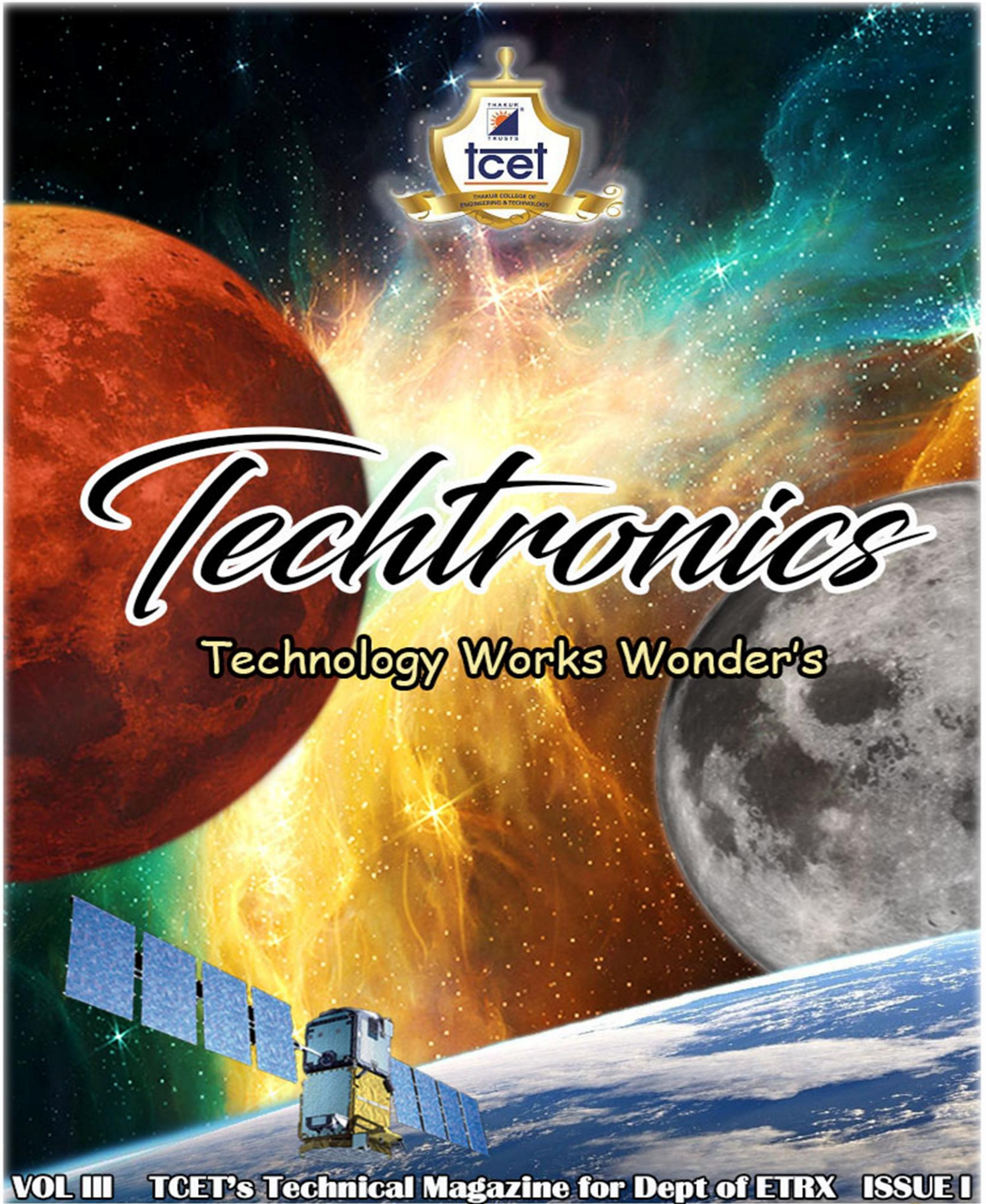


VOL III TCET's Technical Magazine for Dept of ETRX ISSUE I

TCET

DEPARTMENT OF ELECTRONICS ENGINEERING (ETRX)

Credit Based Grading Scheme(Revised - 2012) - University of Mumbai

CBGS-2012(R)

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# Department's Vision and Mission

## Vision

Electronics Department of Thakur College of Engineering and Technology(TCET) will thrive to achieve academic excellence in electronics and electronics related technical education in Mumbai university to develop internationally competent professionals with a sense of responsibility and social sensitivity

## Mission

Electronic's Departments mission is to achieve academic excellence by creating the right academic Ambience, Nurturing, Enhancing personal and professional skills enabling the students to compete globally.

# Principal's Message

I have great pleasure in conveying my best wishes to the Department of Electronics Engineering for releasing the technical magazine "TECHTRONICS" which brings the students and teachers of various disciplines on a common platform to share and display their ideas and creative talents.

I wish all the faculties and students who have involved in bringing out the magazine for their greater success and career ahead!!

**Dr. B. K. MISHRA**

**Principal**

# Editor's Message

It is a noble task on the part of the Department of Electronics Engineering to once again make it with their frequent issue "TECHTRONICS". I wish that this TECHTRONICS establishes to be a flint to fire the enthusiasm and excite their minds for many intrusive innovations among the faculty and students inspire passion among the members of the faculty of Electronics Magazine committee. My greeting to the editorial board to keep the good work!!!

**Dr.MRS. LOCHAN JOLLY**

**Dean SSW**

# HOD's Message,

Once again it's a moment of pride for the whole department of ETRX as we present the latest issue of our magazine "TECHTRONICS" . This time around the magazine isn't just a regular one, it is much more exciting and much more innovative and informative. I appreciate my team for their sincere efforts in putting up such a beautiful magazine on the line. And I wish the radiance of ETRX keeps breaking old boundaries and set's up new limit, as we believe in aiming at stars…for sky is the limit for us.

**Dr .Mrs.Sandhya Save**

**HOD ETRX**

# INDEX



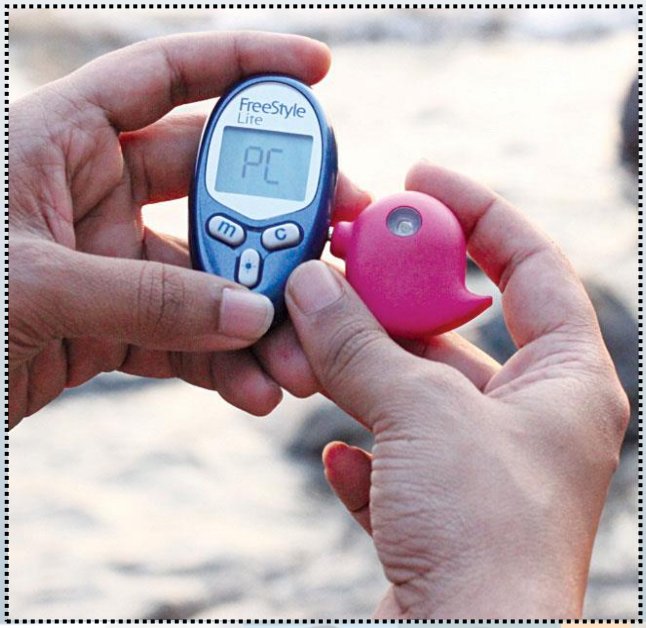
# 1. Faculty Corner

## 1.1 DIABETO: A 360-Degree Diabetes-Management Solution

**Introduction :**

My parents have been living with type-2 diabetes for over 20 years. About four years ago, my fatherís diabetes file was misplaced by his hospital and he had to undergo all tests again. That was when we thought, we can actually solve this problem with the help of technology, and we came up with Diabeto. These are the words of Shreekant Pawar, chief executive officer, Diabeto Medtech India Pvt Ltd, on being asked about what prompted the invention of Diabeto.

**So what did they do?** They came up with a solution for diabetes management package to test blood-glucose levels, analyse test results, and get expert opinion and care, all from the comfort of your home. Read on to find out Diabeto journey from inception to fruition. Easy to use, good to see Plug into your glucometer, pair




**A BIRD'S EYE VIEW AT THIS BIRDIE**

| Specifications | Description |
|---|---|
| Power supply | One lithium-polymer 3.7V 55mAh rechargeable battery |
| Dimension | 61.39 mm x 67.25 mm |
| Weight | About 14 grams |
| Communication protocol | Bluetooth 4.0 |
| Range | 100 metres |
| Power consumption | 821mW |
| Peak current consumption | 19.31mA |

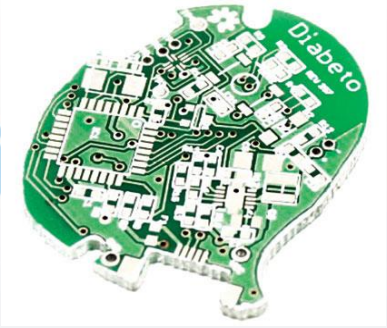
with your smart phone and you are good to go .It is usual for a person suffering from diabetes to regularly check the blood sugar reading using a glucometer. Diabeto is a device that can be attached to a glucometer, simply by plugging its knob into the glucometerís jack. You can then pair the device to your smartphone via Bluetooth.

**A simple-outside, complex-inside design**

It is important to have a device that gives the user not just an accurate experience but a happy one, too. With this in mind, the team at Diabeto designed this piece of hardware that could easily be carried around and one that fits into the palm. In the design of a small bird, it symbolises freedom and comes in blue and pink colour variants.

Fitting everything into this miniature architecture and get it running, along with complying with all prevailing electronic and medical norms, offered enough roadblocks.

It took the team three years to complete it, but they did it in style. They had to manufacture in China finally, as the quality of the product in India was sub-standard and the time, effort and money involved was simply making the whole process tedious.




