



# AATRAl

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EEE Newsletter  
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<b>contents</b>	01
Symposium	02
Alumni Talk	03
Departmental Activities	05
Alumni Meet	06
Bridge Course	07
Electricity and Students	

## SYMPOSIUM 2K16



*"Coming together is a beginning; keeping together is progress; working together is success". Henry Ford*

This was the exact scenario in STROM 2K16 when students from many colleges came together to exhibit their talents and showcase their skills with all credit going to our HOD and the entire EEE department for having provided us this opportunity. The various events that were conducted tested the integrity and the abilities of the students to solve the unsolvable. Though the event was meant primarily for the students of EEE department even students from other departments showed interest in participating. STROM 2K16 enabled us to develop a healthy inter college relationship. Our Principal Dr. Jose Swaminathan provided words of inspiration by saying that engineers should build their thoughts and those thoughts into actions. And finally to answer the question which might have risen in your mind- "STROM", it means electricity in Deutsch.

**Shane Richard.N and Arulious Jora.A**  
II EEE

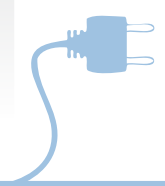
**"What you resist, persists"**  
Carl Jung

## ALUMNI MEET



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## Alumni Talk

### Mr DAVID DEEPAK J

#### EEE Graduate from 2012-2016 Batch



It's been 9 months since I stepped out of LICET, but it's true what they say, "Memories die hard". I feel honoured to be an alumnus of such a great institution. I take great pride in telling that I belong to 2012-16' batch, where I wonder if I would've enjoyed to such an

extent, if I had joined some other college. I take this opportunity to thank all faculty members who had put their hard work in imparting the knowledge into each one of us. At the end of the day it all matters what you have learnt from the college and all of us are very thankful to the life-experience, I should say, that LICET gave us, be it academics, cultural or sports. Nothing can be compared, to the memories we shared. The awesome times that we had, made everything so rad. Whenever I witness some events or happenings here, in my college, NITK (NIT Karnataka) where I am pursuing my masters, it takes me down the memory lane with my friends at LICET leaving a smiling tear on my face. Leaving LICET was the hardest thing to do though I wasn't a hosteller. One can see a different methodology followed by the faculties here at LICET, be it the encouragement they give to the students for taking seminars for improving their communication skills and kill that stage fear, or be it for presenting papers in other colleges or in journals, to improve the student's technical knowledge and to make him/her ready in all aspects to face the outer competitive world for employment. I also take this opportunity to wish my juniors for their future and also to enjoy their stay at LICET. A bit of advice for the juniors: Only a strong foot in the technical arena will help you in the long run, so choose a field which you like and venture into even the smallest of the details in it and leave no leaf unturned.

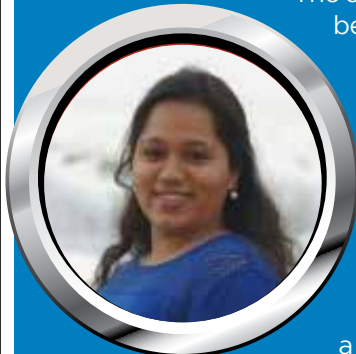
### Mr. ISAIAH BERLIN LIONEL

#### EEE Graduate from 2012-2016 Batch

This is your student, Isaiah Berlin Lionel writing to thank you all for your support and guidance. It has been memorable being here all these four years, thanks to your generosity in dealing with us. I salute Rexy ma'am for being highly approachable. She has always been a mother kind; "YES" for reasonable requests and a smiling "NO" for avoidable cases. On a personal note, I've enjoyed her class with the humorous remarks of her. Big THANK YOU ma'am! Starting from her first subject till P&S, she had been close to us, teaching us in a simple manner. Nancy ma'am was ever ready to help us! Thank you ma'am!

### Ms HIRESHAA KIRAN M S

#### EEE Graduate from 2010 -2014 Batch



The only dream I had after being graduated as an Electrical Engineer was to work in an Electrical Core Company. Even though I had offers from the Leading Gaints in the IT sector, I had always Aspired to work as an Electrical Engineer and Grow further. I

started my Carrier as an Electrical Engineering Trainee in an Energy Auditing Company. This was where I had enhanced the practical knowledge I had gained at LICET and had hands on experience as an Engineer. It was in deed as task to handle energy auditing and reporting as a fresher but I still enjoyed doing it as I could see all that I have learnt coming into existance on site. The initial hardship does definately pay off its Price. It all helped me travell in my carrier and grow stronger. Now I work for Robert Bosch Electrical Drives India Pvt Ltd as a part of the Bosch Production System Team.

LICET is where I learnt engineering in application and built up my skill sets as an Engineer. The fun filled part of college life were Enginea and Sports day events, these were the platform set for us to reinvent ourselves. Each step of my college life at LICET has molded me to be a better person and has deep rooted the attitude to strive for excellence.



This professor was the first to pat me on my back if I do something good and the first to chide me if my performance lags in something. A two minute talk with her has always given me so much energy. Thank you SB ma'am!

