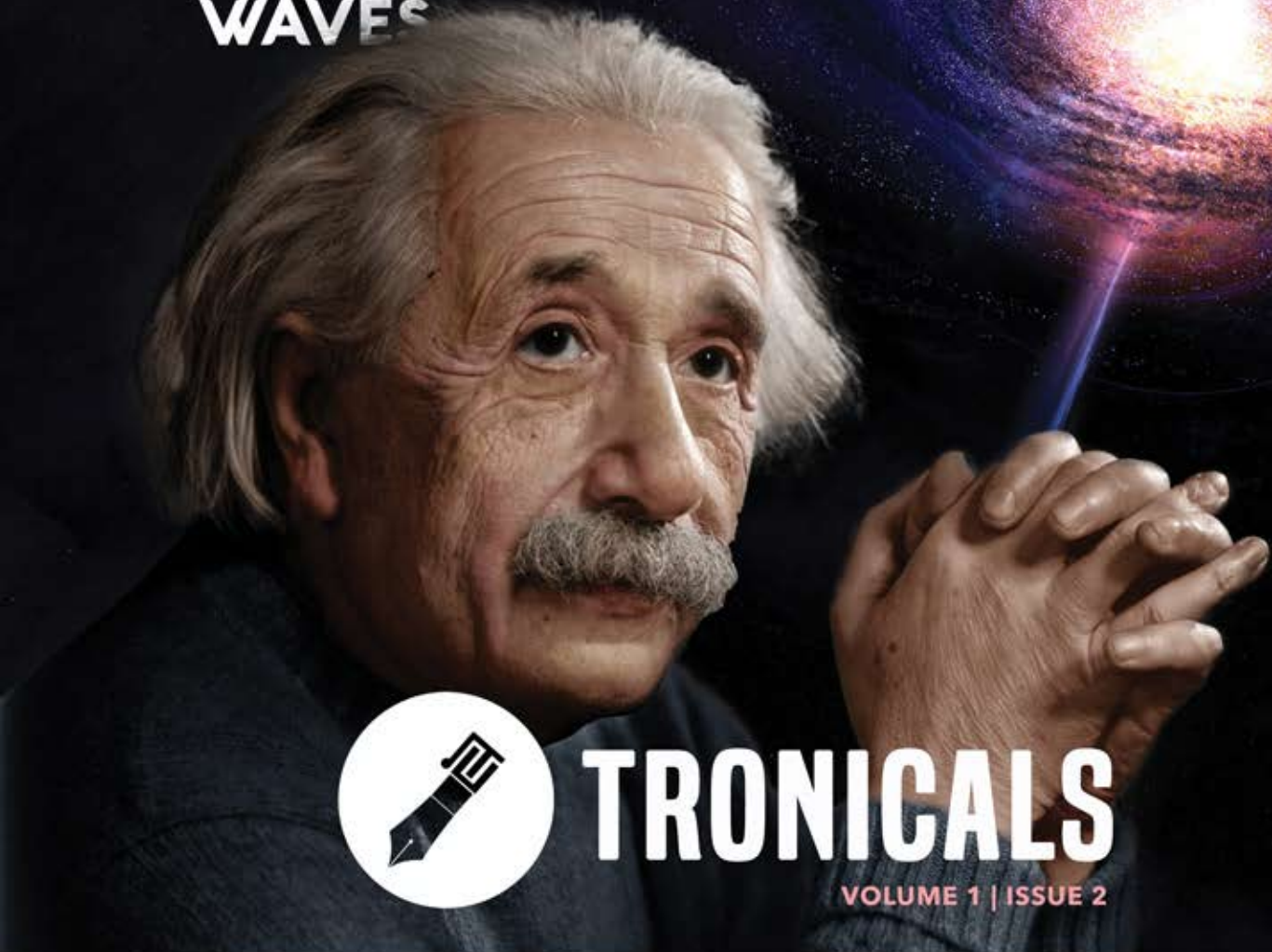




COVER STORY
**GRAVITATIONAL
WAVES**



TRONICALS

VOLUME 1 | ISSUE 2

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

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MESSAGE FROM THE HoD



Dr. K. Sundareswaran
HoD, EEE

I am delighted to write this piece of message for the second issue of "Tronicals". The essential objective of a technical magazine is to inform, engage, inspire and entertain a diverse readership – including students, faculty, parents, and alumni – with a timely and honest portrait of our department activities. This issue has made an earnest attempt in this direction and all the credit for its success falls upon the faculty and students who have worked with dedication and enthusiasm to bring this second issue forward. I convey my regards to all the readers.

-Dr. K. Sundareswaran, HOD, EEE

REVIEW ABOUT THE PREVIOUS ISSUE



Dr. S. Arul Daniel
Dean Academic

Looking back over the years, it is a matter of great pride and happiness, that what started as a biannual publication in the form of EEE newsletter has transcended perceptions and elevated into a magazine. The first issue of TRONICALS, released at the start of this academic session, displays how student creativity supplemented with faculty support can pave new paths, and it stays to serve as a symbolic beacon of progress. The magazine would help provide freshmen students with a glimpse into departmental activities and opportunities. The articles on the history of electrical engineering, and its development in successive issues might set them to think and produce futuristic ideas. Inclusion of more student projects and research arenas at the B. Tech. level would cater to the interests of pupil coteries with similar field preferences. The initiative is verily appreciable and let our department instil in its students the urge to

dream and explore. Conclusively let all your endeavours in these four years be ones that mould you into professional, employable, capable and inquisitive individuals.

-Dr. S. Arul Daniel, Dean Academic

MESSAGE FROM THE FACULTY ADVISOR



Dr. M. Venkata Kirthiga
Faculty Advisor, EEEA

I am delighted on the launch of the second issue of "Tronicals", on the eve of Currents. The EEE Association has played its instrumental role, this academic year as well, alike the previous years, through the year-long activities of various workshops and social events. The 2016 version of Currents commemorates the massive participation of students from all over India. All eight workshops have seen enthusiastic registrations amounting to around 1400 and we are expecting a similar response for the nine events planned for the symposium. Our students have strived to take the symposium to the next level and anxiously awaiting to taste the fruit of their hard work. A similar effort has also been put forth in improving the standard of this Magazine. "Tronicals" showcases the various domains in which our students excel viz., academics, research, co-curricular and extra-curricular activities. It gives a gist of all the activities that have taken part in the EEE department during the last six months. It is astonishing to witness the

achievements and the growth of the students in every facet of their student life. I would appreciate this enterprise and wish whole-heartedly the EEE students to add more feathers on their caps and succeed in their careers ahead!

-Dr. M. Venkata Kirthiga, Faculty Advisor, EEEA

EDITORIAL

Standing at the edge, right before we take the plunge into the deep abyss of the thrilling and unknown adult life, the four years of college flash through our minds. Maybe it was deliverance from the hand of fate or the wish of a child that turned true, every one of us have a different reason that landed us in EEE on that crucial day of admissions.

I always believed EEE to be the magical branch, the branch that can teach us to do all! I think it opens a lot more doors for you than any other field of study. The day our 10th or 25th reunion arrives, we would see the diversity ourselves.

Every year the seniors pass down the same kind of advice; focus on your CGPA, work hard in your intern, prepare well for placements and so on. Yet, when it is your time to work on these advice, you stumble and make the same mistakes again. We weave together a journey, with friends, family, and professors and in some cases prohibited substances! As long as we don't leave college with regrets in our heart, these mistakes are what makes this journey beautiful.

Our batch has had its ups and downs. We've seen them build the new edition of Currents with back breaking work and sincerity. In the upcoming NITTFEST, we want to see our department triumph over all. Win or lose, the love and enthusiasm that you put in working for your department will come back a thousand folds. B.TECH EEE batch 2012-2016 wants to leave a successful and joyful legacy for all our juniors. We welcome everyone to accompany us on the last few dregs of our time in college.