**Compiled By-**

**Dr Sandhya Save**
**(HOD ETRX)**

SCAN TO VIEW VIDEO

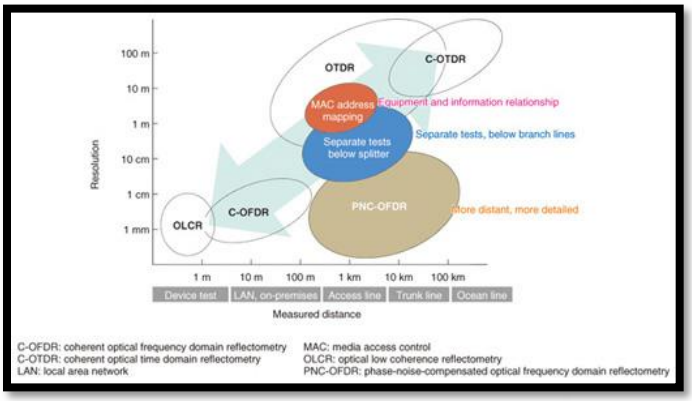
# 1.2 Forty Years in optical Fiber Technology Research

## 1. Forty years of optical fiber technology research

It has been 40 years since the NTT Research and Development Center was opened in 1972 in Tsukuba. The research and development of optical fiber technology also has a history of roughly 40 years. The current optical broadband service infrastructure, which connects 17 million customers, is the result of developing technologies such as single-mode fiber, optical cables, optical interconnects, and operation and maintenance systems. Initially, optical fiber equipment was intended to create an optical fiber network that was as easy to handle as wired networks. However, to obtain high speed and a wide bandwidth, sophisticated skill or knowledge was often needed to build, maintain, and operate the equipment, and, depending on the amount of information being transmitted, the additional care resulted in time-consuming work. The situation was gradually improved through technical innovations, but several issues remained. By resolving these issues and achieving ease of use comparable to or better than that of metal cable, we will be able to provide services of even better quality and at lower cost compared with the efficiency benchmark of working with wire.

## 2. Rapid fault handling

Optical access equipment extending outward from communications buildings is designed to be highly reliable and to withstand harsh environments. However, in extremely rare cases, faults can occur that interrupt service. To repair such faults and quickly restore service, the location and cause of the fault must be narrowed down as much as possible before sending maintenance staff to the site. To achieve this, we are working on three new approaches that will allow us to categorize such faults remotely




Three approaches to categorize remote fault locations.

## 2.1 Accurate measurement of remote fault points

The optical time domain reflectometry (OTDR) technique currently used in the field to measure the distances to fault points is not highly accurate, so it is therefore difficult to determine the precise location and cause of a fault. The phase-noise-compensated optical frequency domain reflectometry (PNC-OFDR) technique that we are researching overcomes these problems. In addition to locating faults, we can also detect tiny identification (ID) patterns embedded in remote connectors, creating the potential for entirely new facility operation scenarios.

## 2.2 Measurement to distinguish fault points below a splitter

In passive optical networks (PONs), optical splitters are placed at locations close to the customers to increase the efficiency of equipment sharing. However, if a fault occurs between a splitter and the customer's residence, the location of the fault cannot be determined correctly using conventional OTDR. We have devised a principle that enables us to obtain measurements below individual splitters using a physical phenomenon called Brillouin scattering*, which occurs within the optical fiber, and have demonstrated this principle for the first time. If this approach can be implemented practically, it will overcome one of the major difficulties with PONs.

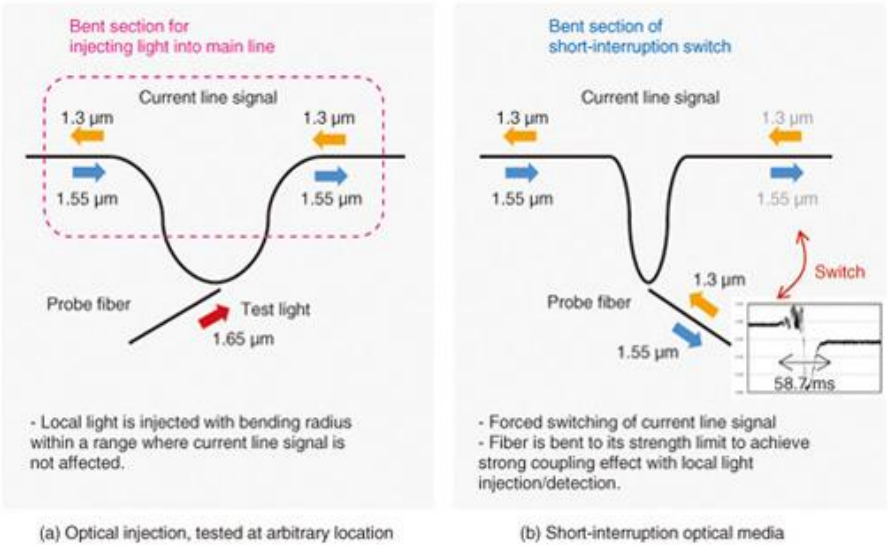
## 2.3 Information linkage between an optical fiber and transmission systems

When a fault occurs, we use different instruments and systems to diagnose the fault in each transmission path (optical fiber) and transmission system. We have focused on measuring the round-trip times between an optical line terminal (OLT) and each optical network unit (ONU). This approach is often employed with PON systems, and we have shown that we can convert the measurement data to an optical fiber length and map ONU MAC (media access control) addresses to the location of reflections at the end of an optical fiber. By establishing this technology, we will be able to use it both to locate faults and to detect potential faults, thus providing preventative maintenance.

* Brillouin scattering: Optical scattering that occurs within a medium due to phonons (sound waves) and that involves changes in frequency.

## 3. Building an equipment database, and safe and secure work navigation

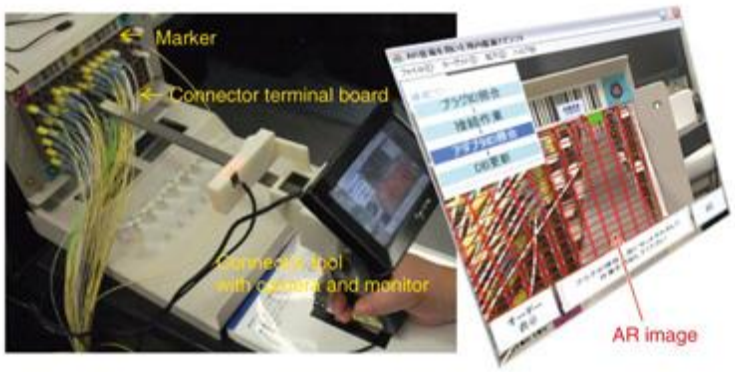
Communication services are provided through various types of equipment. This equipment is complex, and there is a large amount of it, so a lot of work is involved in carefully managing and maintaining a database for each type of equipment. If we are to increase the efficiency of this administration work, we must construct an inexpensive mechanism that can build and update the database autonomously without requiring manual intervention. The mechanism must assign a unique ID to each element of the equipment. We are conducting applied research on an equipment management system using image processing and augmented reality (AR) technologies as an effective means of achieving this. An example of the use of AR technology on optical patch panels in a communications building is shown in Fig. 2. The optical patch panel has connector terminals densely arranged with 4 × 7 mm spacing. The positions of markers attached to the patch panel beforehand are captured with a camera. Then an AR image of the terminal matrix is drawn on the monitor based on a unique ID, and this can be used to direct the work. Also, because the state of the work is being monitored, the database can be built and updated autonomously. Moreover, failsafe functions can be implemented to prevent errors.




Navigating on-premises terminal panels using AR technology.

## 4. Flexible branching of an optical fiber

With metal cables, current flows as long as there is contact, so branches can be established anywhere. If optical fibers could be similarly branched, it would expand the range of operations and maintenance scenarios in which they could be used. Local light injection technology involves placing a probe fiber near a bent section of optical fiber and injecting light through the probe fiber (Fig. 3(a)). Light radiating from the optical fiber passes through the insulation, so some corresponding losses are unavoidable. However, the system should be practically usable if a stable level of coupling efficiency that is suitable for the operational application can be ensured by optimizing the refractive-index-matched materials, optical lenses, and probe position. For example, until now, it was necessary to have a person in the communications building who would inject optical test signals into fibers. However, this line illumination work would change significantly if such test signals could be injected at arbitrary locations. We are also studying applications for tasks such as checking the link status of a line, and for short-interruption optical media switching, which is described below.




Local optical injection/detection technology.

## 5. Switching optical media in the broadband era

Twenty years ago, when telephone services were dominant, if work was undertaken only when lines were not being used, there was little effect on customers. Now, however, in the optical broadband era, information flows nonstop, 24 hours a day, 365 days a year, via Internet, cloud computing, video distribution, and other services. Therefore, the old approach cannot be used without affecting customers. We are conducting R&D to find ways of switching optical media that are appropriate for the modern era.

### 5.1 Uninterruptible optical access line switching system

Approximately four years ago, we conceived principles that enable media to be switched without the disconnection or suspension of services and were able to demonstrate the practical implementation of this approach. Our technique involves connecting an optical fiber (the detour path) of approximately the same length as the current optical fiber (the main path) in parallel with it, disconnecting the main path and transmitting the optical signal over the detour path, performing the switch work while the main path is offline, adjusting the length of the detour path while it is transmitting the signal so that it is approximately the same as that of the main path after switching, reconnecting the main path as the new line in parallel with the detour path, and disconnecting the detour path. All of the steps in this procedure can be performed without interrupting the signal. The system is complex and requires precise control of path lengths, measurements, loss compensation, and the cancellation of interference.

We are therefore undertaking R&D to build a system that is compact, smart, and compatible with a variety of scenarios in the field. If this system can be realized, we will be able to change an optical access line at any time.

