camera, 12 long-range ultrasonic sensors positioned to sense 16 feet around the car in every direction at all speeds, and a high-precision digitally-controlled electric assist braking system.

Today's Tesla Version 7.0 software release allows those tools to deliver a range of new active safety and convenience features, designed to work in conjunction with the automated driving capabilities already offered in Model S. This combined suite of features represents the only fully integrated autopilot system involving four different feedback modules: camera, radar, ultrasonics, and GPS. These mutually reinforcing systems offer realtime data feedback from the Tesla fleet, ensuring that the system is continually learning and improving upon itself. Autopilot allows Model S to steer within a lane, change lanes with the sim-

"Model S to steer within a lane, change lanes with the simple tap of a turn signal, and manage speed by using active, traffic-aware cruise control. Digital control of motors, brakes, and steering helps avoid collisions from the front and sides, as well as preventing the car from wandering off the road. Your car can also scan for a parking space, alert you when one is available, and parallel park on command. Tesla Autopilot relieves drivers of the most tedious and potentially dangerous aspects of road travel. We're building Autopilot to give you more confidence behind the wheel, increase your safety on the road, and make highway driving more enjoyable. While truly driverless cars are still a few years away, Tesla Autopilot functions like the systems that airplane pilots use when conditions are clear. The driver is still responsible for, and ultimately in control of, the car. What's more, you always have intuitive access to the information your car is using to inform its actions. This release also features the most significant visual refresh yet of the digital displays for every single Model S around the world. The Instrument Panel is

is focused on the driver and includes more functional apps to help monitor your ride. The release of Tesla Version 7.0 software is the next step for Tesla Autopilot. We will continue to develop new capabilities and deliver them through over-the-air software updates, keeping our customers at the forefront of driving technology in the years ahead.

Charging:

10 kW capable on-board charger with the following input compatibility: 85-265 V, 45-65 Hz, 1-40 A (Optional 20 kW capable Dual Chargers increases input compatibility to 80 A). Peak charger efficiency of 92%. 10 kW capable Universal Mobile Connector with 120 V, 240 V, and J1772 adapters.

Instrumentation :

17" capacitive touchscreen with media, communication, cabin, and vehicle controls. Bluetooth wireless technology for hands-free calling.

-R.Mukesh Krishna(3rd EEE)

"If you want to find the secrets of the universe, think in terms of energy, frequency and vibration."

Nikola Tesla

GRAPHENE

As its name indicates, graphene is extracted from graphite, the material used in pencils. Like graphite, graphene is entirely composed of carbon atoms and 1mm of graphite contains some 3 million layers of graphene. Whereas graphite is a three-dimensional crystalline arrangement, graphene is a two-dimensional crystal only an atom thick. The carbons are perfectly distributed in a hexagonal honeycomb formation only 0.3 nanometres thick, with just 0.1 nanometres between each atom. This 100% pure carbon simplicity confers some remarkable properties on graphene, very close to the calculated theoretical ones, as observed .



A piece of graphene aerogel - weighing only 0.16 milligrams per cubic centimeter - is placed on a flower .

Graphene conducts electricity better than copper. It is 200 times stronger than steel but six times lighter. It is almost perfectly transparent since it only absorbs 2% of light. It is impermeable to gases, even those as light as hydrogen or helium, and, if that were not enough, chemical components can be added to its surface to alter its properties . "Graphene is a platform, like a chessboard, on to which one can place the pawns you want. The subtlety lies in finding the right positions. There is a real beauty in its simplicity," explained Vincent Bouchiat, from the Institut Néel in Grenoble, part of the National Centre for Scientific Research (CNRS).

"The future lies in pencil graphite!" said Annick Loiseau, from the National Office for Aerospace Studies and Research (ONERA), coining a slogan. She is the French representative to the executive

The project was officially launched last month. "We have already learnt a great deal but new results could emerge in certain situations – only we don't yet know which ones," said Mark Goerbig, another CNRS researcher, who works in the solid physics department at Paris-Sud Orsay University.

This miracle material has come a long way. In theory, such a two-dimensional structure was believed to be unstable and therefore better rolled up, as observed in 1990s with carbon nanotubes. In 2004 two Russian-born scientists, Andre Geim and Konstantin Novoselov, along with others, published the first electronic measurements proving they had isolated graphene. They had removed carbon flakes from graphite using bits of sticky tape – which ultimately led to them winning a [Nobel prize for physics in 2010](#).

