



IN ASSOCIATION
WITH



ELECTRONAUTS

ELECTROVISION- 2017

ISSUE 2

THE ELECTRONICS MAGAZINE

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VISION AND MISSION

DEPARTMENT VISION

To evolve into a centre of excellence in electronics and communication engineering, moulding professionals having inquisitive, innovative and creative minds with sound practical skills who can strive for the betterment of mankind.

DEPARTMENT MISSION

To impart state-of-the-art knowledge to students in electronics and communication engineering and to inculcate in them a high degree of social consciousness and a sense of human values, thereby enabling them to face challenges with courage and conviction.

FROM THE HOD'S DESK



Dr. Jobin K. Antony
M.Sc Electronics
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Madras)



“Electrovision” is one of the means to publish various creative articles and news which reflects state-of-the art.”

I am having immense pleasure to note that this year’s edition of “Electrovision” is ready to release. I would like to congratulate the team of active students and faculty leadership for their efforts to ram-up various department activities under the aegis of department association “Electronauts”. The department association conducts many programs aimed to nurture a professional interest towards the domain of study among all members of the department and “electrovision” is one of the means to publish various creative articles and news which reflects state-of-the art.

Technology related developments are there in the field of communication, microelectronics, automotive electronics, health-care and so on which are closely linked with the common man’s life. Smart phones are ready with enormous computing power at par with a powerful desktop, at the same time it could act as a sensor element which can initiate data capture. The computing and data handling capabilities of mobile devices are going to multiply by the introduction of 5G. Because multitudes of cell phones can collect data, big data analysis based research is also gearing up. 5G envisages a common network platform with dynamic and secure network slices and it facilitates massive machine to machine communication as well as personalized TV.

Plenty of opportunities as well as challenges are awaiting. Hope that “Electrovision” could be a platform for both students and faculty members to conduct fruitful discussion on all these breakthrough developments. Let us strive together for a greener, technically enriched better India !

Jyothis C G


GATE
2 0 1 8

FORMULA FOR SUCCESS IN GATE

GATE (Graduate Aptitude Test in Engineering) is a competitive exam conducted jointly by IISc Bangalore & 7 premier IITs and is considered one of the toughest exams in the country. The GATE Score can be used for admission to various postgraduate programs in Indian higher education institutes and by several Indian public sector undertakings for recruitment into entry-level positions.

This article briefly outlines my preparation for GATE 2017 Electronics & Communication Paper. First of all this is one of the exams that should be not taken lightly. Appear for the exam only if you have genuine interest. I had plans for appearing for GATE as early as 4th semester though my preparation began only from the 5th semester. As a day scholar, there was no possibility for regular preparation and my studies for the same were limited to the semester breaks.

According to our MGU syllabus core electronics subjects were mainly during the 2nd year. All the remaining subjects heavily depend on the knowledge of these subjects. So during the semester breaks, I tried to strengthen my basic concepts in electronics. This was relatively easy as we had an amazing faculty who ensured that we got our basics right. I

did not go for any coaching classes as such. Instead I relied upon the coaching material from different leading coaching institutes which were available online for free. I cleared my doubts with the faculty.

The most important part of the preparation is about 3 to 4 months before the exam. The exam is most likely to fall on the first week of February. The last stage preparation was strictly restricted to previous year question papers which helped me to familiarise with the basic pattern. The GATE paper is on 100 marks and 15% of the paper is general aptitude related questions and the rest are from technical section. We had our placement training sessions during the S7 sem break which mainly focused on GA (General Aptitude) questions. This was more than enough and I didn't have to specially prepare for the GA questions.

As indicated by the mark division a good percentage of the paper is dedicated for core subject related questions. These questions hold the key to improving the score. But the catch is that there is a negative marking scheme for wrong answers. Therefore the first rule is to only answer if you are sure of the answer. Blind guessing will only serve to reduce your score and in turn affect your rank.

Recently the examination model was limited only to the Computer-Based model and it is important to attempt the mock test provided by the IIT hosting the exam. Else there is a chance that you will spend some time figuring out the rules of the test.