### 5.2 Momentarily interrupted optical access line switching system

We are also conducting R&D on another approach to switching media. We can mechanically switch the transmission path in an instant by using a local light injection technique that involves bending the optical fiber close to its breaking limit to maximize the efficiency of the optical link. This approach does not require us to cut the optical fiber (Fig. 3(b)), but it causes a momentary interruption. We have already confirmed the ability to switch within approximately 60 ms. This can only be applied to certain types of optical fiber, but if this simple system is realized, it will be applicable to many work scenarios including cable switching or replacing an OLT.

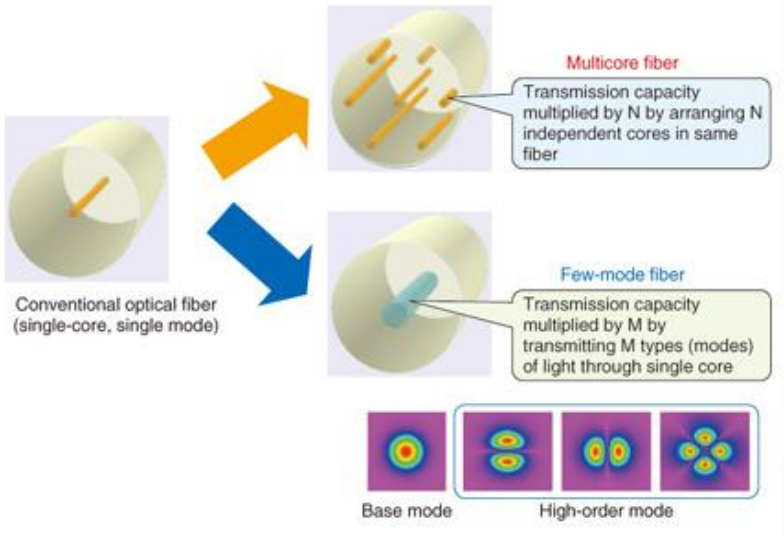
## 6. Expanding applications of bending-loss-resistant fiber

Our free-bending optical cord has overturned the common belief that optical fiber cannot be bent. In the past, great care had to be taken not to bend optical fiber, but we have expanded the range of application scenarios with the implementation of hole-assisted fiber (HAF), which produces almost no losses even when bent. Recently, these optical fibers have even been passed through narrow gaps such as those around doors and window sashes. There is a maintenance and operability trade-off with these technologies, but by applying HAF where it is needed, interruptions due to bending can be eliminated, and it may be possible to simplify the optical cable structure.

## 7. Next-generation optical fiber research for the ultrahigh-speed, high-capacity era

Internet traffic is increasing exponentially with the accelerating spread of services such as social networking and video content services. The bandwidth of optical fiber communications systems that form the backbone for this communication is also being increased yearly.

However, there are limits to the increase in bandwidth and speed that can be achieved with the single-mode optical fiber currently in use, and it is estimated that these limits will be reached in ten years. Therefore, a new transmission medium that overcomes these limitations will need to be created. We are focusing on ways to spatially extend the transmission area of optical fiber, which is one way to overcome these limitations. Current optical fibers transmit optical signals using a single mode, through a single core (transmission path) within a strand of quartz glass. However, optical fiber design and production technology is advancing because of the employment of complex cross sections such as hole structures, and digital transmission processing technology. Fiber with multiple cores in a single strand of quartz glass, and multi-mode fiber capable of transmitting stable signals with multiple modes in a single core are presenting new possibilities for novel fiber structures with higher spatial multiplexing. We have continued to demonstrate the possibilities of multi-core fiber with, for example, a successful 1-Pbit/s transmission over a single 12-core optical fiber of 52 km, which is a world record



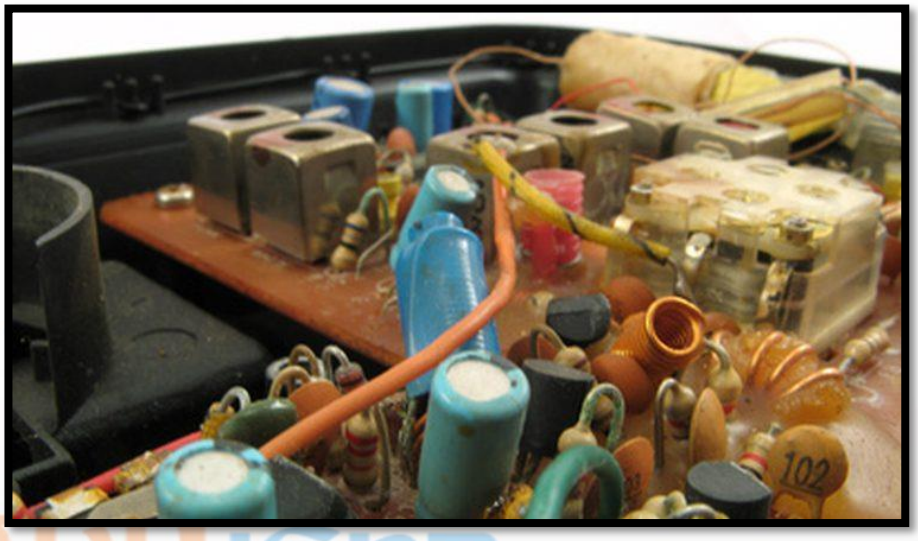

**Compiled By-**

**Dr S C PATIL**
**(Deputy HOD ETRX)**

# 1.3 On-Going Research Topics in Electronics Engineering

## Introduction :

The field of electronics engineering is a vast and ever-evolving one with research being conducted into a wide variety of topics. The field of electronic engineering is of vital importance to computers, cellphones, programming and even the stock market. A lot of money is being poured into both applied research and development and more esoteric ideas that could revolutionize electronic engineering.



### Nanometer Wavelength Printing

Electronic circuits are "printed" by exposing silicon wafers to ultraviolet light and etching the circuit design into the silicon surface. The complexity of the chips is limited by how small the wavelengths of the light are; in a real world analogy, you cannot draw a finer line then the thickness of your pen tip. There is research into using different combinations of lenses and electromagnetic spectrum emissions to etch at even smaller nanometer resolutions. However, there may be a limit to this process if the wires are printed too close to each other; the magnetic fields of the electrons themselves could interact with each other and slow each other down.

## Liquid Cooling:

Liquid cooling is well understood when it comes to mechanical applications -- your car engine, for example -- but cooling circuits with liquids is still being researched. In 2011, only high-end computers use liquid cooling and even then there is a risk of leaks and damage to the circuits. Research is being conducted into nonconductive coolants and leakproof heat exchanges. Laptop applications are also being researched as laptop computers grow in power to rival desktops.

## Photonics

Photonics is the science of using light, primarily lasers, to transmit information and data. Fiber-optic Internet connections are a example of this technology already being used in the real world. In the field of electronics there is a push to use photonics to replace circuits, with lasers taking the place of electrons and circuits being made of fiber-optic wires and mirrors. The benefit of this design is that there is very little heat and programming needs little adaption, since a photonics circuit can operate in binary the same as an electrical circuits.

## Quantum Computing

The cutting edge of electronics engineering is quantum computing, which is incredibly complex but could allow for actual artificial intelligences. Quantum computing uses quantum particles instead of binary bits. The difference is that quantum particles can be used to run trinary programs. Quantum particles can have three polarities: up, down, and "maybe." Until a quantum particle is observed, it can have either polarity depending on its entanglement with another quantum particle.

**Compiled By-**

**Mr V.V Gijare**
**(Asst. Professor)**

# 2. Student's Corner

## 2.1 IGNITED MINDS ….Let's fire hope

*"Eye for an Eye would make the whole world blind"*

– Mahatma Gandhi

Eye for an Eye methaphorically refers to sword for a sword, life for a life , blood for blood. The words from such a revered personality precisely indicates that taking a life in return for another life would just keep the wand of hope and understanding coated in red, and the only way to cleanse the wand is with the water of peace. Or else all that will be left would be rotten bones covering the lands and a canopy of ash covering the sky pushing the world into darkness and sorrow. From the word go the thing that instills fear in one's self is death, and terrorism is just an synonym to it, but if terrorism is fought with peace, it will be based on hope and not fear.

Set in the backdrop of the recent attack on the army camp in Uri, which left 18 brave Indian soldiers martyred. The attack on November 15 at Paris left 130 dead and 352 injured, and so on goes the number with a total of 32658 giving up their lives in just one year by the hands of those children who are in the age to learn and create a better future for the society and protect its well being. Brainwashed with the greed for more money and dream of conquering the world, guns and grenades are handed over to those young crafty brains who by this age be ignited enough with knowledge and be bursting out with ideas of new inventions and dreams. The root to stop terrorism doesn't lie in fighting war, as it is well said terrorism is for the poor and war is the terrorism of the rich, but instead it lies in education.

Education that opens up not just the reasons to what made $E=mc^2$, but to those perspectives that open up the domain of future growth and research. Making the young lads focus on not just the values in life but making them understand and realize why those values are important in life, and surely this would make a difference, a big difference indeed. Thus the only way to suffocate the throat of terrorism is by chocking its supply of new hands and young brains with goal centric education and nothing else. This long term plan would work once the channels through which new "*kasab's* " are bought-in are identified. For a nation as a unit the only immediate measure to counter terrorism is not by war of weapons or words but instead through a detailed bi-lateral conversation. Because peace cannot be achieved by force but only, and only by understanding .

With the world turning out as a single strong unit against the community called terrorists there is no force on our mother earth that would stop us all from seeing a world free of terrorism, with prosperity and glory stealing the throne of growth, terrorism sat upon , and claiming their rightful place in this world once again. A new dawn would come up with the bright orange star up in our sky, with the birds flying in a melody and cold breeze soothing the mood around as the whole world set's free from the clutches of terrorism.

***Compiled By -***

***Vishnu Nair***
**(TE ETRX)**

## 2.2 Turn your life in just 10 minutes

My dad once told me : "You can apply the 10 minutes mantra to turn around your life in a tremendous way."

I didn't understand at first. "What's the big deal in 10 minutes?" I asked.