Though I haven't attended Annie ma'am's classes, she is one person who is always available when I've turned to any needs. I thank you ma'am! Being our class advisor Ramya ma'am should have great endurance. A sister like person who always stood by our side! Happy Mothering soon! Thank you ma'am! Thomas sir talks to me on everything and he has a good ear to hear! A simple professor who taught us responsibility! Thank you sir! My guide for project, Infant sir could be called an encyclopedia. I learnt so much from him. He shows knowledge like rain continuously. Special thanks for his patience with me in project

### Ms SUMITHRA I

#### EEE Graduate from 2012-2016 Batch

LOYOLA - ICAM COLLEGE OF ENGINEERING, that's where my Proudness pings to feel high. LICET JOURNEY has been an Adventurous and surprise package too.

Every faculty extended their utmost support for a fruitful completion of my B.E. It is where my inner abilities provoked. Felt on top when my first article appeared in our college NEWSLETTER.

Apart from academics, it has taught me "What's life all about and How to deal with it". At present I'm doing my masters in POWER ELECTRONICS AND DRIVES in SSN engineering college. Dear juniors, make use of the opportunities, faculty members and library profusely. Take part in cultural and sport activities etc. College life offers finest memories so compile as much you can because when you look back one day, you're



definitely gonna miss your college life. All the best for your future endeavours. Let your journey be successful and Blissful.

proceedings.

Giftsy ma'am was always approachable. Her classes were useful, greatly in terms of exam. She is calm at tiring situations. Thank you ma'am! Monisha ma'am made me feel so responsible. She greatly believed in me and gave certain important tasks. I was stunned when she took pain to come to library to get me PQ book when I couldn't find one. A sound salute to her! Thank you ma'am! Augustine sir was one person who gave me valuable advice at all times. Thank you sir! Wish Sharadha ma'am had taken a subject for us. She was so kind to me always. Thank you ma'am! In a short span of time Priyadharshini ma'am had greatly inspired and cared for us. Thank you ma'am! Our lab attender sirs are the best to find. Messed up is wires, they rescued us. Thank you sirs! Nothing in Lab without you sirs! Sorry if I've wronged any one of you and I always need your blessings in all walks of my life. Thanks a lot for that ENGENIA experience too. Thank you dear Professors and Staffs! Hail EEE department!

## Departmental Activities

### INDUSTRIAL TRAINING

To bestow the feel of having the actual hands on experience, the department arranges for Industrial trainings to students at various industries. Some of them are

1. BSNL
2. KORATUR SUBSTATION
3. ICF
4. FORD

### INDUSTRIAL VISITS OF STUDENTS FOURTH YEARS

The students of final year EEE were given an opportunity to be taken to an Industrial Visit to the SLDC(State Load Dispatch Centre) in TNEB, Mount Road, Chennai on Spetember 30th, 2016. About 60 students and two faculties were part of this Industrial Visit. We were exposed to the SCADA control system technology that's being used in SLDC, since 2010. The SLDC in Mount Road, serves to distribute the power across the various places in the Chennai district, based on the demand and the load. We were taken inside the SLDC workstation and the Additional Executive Engineer, Ms.Gayathri, gave us a practical demonstration as to how the SLDC operates in controlling the power and the load demand, across the various places in the Chennai District, using the various tools and display screens. The State Load Dispatch Center is the apex body to ensure integrated operation of the power system in the Chennai District. It is the strategic functional unit for discharging various functions. The State Load Despatch Centre shall: Be responsible for optimum scheduling and despatch of electricity within a State, in accordance with the contracts entered into with the licenses or the generating companies operating in that State;

- Monitor grid operations
- Keep accounts of the quantity of electricity transmitted through the grid
- Exercise supervision and control over the intra-state transmission system

Be responsible for carrying out real time operations for grid control and despatch of electricity within the State through secure and economic operation of the State grid in accordance with the Grid Standards and the State Grid Code.

By using the SCADA control system, the SLDC could operate the power distribution & demand, from a single location. If there exists to be a problem in the transmission system, it could be rectified using the SCADA system, without human intervention. Moreover, the power distribution to any place, could be turned ON/OFF using the SCADA system. Thereby, the SCADA system proves to be efficient and more secure, when compared with the conventional methods.

**Joseph Rajesh**  
IV EEE

### SECOND YEARS

On 19-08-2016, we 68 students from EEE department [2nd year] accompanied by Mr. Infant Raj and Mrs. Kamala went to BSNL, Maraimalainagar. The subdivisional engineer explained us about the industrial visit. There were three labs. First we went to switch lab. This lab performs exchange of information. It controls and connects the subscribers by extending services. It provides the required power for transmission. Each local area network can spread for about 5 to 6 kilometers. ASCII code is used for networking. DC current is used for transmission because it can be chemically produced using lead acid accumulator. For adding more connection Base Module is used as adding block. There is an Administrative Module which is the main processor in exchange. Next we went to Broadband lab. There we learnt about DSL technique used in broadband communication. Copper cables which were used for landlines are now replaced by Fiber optic cables. FTTH technique is used for homes and MLLL technique is used for banks and offices. The first used internet service was dial up service which supports either internet or voice messages. Now a days DSLAM are used for supporting both internet and voice messages. Then we visited the OFS lab where we learnt about fiber optic communication. Fiber optics is used because