The final and most important thing is not to lose your cool during the exams. Speaking from my own experience with GATE 2017, I was shocked to find that the question paper was a lot tougher than I expected. I became a little nervous at first but fortunately I was able to calm down and focus on the paper. Actually the questions were not really that tough. But it took me some time to realise it.

My normalised gate marks is 54.16 and All India Rank is 861. I attribute my success to my parents, God Almighty and the faculty. Good luck to all those who are planning to attempt the GATE exam.

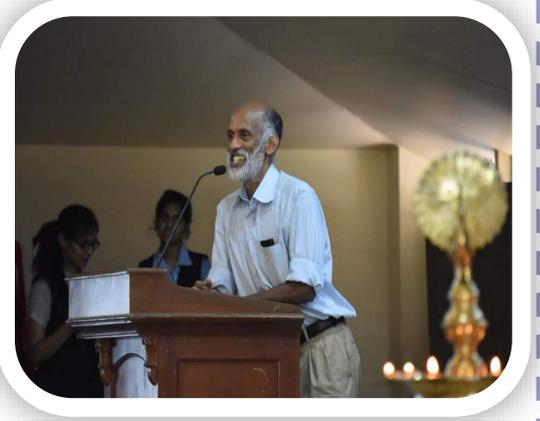
PRACTICE
makes perfect!

INAUGURATION



A firm believer in 'Quality by Design', Mr. Thomas has more than 26 years of industry experience in Telecom, Embedded Systems design, deployment, verification and mentoring in State of Art technologies. As the CTO of VVDN Technologies, prior to founding Digital Core Technologies, Thomas was responsible for delivering superior solutions to their Global customers and raising a competent System design engineering team.

The inaugural ceremony of the club ELECTRONAUTS was held on 10th Tuesday of October 2017 at 3:00pm at Chavara hall RSET. Dr. Jobin K Antony (HoD, Dept of Electronics and Communication) delivered the welcome address. Chief guest, Mr. S Thomas, (the former CTO of VVDN Technologies, founder of Digital Core Technologies) delivered the inaugural address. He also shared with the students his views on smart systems, IoT trends and opportunities and start-ups. He also had very interesting and useful question answer session where he answered several questions by the future electronics engineers about startups, higher studies and latest innovations. Club President Mr. Gokul Krishna, Club Secretary Mr. Niveth K.S also shared the dais.



IDEA PRESENTATION CONTEST

The idea presentation contest was held during afternoon, September 26, 2017 from 3:30 p.m to 4:30p.m . The contest was designed to challenge the technical acumen of students and assessment of their skills in providing engineering solutions. Several challenges were provided and taking them into account a smart system was to be proposed.

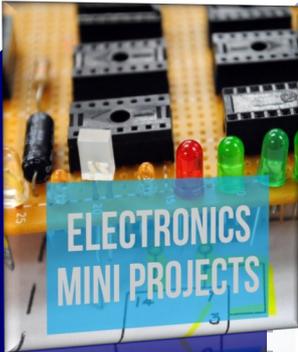
A total of eight teams participated in the contest which was judged by Dr. Jos Prakash A V Assistant Professor, DEC, RSET and Mr. Ramavarma, Adjunct professor, DEC, RSET. *Clinton Dominic, Arundhadhi B* of S7 ECE A bagged thr first prize, *Avinash Krishnan and team* of S5 ECE A won the second prize and *Nirmal and team* of S5 ECE B won the third prize.

The idea was to create a platform for the students to express their ideas, and if they were realistic the club was to provide them with technical and financial support if they needed it to realize their innovations.

The Idea presentation contest was a big success as all the teams from s3 to s7 were able to put forward their ideas and a good session of Q&A made them realise the flaws and how to improve on those.

“Idea presentation :
The time to express
yourselves without
barriers”





MINI PROJECT EXPO

The Mini Project Expo 2017 was 2nd of August, from 11am to 4.30pm. The Program was a platform for the S7 students to showcase their implemented Mini Projects in front of a group of expert Judges and students of RSET also visited the expo, and thereby the students from s1, s3 and s5 were able to interact with their seniors and thus clarify their doubts in various fields of designing and implementing a good working innovative project.

The Expo was inaugurated by Dr. A Unnikrishnan, Principal RSET. The Session was made even better as all the faculty members and the HOD of DEC made their presence felt. The students of S7 presented around 35 projects and each innovative project underwent and severe Q&A session between the judges and the students presenting them.