"There's indeed a big deal about it. 10 minutes, believe me son, can create a marvellous difference in our life," my dad offered wisely.

"Elaborate please, dad,"

"I'll tell you. But first, you've to get up tomorrow at 6.00 am." My dad conditioned. I agreed.

Next day, as I woke up at the agreed time, my dad came to my room.

"What's the time?"

"6.00 am" I replied.

"Okay, so before you can follow the 10 minutes mantra, you have to follow the art of being aware about the clock"

I was confused. My dad continued, "Look at the clock. It's 6.00 am. Now within 10 minutes I ask you to do the following - Arrange your bed and your table; drink two glasses of water, wash your face and brush your teeth. But keep looking at your clock while doing these. That's it"

"Well…Okay," I said, thinking what could be the catch my dad wanted me to capture.

I began and started doing all he asked. All the time, I kept glancing at the wall clock. Finally after 10 minutes (or 30 seconds earlier to be exact) I had finished it all.

"Well done, boy. You have turned around your life!" My dad praised, patting on my back."What?" I was astonished and puzzled, unable to grasp, and asked earnestly "I didn't get you, dad."

"Think, son, think!" My dad urged, "Recall your earlier days. How did your day started off?" I racked my brains and pondered over. Usually, I wake up at 6.00 am. Then, I wander off, yawning lazily and even sleep for some more minutes or sit idly on my chair, my thoughts in thousand directions. And, by the time I finish the above activities, it was already past 7.00 am.

"And today, it's just 6.10 am" my dad said as if he read my mind.

"Yes!" I exclaimed, starting to understand.

"So what made you do it?" my dad asked.

I thought. What made me do it? Because my dad told me to do? No, no. There was more to it. And then it hit me.

**"The art of being aware about the clock"** !!!! I almost shouted.

"Yes and also ten minutes." My dad said, smiling at my wonderstruck face.

My dad explained: By setting your eyes on the clock_ and _thinking about 10 minutes, your mind got **focused** in that span of 10 minutes. It was just like a deadline or a due date. The "10 minutes" deadline kept your mind in the present; in the "NOW" and prevented you from wandering off."

I was impressed. Just a matter of mere 10 minutes had such a mighty effect! I had completed all those routine activities on time. Now, I felt I have so much time ahead (as compared to 7.00am, it was just 6.10 am!). With so much time saved, I could work on creative and productive activities, instead of loitering around aimlessly. Time is indeed, the most precious thing on earth.

A question piqued my curiosity, "Dad, why only 10 minutes. Why can't we divide our activities into 1 hour slots?"

"Good question," my dad said, "we can. But _Shorter the time, *more productive* you will get. Imagine, if I told you to do those routine activities in 1 hour? Your mind will make your actions slower because you'll think you have enough time to do it. Even if an activity takes 1 hour, you can segment it into 10 minutes slots."

"Give an example," I was eager to know more.

"You can, for instance, segment your workout time," my dad resumed. "10 minutes- warm-up; 10 minutes- stretching and 10 minutes-yoga,"

"Really amazing, dad; this 10 minutes stuff can make your life on a roll! Instead of long bouts of inactivity, once can benefit from the short bursts of creativity!"

"Yes. The 10 minutes stuff is just an idea. You can also make it 15 minutes or 20 minutes but not longer than that." My dad paused and continued :

"The 10 minutes mantra can be applied in every aspect of life. A student, a professional, a businessman or anyone can apply this simple but successful technique. Take an example of student. The student can allot 10 minutes time for a topic. After that, he/she can take 2 minutes rest and resume for another ten minutes. He or she can also take time off and read a good book for 10 minutes or allot just 10 minutes for walking. All a student has to do is to be aware of the clock. Elaborating it further, we humans have a tendency to keep on delaying small things. We know we have to pay bills on time, and still we delay it beyond the due dates. We are aware that our bike's tyre's need to get pumped, yet we don't care to stop by the car-shop we pass every day. We promise ourselves to go to a temple on a particular day, yet we never seem to keep our own promise on time. Why? Because our mind wanders off and deems such things as unimportant.

If we vow to take just 10 minutes or 20 minutes of our entire 24 hours, we would never procrastinate and our life will be million times better.

My dad concluded: "The 10 minutes, if followed **Consistently**, can have a tremendous effect in anyone's lifestyle. **Procrastination** and **Idleness** will vanish away replaced by **Focus** and **Intensity"**. People will tell you they are short of time. No time for the

loved ones, no time for pursuing their dreams, no time to eat, no time for their health as if they are the most busiest people on earth! It's the lamest excuse one can give.

This 10 minutes mantra can keep us organized, keep our otherwise disoriented thoughts in check, Balance our life fruitfully and help us to have enough time in our hands. So follow this 10 minutes mantra and see your life turn around at a miraculous pace.

**Compiled by -**

***Sheshmani Yadav***

**(BE ETRX)**

# 2.3 Poem

## 2.3.1 ENGINEERING

### - *FEW FRENCH FRIES SHORT OF HAPPY MEAL"*

What is your plan next dear?
"Engineering" I said without fear,
How was it all four years?
A little too much slogging and more than crocodile tears!

Every person I consulted before
Said "its easy" and nothing more,
If you take up a core,
One day you can have the world tour!

Its less about practical,
And more about remedial,
What is engineering for real?
A few French fries short of a happy meal!

If you leave aside studies,
And also fees,
Only thing better than these
Are those pretty memories!

Bunking all those lecture,
Playing till you get a fracture,
Breaking someone's denture,
With your crush if they venture!

That hour long unnecessary photography session,
Giving photo credits to the photographer's passion,
And those very special #bff instagram mention,
Just think of a selfie & "Cheese" everyone will say in unison!

When these festival arrive,
To showcase their talent, some thrive,
Couples are just happy about the drive to marine drive,
Others enjoy the night with wild & crazy jive!

For some engineering would be dream come true,
Others are still without a clue,
Ending up with Accenture or Infosys & nothing out of blue,
Without 6.5 avg you will be thrown out of the queue!

With those packages some are flying high,
Like a bird Up and up in the sky,
For others who want to go that high,
Only red bull will give them wings to fly!

When you know that there won't be another trip to your favorite corner,
You will wish the time had went a bit slower,
Feel something wet around your eye's corner?
Sad part is we realize how best these four years were only when it is over!

- *Akhila Nair*
**(BE-ETRX)**

## 2.3.2 "FRIENDSHIP IS A REAL GAME OF DICE"

Finding a true friend is sure a task,
as each one of them carry a mask..

If you are lucky and you find one,
Thank god, because he must be one in a million..

But friendship doesn't come with a guarantee,
It has its own conditions, level, and degree..

One will try their best to lure,
And will go out of your life without a cure..

One day they will ask you how are you?
And other day they will ask you who are you?

They will come in your life with a smile,
And while leaving the reason won't be guile..

Other relations too will go on a toss,
And it will take a lifetime to know the cause..

This wasn't the case before,
People hugged, kissed and believed more..

He never ditched,
She never bitched..

But that was long ago,
When there was no hate and ego..

As of now there is no true friend,
As being fake is the new trend..

Memories that come along with it are for sure nice,
But dear,friendship is real game of dice!

- *Akhila Nair*
**(BE-ETRX)**

### 2.3.3 WHAT WAS MY MISTAKE ?

All I wanted was to run, and play,
What's so wrong in being happy and gay?
When men play, no one stares,
But when I do,he does,how dare?

Not every day was a lucky day,
Why was I caught by him that bad May?
He hurt me with all his might,
Couldn't he see my eyes full of fright?
I cried and screamed in pain,he choked my neck,
So that my plea go in vain,what the heck?
Almost on the verge of losing, I was saved,
But why wasn't his guilty charges framed?
Some officers asked me question when I couldn't even speak,
Couldn't they understand that I was too weak?
Everyone blamed me that it was my mistake,
But wasn't I the victim here for God sake?

He is enjoying his life with *huqqa* and long drives in car,
But shouldn't he be the one behind bar?
But rather, I feel like I am jailed,
God don't you think here you have miserably failed?

If I was the damsel in distress,
Why am I asked to neatly dress?
If he was the villain,
Why is he having all the fun?
Some people come in here with sympathy,
But without justice, it isn't it  apathy?
Heard that people around here are mean,
But why should I  kill my dream?
All I wanted was to respectfully live,
Dear God,even that you couldn't give?

- *Akhila Nair*
**(BE ETRX)**

## 2.4 LIFE……Wonderful as Rainbow

Word Life which simply describes the thing whose existence won't be possible without consumption oxygen and with release of CO2, but it would be much better if releasing happiness and extracting sorrows resemble the level of importance as Oxygen and CO2 ?. Thus life simply describes as give and take of happiness and sorrow. The main principle of life is learning and it only happens with mistakes. Yeah it is true that learning is best way to retrieve from mistakes as someone has said it correctly, if you want to learn something then invest something. Nothing is available with free of cost. Life is full of sacrifices to gain something extra , devotion to make name and fame. There are numerous things which can be compared with things happening in life is , to reach to the peak of mountain you have to invest your more energy then moving down the to ground….Similarly , you need to dig the well to achieve a fame in life , but hardly time required to lose it. Your talent in life is truly defined when your habit or comfort zone becomes others wish to do. Life is full of your own involvements and In life you are the only participant of your growth. At the End of the day you only have to fight in the ring of life .Whenever you get failed in life don't curse yourself instead believe that you are lucky to get the lesson before anyone else. You know everybody has some or the other chapters but they don't want to share hence they don't read it loud. Never curse on your failure.Life is not a race between you and others instead it is a race between you and your time , and the difference between both is time is continuously running and you are not. And time is still running till your last breath , which means the Race is Not at completed ! So , you can be a winner in life…..Start running before time moves a head……Live happily , share Happiness