Signing off,

Batch of 2012-2016

Tanya, Chief Editor, Tronicals

TRONICALS TEAM



VISION AND MISSION OF THE DEPARTMENT

ABOUT:

The Department of Electrical and Electronics Engineering, NIT, Tiruchirappalli was started in the year 1964. It offers one Under-Graduate programme (B.Tech.), two Post-Graduate programmes (M.Tech. in Power Systems and Power Electronics) and also research programmes (M.S. and Ph.D.) in the various fields of Electrical and Electronics Engineering. After the transformation from REC to NIT, the department has grown not only in terms of student and faculty strength, but also in improving the laboratory facilities for the teaching and research purposes. Thus, the department has dedicated and state of the art teaching / research laboratories. The department is recognized for excellence in research (First Department in NIT-T to be accorded QIP status for Ph.D. programme), teaching and service to the profession

The faculty members have strong sense of responsibility to provide the finest possible education for both graduate and undergraduate students. The academic strength of the faculty is reflected by the alumni, many of whom are in the top echelons of industry and academia both in India and abroad.

VISION:

To be a centre of excellence in Electrical Energy Systems.

MISSION:

- Empowering students and professionals with state-of-art knowledge and Technological skills.
- Enabling Industries to adopt effective solutions in Energy areas through research and consultancy.
- Evolving appropriate sustainable technologies for rural needs.



B.TECH. PROGRAMME

Programme Educational Objectives (PEOs):

The major objectives of the B.Tech. Programme in Electrical and Electronics Engineering

are to prepare students:

1. for graduate study in engineering
2. to work in research and development organizations
3. for employment in electrical power industries
4. to acquire job in electronic circuit design and fabrication industries
5. to work in IT and ITES industries.

Programme Outcomes (POs):

The students who have undergone the B.Tech. Programme in Electrical and Electronics Engineering (EEE):

1. will have an ability to apply knowledge of mathematics and science in EEE systems.
2. will have an ability to provide solutions for EEE problems by designing and conducting experiments, interpreting and analysing data, and reporting the results.
3. will have comprehensive understanding of the entire range of electronic devices, analog and digital circuits with added state-of art knowledge on advanced electronic systems.
4. will have knowledge and exposure on different power electronic circuits and drives for industrial applications.
5. will have in-depth knowledge in transmission and distribution systems, power system analysis and protection systems to pursue a career in the power sector.
6. will have a good knowledge in microprocessors/microcontrollers, data structures, computer programming and simulation software.
7. will be able to develop mathematical modelling, analysis and design of control systems and associated instrumentation for EEE.
8. will be able to systematically carry out projects related to EEE.
9. will have an ability to participate as members in various professional bodies as well as multidisciplinary design teams.
10. will demonstrate the ability to choose and apply appropriate resource management techniques so as to optimally utilize the available resources.
11. will be proficient in English language in both verbal and written forms which will enable them to compete globally.
12. will have confidence to apply engineering solutions with professional, ethical and social responsibilities.
13. will be able to excel in their professional endeavours through self-education.
14. will be able to design and build renewable energy systems for developing clean energy and sustainable technologies.

M.TECH IN POWER SYSTEMS

Programme Educational Objectives (PEOs):

The major objectives of the M.Tech. Programme in Power Systems are to equip the students with adequate knowledge and skills in Power Systems Engineering and to prepare them for the following career options:

1. research programmes in Power Systems Engineering
2. employment in power research and development organisations
3. to work in electric power industries and energy sectors
4. faculty positions in reputed institutions.

Programme Outcomes (POs):

A student who has undergone M.Tech. Programme in Power Systems (PS) will:

1. have an ability to evaluate and analyse problems related to Power Systems and be able to synthesise the domain knowledge and incorporate the principles in the state of art systems for further enrichment
2. be able to critically investigate the prevailing complex PS scenarios and arrive at possible solutions independently, by applying the acquired theoretical and practical knowledge
3. be able to solve PS problems such as load flows, state estimation, fault analysis and stability studies
4. be able to develop broad-based economically viable solutions for unit commitment and scheduling
5. be able to identify optimal solutions for improvising power transfer capability, enhancing power quality and reliability
6. be able to evolve new schemes based on literature survey, and propose solutions through appropriate research methodologies, techniques and tools, and also by designing and conducting experiments
7. be able to interpret power system data and work on well-defined projects with well-defined goals to provide real time solutions pertaining to PS
8. be able to develop, choose, learn and apply appropriate techniques, various resources including hardware and IT tools for modern power engineering, including prediction and modelling with an understanding of the limitations
9. be able to develop dedicated software for analysing and evaluating specific power system problems
10. be able to participate in collaborative-multidisciplinary engineering / research tasks and work as a team member in such tasks related to PS domain, giving due consideration to economic and financial intricacies, and lead the team in specific spheres
11. be able to confidently interact with the industrial experts for providing consultancy
12. be able to pursue challenging professional endeavours based on acquired competence and knowledge
13. be a responsible professional with intellectual integrity, code of conduct and ethics of research, being aware of the research outcomes and serve towards the sustainable development of the society
14. be capable of examining critically the outcomes of research and development independently without any external drive.

M.TECH IN POWER ELECTRONICS

Programme Educational Objectives (PEOs):

The major objectives of the M.Tech. Programme in Power Electronics are to equip the students with adequate knowledge and skills in Power Electronics and to prepare them for the following career options:

1. research programmes in Power Electronics and related areas
2. employment in R & D organisations related to sustainable technologies
3. to work in power electronic circuit design and fabrication industries
4. faculty positions in reputed institutions.

Programme Outcomes (POs):

A student who has undergone M.Tech. Programme in Power Electronics (PE) will:

1. have an ability to evaluate and analyse problems related to Power Electronic Systems and incorporate the principles in the state of art systems for further improvement
2. be able to investigate critical PE problems and to arrive at possible solutions independently, by applying theoretical and practical considerations
3. be able to solve PE problems such as switching control, converter design, analysis and control of solid state drives and stability studies
4. be able to develop appropriate power converters for sustainable energy technologies
5. be able to identify optimal solutions for improvising power conversion and transfer capability, enhancing power quality and reliability through PE based solutions
6. be able to evolve new power electronic topologies and control schemes based on literature survey and propose solutions through appropriate research methodologies, techniques and tools, and also by designing and conducting experiments
7. be able to work on small, well-defined projects with particular goals to provide real time solutions pertaining to power electronics
8. be able to develop, choose, learn and apply appropriate techniques, various resources including sophisticated digital controllers and IT tools for modern power electronic system simulation, including prediction and modelling with existing constraints
9. be able to develop dedicated software for analysing and evaluating specific power electronics and control problems
10. be able to participate in collaborative-multidisciplinary engineering / research tasks and work as a team member in such tasks related to PE domain, giving due consideration to ecological and economical intricacies, and lead the team in specific areas
11. be able to confidently interact with the industrial experts for providing consultancy
12. be able to pursue challenging professional endeavours based on acquired competence and knowledge
13. be a responsible professional with intellectual integrity, code of conduct and ethics of research, being aware of the research outcomes and serve towards the sustainable development of the society
14. be capable of examining critically the outcomes of research and development independently without any external drive.



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MOVING TO STUDENT CENTRIC EDUCATION

It has been a semester since the flipped style classes began, an initiative from the faculty of EEE department. Though this style of teaching has been implemented for freshmen students, very few faculty have experimented with it. Last semester, the final year and post graduate students of EEE were subjected to this style of teaching by Dr. Raja, Dr. Selvan, and Dr. Venkata Kirthiga. In general, the feedback from students have been positive with respect to teaching and evaluation methodology.