Strictly speaking, graphene is single-layered, but manufacturing processes may create stacks of several layers. When more than 10 layers are created, the properties change enormously and resemble graphite more than graphene. In fact, as with carbon nanotubes, the considerable diversity of types of graphene need to be taken into account. Size certainly matters, but so does the chemical state. The molecule may be oxidised to a greater or lesser extent, or contain different amounts of residual impurities as a result of how the graphene is synthesised, or how its layers are built up.

"The theory only really held true for two dimensions, but in actual fact the crystal grows in a three-dimensional space and the small surface fluctuations, like waves, stabilise the crystal," said Goerbig.

Experiments rapidly confirmed the marvellous behaviour of this new material, which can be explained by a kind of sea of electrons on the surface that nothing can stop and that do not interact with each other. It's as though the electrons have no mass and move at a speed 300 times slower than light. The mathematical equation to describe them is closer to that for high-energy particles than for solid matter, hence this outstanding performance that suggests so many potential uses.

-K.S.Varsha(3rd EEE)

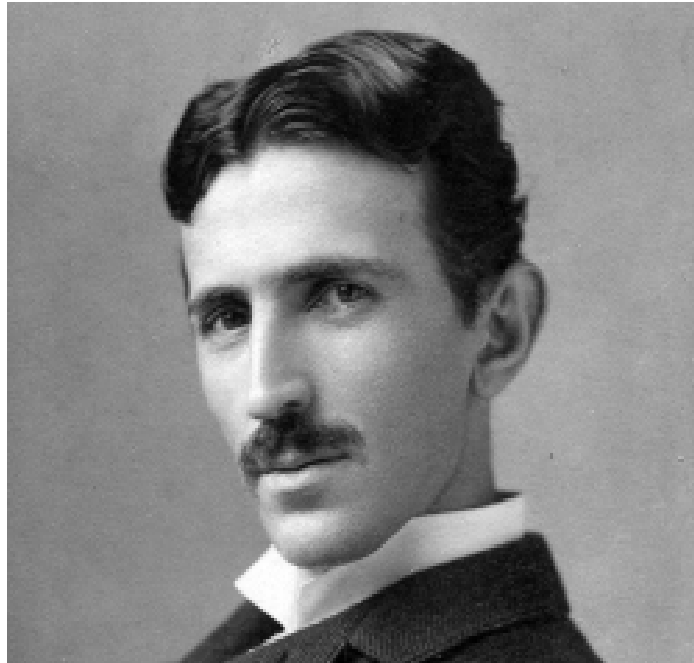
Any intelligent fool can make things bigger, more complex, and more violent. It takes a touch of genius -- and a lot of courage -- to move in the opposite direction.

Albert Einstein

NIKOLA TESLA

Synopsis:

Inventor Nikola Tesla was born in July of 1856, in what is now Croatia. He came to the United States in 1884 and briefly worked with Thomas Edison before the two parted ways. He sold several patent rights, including those to his alternating-current machinery, to George Westinghouse. His 1891 invention, the "Tesla coil," is still used in radio technology today. Tesla died in New York City on January 7, 1943.



Early Life:

Nikola Tesla was born on July 10, 1856, in what is now Smiljan, Croatia. Tesla's interest in electrical invention was spurred by his mother, Djuka Mandic, who invented small household appliances in her spare time while her son was growing up. Tesla's father, Milutin Tesla, was a priest and a writer, and he pushed for his son to join the priesthood. At the age 28 Tesla decided to leave Europe for America.

Famed Inventor:

In 1884 Tesla arrived the United States with little more than the clothes on his back and a letter of introduction to famed inventor and business mogul Thomas Edison, whose DC-based electrical works were fast becoming the standard in the country. Edison hired Tesla, and the two men were soon working tirelessly alongside each other, making improvements to Edison's inventions. However, several months later, the two parted ways due to a conflicting business-scientific relationship, attributed by historians to their incredibly different personalities. Edison was a power figure who focused on marketing and financial success, Tesla was commercially out-of-tune and somewhat vulnerable. Tesla's AC system eventually caught the attention of American engineer and business man George Westinghouse, who was seeking a solution to supplying the nation with long-distance power. Convinced that Tesla's inventions would help him achieve this, in 1888 he purchased

Tesla, for his part, continued in his work and would patent several more inventions during this period, including the "Tesla coil," which laid the foundation for wireless technologies and is still used in radio technology today. In addition to his AC system and coil, throughout his career, Tesla discovered, designed and developed ideas for a number of other important inventions—most of which were officially patented by other inventors—including dynamos (electrical generators similar to batteries) and the induction motor. He was also a pioneer in the discovery of radar technology, X-ray technology, remote control and the rotating magnetic field—the basis of most AC machinery.