**Compiled By-**

**Sheshmani Yadav**

**(BE ETRX)**

## 2.5 Hindi "Kavita"

### चन्दन है इस देश की माटी

चन्दन है इस देश की माटी,तपोभूमि हर ग्राम है।
हर बाला देवी की प्रतिमा,बच्चा-बच्चा राम है ॥

हर शरीर मन्दिर सा पावन,हर मानव उपकारी है।
जहाँ सिंह बन गये खिलौने,गाय जहाँ मा प्यारी है।
जहाँ सवेरा शंख बजाता,लोरी गाती शाम है।
हर बाला देवी की प्रतिमा,बच्चा-बच्चा राम है ॥

जहाँ कर्म से भाग्य बदलते,श्रम निष्ठा कल्याणी है।
त्याग और तप की गाथाएँ,गाती कवि की वाणी है ॥
ज्ञान जहाँ का गंगा जल सा,निर्मल है अविराम है।
हर बाला देवी की प्रतिमा,बच्चा-बच्चा राम है ॥

इसके सैनिक समर भूमि में,गाया करते गीता हैं।
जहाँ खेत में हल के नीचे,खेला करती सीता हैं।
जीवन का आदर्श यहाँ पर,परमेश्वर का धाम है।
हर बाला देवी की प्रतिमा,बच्चा-बच्चा राम है ॥

चन्दन है इस देश की माटी,तपोभूमि हर ग्राम है।
हर बाला देवी की प्रतिमा,बच्चा-बच्चा राम है ॥

**Compiled By -**
**Nitesh Dixit**
**(TE ETRX)**

# 2.6 Space Themed Articles

## 2.6.1 Supernova

A Supernova is an astronomical event that occurs during the last stellar evolutionary stages of a massive star's life, whose dramatic and catastrophic destruction is marked by one final titanic explosion. This causes the sudden appearance of a "new" bright star, before slowly fading from sight over several weeks or months

In Latin, Nova means "new", referring astronomically to what appears to be a temporary new bright star. Adding the prefix "super-" distinguishes supernovae from ordinary novae, which are far less luminous. The word supernova was coined by Walter Baade and Fritz Zwicky in 1931. Supernovae are more energetic than novae.

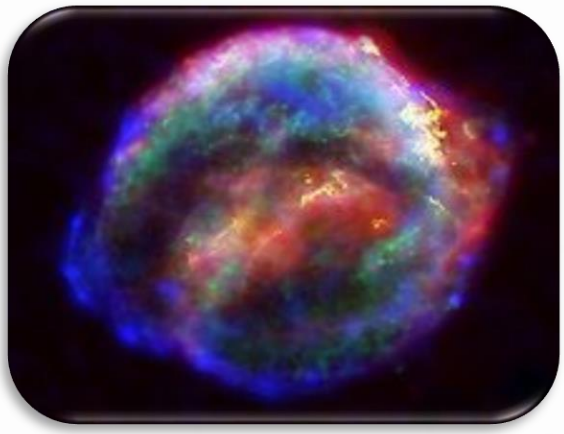
Only three Milky Way naked-eye supernova events have been observed during the last thousand years, though many have been seen in other galaxies using telescopes. The most recent directly observed supernova in the Milky Way was Kepler's Supernova in 1604, but the remnants of two more recent supernovae have also been found. Statistical observations of supernovae in other galaxies suggest they occur on average about three times every century in the Milky Way, and that any galactic supernova would almost certainly be observable with modern astronomical telescopes.

Theoretical studies indicate that most supernovae are triggered by one of two basic mechanisms: the sudden re-ignition of nuclear fusion in a degenerate star or the sudden gravitational collapse of a massive star's core. In the first instance, a degenerate white dwarf may accumulate sufficient material from a binary companion, either through accretion or via a merger, to raise its core temperature enough to trigger runaway nuclear fusion, completely disrupting the star. In the second case, the core of a massive star may undergo sudden gravitational collapse, releasing gravitational potential energy as a supernova.

## HISTORY

The earliest recorded supernova, SN 185, was viewed by Chinese astronomers in 185 AD. The brightest recorded supernova was SN 1006, which occurred in 1006 AD and was described in detail by Chinese and Islamic astronomers. The widely observed supernova SN 1054 produced the Crab Nebula. Supernovae SN 1572 and SN 1604, the latest to be observed with the naked eye in the Milky Way galaxy, had notable effects on the development of astronomy in Europe because they were used to argue against the Aristotelian idea that the universe beyond the Moon and planets was static and unchanging. Johannes Kepler began observing SN 1604 at its peak on October 17, 1604, and continued to make estimates of its brightness until it faded from naked eye view a year later. It was the second supernova to be observed in a generation (after SN 1572 seen by Tycho Brahe in Cassiopeia).

Multi-wavelength X-ray, infrared, and optical compilation image of Kepler's supernova remnant, SN 1604

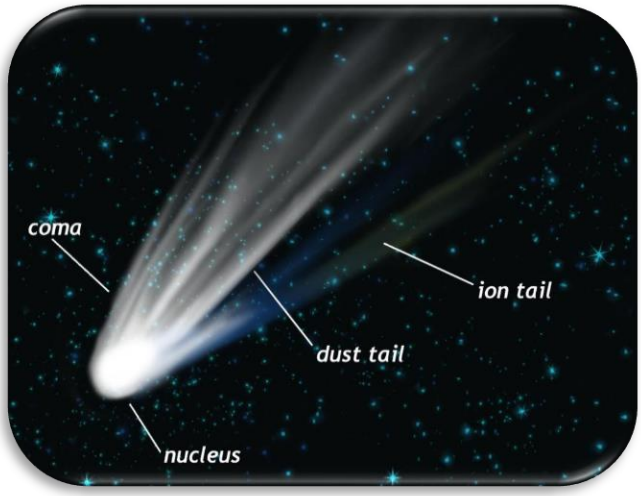


**Compiled By -**

*Vishnu Nair*
**(TE ETRX)**

## 2.6.2 Comet…a blazing star

A comet is an icy small Solar System body that, when passing close to the Sun, warms and begins to evolve gasses, a process called out-gassing. This produces a visible atmosphere or coma, and sometimes also a tail. These phenomena are due to the effects of solar radiation and the solar wind acting upon the nucleus of the comet. Comet nuclei range from a few hundred metre's to tens of kilometres across and are composed of loose collections of ice, dust, and small rocky particles. The coma may be up to 15 times the Earth's diameter, while the tail may stretch one astronomical unit. If sufficiently bright, a comet may be seen from the Earth without the aid of a telescope and may subtend an arc of 30° (60 Moons) across the sky.Comets are distinguished from asteroids by the presence of an extended, gravitationally unbound atmosphere surrounding their central nucleus. This atmosphere has parts termed the coma (the central part immediately surrounding the nucleus) and the tail (a typically linear section consisting of dust or gas blown out from the coma by the Sun's light pressure or outstreaming solar wind plasma). However, extinct comets that have passed close to the Sun many times have lost nearly all of their volatile ices and dust and may come to resemble small asteroids. Asteroids are thought to have a different origin from comets, having formed inside the orbit of Jupiter rather than in the outer Solar System.



The discovery of mainbelt comets and active centaur minor planets has blurred the distinction between asteroids and comets.

As of November 2014 there are 5,253 known comets, a number that is steadily increasing as they are discovered. However, this represents only a tiny fraction of the total potential comet population, as the reservoir of comet-like bodies in the outer Solar System (in the Oort cloud) is estimated to be one trillion. Roughly one comet per year is visible to the naked eye, though many of those are faint and unspectacular. Particularly bright examples are called "Great Comets". Comets have been visited by unmanned probes such as the European Space Agency's Rosetta, which became the first ever to land a robotic spacecraft on a comet, and NASA's Deep Impact, which blasted a crater on Comet Tempel 1 to study its interior.

**Compiled By –**

***Raj Dubey***
**(SE ETRX)**

## 2.4.3 Black Holes

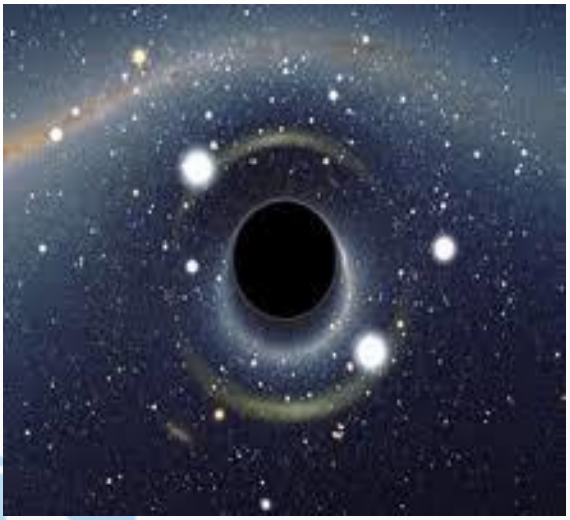
A black hole is a region of spacetime exhibiting such strong gravitational effects that nothing—not even particles and electromagnetic radiation such as light—can escape from inside it.The theory of general relativity predicts that a sufficiently compact mass can deform spacetime to form a black hole.

Despite its invisible interior, the presence of a black hole can be inferred through its interaction with other matter and with electromagnetic radiation such as visible light. Matter that falls onto a black hole can form an external accretion disk heated by friction, forming some of the brightest objects in the universe. If there are other stars orbiting a black hole, their orbits can be used to determine the black hole's mass and location. Such observations can be used to exclude possible alternatives such as neutron stars. In this way, astronomers have identified numerous stellar black hole candidates in binary systems, and established that the radio source known as Sagittarius A*, at the core of our own Milky Way galaxy, contains a supermassive black hole of about 4.3 million solar masses.

Black holes of stellar mass are expected to form when very massive stars collapse at the end of their life cycle. After a black hole has formed, it can continue to grow by absorbing mass from its surroundings. By absorbing other stars and merging with other black holes, supermassive black holes of millions of solar masses ($M_\odot$) may form.