1. They can be used to transmit data at higher bandwidth.
2. They can be used for transmitting data over long distance.

Fiber distribution frame is for transmitting data. The fiber optics works on the principle of total internal reflection. Multiplexers and Demultiplexers play a vital role in data transmission. Synchronous Digital Hierarchy method is being widely used in India. Finally we visited the museum. The museum perfectly explained the history of communication. There were all types of telephones from the origin till date, teleprinting machines and so on. One striking feature of this museum is that it had a replica of the design of the first telephone by Alexander Graham Bell. As the students of Electrical and Electronics Engineering we found this Industrial Visit very useful. We thank our HOD Mrs. Inba Remy for permitting us to go on the visit, and the faculty members who accompanied us during the trip.

**Arullious Jora**  
II EEE

### INPLANT TRAINING

Given below are some of the industries that our students underwent training.

S.No	Organisation	Total No of Students	Year
1.	BSNL	7	I
2.	BSNL, ICF, MAPS KALPAKKAM, EATON POWER QUALITY PVT LTD, SUN BEAM GENERATORS, EMU TAMBARAM, TEMPEL PRECISION MEATAL, TRANSFORMER MAKING DISTRIBUTION, VERSABYTE DATA SYSTEMS	19	II

### THIRD YEARS

The students of III EEE visited the Neyveli Lignite Corporation on 27.07.2016. We left college at 5 AM and reached there at 9:30 AM.

We first visited the coal mining yard. It is one of the largest open-pit lignite mines in India, presently mining 24 MT of lignite. The guide explained the mining process and how the coal was taken to the reactors for fuelling. They also discussed the availability of coal and the lifespan of the thermal power plant. The plant is capable of producing 1020 MW and 1,970 MW respectively including their expansion units. The total installed capacity of this station is 2990 M W as of December 2014.

We were then taken to the control room and the control systems of the entire power plant using SCADA was briefed to us. We then saw the cooling towers. Finally, we visited the switch yard where the distribution of electricity was explained to us. We left the power plant at 1:30 PM and reached college by 8 PM. The Industrial Visit proved to be very effective in understanding the practicality of a thermal power plant working.

**Silvia Noble**  
III EEE

### THIRD YEARS VISIT TO NEYVELI LIGNITE CORPORATION



## TRAINING PROGRAMME

### L&T Switchgear

The final year students of our department attended a training programme "INTRODUCTION TO INDUSTRIAL ELECTRICAL SYSTEMS" at Larsen & Toubro Switchgear Training Centre, Coonoor for three days from 16th to 18th of September, 2016. The main objective of L&T training is to bridge the gap between the academia and industry. About 39 students and three faculties were a part of this training. We had theory class in the morning followed by lab sessions in the afternoon. The first class started with a motivational talk and a fun-filled photo session in the admirable garden. The course of training bestowed us with ample practical knowledge about some switchgear equipment like contactors, fuses, circuit breakers and MCB's. The classes were divided and handled by three of the faculties from L & T. The sessions were exciting because we had a chance to learn things practically and the L&T employees were glad by our lively interaction with them. The last class was about soft-skills from which we gained an idea of working in an industrial environment. The training programme ended with a test conducted by the training centre followed by certificate distribution. We are sure that the knowledge gained will help us improve our proficiency in handling electrical systems and transform us into excellent electrical engineers. Besides the prolonged informative training classes, we also had lots of cherishing moments during our stay at YWCA, Arunagiri, and all through our voyage. KNOWLEDGE GAINED NEVER FADES NEITHER WILL THE MEMORY.



Joylin  
IV EEE

### SYMPOSIUM-STORM 2K16

**STROM 2016** was conducted on 27-08-2016. The extravagantly cooked up Strom 16 has come forth to heap juvenile techies from peninsular India wherein we challenge your technical and non-technical competence and assure contentment of your participation.

#### EVENTS CONDUCTED:

- Carta Parle
- MA3OX
- Made in China
- Bob the Builder
- The Voice
- The Amazing Race
- Jigarthanda
- Google Mama

#### PAPER PRESENTATION TOPICS:

- Renewable Energy Technologies
- HVAC system and natural ventilation
- Distributed energy systems
- Soft Computing and its Application in Power Engineering
- Power System Operation Control and Optimization
- Intelligent Energy, Power Transmission Distribution, Interconnects and Protection
- FACTS and Power Quality
- Electrical Drives and Control
- Electrical Machines and EMI Issues
- Bio Medical Instrumentation and its applications

More than 400 students from various colleges took part in the various events conducted by our department. Students who won their respective events were awarded with certificates and cash prize of Rs.1500. Our department witnessed the most number of participants which made the symposium a grand success. The event concluded with the Principal's address which proved to be very inspirational and made this day a memorable one.