The fall from Grace:

Having become obsessed with the wireless transmission of energy, around 1900 Nikola set to work on his boldest project yet: to build a global, wireless communication system—to be transmitted through a large electrical tower—for sharing information and providing free electricity throughout the world.

With funding from a group of investors that included financial giant J. P. Morgan, in 1901 Tesla began work on the project in earnest, designing and building a lab with a power plant and a massive transmission tower on a site on Long Island, New York, that became known as Wardenclyffe. However, when doubts arose among his investors about the plausibility of Tesla's system and his rival, Guglielmo Marconi—with the financial support of Andrew Carnegie and Thomas Edison—continued to make great advances with his own radio technologies, Tesla had no choice but to abandon the project. The Wardenclyffe staff was laid off in 1906 and by 1915 the site had fallen into foreclosure. Two years later Tesla declared bankruptcy and the tower was dismantled and sold for scrap to help pay the debts he had accrued.

-M.Ashoke kumar(3rd EEE)

"Don't take rest after your first victory because if you fail in second, more lips are waiting to say that your first victory was just luck."

A.P.J Abdul Kalam

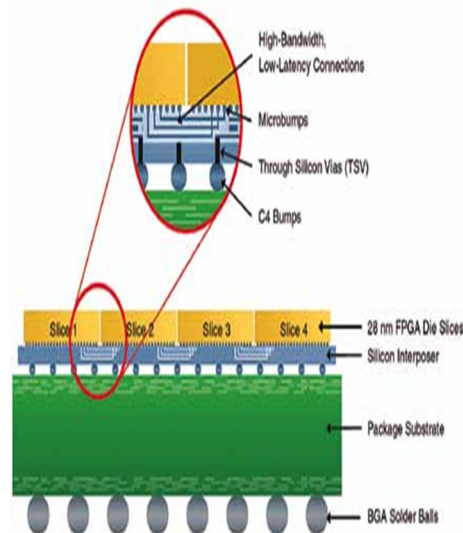
3D CHIPS - THE FUTURE OF ELECTRONICS

Three-dimensional integrated circuits or 3D chips are believed to be the best way to keep Moore's Law ticking. These sound ideal for next-generation designs, provided manufacturing beefs up and costs go down. Here we try to answer some frequently-asked questions about 3D chips—and whether they really are 3D. On an average, a chip holds over one billion transistors today. Intel's 10-core Xeon Westmere-EX packs 2.6 billion transistors into a 512mm² area using 32nm technology. But even that is not enough. The thirst for more features and processing power is unquench-able, but how much more can you pack on to a chip?.

Plus, if you need to make chips denser, the fabrication costs might also become unreasonably high. Such issues have led to the adoption of three-dimensional (3D) integrated circuit technology, wherein two or more dice are stacked atop each other and linked with suitable interconnects. You can draw a parallel with skyscrapers, which help overcome space shortage within large cities, and elevators that make it possible for people and even vehicles to easily travel to any of the floors.

What are the main benefits of 3D chips?

1. 3D chips save space. Dice that used to be centimetres apart on a chip can now be placed millimetres apart, and that too vertically.
2. Since the dice are close by, the interconnect length is significantly smaller. This results in low latency and higher performance.
3. Stacking helps overcome the memory-to-processor performance .



4. 3D interconnects permit data to be moved both horizontally and vertically. This helps boost performance by 30 to 40 per cent.

Are today's '3D' chips really 3D?

There is a difference between a 3D package and a 3D IC.

In a 3D package, separate chips are stacked in a single package. They may be stacked one above the other or side-by-side. This arrangement is often called a chip stack, system-in-package (SiP) or multi-chip module (MCM).

A 3D IC is a single chip. Multiple dice are stacked, connected using through-silicon vias (TSVs), and multiple groups of dice again connected together using a silicon interposer—and all of this is mounted on a single SiP.