This flexible mode allows the teachers to draft their own curriculum, adhering to some basic requirements, and construct any method of evaluation. While this has resulted in a major increase in the number of exams, the schedule and topic congregation for each assessment have reduced the quantity of study for students. Some courses have extensive theoretical content, which are better evaluated via simulations and model studies, thereby ensuring that all students gain the requisite knowledge of the subject. While this mode of practical assignment based evaluation allows some students to binge on other students, the overall effectiveness of knowledge transfer has only been enhanced.

For a course handled in flipped style, students have to face around five to six assessments, simulation/experimentation based assignments, highly scattered marking schemes, and yes, go to industrial visits. From a student point of view, the workload is quite high. But the entire semester passes without any last minute cramming and late night studies since we are constantly evaluated and the examinations have smaller scope, thereby reducing the preparation time for each exam.

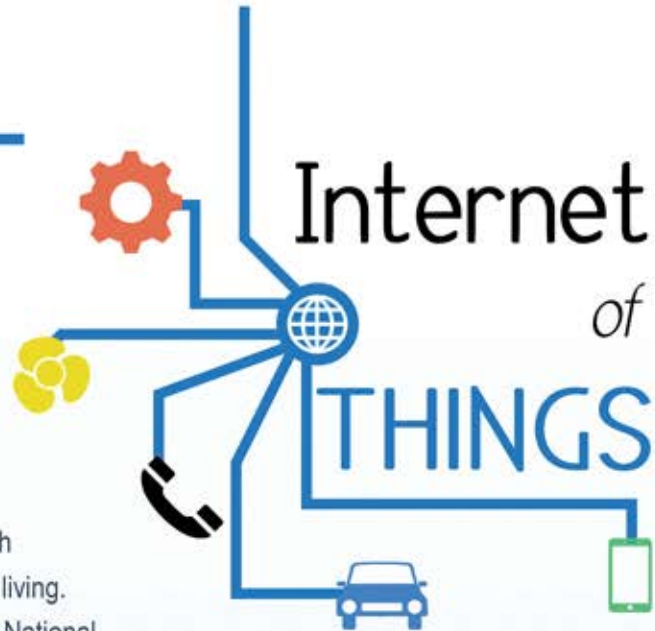
While all this sounds extensive, it is only the tip of the iceberg for the faculty. Preparing to handle a flexible style class is an exhausting process, which involves assembling a creative and efficient plan for teaching and evaluation, several months in advance. Frankly, correcting cycle test papers is a facile job compared to grading the quality of "questions" spawned by the students. Furthermore, recording and editing the video lectures for students has been a tedious task for the faculty, which would be a lot easier if a dedicated Audio-Visual facility were to be set up. This facility would soon become a huge demand from all the faculty, so a well-equipped version needs to be constructed by the administration.

Another giant problem spurred for both the faculty and the students in the form of attendance. Since the number of contact classes have been greatly reduced, maintaining the minimum percentage of attendance became laborious. Specifically for the final year students who are wading through the placement process, attending 75% of classes is inherently difficult, not to mention that the 25% of the bunkable classes would now tantamount to just five. The compensation assessment was introduced and students lacking attendance were now expected to prove their knowledge of the subject, in order to sit for the final assessment. Students were also required to take the compensation assessment, if their regular assessment performance was unsatisfactory. All those who hoped to pass the subject by cramming the notes just before the final exam have now been revoked of that privilege.

Other universities have also adopted a version of this flipped style curriculum, wherein some of the features have been successfully reconstructed. The reformed version of our curriculum has still got several iterations to go, in order to reach the ideal version, in which student would have complete control over their choice of subjects. The department would offer core subjects in all years, and the students can prioritize to study their field of interest before moving on to the rest.

It would also at least eight to ten years for NIT students to get control over the choice of teachers, as in multiple teachers would offer the same course, a feature which already exists in IITs.

IoT @ NITT



In today's internet integrated society, a product needs to be constantly updated in order to refrain itself from turing obsolete. The Internet of Things (IoT), is the new phase of modern day research that has immense influence in various aspects of our living.

The members of 'The 1981 Alumni Trust' of the National Institute of Technology, Trichirappalli have set up an 'Internet of Things' Innovation Centre at our institute for taking up research from July 24, 2015. The establishment of this research laboratory was at an expenditure of Rs. 20 lakhs. The trust has also offered three projects to be taken up by the students: Smart Public Bus Transport System, Smart Home with User Feedback Interface and IoT Assisted Car.

The Smart Public Bus Transport System would give information through a smart phone to commuters on its' exact time of arrival. It could be used by the transport sector and buses attached to schools or colleges, so that the commuters or students would know the exact time of the arrival of the buses. They could get information on delays due to traffic snarls or other unforeseen situations. The smart house would be useful in getting real-time information and operation of household appliances such as lights, refrigerator and electric fans. For the IoT assisted car, an electronic system needs to be interfaced so as to make the car more interactive and also allow the driver to know the internal conditions of the car during the ride. The proposed electronic system will measure the gear oil level and the fuel level and shall send the data to the driver as well as those at the pits.

This research laboratory at our institute is headed by the Student President Rajat Sanklecha. All technical club heads and members of the above mentioned projects are granted access to the IoT laboratory. It is equipped with fingerprint biometric system. Students get to interact with industry experts in relevant fields through the support of the alumni. The benefits of this new establishment are an apex for the students as well as the institute. It benefits the college in enhancing students' practical skills and undergraduate research experience, thus easing them more towards employability and entrepreneurial thinking.

S. Ramachandra, N. Venkataraman, and B.V. Ramanan are the key alumni members behind this initiative. Dr. A.K. Bakthavatsalam and Dr. M. Bhaskar will assist the students as faculty advisors. Rajat Sanklecha, Srivignesh PSS, Girish Kumar and Anirudh R play the role of crucial members from the student side. Kumar Ventramani, Katni Venkat and Balu Srinivasan will be the alumni mentors and Raji Sankaranarayanan from Cisco IoT will be the industrial mentor for our IoT research laboratory.



GOAL-LINE TECHNOLOGY



The world kept talking as to what could have happened in the match between Germany and England in the 2010 World Cup had Frank Lampard's goal been allowed. Germany were leading 2-1 when Lampard's volley hit the underside of the crossbar and bounced off the inside of the goal. That goal could have made the world of a difference to the complexion of the game in which Germany ran out 4-1 winners eventually.