The students were given a ballot paper to vote for their favourite project and a hence a voting was done to choose the “People’s Choice” project. Mr. Nirmal Valsan and Mr. U. Ramnath Shenoy both of S7 EC beta bagged the first prize as well as the People’s Choice award for their “IoT Based Smart Office”. Mr. Thomas Cherian and Mr. Tivin Wilson also from S7 EC Beta were the runners up for their Innovative “Smart Medicine Box” project. The Chief Guest Mr. S Thomas (Electronauts Inauguration) distributed the prizes.

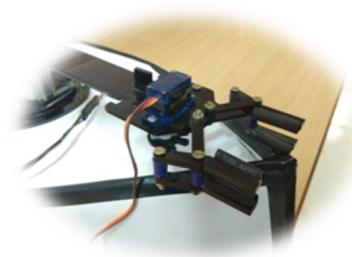
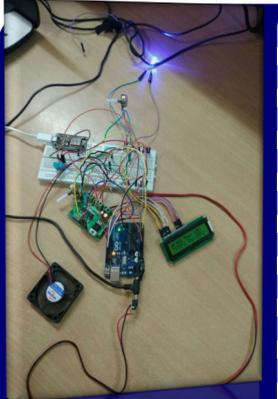


INNOWAKE 2017

INNO-WAKE 2017, was a working model project competition for S5 ECE students, the competition was held on 22- 11-2017. The main aim was to allow the students a platform to display their practical skills and bring out the Engineer in them.

The students took it in the right sense by helping each other out, when they faced some errors and discrepancies, thereby the spirit of Engineering won and yet the competitive spirit was never lost.

Mr. Sunny G and team bagged the first prize for “SMART BUS STOPPING SYSTEM” project and Mr. Benitto Jolly and team were the runners up for their “E-Plug” Model after undergoing careful scrutiny by the expert panel of Judges.



ARDUINO WORKSHOP

An Arduino workshop was held on 09-11-17 for the Third year students, the workshop was a huge success as over 60 students were enrolled and had a chance to get the basics of this useful and powerful board straight from the experienced.

The workshop was a success as students gave really good and positive feedback and even went on to request that such workshops be conducted again so that they can learn new skills and be prepared for the extremely fast developing electronics world.

Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board. It is an open-source electronics prototyping platform based on flexible, easy-to-use hardware and software. It's intended for artists, designers, hobbyists, and anyone interested in creating interactive objects or environments.

This being a basic board, many of the projects by the students are based on this board.



LED BULB DRIVER DESIGN WORKSHOP - PHASE 1

A Workshop was conducted for the students of s5 and s3 during which they were given hand on experience on how to make a LED using the basic components and a driver IC.

The workshop conducted by Electro-nauts was overseen by Mr. Nitheesh Kurian, Assistant Professor DEC RSET and Mr. Nithin Babu, Assistant Professor DEC RSET. About 140 students got the opportunity to attend the workshop and around 200 quality LEDs were made and students were thus experienced in how to go about making such electronics projects and also were able to do soldering and casing of the LED successfully.





Avinash
Krishnan
S5 ECE A

WHY 5G?

The first generation network (1G) kicked off an era of wireless telecommunication technology. Although revolutionary during its time, it did not ensure security and was less efficient as it dealt with analog signals. Later came the 2G which was similar to the first generation. However, 2G utilized digital signals which meant better encoding, better efficiency and also had a comparatively longer spectrum allowing many more users in the network. With technology improving day by day and increasing connectivity, next generation network, 3G became a reality which offered speeds up to 200kbps followed by 3.5G which offered about 3 Megabits per second.

We currently live in the age 4G network. Providing speeds up to 100Mbps, 4G proved to be a breakthrough in communication technology enabling faster downloads along with high definition video streaming and voice call.

With such great speeds in 4G, people may ask why 5G? The answer lies in: (i) connectivity, (ii) latency and (iii) capacity. Connectivity has been increasing at high rates with rise in population and newer technologies. Autonomous vehicles and artificial intelligence (AI) are said to reach its peak by 2030 and this could lead to very high traffic in the spectrum. In the year 2015, the traffic was about 1 ZettaBytes(a trillion GigaBytes) per year and this is expected to increase to 4 ZettaBytes per year according to the CEO of NOKIA, Rajeev Suri. Here's where 5G comes into play.