Joel and Minna  
II EEE



## ENTREPRENEURS

### The Beginning

The Entrepreneurship Cell, LICET had given us a good platform to become a young entrepreneur on the symposium held on 27th August 2016 at LICET. Jerome, Mavin and Athen of final year EEE had a startup selling imported chocolates and cookies and some hand-craft items. The stall was located at visitors lounge and then shifted to central lobby during the noon to reach out most of the customers. The faculty members and students of LICET contributed to 85 percent of our total sales. Students from other college were the rest who made us to be success in our first attempt. The products sold had a price of 5 Rupees to 25 Rupees. As all the items were sold out at 11.30 A.M. we arranged for another set and sold out the same by 2.00 P.M. Within the sales time of 4 hours, we managed to sell all items with a profit of 25 percent. No doubt it was a joyful day for us as a young entrepreneur.



Jerome and Athen  
IV EEE

### LICET TREATU'16

**LIBAzaar!** Does the name sound familiar? Yes, one of the biggest carnivals of Chennai arranged by LIBA, a top-most B-school in Chennai, to encourage young entrepreneurs. A one day programme where you will be entertained utmost. Stalls that sells eatables, boutiques, knick-knacks and decorative figurines. Also the game show, dance show, DJ's and the performance by the Loyola Dream Team stunned everyone.

We, the final year students of EEE took part in this event on 25th September 2016. A team of 10 students, Athen, Boopalan, Jerome, Joyson, Mavin, Pradeep, Rohan, Sreekuttan, Lubna and Meena joined to strive for success. We invested an amount of Rs.13500 that includes rent for the stall per day of Rs.3500.

We named it as **LICET TREATU'16**, planned to have all the things at one place to gather others attention. The items were combo packs of traditional biriyani and gobi-65, home-made red velvet cakes, Brownies, Dough-nuts. Refreshments like milkshakes, fusion juices and fresh juices. We also had hand-made gifts, greetings serving our customers a gift for their loved ones. We divided ourselves into two groups. Part of 4 people spent days in advertising our stall. We had set-up a web page and a facebook page that helped us to reach the huge audience. Others worked on setting up the stall. Selfie Contest, a way to hike up customer's attention. Decorations, Posters and a digital display of the menu with prices grabbed everyone's diligence. On that ecstatic day from dawn to dusk we were the dons of LIBAzaar. At the peak time we stumbled in handling the customers. All the items were re-stocked again in the evening.

Touch-me-not was a fun game to capture the attention of the kids and youngsters. The evening time major munch is the pasta. Oh! Yes, we are glad to say that we tasted the success. At the end of the tiresome day, we earned a profit of 45% each. We are grateful, thankful and blessed. We thank Rev Dr A. Ignacy SJ, Director, Dr. Jose Swaminathan, Principal, Ms A Inba Remy, HoD and the Entrepreneur cell for their support and motivation. We would like to thank our beloved friends who lend their helps at right time. Though whelming in a victory, we had a great experience and good times that never fades out.



Pradeep and Jerome  
IV EEE

**SEMINAR & GUEST LECTURES**

Guest lectures were carefully weaved with both academics and industry forum. Accordingly, eminent professors from IIT (academicians) and Senior Management Executives of Companies were invited to interact with our students. Such an approach gives an insight to the student on the importance of acquiring theoretical knowledge and to meet out the industries expectation.

DATE	VENUE	TOPIC	SPEAKER'S NAME AND ADDRESS	PARTICIPANTS (Students)
22.9.16	F-11	Applications Of Switched Reluctance Motor	Dr. Ramani Kalpathi, Professor EEE Dept. St. Joseph College Of Engineering Chennai.	IV year EEE
18.07.16	F-11	Overview of Power Systems- It's Operation And Control	Dr.V. Gomathi Assistant Professor Power Systems Division Dept of EEE CEG Guindy Chennai.	III & IV year - EEE

**FEEDBACK ON GUEST LECTURE**

Dr. Gomathi Venugopal, professor of Electrical and Electronics Engineering at Anna University, gave a guest lecture on the topic "Overview on power systems - its operation and control" on 18th July 2016. The guest lecture was attended by the students of III EEE. She began by stressing on the importance of using solar energy to satisfy power demands. She appreciated the students who had understood its importance and were already using solar energy as an alternate source.

She spoke about the concepts of power grid and its operation and maintenance. she also explained that one of the main difficulties in power systems is that the amount of active power consumed plus losses should always equal the active power produced. Even small deviations from the nominal frequency value would damage synchronous machines and other appliances. The transmission system operator make's sure frequency is constant In some countries this is achieved through a balancing market using ancillary services. The various switchgears and the importance of relay system and settings were explained. She also briefed on the topic of controlling the power systems by cloud



computing software. She gave a view of how power electronic devices used to control the power systems can be interfaced with software and operated with much ease.

On the whole the lecture was an eye-opener on how cloud computing can be integrated with electronic devices in a power system. The students were greatly benefitted by the lecture.

**Silvia Noble**  
III EEE

**OUTREACH PROGRAM**

The students of Loyola-ICAM College of Engineering and Technology, in association with Chennai volunteer (Meri Foundation) have teamed up to serve the school students. We have focused to teach the school students to improve their spoken English and other soft skills.