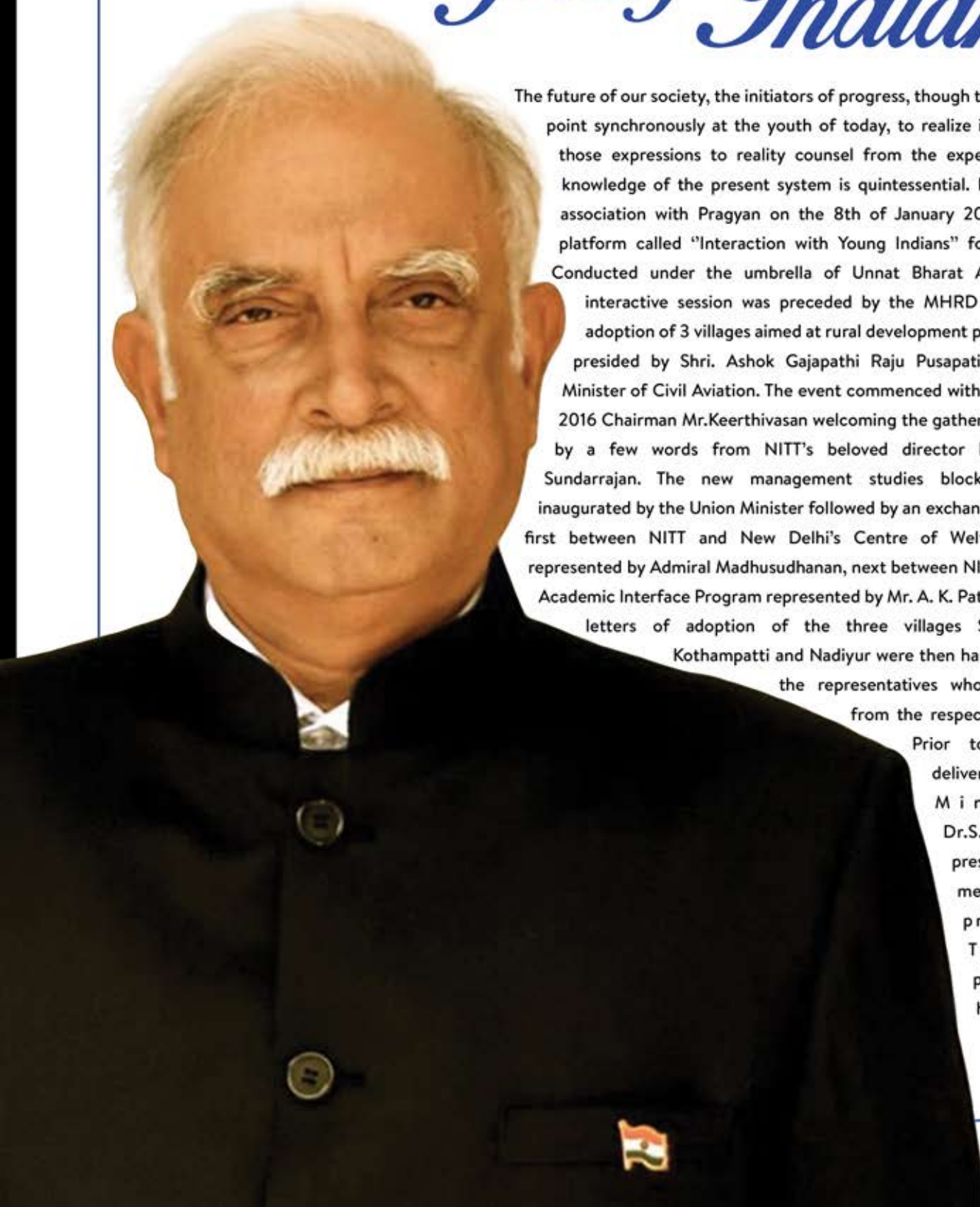
This was one major instance, where the need for goal-line technology was exposed badly. An alternate solution to such cases would be incorporating a fifth linesman alongside each of the goals' posts to check whether the ball had crossed the line or not. However, expecting the 2nd and 3rd officials to bring out correct results from that distance, is indeed asking too much of them. The argument, that there have been goals wrongly disallowed for offside too, shall definitely arise. Two linesmen are deployed on each flank to detect offside or fouls. Implementing and establishing a form of technology for even that would make football lose its human element. Refereeing is an art and a widely respected profession, and bringing forward technological assistance to it in any manner would demean the profession altogether. Scenarios like that of Frank Lampard are seen as extreme cases and hence the call for goal-line technology was even considered.

Every proposal has its pros and cons. As much as the implementation of goal-line technology may seem important, it has its own disadvantages because of which the necessity of it is put under question. The same disadvantages are the reason why the technology is functional in very few competitions. Any new form of technology is weighed with its cost and necessity to decide whether it would be worthwhile to use it. The need for goal-line technology occurs rarely, which makes it justifiable for various clubs to doubt its requirement. And of course, usage of technology for the job that is expected to do by the match officials is a loss of human element for football.

Essentially, goal-line technology is a opto-electronic arrangement, which detects the crossing of the football. Growth of science and technology is directly proportional to costs that they are associated with, but they don't come hand in hand with the affordability of various clubs. Irrespective of the technological progress in their environment, most of the football clubs have limited affordability and expecting them to deploy something which has a cost as high as that of goal-line technology, that would be of use only in rare instances, is absolutely baseless. Technological assistance is usually taken only for the cases that are impossible for the human eye to notice (like hawk-eye in cricket and tennis). Frank Lampard's scenario is something that could have very well been noticed by the officials and the wrong judgement would ultimately come down to human error and Lampard's misfortune. It is for the same reason why goal-line technology is used only in competitions where the participant football clubs have enough affordability, like the Premier League and Bundesliga, and was also recently used in 2014 FIFA World Cup. How far the costs come down in the future will eventually determine the success of goal-line technology. Till then, it will only remain to be something that is still under the process of globalisation.

Interaction

With Young Indians



The future of our society, the initiators of progress, though these phrases point synchronously at the youth of today, to realize it or convert those expressions to reality counsel from the experienced and knowledge of the present system is quintessential. NIT Trichy in association with Pragyan on the 8th of January 2016 set up a platform called "Interaction with Young Indians" for the same. Conducted under the umbrella of Unnat Bharat Abhiyan, the interactive session was preceded by the MHRD initiative of adoption of 3 villages aimed at rural development processes and presided by Shri. Ashok Gajapathi Raju Pusapati, the Union Minister of Civil Aviation. The event commenced with the Pragyan 2016 Chairman Mr. Keerthivasan welcoming the gathering followed by a few words from NITT's beloved director Dr. Srinivasan Sundarrajan. The new management studies block was then inaugurated by the Union Minister followed by an exchange of MOUs, first between NITT and New Delhi's Centre of Welfare Studies represented by Admiral Madhusudhanan, next between NITT and TCS's Academic Interface Program represented by Mr. A. K. Pattabiram. The letters of adoption of the three villages Solaganpatti, Kothampatti and Nadiyur were then handed over to the representatives who had come from the respective villages.

Prior to the talk delivered by the Minister, Dr. S. Sundarrajan presented a memento, the prestigious Thanjavur plate to the honorable minister.

The minister initially having stressed upon the role of youth in Indian politics and the growing opportunities in the Indian Aviation arena, advised the youth to collect ideas from everywhere and not just stick to former orthodox methods. He also asked the students to take pride in the past and not live in it. The gathered students then began asking questions and putting forth queries about the present scenario of Indian aviation concerning which the Minister gladly responded and urged more students to develop interest in the aviation industry. Following are some of those questions:

1. Why does the Trichy International Airport have limited connectivity and not many destination options?

There are many limitations that bar us from expanding reach, the prominent ones being airline profitability and affordability. Roadblocks when looking forward in terms of aviation would be acquiring land for airports and flight services as they need vast space to operate comfortably. Financial aspects and profitability of the operating airlines predominantly decide the success and frequency of flight services in an airport.

2. Regarding the ban on flying multirotors and drones in Indian cities, when can we expect such bans or laws, forbidding eager drone designers or amateur copter builders from freely showcasing their designs, to be lifted?

There are many social and humanitarian aspects involved in legalizing amateur drone flying in cities. The system is trying to come up with a regulatory framework that would appease everyone and yet not neglect the defense and social concerns at hand. Though the government wishes that the youth are not demotivated but are encouraged to freely follow their dreams and make the nation proud, the safety concerns of the common man always come into question and we must try our best not to compromise on that strata.

3. Why have certain already inaugurated airports not officially begun operation?

Airport functionality depends mainly on airlines cooperation. An airline is like a free-spirited animal, you can encourage it, motivate it, but cannot make it run unless it decides for its own.

4. Is foreign investment in airlines sector beneficial?

The fact that Kingfisher business went down is an ideal example as to why airline business ventures are very risky in terms of profitability. As a result, investors are few and finally commerce depends mainly on the interest of the investor which in turn is triggered by the risk factors and profit involved. Rising fuel prices have limited our array of potential investors and thereby imposed a negative impact relative to the aviation zone.

Despite all this it must be our constant effort to do all we can to help the Civil Aviation Industry and sector succeed as this has a direct effect on not just national and global trade and social economy, but even in terms of research and scientific endeavors that would benefit defense and military.