There is general consensus that supermassive black holes exist in the centers of most galaxies. By their very nature, black holes do not directly emit any electromagnetic radiation other than the hypothetical Hawking radiation, so astrophysicists searching for black holes must generally rely on indirect observations. For example, a black hole's existence can sometimes be inferred by observing its gravitational interactions with its surroundings.

Scientists can't directly observe black holes with telescopes that detect x-rays, light, or other forms of electromagnetic radiation. We can, however, infer the presence of black holes and study them by detecting their effect on other matter nearby. If a black hole passes through a cloud of interstellar matter, for example, it will draw matter inward in a process known as accretion. A similar process can occur if a normal star passes close to a black hole. In this case, the black hole can tear the star apart as it pulls it toward itself. As the attracted matter accelerates and heats up, it emits x-rays that radiate into space. Recent discoveries offer some tantalizing evidence that black holes have a dramatic influence on the neighborhoods around them - emitting powerful gamma ray bursts, devouring nearby stars, and spurring the growth of new stars in some areas while stalling it in others.



Most black holes form from the remnants of a large star that dies in a supernova explosion. (Smaller stars become dense neutron stars, which are not massive enough to trap light.) If the total mass of the star is large enough (about three times the mass of the Sun), it can be proven theoretically that no force can keep the star from collapsing under the influence of gravity. However, as the star collapses, a strange thing occurs.

As the surface of the star nears an imaginary surface called the "event horizon," time on the star slows relative to the time kept by observers far away. When the surface reaches the event horizon, time stands still, and the star can collapse no more - it is a frozen collapsing object.

Although the basic formation process is understood, one perennial mystery in the science of black holes is that they appear to exist on two radically different size scales. On the one end, there are the countless black holes that are the remnants of massive stars. Peppered throughout the Universe, these "stellar mass" black holes are generally 10 to 24 times as massive as the Sun. Astronomers spot them when another star draws near enough for some of the matter surrounding it to be snared by the black hole's gravity, churning out x-rays in the process. Most stellar black holes, however, lead isolated lives and are impossible to detect. Judging from the number of stars large enough to produce such black holes, however, scientists estimate that there are as many as ten million to a billion such black holes in the Milky Way alone.

Historically, astronomers have long believed that no mid-sized black holes exist. However, recent evidence from Chandra, XMM-Newton and Hubble strengthens the case that mid-size black holes do exist. One possible mechanism for the formation of supermassive black holes involves a chain reaction of collisions of stars in compact star clusters that results in the buildup of extremely massive stars, which then collapse to form intermediate-mass black holes. The star clusters then sink to the center of the galaxy, where the intermediate-mass black holes merge to form a supermassive black hole.

**Compiled By –**

**Sakshi Sultania**
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## 2.6.4 Saturn's Ring

The rings of the saturn are the most extensive planetary ring system in the solar system, These rings consist of countless small particles, ranging from micrometer to meter's in size. These rings are made up of water ice, with a trace of rocky material .there is no consensus regarding the mechanism of formation. Some features reveal that it is originated recently but theoretical model indicates it has formed early in the solar system's history. Saturn's brightness increases due to reflection from rings. Rings are not visible from earth unaided vision

In 1960, with the invention of telescope Galileo Galilei was able to see the Saturn rings but it was not close enough to discern their true nature. In 1655, Christiann Huygens was the first to describe as a disk surrounding Saturn. Giovanni Domenico Cassini in 1675 composed rings was composed of multiple smaller ring with gap between them and the largest gap was named as Cassini Division . James clerk Maxwell in 1859, Demonstrated rings could not be of solids because they could be stable and break apart. In 1895, his proposal was found to be correct.

These rings have numerous gaps where particle density drops sharply. Stabilizing resonances are responsible for longevity of several rings such as Titan Ringlet & G-Ring. Phoebe ring are beyond the main ring tilted at an angle of $27^0$ to others rings.

The rings are named alphabetically in the order they were discovered. The dense main rings are extended from 7000km to 80,000km above certain equator with the thickness of 10m little and as much as 1km.they composed of 99.9% of pure water ice with impurities tholin's and silicates. As per Voyager the total mass of the ring was estimated to be $3*10^{19}$ kg. The ring of Saturn posses their own atmosphere independent of planet. These rings produces the sound which is revealed by NASA.

**Compiled By-**

***Hariprasad Pandey***

***SE ETRX***

# 3. Technical Article

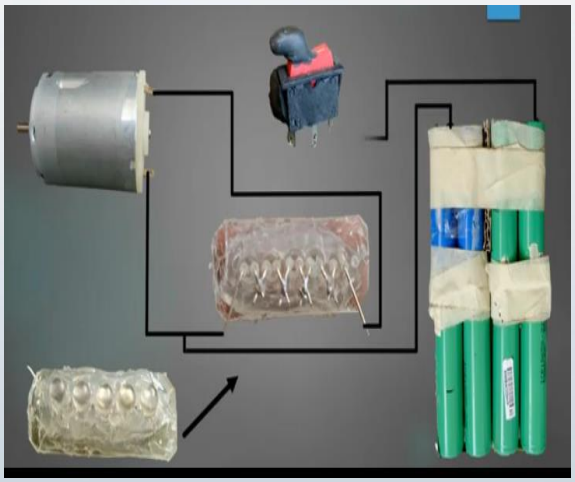
## 3.1 TECHNICAL PAPER'S (TE ETRX)

### 3.1.1 HOVERBOARD

***Abstract:*** Our goal is to reduce pollution from cars and gasoline and make the transportation more fun. We plan to do this by making all new means of travel. This invention will reduce the amount of cars sold and the amount of gasoline used and put into the air. We plan to create an environmentally safe hover-board. By using this technology we will create a fun and safe invention.

***Introduction:*** Our project is about the Hoverboard. All the technologies presented in this project is either available now or in the works, as emerging technologies. Everything in this project is possible and probable in the future and the hoverboard. Hoverboard parks and hoverboarder are all ready to do a time warp into the future.

***Block diagram and working:*** When the switch is pressed the motor gets supply and hence the motor starts rotating in clockwise direction. Depending on whether right or left switch is pressed the right or left motor rotates which is used to direct the hoverboard either right or left by pressing the switch of motor of that particular direction. Inorder to move forward both the switches of hoverboard are pressed and to stop the hoverboard the switch is released.



## APPLICATIONS

- Transportation
- Military
- Tramp-boarding
- Transporting luggage

## FUTURE SCOPE

- Hoverboard can be made to fly above ground by attaching magnetic strip to ground and a strong magnet on the hoverboard.
- Hoverboard can be made light and strong by using carbon-fibre as the material for board.
- Hoverboard can be remotely controlled by the user using open source hardware such as arduino.


**Conceptualized and Conceived by –**

| Vrushali Naik | Nitesh Dixit | Shashank Dubey |
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## 3.1.2 Garbage seperation system

***Abstract-*** A trend of significant increase in municipal solid waste generation has been recorded world-wide. This has been found due to population growth rate, industrialization, urbanization and economic growth which have ultimately resulted in increase in solid waste generation. Final destination of solid waste in India is disposal .Most urban solid waste in Indian cities and town is land-filled and dumped.

***INTRODUCTION-*** Segregation is the first step towards proper disposal of both categories of waste. Waste from a house can be broadly divided in to two categories – dry waste and wet waste. Both need to be disposed and recycled differently. Wet waste includes cooked and uncooked food, waste from fruits and flowers, fallen leaves, dust from sweeping and other similar things. On the other hand, paper, plastic, rubber, metals, leather, cloth rags, wire, glass and things etc. fall under the category of dry waste.

***PROJECT DESCRIPTION:*** By using arduino we can control the motors for conveyor belt. Inductive proximity sensor is used to sense metallic objects. According to the signal from the inductive proximity sensor the Arduino is programmed to actuate a piston which will separate the metallic waste. Using 2 DC motors and leather belt conveyor belt is prepared on which garbage will be placed. The DC motors are controlled using Arduino. The metallic object is detected by the inductive proximity detector. A blower is attached at the end of the conveyor belt to separate dry waste. The dry waste being light in weight will get blown away from the conveyor belt and will fall into the garbage bin. The wet waste being heavy in weight will not get blown away due to the blower and will get deposited in the garbage bin at the end of the conveyor belt.

***EXPECTED OUTCOME :***

The project is designed to successfully separate wet, dry and metallic waste.

## FUTURE SCOPE :

Inlet section can be incorporated with a crusher mechanism to reduce the size of the incoming waste.The nearest industries can be supplied the metallic waste for recycling. Plastic can be segregated from the collected from the dry waste and can also be processed based on their type, grades and colours.


## Acknowledgment:

I would like to thank my mentors and project guides for their constant support and motivation in the construction of this project. I would like to thank Jyoti.K Mam for her support and guidance during our project.


## Conceptualized and Conceived by –


| | | |
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| *Aditi Jadhav* | *Raj Aya* | *Tanuj Dayal* |
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## 3.1.3 Electronic Walking Stick for Blind

***Abstract-*** There is a great dependency for any type of movement or walking within area or out of the particular area, they use only their natural senses such as touch or sound for identification or walking .To overcome all these problems of blind people, need to develop a project by using simple available technologies. This walking stick for blind people which have multiple sensors, with the help of sensors it has possible to enhance more features to the walking stick.