3D chips are in development stage,. Pure 3D ICs (stacking in package) are still a point of research. Although Intel has showcased quite a few 3D ICs in the past, such as the 3D Pentium CPU in 2004 .

Challenges before the industry :

First, there is the issue of thermal flux. "Stacking multiple active dies directly on top of each other leads to high concentrations of heat which cannot easily be dissipated," explains Peckham. SSI technology places active silicon side-by-side with active silicon on top of passive silicon, thus avoiding the thermal flux issues. While this is workable in MCMs, it is still a daunting issue in true 3D chips. IBM, along with 3M, is working hard to overcome this problem . Testing of independent dice is relatively tough because of the tight integration between active layers.

Techniques for stacking the dice in a 3D chip

There are several ways to stack chips. Giles Peckham, EMEA director-Marketing, Xilinx, explains the most common ones:

1. Connecting two stacked chips to a flip chip at the bottom of the stack. Examples are SoCs where dynamic random-access memory (DRAM) is placed on top of the central processing unit (CPU).
2. Using TSV, where the dice are placed on top of each other and connected through vertical copper channels. An example of TSV usage is the super-density DRAMs used in camera CMOS sensors.
3. Making use of a silicon transposer, which connects two or more chips together—much like the transposers used in AMD graphics cards. Xilinx adopts a technology called stacked silicon interconnect (SSI).

-V Nanthagopal(3rd EEE)

"There is a fundamental difference between religion, which is based on authority, and science, which is based on observation and reason. Science will win, because it works."

SAPHONIAN WIND TURBINE DESIGN

Inspiration:

Sailboats are an old technology that has been used for ages. Till today, a sail is the only system capable of capturing and converting the majority of the kinetic energy of the wind into mechanical power. Sails produce energy to power transportation. So, we asked the question: can we use a sail-inspired wind technology to produce electricity? As illustrated by the development of the Solar Aero and Catching Wind Power turbines.



Pototype:

Our last results came from our last Saphonian prototype characteristics:

Version: Generation 2 (V.2)
 Diameter: 1.2 m
 Area: 1.13 m²
 Rated Wind Speed: Not applicable
 Number of Pistons: 5
 Transmission Option: Hydraulic
 The above mentioned values are for test conditions .

Biomimetics An Biodesign:

Biomimetics is a human-made process resulting from the observance of the nature, which inspired high-tech solutions. As regard to this philosophy, the Saphonian can be considered as a Biomimetic-compliant system inspired from nature to satisfy nature. So, the Saphonian Zero-Blade design and development reconcile outstanding technical performance and high nature integration potential.

Zero-Blade Technology:

Saphon's aim wasn't to improve the current wind turbines technology but rather to challenge the "box" and develop a radical new way of harnessing the wind. Anis' basic idea was to remove the whole rotating system (blades and hub) and to replace it by a non-rotational sail-shaped body. The idea has evolved over time and emerged as a promising technology named the Zero-Blade Technology. The related wind converter, baptized "The Saphonian", is bladeless, rotationless, and follows, instead, a back and forth 3D knot motion, largely inspired from sailboats .

he tests we have done with our various prototypes (V.1 and V.2) have confirmed and validated most of our theoretical assumptions / projections. They also proved that the Saphonian is by far more efficient than a comparable bladed turbines and that its Performance Coefficient (Cp) is way beyond Betz Limit (59.3%). The Saphonian efficiency level stands at the outstanding level of around 80% (for the same swept area) and therefore, its generated power is increasing exponentially with the wind speed. The Saphonian has no rated wind speed and the synchronization of its motion with the different wind speeds enables it to remain at its efficiency optimum level at any wind speed. Giving its bladeless design, the Saphonian has no tip speed ratio (λ).

Illustration:

Tunisian green energy startup Saphon Energy has created a new bladeless wind turbine which draws inspiration from the design of a ship's sails, and promises to convert the kinetic energy of the wind

Dubbed the "Saphonian," in honor of an ancient wind divinity worshiped by the Carthaginian Mediterranean culture which predated modern Tunisia, the current iteration of bladeless wind turbine is the second prototype developed by the company thus far. and Catching Wind Power bladeless turbines, there is a perceived need for wind turbines which can offer renewable energy while also avoiding the use of rotating blades, which can cause noise pollution and be harmful to birds.