GRAVITATIONAL WAVE DISCOVERY



In Einstein's theory of general relativity, gravity is treated as a phenomenon resulting from the curvature of spacetime. This curvature is caused by the presence of mass. Generally, the more mass that is contained within a given volume of space, the greater the curvature of spacetime will be at the boundary of this volume. As objects with mass move around in spacetime, the curvature changes to reflect the changed locations of those objects. In certain circumstances, accelerating objects generate changes in this curvature, which propagate outwards at the speed of light in a wave-like manner. These propagating phenomena are known as gravitational waves.

They carry information about the black holes and the nature of gravity that scientists would not be able to obtain otherwise. This is the first time black holes have been directly detected. You can't see black holes with telescopes. Up until now, scientists inferred that black holes existed by observing stars and the gas swirling around them, measuring the gravitational effect black holes have on other matter in the universe. But with this discovery, scientists detected gravitational signals directly from black holes. In addition, scientists can now learn more about binary black holes: how many there are in the universe, how often they merge, how often they are born and where they come from. It also opens a new window for astronomy and astrophysics. Currently, scientists study space via electromagnetic waves. Now, scientists study space with gravitational waves.

Here we list down a number of problems which may be solved correctly and concisely by applying relativistic methods

1. The Lorentz Transformation
2. Transformation of fields and sources
3. Doppler Effect
4. Constitutive Equations
5. Boundary Conditions
6. Quasistationary Approach
7. The instantaneous rest frame hypothesis
8. Rotating Bodies
9. Induction Law
10. Accelerated frame of reference
11. Magnetic Levitation
12. Braking force exerted by motional Foucault currents
13. Acceleration of space vehicles

IS RELATIVITY RELEVANT TO AN ELECTRICAL ENGINEER

For most of us Relativity evokes intricate formal manipulations, pleasing to the professional mathematician, but awe-inspiring, and even repulsive, to the average Electrical engineer. And yet, Physics of the greatest importance hides behind the forest of tensors and four dimensional symbols which confronts the reader of relativistic texts. Einstein's fundamental 1905 paper, "Zur Elektrodynamik Bewegter Körper", already contains, in its title, the reason why the Physics of Relativity may indeed be relevant to the Electrical Engineer.

Whether Relativity may be termed relevant to the Electrical Engineer depends on the meaning attached to the word "relevant", and on the kind of engineer one talks about. The answer also depends on one's point of view, purely intellectual or utilitarian.

Intellectually, Relativity is a most satisfying theory, It allows one to formulate problems in a clear and systematic way and leads, for example, to a swift and correct derivation of a formula. It may be claimed that any first course in Fields should contain a short introduction to Special Relativity. From a utilitarian point of view we may assert, in all fairness, that most electrical engineers can live quite happily without Relativity. Electromechanical engineers, on the other hand, are in much greater need of Relativity for a host of problems, including those involving flux linkages and sliding contacts.



GRAVITATIONAL

WAVE

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CORNER

DISCOVERY

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NAME

Gender, Nationality, Age
Address
Contact info – Phone no, Email id

Make sure you have a formal email id and keep checking your inbox regularly.

PERSONAL DETAILS

Father's Name, Date Of Birth, Languages Known
Do not mention Roll Number & Webmail ID.

EDUCATION

| Degree | Department | | | | | CGPA |
|-------------------|-------------|-------------|--------------|-------------|-------------|------------|
| Semester | I | II | III | IV | V | |
| | Month, Year | Month, Year | Month, Year | Month, Year | Month, Year | |
| GPA | | | | | | |
| Class XII (Board) | Year | | School, City | | | Percentage |
| Class X (Board) | Year | | School, City | | | Percentage |

EXPERIENCE/WORK HISTORY (OPTIONAL AT UNDERGRAD LEVEL)
Paid, volunteer or military. Emphasize duties, responsibilities, skills, abilities and accomplishments appropriate to the position for which you are applying. Note the job title, employing organization, and dates of employment.

JOB OBJECTIVE

One line description of the type of position desired.

ACADEMIC ACHIEVEMENTS AND CO-CURRICULAR ACTIVITIES

Mention any relevant achievements that you might have to the job description. You may mention honors, specific trainings etc. All academic and co-curricular achievements should be in reverse. Avoid mentioning your AIEEE/IIT-JEE rank in your academic achievements. You can mention your NIMCET rank if you feel it's worth mentioning (40 or higher is a good rank). No mention Rank in class (For ex. Currently placed 1st in the class)

SKILLS & ABILITIES

Foreign languages, computer skills, office skills, lab techniques or transferable skills not mentioned elsewhere in the resume.

PROJECT WORK / TRAINING

List academic projects with the title and a short description. You may mention any training undergone in academic fields as well.

- **Name of Project/In-Plant Training**
Under Mentor Name
Sponsored by/College Name (Duration)
[Concise Description]

RESEARCH AND PUBLICATIONS

Briefly describe relevant research projects. List articles, papers or books that have been published.

EXTRA CURRICULAR ACTIVITIES

In order of importance, list student activities/ organizations, professional associations and committees in which you have participated. List any offices that you held and indicate the skills you used.

As a first or even a second year student, it's okay to include work experience, leadership or highlights of activities, and accomplishments from high school. By your third year in college your resume should include experience and activities from college only.

Names of Tech Fests should be as follows with the description lines in brackets:

- o Pragan '<year>' (The International Techno-Management Festival of NIT-Trichy)
- o Festember '<year>' (The National Level Inter-Collegiate Cultural Festival of NIT-Trichy)
- o Nintfest '<year>' (The Inter-Departmental Cultural Festival of NIT-Trichy)
- o Verson '<year>' (A National Level MCA Technical Symposium)

In case you were a manager/deputy manager/coordinator in any festival in our college in one year or in successive years, mention it as such:

Was part of <Festival> (<Description of the festival>) in the following capabilities:

Manager of <team> during <Festival> <Year>

Deputy Manager of <team> during <Festival> <Year>

REFERENCES (OPTIONAL AT UNDERGRAD LEVEL)

When you are asked for references create a separate page with the word "References" at the top. List names, titles and contact information. Always ask permission before using anyone's name as a reference. Do not use your relatives or friends as references. Try to use people who know about your work-related abilities. Former employers, volunteer project supervisors, counselors and faculty are good choices for references.

Spend time with your resume. It is a two page reflection of your achievements and capabilities. If the formatting is sloppy or there is a typo, it is a black mark against you.

KEY POINTS TO NOTE

An effective resume succinctly describes your education and experience in relation to the job you are applying for. You will often make your first impressions on employers through your writing, and you'll want those impressions to be outstanding. Your resume is a written snapshot that should clearly support your career goal and be tailored to that position. Information on the resume should be presented in order of relevance to the position.

DEVELOPING A RESUME:

1. Analyze the job description: Review job descriptions for the skills and abilities that employers are seeking. Read through the descriptions and highlight the required skills, attributes and qualifications. Use these words in your resume. Include component that are appropriate for your background and the job that you are targeting.

2. Create a list of accomplishments: Take some time to think about your accomplishments: things that you did well, enjoyed doing, and were proud of. Include education/training, volunteer opportunities, jobs, projects, school assignments, travel and group/team activities. Describe in detail what you did, who you did it with, what equipment you used and what happened. Quantify your results, if possible, and use commonly understood terminology. Identify the personal strengths and skills that you used to achieve your accomplishments. Don't be humble; this is your chance to promote your skills and abilities. Emphasize results produced, significant achievements, recognition from others. Make sure whatever you put in the resume is entirely factual and there should be certificates to back up every achievement you mention.

3. Analyze experiences for relevant skill areas Analyze your experiences to identify your skill areas. Always have some experiences in mind when writing skills in the resume. This enables you to explain with examples when facing an interview.

4. Write descriptive phrases: Write short phrases to describe what you did that illustrates each skill. Be concise and specific. Arrange the descriptive phrases in order of relevance to the position for which you are applying.