The 5G network uses 'millimeter wave' technology. This provides a much better spectrum and a much wide channel bandwidth of about 1-2GHz. However this poses great challenges in terms of circuit design as current handsets work at 10-20 MHz and these waves can be almost completely absorbed by obstacles.

5G can be extremely helpful in the industrial sector and health sector. While the latency of 4G networks is about a 100ms, latency of 5G is less than 1ms! This proves extremely useful in the automation industry where very low response times are desirable. People can control machines for mining and other life endangering activities remotely more efficiently with this technology. Doctors in cities can communicate with those in rural areas by exchanging health records of patients and having live interactions with them especially at times of surgery and other emergency situations hence increasing life expectancy.

This technology is not expected to be developed overnight. The next phases include 4.5G pro, 4.7G, 4.9G and then comes the 5G which can deliver speeds greater than 1GBps. They are currently under research and testing by NOKIA and ERICSSON.





Sunny G
S5 ECE C

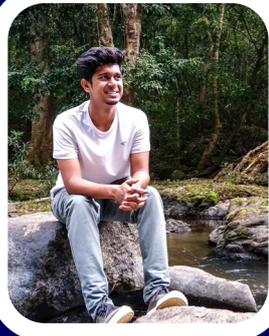
SMART BUS STOPPING SYSTEM

Device which allows passengers to set their destination from bus stop which send this data to a device fixed in buses and notifies the driver whether there is passenger getting in from a bus stop. If there are no passengers getting in from a stop the bus can go without stopping in that bus stop. It will also notify the driver if any person is there to get down at coming stop based on the inputted details by the passenger. We could also implement a system of booking ticket from bus stop in order to ensure that the response is genuine from a passenger.

PURPOSES OF THIS SYSTEM:

- This increases the safety for all passengers and also timings could be known by them
- This is going to be useful for old people, physically challenged, as they are sure that bus will come and stop at their stop
- This is going to be useful for the bus drivers as they need not stop in all the stops and so this reduces the uncertainty for the bus driver.





Belen Mathews
S5 ECE A

E-PLUG

The e-plug or the 'economical-plug' has been created and designed to make homes smarter in an economical and environment friendly way.

NEED FOR E-PLUG

Connecting the current appliances to the internet of things (IoT) requires tedious re-wiring and hence becomes expensive normally. This could be overcome by using a plug which has the advantages of small size and low cost.

- To reduce power consumption
- For better security
- For monitoring power usage
- Simplicity of living
- Reliability



CONCEPT OF E-PLUG

E-Plug integrates the existing appliances to the IoT and can be easily operated using an app. This allows control over the appliances through an app rather than physically turning on/off switches. The concept is "The use of control systems and information technologies to reduce the need for human work in the production of goods and services." And no matter how technologically behind-the-times you think you are, you likely use some form of automation in your home every day. Typical examples of basic automation include garage-door openers, alarm clocks, timers on a coffee machine and remote controls.

However, when we talk about home automation and smart homes, the capabilities go quite a bit further. And instead of individual devices working independently, a smart home integrates multiple sub-systems that are all controlled by a master home automation controller. This main automation controller is like the home automation system's quarterback, receiving input from all devices around the home, issuing commands and controlling everything.