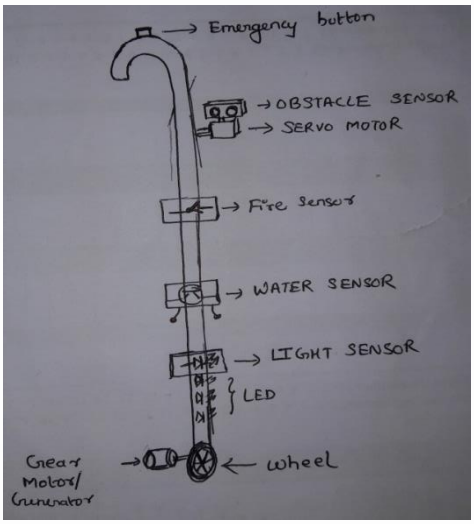
***INTRODUCTION -***In this project, a simple, cheap, user friendly, smart blind walking stick is designed and implemented to improve the mobility of both blind and visually impaired people on streets. The features are to detect the obstacle for collision avoidance, fire sensor, water-level sensor, light sensor, GPS tracking and emergency SMS. Sensors play a key role to make walking free of obstacles for the blind people.

***SCOPE OF THE PROJECT:***

The project mainly includes:

- Power generation for sensor circuits
- Sensors :
  - Obstacle detection using ultrasonic waves
  - Fire Sensor
  - Water-level sensor
  - Indicate presence of blind person in the dark by LEDs
- Send SMS to family members during emergency by push button
- Person can be traced on Google Map by family

***APPLICATION-*** Visually impaired persons will be able to travel places alone comfortably without any human assistance. Due to power generation by generator while walking, there is no need of replacing batteries. Person does not need to search for a mobile to call help; just a push button and family will be informed about it. Family member can trace the person's location.




***FUTURE SCOPE -*** This electronic stick can be further enabled with Voice assistance like Siri(iOS), Google voice search and voice navigation for a pre-defined location. A particular path will be set by the family and the navigation will be sent to the visually impaired person.

***CONCLUSION-***

This paper describes about an electronic walking stick to provide assistance to visually impaired persons while walking on streets. This will replace the current walking stick with electronic smart stick with various sensors. It would help to avoid accidents of visually impaired persons and help them to walk freely without human assistance.

**Conceptualized and Conceived by –**

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# 3.1.4 PROGRAMMABLE ENERGY METER WITH BILL ESTIMATION AND CONTROL WITH SECURITY

***Abstract:*** The demand for power has increased exponentially over the last century. One avenue through which today's energy problems can be solved through the reduction of energy usage in households. This has increased the emphasis on the need for accurate and economic methods of power measurement. The goal of providing such data is to optimize and reduce their power consumption. The electric consumption and usage are monitored and maintained by the Electric Bill Meters. Various types of Bill Meters are available nowadays in the Bill Meters manufacturing industry which keeps the track of the electric bill usage. The Electric Bill gives the information such as voltage, current, power consumed by the home appliances. The idea of Energy Bill meter should be taken one step forward with setting the value of estimated cost i.e. programmable Energy Bill Meter and User control, also providing the logging of data such as voltage, power and cost on the internet so that the user can keep a track of real time bill usage.

## INTRODUCTION :

As we know that the rate at which electric energy is transferred by an electric circuit is called power. Power is an important electrical quantity and everything in our world today depends on having the power to keep them running. It helps in estimation of transmission losses between the generation-distribution and distribution-consumer apparatus. This estimation helps in power theft detection and in turn reduces the transmission losses. Measurement of electrical power may be done to measure electrical parameters of a system. Depending upon the requirement of accuracy, time and the nature of the circuit there is a choice for method and instrument to be used in any given case of measurement. In the existing power utility set up, consumers are presented with usage information only once a month with their bill. The length of time between updates about power usage is far too long for a consumer to observe a changed behaviour's effect on power usage.

This programmable Energy Bill Meter with Bill estimation gives the user a real time information of the bill of Home appliances (Hence Programmable). Unlike today's energy bill meters, this programmable Energy meter with bill estimation provides a control to the user to switch ON and OFF the home appliances with the help of his/her mobile phone remotely with the help of GSM Module once the cost limit for that particular appliance is exceeded. This provides the user with a virtual control over his/her home appliances. Also user can monitor the usage using data logging technique through Internet of Things (IoT). This Bill Meter can be used to prevent the unnecessary wastage of electricity and money. Here in this project we used Arduino Uno, a microcontroller board based on the ATmega328.

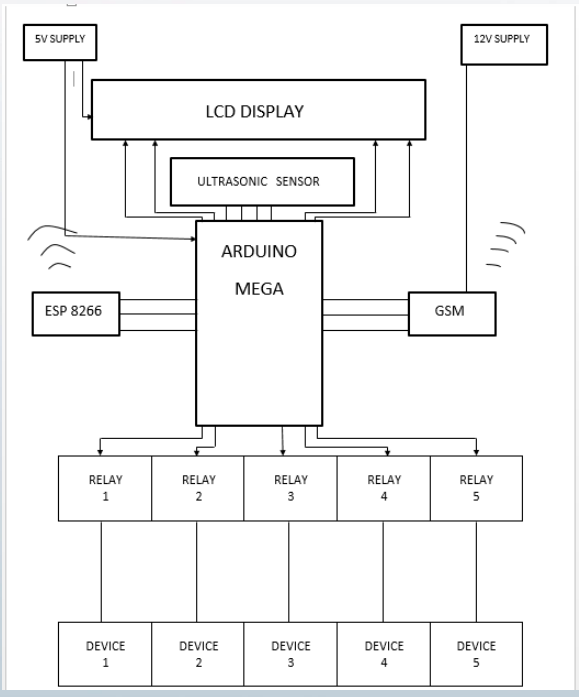
***Applications and future scope***

~The energy meter can be designed to have a unique identification number that will indicate the locality and consumer type as the billing system is different for different types of users. This number along with the consumed units of electricity can be sent with-out human intervention. The department can maintain a database to identify the type of location using this number and calculate the bil accordingly and send it to the user.

~ For developing countries like India where a major chunk of the population lives below poverty line will become alert while consuming electricity if their bills reach them on a weekly or monthly basis as desired by them.

• If such bills reach more frequently, the user become alert if there is theft of electricity by undesired sources or if the electrical appliances are left in working mode even when the users are not around.

• The system can be made smart by having a battery backup in case power fails.



• Further reliability analysis can be done about the number of failures during the initial implementation, mature stage and the last stage.
• Effort can be made for the meters to remain robust so that the users do not have to replace their meters frequently. Also, these meters should be compatible with more than one remote monitoring system.

**Conceptualized and Conceived by –**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# 3.2 TECHNICAL PAPER'S (SE ETRX)

## 3.2.1 IMPORTANCE OF ETHICS IN CYBER CRIME

***Abstract-*** Ethics is a branch of philosophy that deals with what is considered to be right or wrong. As information in cyberspace can be accessed globally, a research field of "computer ethics" is needed to examine what is right and wrong for Internet users can do, and what are the social impacts of Information Technology (IT) in general. Such research will underpin action that must be taken not only to harness the power of the IT itself, but also to survive its revolution.

***Introduction-***

Ethics is a branch of philosophy that deals with what is considered to be right or wrong. Definitions of ethics have been widely proposed, such as "codes of morals of a particular profession", "the standards of conduct of a given profession", "agreement among people to do the right and to avoid wrong". Webster's Collegiate Dictionary defines ethics as "the discipline dealing with what is good and bad and with moral duty and obligation". In more simple words, it is the study of what is right to do in a given situation, and what we ought to do. Primarily, the importance of computer security is to protect the computer and its data as well as its user's identity. When computer hackers gain access to a computer, they can often see everything that is stored there. This might include bank information, tax identification documents and sensitive health information, along with more mundane files such as word processing documents and family photos. Cyber criminals can use personally identifiable information to steal identities and perpetrate fraud. Taking charge of the computer security usually is simple as installing an anti-virus program or purchasing basic computer security software. The importance of computer security extends to computer skills. Users should educate themselves about the risks of the Internet, particularly with downloads.

They should take care when sharing personal information with non-trusted websites & should keep credit card information closely guarded.

***Ten Commandments of Computer Ethics***

1. Thou Shall Not Use A Computer To Harm Other People.

2. Thou Shall Not Interfere With Other People's Computer Work.

3. Thou Shall Not Snoop Around In Other People's Computer Files.

4. Thou Shall Not Use A Computer To Steal.

5. Thou Shall Not Use A Computer To Bear False Witness.

6. Thou Shall Not Copy Or Use Proprietary Software For Which You have Not Paid.

7. Thou Shall Not Use Other People's Computer Resources Without Authorization Or Proper Compensation.

8. Thou Shall Not Appropriate Other People's Intellectual Output.

9. Thou Shall Think About The Social Consequences Of The Program You Are Writing Or The System You Are Designing.

10. Thou Shall Always Use A Computer In Ways That Insure Consideration And Respect For Your Fellow Humans.

***Cyber CRIME VARIANTS***

1. Cyber-stalking :

Cyber stalking is use of the Internet or other electronic
means tostalk someone. This term is used interchangeably with online harassment and online abuse. Stalking generally involves harassing or threatening behavior that an individual engages in repeatedly, such as following a person, appearing at a person's home or place of business, making harassing phone calls, leaving written messages or objects, or vandalizing a person's property.

2. Hacking :

"Hacking" is a crime, which entails cracking systems and gaining unauthorized access to the data stored in them. Hacking had witnessed a 37 per cent increase this year.

3. Phishing :

Phishing is just one of the many frauds on the Internet, trying to fool people into parting with their money. Phishing refers to the receipt of unsolicited emails by customers of financial institutions, requesting them to enter their username, password or other personal information to access their account for some reason. Customers are directed to a fraudulent replica of the Original institution's website when they click on the links on the email to enter their information, and so they remain unaware that the fraud has occurred. The fraudster then has access to the customer's online bank account and to the funds contained in that account. F-Secure Corporation's summary of 'data security' threats during the first half of 2007 has revealed that the study found the banking industry as soft target for phishing scams in India.

4.Cross Site Scripting Cross :

Site scripting (XSS) is a type of computer security vulnerability typically found in web applications which allow code injection by malicious web users into the web pages viewed by other users. Examples of such code include HTML code and client side scripts. An exploited cross site scripting vulnerability can be used by attackers to bypass access controls.