On 23rd July, at 9:00 AM our team assembled at St. Joseph Matriculation School, Susaipuram. Ms. Vidhya, programme in charge from Chennai volunteer gave us general instructions about the programme. Our department students Athen Raj, Mavin from final year and Shyam Sridhar, Ajithkumar from third year were part of the team. We were divided into 5 teams and classes of 6, 7, 8, 9 and 10th were allotted to each team. Each class was given an activity like outdoor games, spoken English and icebreakers such as puzzles and dumsherads. With the help of the teachers and two of our faculty members. We conducted the events and we assured that the children had a quality time. And also we made sure that students did not get bored.

At last all the volunteers assembled together and we were asked to give our feedback on the program. Everyone felt happy to do so and they suggested few things which the children need to be taught.

**Shyam Sridhar and Ajith kumar**  
III EEE

**ALUMNI MEET-2016**

We the final years of EEE had immense pleasure to be a part of the second Alumni meet conducted at LICET. The alumni of our department meet started at 11.45am. The meet started with a formal welcome speech by one of our friend by reminding us, "You didn't finish college, which you feel really weird because we awarded you the alumni of distinction recently". We sent the invitation through email to let them know about the meet. We were glad that the occasion was graced by more than 50 students. 15 students were from first batch, 7 people from the second batch and



remaining 31 were our beloved immediate seniors. Many of them pursuing Masters in and overseas. Some are getting experience at work to form their own start-ups. After the warm welcome, to recall the old days, we made them to write their memories in a card board. Even though there was a shortage of time we managed to conduct fun games like Dub smash, lemon on the spoon, musical chair, etc. They gladly participated and cherished the moments by trolling their friends, mocking themselves and recalling their old memories. This was followed by our seniors sharing their flashbacks and experiences with the department. Calvin of 2016 batch shared a video describing his past memories. We were glad to see the people whom were very close some years before, re-exploring the relationship of the past. Lunch was provided soon after the event. All went well according to our plans! We thank our alumni coordinator Mr. A Infant Raj for the support and guidance. The day proved to be an unforgettable one for the alumni's and it was with a heavy heart they departed.

**Lubna Tabassum**  
IV EEE



## Bridge Course

I feel the Bridge Course was a good way to break the ice and mingle with the other students and staff. Personally to me, this pre-academic course was enjoyable and educative.

There were about three seminars given to the students by notable personalities of our society held at our auditorium, G01. We had seniors from our EEE department who came to our class regularly to educate us about the 4 year course, the different subjects and projects we would have to face in the future, more about the college and its association with the French University, ICAM. They also told us about the exchange program with associated countries. One of the French staff members from France, told us about the education system in France and how greatly it differs from the system followed in India. He told us that the French schools have more of application based work involving a lot of practical sessions. One of my favorite sessions about the Bridge Course was the Project session. All the students were grouped with a leader, a speaker and an adviser, each. The topic given to us was to build a toy that meets certain requirements. It was a lot of fun. The team members were able to know each more and were able to work together. We had a bit of introductory classes held by our teachers. They weren't boring and were managed very well. What I remember about the maths class was that our Sir had given us puzzles every day for us to solve in class. The sessions were very interactive and not one sided. There were sessions where we would try to recollect what we had learnt at school.

In all, the bridge course was educational and enjoyable. It has made a good impression on us about the good natured environment the students can cherish for the next four years.



**Ajay Jose**  
I EEE



Bridge course connects us from our 12th Standard to Our Engineering degree course. Bridge course was started on 11th July 2016 for a Span of 20 days. It was indeed very helpful for us to take this course to start our journey toward Engineering. On the first day we were introduced to the career opportunities in this Engineering Career and we started to get familiar with the journey towards Engineering. Bridge course not only dealt with studies but also was included with activities such as the introduction game in which we were divided into groups and for the first time we were made to think as real Engineers. Introduction game helped us to know each other because it was a very new atmosphere for everyone who had joined LICET. We all came to know each other very well and it helped us to create a product which was asked to do as an activity. We all really enjoyed the activity as it was totally fun and we were able to learn new things from it. We also had some motivational and encouraging speech from Mr. Sylendra Babu I.P.S who is a well known ADGP (Additional Director General of Police, Tamil Nadu) inspired the students to set goals for life and urged them to be good citizens and also gave us instances from his own life. It is needless to say that it caused tremendous influence on the students. On 14th July Dr. Shanthi Davidar, a well know psychiatrist and her counselor Ms. Arthi addressed the students on healthy relationships and the consequences of immature relationships. She also spoke about the influence of media on the

present generation. Students were deeply inspired by her speech. In the present computer era cybercrimes has become the order of the day. In order to safe guard them from falling a prey to cyber crimes, the High court lawyer Mr. Bruno Cruz was invited to talk on crimes related to the youth. We were enriched by the knowledge given by him. Overall the bridge course was a great success and enjoyed by every student of LICET. On behalf of all the students I thank all the faculty Members of LICET for arranging such a beautiful course for us and I Specially thank Our Director, Rev Dr.A. Ignacy, Principal, Dr Jose Swaminathan and our very own HoD Ma'am Ms. Inba Rexy for taking so much pain for arranging the bridge course and making it a grand success. Thanks Again To All.....!!!