Clinton Dominic,

Arundhadhi B

S7 ECE A

THE ONE STOP SHOP

It is the festive season and if there is anything that everyone is looking forward to as much as the variety of foods on offer, it is the shopping that has become a feature of the season. The shopping experience itself has undergone radical changes over the years, from travelling miles in search of finest the products, to the customer being spoilt for choice, having everything under a single roof in the modern mall. The next stage in the evolution came with the advent of online shopping and the e-commerce sector in the late 90's. Online shopping was considered to be the zenith of the shopping experience, and expected to completely replace supermarkets as we know it. After all, that's how natural evolution worked, right? Well, to be fair, the e-commerce sector is at an all time high with an unprecedented number of customers and has consistently produced record sales. However, contrary to expectations, the impact on conventional supermarkets has been negligible, with people regularly thronging malls and retailers posting healthy sales. This observation in its essence became the impetus for us, to develop an idea to revolutionize the shopping experience. We realized that, though modern society has acclimatized to online shopping, the experience of going out, and picking out the things one wanted to buy was something consumers held sacred, with an almost romantic fervor. Another observation indicated that the most attractive aspect of online shopping was the sheer information on offer, everything from the price, offers and similar products were available on the same page. This led us to envision the creation of a retailing unit that combined the product information to the 'shopping experience' that a mall offered. So how do you go about achieving this? Well, we came with the idea of an electronic shopping cart, complete with a monitor and a tubular body supported by a plastic frame. The cart will contain two primary sensors, one placed below the monitor and another at the mouth of the tubular body. The first sensor (below monitor), scans the product and all required information; everything from price, ingredients/contents, similarly priced products and available promotions and offers will be displayed on the monitor. The information itself is extracted from the retailer's product database, which will also contain information pertaining to the location of the product and availability of additional supplies in the store warehouse. Thus, the customer can seek directions to the location of a product and is also notified of the quantity available. The second sensor, will serve as a solution to the problem that has plagued shoppers all over the world, *endless queues*. When the customer, places an object into the mouth of the cart, the sensor detects the product and its price is added to the net total. If the consumer changes their mind and decides to remove the product, the corresponding quantity and price is reduced from the total. Once the customer has completed shopping, they can head over to the exit terminal where the system is notified that the purchase is completed and the products can be moved to disposable bags. Payments may be made through net-banking or using credit/bank cards and thus the hassles of waiting in endless long queues will be a distant memory. Another constant consumer gripe is that many a times the freshness of a store/market bought food item has proven wanting. We aim to resolve this in the proposed model with the introduction of the IOT-sensor aisles for grocery, meat and other food items. These sensors give real time inputs about the freshness of a product and ensure that the produce on offer is top notch every time, raising the consumer experience to a whole new level. Additional features such as the fully automated card, reward programs for frequent users etc. are in the pipeline. Such a system minimizes the need for on-floor staff and cashiers. The intended target audiences for the smart shop are large supermarket chains and MNC's who wish to offer a revolutionary, end-to-end, shopping experience and quite simply change the way people buy things. We believe that *THE ONE STOP SHOP* has a bright future and may come to alter our lifestyles as we know it.



Brian Mathew

S5 ECE A

MODERN ELECTRONICS WORLD

'Electronics' is one of the most commonly used word in the world nowadays. Wherever we look now we will be able to see how electronics has revolutionized the world. Every task is in our life can now be done in a simple and efficient way due to the evolution of the electronic world. Every thing can now be made automatic because of the innovation in electronics.

The different technological things such as mobile phones, television, computers etc which started as small innovations but now has become an important part in our daily life. There are people who depend very much on the electronic devices made but actually doesn't realise how it was achieved. If these inventions were not there it would have totally changed the world and things wouldn't have been running smoothly as it is now.

If we look closely we can see that the growth of the world is directly proportional to the growth of electronics and other technologies. Now we all prefer everything as small as possible that is when we take the case of mobiles we prefer maximum facilities with light weight features. This is one of the case where electronics plays it's vital role.

If we look back through the history of electronics we will be able to recognise it's marvelousness. Something very small like the transistor has played an important role in our life. It is one of the main invention which took over the world and made everyone realise how vast electronics is and how much more it can provide.

Now take the case of computers. The first computers were very large and would take up the space of two rooms. But now due to the evolution in electronics world we were able to make computers in a size very small that now it can be carried anywhere easily. Now every electronic product is marketed on its size.

Day by day due to the new innovations in electronics we are able to reduce everything to size in the range of nanometres and make different things which were thought as impossible once. So electronics has really proved that nothing in the world is impossible.

Even if we take a look at the recent events we can see a high tech artificial robot named Sophia was given citizenship in Saudi Arabia. It is something that was thought impossible but due to the development of nanotechnology and electronics we were able to achieve a different level of application and make everything possible. So in one word electronics can now simply be called as the 'FUTURE' because everything that is yet to come and surprise all of us will be from electronics that's for sure. The only thing we have to do is expect the unexpected.