5. Choose the appropriate format There are several resume formats to choose from so be sure to choose the format that best presents your background and qualifications. Broadly there are two types:

(i). **Chronological.** This resume lists your background in a reverse chronological sequence, starting with the most recent. You may arrange your headings various ways, depending upon what aspects of your background you wish to stress. This format works best when your work, volunteer and academic experiences relate directly to the type of job for which you are applying. It is preferred by most on-campus recruiters and business employers.

(ii). **Skills/Functional.** This resume highlights your most important skills or functions. Headings are built around these areas. Job titles, employers and dates of employment are listed in a brief section at the bottom of the page. This format allows you to highlight skills, knowledge and abilities relevant to the position regardless of where and when you obtained them. It works well when your work experience is not directly related to your career goal, you are entering the job market for the first time, or you are making a career change.

We have a standard institute format that follows the chronological type of resume. It is suggested to use the institute format when applying for jobs/positions on-campus, as it is easily readable. Stick to the TP format when it comes to font type, size and formatting. **DO NOT** deviate from it in the slightest. However, it is suggested to change the format once you pass out of the institution. You can download the Resume guidelines and the institute resume format from tp.nitt.edu

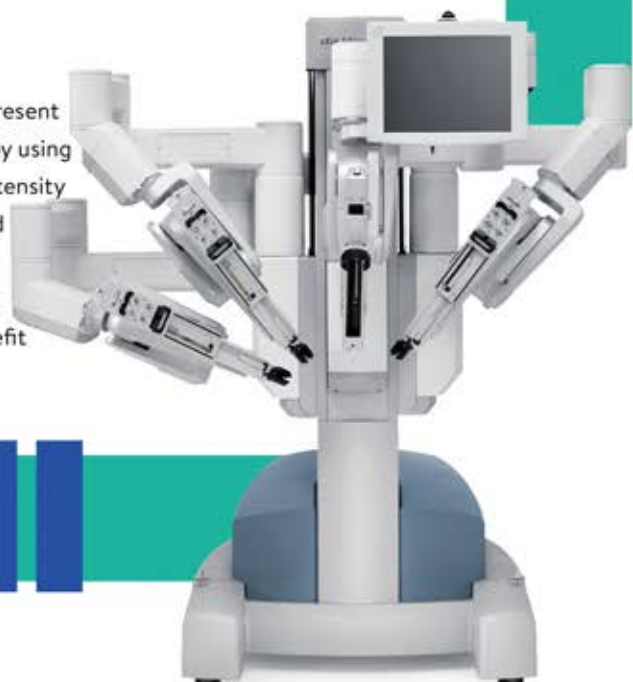
6. Proofreading & Grammar: Check the spelling of every word; make sure grammar and punctuation are correct. Don't use abbreviations. Don't use all capitals or italics anywhere. Only Bold is allowed. Do not put unnecessary spacing. Use a single space after each full stop and comma. Make sure that your resume doesn't run for more than 2 pages. Have someone else proofread your resume. Get feedback from several people.

From medical surgeries to assistive technology to prosthetics, everything around us is becoming technologically advanced and intelligent due to booming inter-disciplinary research in the field of robotics and medicine. This has increased man-machine interaction and has started to bridge the gap between requirements of doctors and innovations of engineers, while constantly improving the quality of life and longevity of mankind. A medical robot is one that allows surgeons greater access to areas under operation using more precise and less invasive methods. They are widely used in most of the tele-manipulators, which use the surgeon's actions on one side to control the "effector" on the other side.

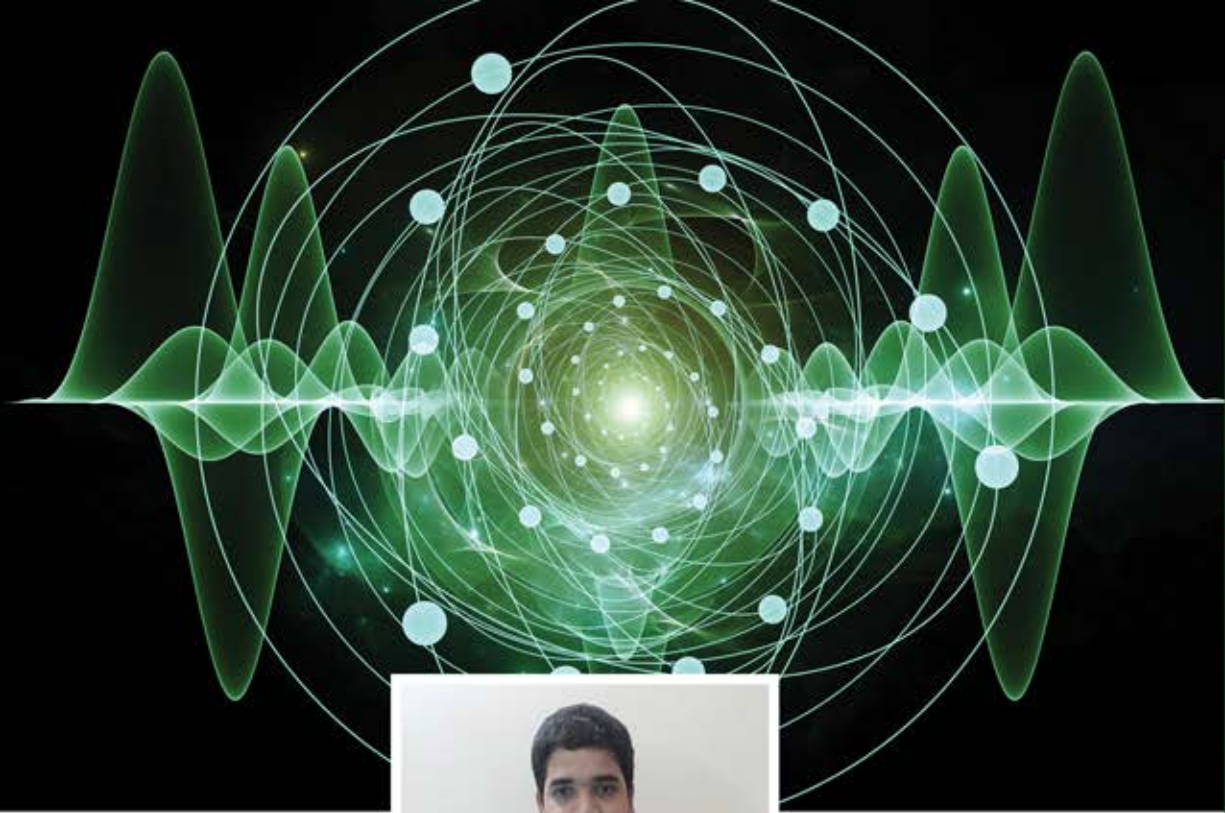
Over the last two decades, these robots have transformed and revolutionized the way surgeons perform complex surgeries. These robots can be operated either on-site or off-site. With the advancements in sensor technology, haptic feedback and advanced controllers, a complicated surgery is as simple as playing a game on Xbox or PlayStation Consoles. One of the most advanced and popular surgical robot is the Da Vinci Robot. With the da Vinci Surgical System, surgeons operate through just a few small incisions. The da Vinci System features a magnified 3D high-definition vision system and tiny wristed instruments that bend and rotate far greater than the human hand. As a result, da Vinci enables your surgeon to operate with enhanced vision, precision and control. The advantages of these robots include minimal invasion, lesser blood loss, and faster recovery, precise and monitored cuts and reduced risk of infection. These robots can be utilized for a wide range of surgical procedures like cardiac surgery, general surgery, head and neck surgery and thoracic surgery. The doctors interact with the patient's body by using haptic feedback.