**Kevin Arnold Rossario**  
I EEE

## Summer Program 2016

### LILLE CAMPUS

The Summer Program organized by LICET and ICAM was a truly wonderful experience. We learnt many new things with regard to both our line of education as well as the French culture. I would like to thank all the faculty members both at LICET and the Alliance Fraçaise for making this possible. Over the course of the 24 days in Lille, we got to develop our skills in a multitude of areas. We learnt the basics of Android Application development and even made our own working android application. This was a remarkable achievement as most of us knew nothing about developing an application – a special mention of appreciation to our professor, who made the sessions enjoyable and knowledgeable. The second phase was the development of a “Solar Car”. This again began with a computer where we were taught how to use design software – Solidworks, to design components. The experience was made better by commanding a 3D printer to print our own unique design. With this done, we moved over to the machining area where – under the guidance of skilled professionals, we drilled and machined solid blocks of steel to suit our requirements.

With all the components ready, it was time to assemble our own cars. This is where we learnt one of the most important life lessons – team work. All of us, our professor from LICET included, worked together and over the remaining days completed all our cars. We even had the time to organize a small race!

We also went to a Steel industry – Arcelor Mittal, where we saw the entire process of Steel manufacturing with all the heavy machinery. The amount of importance given to ‘health and safety’ is tremendous, as we went around the plant dressed in full safety equipment with our ‘hard hat’ helmets and safety goggles.

Apart from the education, we were also taken to places in and around Lille to help us learn more about the French culture. We visited places like Bruges and Boulogne and indulged ourselves into the different food and culture. The program also helps a person to develop himself/herself into a better more independent individual as we learn to manage ourselves in a new environment – but this too is a fun and joyful endeavour. Overall this program was well organized and at the end not only did we learn to work together and learn but we also had a very good time and emerged as better people.

**Joshua Ray Sundaraja**  
III EEE

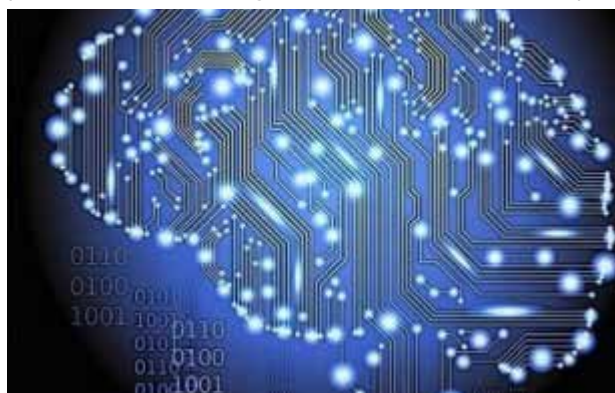


## Electricity and Students

### THE FUTURE OF NANOTECHNOLOGY ELECTRONICS IN MEDICINE

Thanks to the development of nanotechnology, especially nanoelectronics, the medical sector is about to undergo thorough changes by implanting and incorporating electronics in human body using the applications of nanomaterials in the nanoscale. A lot of nanotechnology work is going on in the area of brain research. For instance the use of a carbon nanotube rope to electrically stimulate neural stem cells and to repair brain.

A bit further out, and actually beyond the scope of medicine efforts are to build artificial brains—something that is called neuromorphic engineering: a new interdisciplinary field that includes nanotechnologies with a goal to design artificial neural systems having physical architectures very similar to biological nervous systems. Advances in this research area could lead to extremely sophisticated smart materials with multifunctional capabilities that are built in—literally hard-wired. The impact of this research could cover the spectrum of biomedical possibilities from diagnostic studies to the creation of cyborgs. Biocompatibility may be more particularly important because many of the materials used in the fabrication of nanoelectronics are neither closely related to commonly used biomaterials nor known to be biodegradable. Outside the body, diagnostic systems will benefit hugely from nanoscale applications. “The close integration of nanomaterials with cells and tissues will allow the development of in vitro platforms for basic research and for applied area of diagnostics. Such lab-on-a-chip systems could, for example, enable testing of the effects of candidate therapeutic molecules on intercellular, single-cell, and even intracellular electrical activity. Furthermore, by the assembly and fabrication of multiple devices per chip, it is possible to investigate the effects of multiple



analyzes on cellular processes at a spatiotemporal resolution not easily achievable by other means. Sensing and stimulation could be linked, creating closed-loop feedback systems that would be analogous to reflex arcs in the autonomic nervous system. Ultimately, here we are getting almost into science fiction territory, nanostructures could not only incorporate sensing and stimulating capabilities but also potentially introduce computational capabilities and energy-generating elements. In this way, one could fabricate a truly independent system that senses and analyzes signals, initiates interventions, and is self-sustained. Future developments in this direction could, for example, lead to a synthetic nanoelectronic autonomic nervous system.