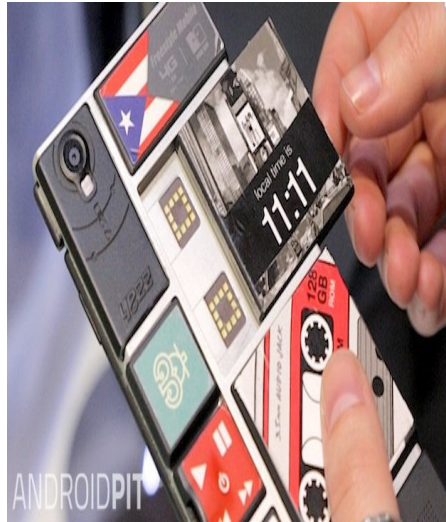
The Saphonian turbine implements a patented system called "Zero-Blade Technology" in order to harness the wind's energy. This is said to involve channeling the wind in a back and forth motion, until it is converted into mechanical energy using pistons. The pistons then produce hydraulic pressure, which can be instantly converted to electricity via a hydraulic motor and a generator, or stored in a hydraulic accumulator .

- S Abinaya(3rd EEE)

Do not fear mistakes. You will know failure. Continue to reach out. -- Benjamin Franklin

GOOGLE PROJECT ERA

Google is attempting to revolutionize the smartphone industry with its Project Ara modular smartphone, which it will be launching in Puerto Rico as a pilot launch. Google has also recently announced one of the first creators of modules for the new device, a company called Yezz. Project Ara is a new platform that allows users to create their own smartphones through purchasing modules rather than full phones. This is great because it's cheaper for the user and should also allow a user to keep their phone for longer. For example, as technology evolves, users can upgrade parts such as processors or storage rather



what's the big idea?

We first heard about Project Ara back in 2013 when it was called Phone-Bloks. Google gave it a new name and built a prototype earlier this year, and it retained project Ara when it sold its recently acquired Motorola division to Lenovo. The idea behind Project Ara is simple enough, although Google doesn't do it any favors by describing it as "a development effort to create a modular hardware ecosystem". It takes a smartphone and breaks it down into LEGO-style blocks, and those blocks are attached to each other and to a metal base plate using magnets.

Not only that, but someone who is really into photography might want to focus their money on buying high-tech camera modules, while someone who has a lot of media might first want to upgrade their storage. This could completely change the "one size fits all" mentality surrounding the smartphone industry and will really allow users to personalize their smartphone experience. Yezz is the first of what is expected to be many manufacturers creating Ara modules. As more companies begin to create modules, more options and possibilities will become available to users. While it is unclear how much Project Ara modules will cost, the idea is that they will be much cheaper than purchasing new phones. Yezz operates in Miami but counts Latin America as one of its main markets, which is likely the reason that Google has approached the company as one of its first module creators. It is not known if Yezz will find success in the U.S. market once Project Ara is finally



Luckily, the ambitious project has managed to survive, is still live and after a considerable period of silence has been quite active with status updates in the last few days. We now know that the previously planned Puerto Rico debut won't come to pass and that the launch is postponed for 2016 and perhaps even later.