Majority of the surgical systems which are required to perform minimal operations are generally cable-driven. This cable-driven mechanism allows power transmission. Usage of cable-driven mechanism reduces the mass and inertia of actuators which are on the moving part (such as the arm). This also reduces the profile of the arm and increases the portability and suitability for use in minimally invasive surgical procedures. However these have major limitations as well. These cable-driven systems respond only to tension. This tension is created by virtue of a pull and not a push, due to which the control over the system is limited. Although the cables are reasonably stiff, they still deform especially under high dynamic loads or interaction with heavier objects. As a consequence, the joint positions are not always proportional to the motor positions and are instead related by the dynamics of power transmission through the elastically deformed cable. The elasticity in the cable also means that there could be oscillations in the joint position. These factors can reduce the accuracy and precision of the surgical system over a period of time. The solution for this involves the development of highly articulated micro-actuating segments composed of linear actuators. These linear actuators can have a bi-directional movement. So in order to bend into a concave or convex structure, they can do so by adjusting the movement of each actuator and co-ordinating between each micro-actuator.

However one major factor that might be missing in this type of micro-actuated system is the haptic feedback which is otherwise present in case of cable-driven mechanism. This problem can be resolved by using haptic vibration patterns at the gripper using micro-motors. The intensity of the vibration pattern communicates the pressure being applied on the tip of the surgical tool. The advantages of this system are better dexterity and precise control. Though this is a concept still in its research stage, when commercialized, it would definitely benefit the patients.



DEVALLA SRIPAD KRISHNA



ANIRUDH CHANDRASEKARAN

Condensed Matter Physics physics that seeks to behaviour of matter. In a study of macroscopic using microscopic models. It is one of the of physics today, thanks to that it offers. Among the of exotic effects in magnetic systems has witnessed a surge in interest. Notable ones are the quantum Hall effect and the thermal Hall effect. Apart from the interesting and peculiar features that are associated with such phenomena, their potential applications are so amazing that they merit further study.

(CMP) is a discipline of study collective restricted sense, it is the properties of materials quantum mechanical most popular disciplines the exciting prospects areas of CMP, the study of exotic effects in magnetic systems has witnessed a surge in interest. Notable ones are the quantum Hall effect and the thermal Hall effect. Apart from the interesting and peculiar features that are associated with such phenomena, their potential applications are so amazing that they merit further study.

The Hall effects, among other things, are studied under the sub discipline "Topology in condensed matter". It investigates the effect of non-trivial geometric structure of the energy bands (this itself is a naive definition of the field). The various Hall effects are consequences of "non-trivial topology" in some materials. Both the Hall effects are analogues of the familiar classical Hall effect in electromagnetism. Another closely related phenomenon is the existence of the so-called spin liquids.

The aforementioned relics of CMP have made the possibility of spintronics and quantum computers real. Although a full and working spintronics computer and quantum computer are probably a decade or two away (possibly more!), we know what the building blocks could be. The Quantum Hall and Quantum spin Hall effects have opened the door to spintronics while spin liquids come across as good candidates to realize topological quantum computation.

Both spintronic devices and quantum computers would vastly improve computation. The latter, especially, would change the way computation is done, in a fundamental manner. Even energy consumptions will reduce considerably, making computation more sustainable. Hopefully, we will live to see these devices become a reality.



Synchrophasor

A smart step towards smart grid

When we are dealing with Power Systems, massive power transfer across the power transmission network, the engineering marvel, is the center of our concern. Clearly, we are in dire need of a completely revamped power system that would be more efficient. In the conventional sense, consumer load is managed to match the generation, transmission and distribution capacity. The new approach, also called the bottom-up approach, aims to iterate the power system based on consumer needs.

A few decades ago, when we were facing frequent blackouts and brownouts, caused due to the unprecedented growth in power demand, compared to the sluggish development in power system infrastructure. The Supervisory Control and Data Acquisition System (SCADA) of 1960s, introduced remote monitoring of the power system, alas, its colossal structure impeded accurate monitoring. When digital technology hit the markets, the vast complexity of the power system could finally be brought into the scope of computerized monitoring and control. Automation and consumer-generation communication gave birth to what we call today as smart grids.

Synchronized Phasor Measurement is the next step in power system automation. When centralized control is envisioned, detailed monitoring systems are indispensable. Phasor measurements provide a complete picture of the power system state. Since the data sampling of Phasor Measurement Units (PMUs) are synchronized via GPS signals from satellites in orbit, the measurements obtained from PMUs

are a comprehensive package which leads to Wide Area Measurement (WAM) and Control. For example, a fault occurring in Trichy, may be detected by two different PMUs, both of whose data is required to make a protective decision. Obviously, the data taken under consideration must be synchronized to a common clock, else the protection action may not occur.

The state of power system and its load flow conditions needs to be accurately known. Early state estimators and load flow analysis techniques could only go so far as to delineate the power system before the complexity overloads the computers. Now, the data obtained from PMUs can be directly used to estimate the state of a power system, by performing Fourier analysis on the sampled data. Prior to the invention of this technique, differential protection of transmission lines demanded lengthy pilot wiring. PMUs, with their satellite-synchronized data acquisition systems, have rendered pilot wires obsolete.

Furthermore, cutting-edge research like "adaptive relaying", "intelligent islanding" are reshaping the concept of power system control and operation. PMU installation has also begun in India, and millions of dollars are being allocated to modernize the power system as we speak.

You can also refer to Synchro Phasor Measurement by A.G. Phadke and J.S. Thorpe of the Virginia Polytechnic Institute.



Rounak Meyur

PLACEMENT STATISTICS AND INTERNSHIPS

INTERNSHIPS

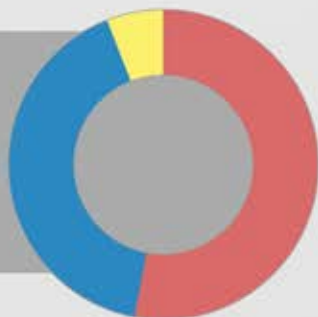
| | |
|----------------------|------------------|
| Qualcomm | Saurabh Dubey |
| Texas Instruments | Sri Sowmya |
| | Pratishthit Iyer |
| | Ramanathan RM |
| National Instruments | Harshavardhan S |
| Sandisk | Pavithra S |
| P&G | Harini Sekar |
| L&T | Kauviya S |
| Alstom | Meenakshi Naidu |
| Fidelity | Manisha B |
| | Manpreet Singh |
| | Kaushik Ram G |
| Siemens | Sujitha M |
| | Simrain Jain |

PLACEMENT STATISTICS

Number of students registered: 70

Number of students placed: 66

Percentage: 94.2%



Core: 53.03%

Software: 40.9%

Management: 6.06%

ACTIVITIES OF EEEA

Green Drive Article

A green drive was conducted in the month of November by the EEE Department of NITT. It was conducted in two phases. The EEEA took care of the event as a part of its social responsibility. We were provided with saplings by one of our alumni. The saplings were brought to the campus by a mini truck and were kept piled in the department, from where anyone who is a nature lover and wants to add to the greenery of the campus, could come and get saplings of different varieties for free. There were saplings of thousands of plants. The faculty and students of our department helped out in conducting the event smoothly. There was such a huge demand for the saplings that around 600 of them were distributed within 2 to 3 days of the first drive. LEAP, the nature club of NITT was also in the queue of customers. Among the other customers were the students and professors of all the departments of our institute. The drive had to be conducted once again to fulfill the demands of the green enthusiasts. The second drive saw the distribution of over 700 saplings, which was a better statistic than that of the first drive. Overall, the programme was a huge success.



Ashram Visit Article

Daan Utsav is the nationwide 'Joy of Giving' festival celebrated during the week of Gandhi Jayanti, usually from Oct 2-8. It was launched back in 2009. The students of EEE department reached out to Malarchi Ashram on the 2nd of October, 2015 to celebrate that year's Daan Utsav. The event was held in association with Humanitty. Malarchi Ashram is a home for mentally retarded children and takes care of all needs of these children including schooling.