(source: Nanowerk)

**Ermine Jose J**  
II EEE

### THE KNIGHTS TOUR

The game of chess traces its origin in India. History tells us that the war of Kalinga during King Ashoka's regime, left many soldiers battle wounded. These soldiers who rather led an interesting life were forced to remain either immobile or unfit for further services. As a remedy to their monotonous existence, the game of chess was invented. It was actually invented by Buddhist monks though the true inventor remains unknown. As most will be familiar, chess is played on a board of 64 squares in which white and black colours are present in an alternate manner throughout the 64 squares. Totally there are 32 pieces, 16 each for the two players. One player plays with 16 pieces in white, while the other plays in black. As a rule, the player with the white pieces makes the first move. Of those 16 pieces, there are 8 soldiers, 2 castles, 2 knights, 2 bishops, a queen and a king. Soon this game began to spread to the eastern nations and was becoming famous in Switzerland during the 18th century. At that time a man challenged a mathematician to cover all the 64 squares of the chess board using a knight in 64 moves. This mathematician constructed a semi-magic square to find the solution for the given problem. A semi-magic square is one in which the sum of rows and columns add up to give the same number while the sum of the diagonal differs. However in a magic square even the sum of the diagonals equals to that of the sum of the rows and columns.

The semi-magic square is the solution stated by the mathematician. If this is closely observed one could find that all the rows and columns add up to give a sum of 260. Also if the sixteen 2\*2 squares are observed, they give a sum of 130. And also if the first 4 entries in any row or column are observed, they give a sum of 130. However the sum of both the diagonals is not 260. Many attempts have been made to find a solution that gives a magic square. But it was finally confirmed in 2003 that no magic square exists as a solution for this problem. Now finally as for the mathematician who found this solution (of semi-magic square) it is none other than Leonhard Euler.

**C. Abishek Joel**  
II EEE

1	48	31	50	33	16	63	18
30	51	46	3	62	19	14	35
47	2	49	32	15	34	17	64
52	29	4	45	20	61	36	13
5	44	25	56	9	40	21	60
28	53	8	41	24	57	12	37
43	6	55	26	39	10	59	22
54	27	42	7	58	23	38	11

### HYBRID ELECTRIC VEHICLE

The hybrid electric vehicle (HEV) is a vehicle that runs on the combination of energy sources. Our HEV runs on both electricity and petrol. It uses a motor which is powered through a battery and regulated by a converter which serves as one of the driving mechanisms. The other driving source is the internal combustion engine which is supplied by petrol. Both these are operated at various conditions.

The battery is connected to the motor through a Bi-directional buck boost converter for motoring as well as regenerative braking. A controller based on Arduino is used to give the control pulses to the converter switches to control the duty cycle to provide the required output voltage. The controller is programmed such that at the start, the engine is operated by opening the solenoid valve upto a certain speed. Then the motor is operated and engine is cut off by closing the solenoid valve.

The motor is operated at a reduced voltage which is increased gradually by varying the duty cycle and it attains 12V for maximum speed of operation. Once the battery has drained below 35% it is inefficient to use the motor for operation and the engine is switched into operation. The process of bringing the engine to operation involves opening the solenoid valve actuated by a switch which is controlled by the controller board and giving supply to the spark valve simultaneously. This rushes the petrol into the IC engine and the combustion occurs due to the activation of the spark plug.

Meanwhile the motor keeps running as it is coupled to the shaft and acts as a generator. Control pulses are given to the converter such that the power flows from the generator to the battery. The converter is operated in boost mode to obtain charging voltage of about 14-15 volts in order to charge the 12 V battery. Thus the engine aids in charging the battery with the help of the motor which is attached to the shaft in parallel fashion with the IC engine. When the charge attains 80-90% the rate of charging decreases and hence it is not advisable to charge the battery any further. Hence the engine is cut off and the motor resumes operation. For cutting off the engine and giving supply to the motor it is necessary to cut off the fuel supply. For this the solenoid valve is de-energized, the fuel supply to the engine and the supply to the spark plug is cut off. For regenerative braking, motor is used in generating mode. There are many types and models of HEVs available in the market today. Our system is a parallel hybrid system, which integrates both the engine and the motor on the same shaft to obtain better efficiency.

**L Jishak Kasparov**  
**N Muthamil Selvan**  
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IV EEE

## THE WAR OF CURRENTS

Imagine yourself in a world devoid of the modern facilities. No smartphones, no internet, no fans, no lights, no television and to sum it up, no electricity. People are used to living in this state and they don't complain for that's how it's been since humanity evolved. But things would be subject to change very soon. Over the next 15 years, you will be led through a series of extraordinary events that had a lot of surprises and shocks for the world and America in particular. These events, mind you are the seeds which later, brought forth fruits - tasty fruits.

Let us start from 1879. The world is lit up by conventional gas lamps. People are not very happy with it but they couldn't possibly complain for this was the best source of light available. But there was a man who thought very differently from most others. An ambitious inventor and just 31 years old, Thomas Edison has already earned a name for himself in this society. "The wizard of Menlo park" as many called him - has already stunned the world with his latest invention, the phonograph.

Having over 2000 patents in different countries, Edison's reputation as an inventor was the charisma for the top inventors of his time. Now this gentleman was heading a different mission - to generate electricity. It was a new idea which nobody had proposed before but his inventors were backing him for one reason - he was a genius. Leading a young team of engineers at Menlo Park, Edison & his team faced a lot of failure to start with. But he relied on these 3 magical words, "Persistence, Patience and Perseverance".