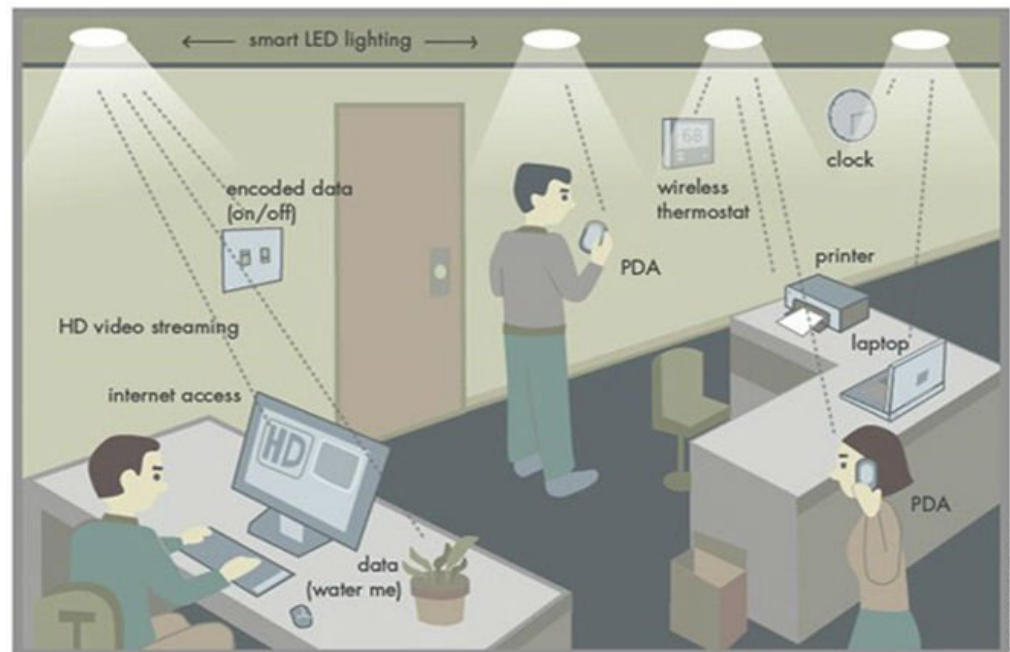
The latest development in the project Ara saga suggests that the initiative might be passed along to Motorola. Since Ara was first adopted by Google, Motorola Mobility was sold off to Lenovo for \$2.9 billion, naturally leading to some restructure in the Moto-managed research and development. This affected many Google projects, but the search giant never sold off Motorola completely. In fact its large patent portfolio and "Advanced Technology Group" are still part of the Google family and might actually take over project Ara.

-E KothaiNayagi(3rd EEE)

"The scientists of today think deeply instead of clearly. One must be sane to think clearly, but one can think deeply and be quite insane."

LIFI (LIGHT FIDELITY)

Expect to hear a whole lot more about Li-Fi - a wireless technology that transmits high-speed data using visible light communication (VLC) - in the coming months. With scientists achieving speeds of 224 gigabits per second in the lab using Li-Fi earlier this year, the potential for this technology to change everything about the way we use the Internet is huge. And now, scientists have taken Li-Fi out of the lab for the first time.



Trialling it in offices and industrial environments in Tallinn, Estonia, reporting that they can achieve data transmission at 1 GB per second - that's 100 times faster than current average Wi-Fi speeds. Li-Fi was invented by Harald Haas from the University of Edinburgh, Scotland back in 2011, when he demonstrated for the first time that by flickering the light from a single LED, he could transmit far more data than a cellular tower. Think back to that lab-based record of 224 gigabits per second - that's 18 movies of 1.5 GB each being downloaded every single second.

The technology uses Visible Light Communication (VLC), a medium that uses visible light between 400 and 800 terahertz (THz). It works basically like an incredibly advanced form of Morse code - just like switching a torch on and off according to a certain pattern can relay a secret message, flicking an LED on and off at extreme speeds can be used to write and transmit things in binary code.

The benefits of Li-Fi over Wi-Fi, other than potentially much faster speeds, is that because light cannot pass through walls, it makes it a whole lot more secure, and as Anthony Cuthbertson points out at IBTimes UK, this also means there's less interference between devices.

While Cuthbertson says Li-Fi will probably not completely replace Wi-Fi in the coming decades, the two technologies could be used together to achieve more efficient and secure networks. Our homes, offices, and industry buildings have already been fitted with infrastructure to provide Wi-Fi, and ripping all of this out to replace it with Li-Fi technology isn't particularly feasible, so the idea is to retrofit the devices we have right now to work with Li-Fi technology. Research teams around the world are working on just that. Li-Fi experts reported for the The Conversation last month that Haas and his team have launched PureLiFi, a company that offers a plug-and-play application for secure wireless Internet access with a

If applications like these and the Velmenni trial in Estonia prove successful, we could achieve the dream outlined by Haas in his 2011 TED talk below - everyone gaining access to the Internet via LED light bulbs in their home.

"All we need to do is fit a small microchip to every potential illumination device and this would then combine two basic functionalities: illumination and wireless data transmission," Haas said.

"In the future we will not only have 14 billion light bulbs, we may have 14 billion Li-Fis deployed worldwide for a cleaner, greener, and

-M Arun(3rd EEE)

"If your hate could be turned into electricity, it would light up the whole world."

POWER WALL

Power wall:

Powerwall is a home battery that charges using electricity generated from solar panels, or when utility rates are low, and powers your home in the evening. It also fortifies your home against power outages by providing a backup electricity supply. Automated, compact and simple to install, Powerwall offers independence from the utility grid and the security of an emergency backup. Tesla home batteries maximize the usefulness of your solar panels and offer a variety of backup electricity supply solutions. You can even go off the grid.