As a part of this event, we donated a cheque of ₹10,000 and also distributed sweets to the children there. We spent around a couple of hours with them, playing the games that they played, like throw ball. The children and officials of the Ashram were visibly happy with our visit and Daan Utsav was thus well celebrated.



ACTIVITIES OF EEEA

Touchpad Workshop

On 18 and 19th September, with the current workshop team organized a "touchpad development workshop" exclusively for first years. The students were taught how to interface a resistive touch screen, and with it a portable handwriting recognition device under ten hours. Thirty odd teams of maximum three participated in this workshop, which took place following the EEE Association Inauguration. The students did not only learn theory but also had a hands-on session, inciting the grand success of the workshop. The students were given an introduction to basics of electronics, and were trained in breadboard connections. Arduino Uno was used in implementing the problem statement and so the students were made familiar with Arduino IDE as well as processing IDE.



SHORT COURSE IN IoT

A two-day workshop on the Internet of Things (IoT) using Arduino was organised on 13th and 14th November, 2015 by Dr. S. Sudha from department of Electrical & Electronics Engineering.

The Internet of Things (IoT) is a network of physical objects or "things" embedded with electronics, software, sensors, and network connectivity, which enables these objects to collect and exchange data. It is an environment in which animals, objects or people with unique identifiers are able to transfer data over a network without requiring human-to-computer or human to-human interaction. IoT has evolved from the convergence of wireless technologies, micro-electromechanical systems (MEMS) and the Internet.

The workshop aimed to provide hands-on experience to the participants to interface the things for different applications using the Arduino kit with devices such as sensors and actuators. Also, it enabled the participants to connect the Arduino device to cloud.

The workshop included basics of Python, cloud computing, Python scripting development, introduction to App builders and controlling and connecting via such Apps. Second day comprised of lectures on wireless sensor networks, Arduino programming and Bluetooth integration. The workshop ended productively with a full assembling and testing of the IoT and WiFi setup.

EEE ASSOCIATION INAUGURATION

The Electrical and Electronics Engineering Association (EEEE) of NIT Trichy was inaugurated for the year 2015-2016 on 7th September, 2015. The chief guest of the occasion was Mr. Dineshkumar N. S., Component Design Engineer from Intel, Bengaluru, who was also an alumnus of the EEE Department of NIT Trichy, batch of 2005. The event started by 3 p.m. with a prayer and lighting of lamp by the guests. This was followed by a welcome address by the Head of the Department, Dr. K. Sundareswaran. He recalled how the EEE Association has come a long way from its very humble beginning during his early years in the department. This was followed by the introduction of all the office bearers and executive members of the EEE association by the faculty advisor of EEEA, Dr. M.Venkata Kirthiga. The office bearers included Chairman, Overall coordinator, Treasurer, Vice Chairman, Secretaries and Joint Secretary.

Then, the overall coordinator of EEEA, Mr. Jaiganesh Subbarayan announced the agenda for the year 2015-2016. It consisted of yearlong activities like workshops and guest lectures aimed at promoting research and bridging the gap between industry and academic curriculum. He also stressed on the main activity of the EEEA, which is to host Currents, the national technical symposium of the EEE department of NIT Trichy. This was then followed by the introduction of the chief guest, Mr. Dineshkumar N.S. by the Chairman of EEEA, Mr. Sudarshan Venkatraman.

Thereafter, the Presidential Address was delivered by the Director of our institute who applauded the department for being at the forefront of all academic and curriculum reforms in the institute, and its recent NBA accreditation for the UG programme. He also praised the EEE department faculty and students for their enthusiastic academic and administrative participation.

This was followed by the highlight of the evening, the release of the very first edition of the department magazine, 'TRONICALS'. The 'EEE Newsletter' has now been replaced by this versatile magazine which includes technical and literary articles from the students as well faculty. The inaugural address was then delivered by Mr. Dineshkumar, who recalled his days as a student in this very institute. He was extremely moved by the enthusiasm of the students and wished that everyone benefits from the activities of the EEE Association. He also delivered a lecture on SystemC/Transaction Level Modelling.

This was followed by the vote of thanks by the Treasurer of EEEA, Mr. Deepak Srivatsav. Finally, the inaugural ended with the national anthem.





COFFEE WITH COORDINATORS

What's the secret behind coordinating with final years?

SK: Last year, during NittFest the biggest issue was coordinating among final years. I realized that the only way to get the work done was to have a vague idea of where to find my classmates at any point in time. You can also call this technique as stalking, but my options were limited, and I was desperate. Even in my third year, I used to take an active interest in how my batch mates spend their free time. After I became the coordinator, I had to step up my game.

What difference do we show in this year's preparation from last year's?

SK: The principle difference is that the preparation began in November unlike starting three weeks before. The second years have always been enthusiastic, as proven by their success in Horizons '15. In many ways, their interest in NittFest participation is tantamount to final years' dedication. Understandably, the third years have bigger concerns, like academics and internships. Expecting them to participate as much as second years is not reasonable, so, I am expecting only a minimal amount of participation from them.

"In third year, culturals are the least preferred activity"

Do we have a solution for the space constraint?

SK: We are trying to get two rooms in Ojas for Mano. In case we don't get that, there are two common rooms, one each in Garnet B and Garnet C where they can practice. The arts team can use the department SAC. We are setting up two flood lights, one near the parking lot and the other behind the department. We would also be trying to get some space in the Electronics Lab at least for the last one week, but we know that it will be difficult. We are also setting up two big fans, one for the Dance Troupe and the other in SAC. Following this, we would also arrange two watermelon cans every evening.

"Every evening, we are going to have two watermelon juice cans in the department during the last one week of NittFest practice."

What are the wars waging between the EEE department and the NittFest core?

Kaushal: The main issue is to increase Qawwali's points to the level of Choreo or Mano. For each and every cluster, the NittFest core organises a bunch of meetings, during which the intricacies of the various events are argued upon. Our goal is to make sure that maximum amount of rules and regulations are favourable to us.

How do we plan to fight against disqualification?

Kaushal: Along with me, Sripad and Sudarshan will be ready to fight in our favour, when a difficult situation arises. Fortunately, the NittFest core has agreed not to disqualify any team in any event, only reduction in points will be the item of argument. With respect to EEE, the fight for points reduction happens in the stage events like spoof, take one, arts. So, we will have to concentrate on that.

"In NittFest '16, there is no disqualification."

"In NittFest '16, there is no disqualification."





10 POINTS FOR GETTING PLACED

Maintain a minimum CGPA of 6 with no standing arrears by 7th semester. This is the minimum criterion in many companies, so it improves your eligibility. Maintaining a CGPA above 7 increases the chances further.

Take CPCs seriously as they are made based on placement experiences. Similar questions are asked in interviews every year.

Find your area of interest. Focus on specific subjects so that you may make suitable choices of companies.

Have at least one major project on your resume by 4th year. It could be a research project or an industry-based project (i.e. in a company).

Read newspapers every day. They are the sources of all GD topics. Practise aptitude well. Every company has the first round as an aptitude test, so improve your speed.

Prepare a good resume using the right format. There should be not a single spelling/grammatical mistake in the resume.



Prepare a solid introduction. In interviews, first impression is the only impression. Practise your introduction repeatedly, record it and listen to it till you perfect it.

For interviews, you should know information about the company. Go through their website and Wikipedia page. This gives a good impression that you really are interested in the company.

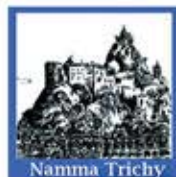
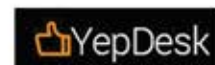
Interviewers always look for confidence, positive attitude and a willingness to learn. Put on your best mannerisms during the process.

Take every experience as a learning process. Some may get it right the first time but some may struggle.

DONT GIVE UP



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