His efforts eventually paid dividends. In October 1879, Edison was finally able to make a bulb glow on electricity. He used carbonized thread in his bulb which made it glow steadily & efficiently. But it was not the end of it all. It marked the beginning of a revolution in the field of power transfer. Having done this, Edison had to extend his ideas to a much longer scope. So, he started with his ideas of harnessing electric power. He had theoretically created a transmission and distribution system for the city of Manhattan and his ever faithful investors were ready with whatever he demanded. In 1882, this became a reality. The first power station in the world was built at Pearl street which supplied electric power to a lucky few - who were quite rich. 1882 was a successful year for Edison thanks mainly to his latest invention. He secured almost 100 patents that year alone and the 52 light bulbs which were lit up overshadowed the drawbacks of the D.C. system which Edison had so long been advocating a safe, clean and more pleasant.

Now, I would ask you to turn your attention to another genius who is still under the constructive phase. Many hundred miles away from Edison, in the Austrian Polytechnic school was Nikola Tesla. He was a brilliant student in his first year, never missing a lecture and making the highest grades

possible. But a remarkable incident took place in his second year which would later go on to be marked by historians as

the turning point. Tesla came in conflict with Professor Poeschl over the Gramme Dynamo. He suggested that the commutator retarded the efficiency and weren't necessary. When asked for an alternative, he would just say "I don't know".

A generator produces current which naturally changes direction periodically, called Alternating Current (AC). During his time this current was channeled in a single direction and used, called a Direct Current (DC). This is the concept on which Edison has been realising every detail in his distribution system.

But Tesla finds that the commutator's used to transfer energy to motor, create friction thereby reducing the efficiency. He envisions that the natural AC from the generator could be used to run motors and that the commutators weren't necessary. He stopped attending lectures from the third year and dropped out, confident in creating history with his new concept.

The next few years, Tesla spent in strengthening his ideas by creating a working prototype - a motor which operates completely under AC. After years of struggle he finally managed to successfully build an induction motor and was waiting for an opportunity to showcase his new invention for he didn't have the money or recognition to advertise.

So what exactly happened during these years? It was a roller coaster ride for Tesla, leading an adventurous life where he worked as draftsman for an engineering firm, spending spare time in a pub playing chess and cards. In 1879, he started teaching in his old school "Real Gymnasium" at Gospic. In January 1881, Tesla's uncle arranged a work at the Budapest Telephone Exchange in Hungary where he was assigned the position of chief electrician. During this period, he made numerous improvements to the equipments & developed an amplifier device.

In February 1882, he suffers a mental breakdown, obsessed with solving the riddle of AC. But the spark of inspiration is drawn from a walk with his friend Anthony Szigety. An idea comes to him in a flash while looking at the setting sun and that very moment he draws the diagram of the motor in the sand.

In April that same year, Tesla & Anthony accepted positions at the recently started conventional Edison Company in Paris. He installed lighting systems in the Paris Opera house & Bavaria & submitted plans for improving the Edison dynamos. This makes it obvious that these were done in DC system of Edison.

For his improvement plans he was expecting to be compensated but was dispatched to

Strasbourg before payment was awarded. In

February 1883, he was assigned to repair the new DC lighting system installed at the German railway company which was damaged on a trial run. In spite of being approved by the government after repair he never received the compensation.

By this time, Tesla had managed to complete the design and construction of his AC induction motor and was ready for a demonstration. Since DC was the talk of the day, the investors couldn't understand the value of his invention despite the efficient functioning.

We have come to a point where these two tales which have been parallel are going to meet at a common point. Having an idea which could possibly destroy Edison's DC system, Tesla travels to America under the recommendation of one of his professors to work under the genius himself. The war of currents is about to begin. The battle lines have been drawn. Will it be Edison or Tesla to prevail? Let's find out.

In 1884 and Edison's DC system is growing at a rapid pace. It now supplies power to the barons of the United States. As I had mentioned earlier, Edison's DC system had its own limitations. The power generated from his system could supply it efficiently within only half a mile radius from a power station.

This made it almost impossible for power to be supplied in the rural areas. If not for these drawbacks, Edison's system was a flawless one.

In June the same year, Tesla arrived in New York and met Edison. Edison was impressed by the skills Tesla possessed and immediately sends him to "The Oregon", the first ever ocean liner to have an electric lighting. Apparently the dynamos were badly damaged and Edison sent him there to test his skills practically. Tesla doesn't take much difficulty and Edison is impressed and was quoted as calling Tesla "A good man". As time went on, Edison promises Tesla a 50000 dollar prize money if he improves the DC system and dismissed the idea of AC claiming it to be dangerous.

Tesla is badly hurt when his idea is rejected but kept working on it undeterred. He also finds a solution to improve the DC system and submits it to Edison. But Edison refuses to offer the cash prize and orders him to return to work saying, "You don't understand our American sense of humor". Subsequently, Tesla resigns and tries to find a job on his own. But he couldn't get much more than digging ditches for the underground cables.

Until next installment

**N.Shane Richard Vignesh  
II year**

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