Capacity:

Each Powerwall has a 7 kWh energy storage capacity, sufficient to power most homes during the evening using electricity generated by solar panels during the day. Multiple batteries may be installed together for homes with greater energy needs. A 10 kWh weekly cycle version is available for backup applications.

How much electricity does my home use?

Common household electricity consumption is about 7.45 kw. And it varies based on the consumer who uses it.

Solar electricity at night:

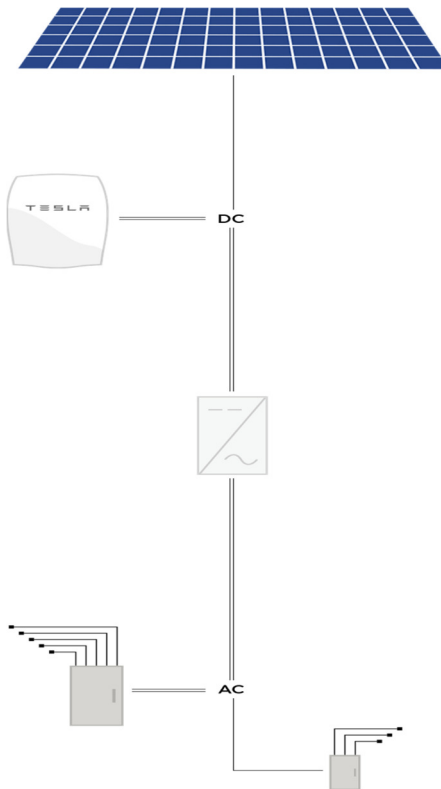
Powerwall stores electricity generated by solar panels during the day and makes it available to your home in the evening. This bridges the gap between peak solar and peak demand, allowing you to use your photons when you need them.

Go net zero:

Combine solar panels and one or more Powerwall home batteries to power your home independently from the utility grid. A net zero energy rating means that your home produces as much energy as it consumes, but is still connected to the utility grid for periods of high demand.

Emergency backup:

In the event of a utility outage, Powerwall can power your entire home or select appliances with an uninterrupted supply of electricity. When installed along with solar panels, Powerwall will allow your home to use solar generated electricity during a utility outage. Current generation home batteries are bulky,



Solarpanels:

Panels convert sunlight into electricity that charges Powerwall and powers your home during the day. Without solar, Powerwall can reduce time of use power bills by strategically shifting energy consumption.

Powerwall:

The home battery is charged with electricity generated by solar panels or from the utility grid.

Inverter:

The inverter converts direct current electricity from solar panels, the grid and Powerwall into the alternating current used by your home's lights, appliances and devices. All Powerwall installations require a compatible inverter. To maximize solar consumption, a meter is also installed to measure solar production and home energy use.

-S Sarath(3rd EEE)

As far as the laws of mathematics refer to reality, they are not certain; and as far as they are certain, they do not refer to reality. -- Albert Einstein

Test Your Grey Cells

TRICKY PUZZLES

Questions:

1. What mathematical symbol can be put between 5 and 9, to get a number bigger than 5 and smaller than 9?
2. A poor woman and a rich woman are talking about music. The poor woman says she has studied music and can name a song with any name in it. The rich woman says "OK, if you can find a song with my son's name in it, I will give you a thousand dollars. His name is Demarcus-Jabari." The poor woman gives her answer and is instantly \$1,000 richer. What was her answer?
3. A bomb goes off. Carnage. One person, only a few feet away, survives! How can this be?
4. You are in a dark room with a candle, a wood stove and a gas lamp. You only have one match, so what do you light first?
5. What occurs once in every minute, twice in every moment, but never in a thousand years?
6. You are making an opaque cube (ie you cannot see through its sides). It can be any size that you want it to be. Where do you place the cube so that you can see as many sides as possible?
7. A criminal gets to pick his punishment by choosing among three rooms. The first is full of burning fires, the second is full of assassins with loaded guns, and the third is full of lions that haven't eaten in 3 years. Which room is the safest choice?
8. The following equation is wrong: $101 - 102 = 1$. Move one numeral to make it correct. Move one line to make it correct.

Answers:

1. A Decimal Point (5.9).
2. "Happy Birthday."
3. The person was watching it on TV.
4. The match of course.
5. The letter "m".
6. You place it so you are standing inside it, in a corner. You can then see all sides. It is a very big cube.
7. The Third Room. The Lions will be dead by now (we should punish whoever was supposed to look after them! Luckily this is just a puzzle and not real).

BRAIN TEASERS

Questions:

1. I am an odd number. Take away one letter and I become even. What number am I?
2. Using only addition, how do you add eight 8's and get the number 1000?
3. Sally is 54 years old and her mother is 80, how many years ago was Sally's mother three times her age?
4. Which 3 numbers have the same answer whether they're added or multiplied together?
5. There is a basket containing 5 apples, how do you divide the apples among 5 children so that each child has 1 apple while 1 apple remains in the basket?
6. There is a three digit number. The second digit is four times as big as the third digit, while the first digit is three less than the second digit. What is the number?
7. What word looks the same backwards and upside down?
8. Two girls were born to the same mother, at the same time, on the same day, in the same month and in the same year and yet somehow they're not twins. Why not?
9. A ship anchored in a port has a ladder which hangs over the side. The length of the ladder is 200cm, the distance between each rung is 20cm and the bottom rung touches the water. The tide rises at a rate of 10cm an hour. When will the water reach the fifth rung?

Answers:

1. Seven (take away the 's' and it becomes 'even').
2. $888 + 88 + 8 + 8 + 8 = 1000$
3. 41 years ago, when Sally was 13 and her mother was 39.
4. 1, 2 and 3.
5. 4 children get 1 apple each while the fifth child gets the basket with the remaining apple still in it.
6. 141
7. SWIMS
8. Because there was a third girl, which makes them triplets!
9. The tide raises both the water and the boat so the water will never reach the fifth rung.

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Vision of the institute:

We develop a globally competitive workforce and entrepreneurs.

Mission of the institute:

Dr.Mahalingam College of Engineering and Technology, Pollachi endeavours to impart high quality, competency based technical education in engineering and technology to the younger generation with the required skills and abilities to face the challenging needs of the industry around the globe. This institution is also striving hard to attain a unique status in the international level by means of infrastructure, start-of-the-art computer facilities and techniques.

Vision of the department:

Emerge as the world leader for the Electrical and Electronics Engineering education and research for the application of knowledge to the society.

Mission of the department:

The EEE Department believes that every student is a unique and is in a process of continuous growth. In order to foster growth and empowerment, we commit ourselves to,

- Provide a stimulating learning environment with a technological orientation to maximize individual potential.
- Continuous pursuit of quality and excellence.
- Provide appropriate know-how and up-to-date knowledge.
- Nurture creativity and ambit for research.

Programme Educational Objectives

PEO1. Actively apply technical and professional skills in engineering practices to face industrial challenges around the globe.

PEO2. Own their professional and personal development by continuous learning and apply to create new knowledge.

PEO3. Conduct themselves in a responsible, professional and ethical manner supporting sustainable economic development, which enhances the quality of life

Programme Outcomes

- PO1** : Apply the knowledge of Mathematics, Science and Engineering to solve problems in the field of Electrical and Electronics Engineering
- PO2** : Identify, formulate/model, analyze and solve complex problems in the field of Electrical and Electronics Engineering
- PO3** : Design an Electrical/Electronic System/Component, or Process to meet specific purpose with due consideration for economic, environmental, social, political, ethical, health and safety issues
- PO4** : Design and conduct experiment, analyze and interpret data to provide valid conclusions in the field of Electrical and Electronics Engineering
- PO5** : Apply appropriate techniques and modern tools for design and analysis of Electrical/Electronic systems with specified constraints
- PO6** : Apply contextual knowledge to provide engineering solutions with societal, professional & environmental responsibilities
- PO7** : Provide sustainable solutions within societal and environmental contexts for problems related to Electrical and Electronics Engineering
- PO8** : Comply with code of conduct and professional ethics in engineering practices
- PO9** : Work effectively as an individual or as a member/leader in multi-disciplinary team to find solutions for engineering problems
- PO10** : Communicate effectively to engineering community and society with proper aids and documents
- PO11** : Demonstrate knowledge and understanding of the engineering and management principles to manage projects in multidisciplinary environment
- PO12** : Recognize the need for, and have the ability to engage in independent and lifelong learning