5. Vishing :

Vishing is the criminal practice of using social engineering and Voice over IP (VoIP) to gain access to private,personal and financial. Information from the public for the purpose of financial reward. The term is a combination of "voice" and phishing. Vishing exploits the public's trust in land-line telephone services, which have traditionally terminated in-physical locations which are known to the telephone company, and associated with a bill payer. The victim is often unaware that VoIP allows for caller ID spoofing, inexpensive, complex automated systems and anonymity for the billpayer. Vishing is typically used to steal credit card numbers or other information used in identity theft schemes from individuals.

6. Cyber Squatting :

Cyber squatting is the act of registering a famous domain name and then selling it for a fortune. This is an issue that has not been tackled in IT act 2000.

7. Bot Networks :

A cyber crime called 'Bot Networks', wherein spamsters and other perpetrators of cyber crimes remotely take control of computers without the users realizing it, is increasing at an alarming rate. Computers get linked to Bot Networks when users unknowingly download malicious codes such as Trojan horse sent as e-mail attachments. Such affected computers, known as zombies, can work together whenever the malicious code within them get activated, and those who are behind the Bot Networks attacks get the computing powers of thousands of systems at their disposal. Attackers often coordinate large groups of Bot-controlled systems, or Boot networks, to scan for vulnerable systems and use them to increase the speed and breadth of their attacks. Trojan horse provides a backdoor to the computers acquired. A 'backdoor" is a method of bypassing normal authentication, or of securing remote access to a computer, while attempting to remain hidden from casual inspection. The backdoor may take the form of an installed program, or could be a modification to a legitimate program. Boot networks create unique problems for organizations because they can be remotely upgraded with new exploits very quickly and this could help attackers pre-empt security efforts.

***Conclusion***: Computer ethics is a set of moral principles that regulate the use of computers. Cyber crime is criminal activity done using computers and the internet. As the Cyber Crime is growing in wide scale and becoming a global issue. Regardless of regional and national boundaries researchers are working together to find out all possible solutions. Various legislative acts are enforced and implement. Organizations are instructed to abide and follow the safety measures. To fight with Cyber Crime, Cross-Domain Solutions are becoming popular to resolve issues. Cross Domain Solutions suggest both the parties to follow protocols and standards. The parties using such solutions are communicating across the system's hardware and software for authentication and data transfer.

Cross domain solutions provide seamless sharing and access of information. Other Safety measures like checking the person in ethical behavior on moral basis before employment or assigning such confidential work must be done. The Educational Institutes can play vital role to make a strong ethical base by including such subjects as compulsory ones. Government may do frequent checking on Cyber Community for illegal services and face them to strictly follow the standards. The professionals also be motivated to be honest with their job roles and their services shall be recognized time to time, so that to encourage them to abide by morals and not to move away from ethical culture.

**Conceptualized and Conceived by –**

*Hari N Khatavkar*
*UG Student*
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*Rahul Jha*
*UG Student*
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# 3.2.2 4G TECHNOLOGY

***ABSTRACT:***

4G wireless communication networks are characterized by the need to support heterogeneous terminals differing in size, display, battery, computational power, etc. For efficient usage of the wireless spectrum all devices should be served by the same spectrum instead of allocating spectradedicated to the different terminal classes. 4Gmobile communications should not focus only odata-rate increase and new air-interface, butshould, instead converge the advanced wireless mobile communications and high-speed wireless access systems into an OWA platform, which becomes the core of this emerging next-generation mobile technology. Based on this OWA model, 4G mobile will deliver the best business solutions to the wireless and mobile industries, such as CDMA/WLAN/GPRS and WCDMA/OFDM/WLAN.

Future wireless service will be characterized by global mobile access (terminal and personal mobility); high quality of service (full coverage, intelligibility, no drop, and no/lower call blocking and latency); and easy and simple access to multimedia voice, data, message, video,Worldwide Web, global positioning system (GPS), etc., services via a single user terminal.

***Introduction :***

4G or Fourth Generation is future technology for mobile and wireless communications. It will be the successor for the 3rd Generation (3G) network technology. Currently 3G networks are under deployment. Approximately 4G deployments are expected to be seen around 2010 to 2015. There is no formal definition for what 4G is; however, there are certain objectives that are projected for 4G. These objectives include, that 4G will be fully IP based integrated system. 4G will be capable of providing between 100 Mbps and 1Gbps speeds both indoor and outdoor with premium quality and high security. The evolution from 3G to 4G will be driven by services that offer better quality (e.g. multimedia, video and sound) thanks to greater bandwidth, more sophistication in the association of a large quantity of information, and improved personalization.

Convergence with other network (enterprise, fixed) services will come about through the high session data rate. Machine-to machine transmission will involve two basic equipment types: sensors (which measure parameters) and tags (which are generally read/write equipment). In simplest terms, 4G will be an integrated system of voice, data and image communications that will support a wide range of personal and business communications.

## WIRELESS SYSTEM EVOLUTION;

The history and evolution of mobile service from the 1G (first generation) to 4G (fourth generation) are discussed in this section. As the second generation was a total replacement of the first generation networks and handsets, and the third generation was a total replacement of the second generation networks and handsets, so the fourth generation cannot be just an incremental evolution of 3G technologies. The following table presents a short history of mobile telephone technologies.

| Technology | 1G | 2G | 3G | 4G |
|---|---|---|---|---|
| Design began | 1970 | 1980 | 1990 | 2000 |
| Implementation | 1984 | 1991 | 2002 | 2010? |
| Service | Analog voice, synchro nous data to 9.6Kbps | Digital voice,short messages | Higher capacity, broadba nd data up to 2Mbps | Higher capacity, completely IPoriented, multimedia data |
| Data Bandwidth | 1.9 Kbps | 14.4 Kbps | 2 Mbps | 200 Mbps |
| Multiplexing | FDMA | TDMA | FDMA | FDMA |
| Core Network | PSTN | PSTN | Packet Networ | Internet |

**ABBREVIATIONS:**

AMPS = advanced mobile phone service
CDMA = code division multiple access
FDMA = frequency division multiple access
GPRS = general packet radio system
GSM = global system for mobile
NMT = Nordic mobile telephone
PDC = personal digital cellular
PSTN = public switched telephone network
TACS = total access communications system
TDMA = time division multiple access
WCDMA = wideband CDMA

## PRINCIPAL TECHNOLOGIES USED IN 4G

### 4.1 OFDM (Orthogonal Frequency Division Multiplexing):-

OFDM increases bandwidth by splitting a data-bearing radio signal into smaller signal sets and modulating each onto a different subcarrier, transmitting them simultaneously at different frequencies. The subcarriers are spaced orthogonally and thus large numbers can be packed closely together with minimal interference. To maintain orthogonality among the tones, a cyclic prefix is added, the length of which is greater than the expected delay spread. With proper coding and interleaving across frequencies, multipath becomes an OFDM system advantage by yielding frequency diversity. OFDM can be implemented efficiently by using fast Fourier transforms (FFTs) at the transmitter and receiver.

### 4.2 MIMO (Multiple Input-Multiple Output):-

MIMO is a spatial diversity technique that increases coverage or data capacity by either transmitting the same data on different antennas or different data on different antennas. A highperformance 4G broadband wireless mobile service requires multiple antennas be used at both the base station and subscriber ends.

Multiple antenna technologies enable high capacities suited for internet and multimedia services and also dramatically increase range and reliability. Multiple antennas at the transmitter and receiver provide diversity in a fading environment.

By employing multiple antennas, multiple spatial channels are created, making it unlikely that all channels fade simultaneously. With MIMO, the channel response becomes a matrix. Because each narrow band carrier can be equalized independently, the complexity of space-time equalizers is avoided.

**4.3 AMC (Adaptive Modulation and Coding):-**

The principle of AMC is to change the modulation and coding format (transport format) in accordance with instantaneous variations in channel conditions. AMC extends the system's ability to adapt to good channel conditions. Channel conditions should be estimated based on feedback from the receiver. AMC allows different data rates to be assigned to different users, depending on their channel conditions. Since channel conditions vary over time, the receiver collects a set of channel statistics, such as modulation and coding, signal bandwidth, signal power, training period, channel estimation filters, and automatic gain control, which are used by both the transmitter and the receiver to optimize system parameters.

**4.4 Open Broadband Wireless Core:-**

The open wireless platform requires: Area- and power-efficient broadband signal processing for wideband wireless applications The highest industry channel density (million operations per second [MOPS] pooling) in flexible new base transceiver station (BTS) signal processing architectures Waveform-specific processors that provide new architecture for platform reuse in terminals for multiservice capability Terminal solutions that achieve the highest computational efficiency for application with high flexibility Powerful, layered software architecture using the virtual machine programming concept

## 5. WORKING OF 4G

### Internet Protocol

In the 4G wireless networks, each node will be assigned a 4G-IP address (based on IPv6), which will be formed by a permanent "home" IP address and a dynamic "care-of" address that represents its actual location. When a device (computer) in the Internet wants to communicate with another device (cell phone) in the wireless network, the computer will send a packet to the 4G-IP address of the cell phone targeting on its home address. Then a directory server on the cell phone's home network will forward this packet to the cell phone's care-of address through a tunnel, P a g e | 4 mobile IP; moreover, the directory server will also inform the computer that the cell phone's care-of address (real location), so next packets can be sent to the cell phone directly. The idea is that the 4G-IP address (IPv6) can carry more information than the IP address (IPv4) that we use right now. IPv6 includes 128 bits, which is 4 times more than 32bits IP address in IPv4. In this rich data IP address, software can use them to distinguish different services and to communicate and combine with other network areas, such as computer (PC) and cell phones' network

## 6. APPLICATIONS

To achieve the goals of true broadband service, the systems need to make the leap to a fourth-generation (4G) network. This is where Global Wireless Communications (GWC) enters the fray and excels at it. GWC will provide high speed, high capacity, low cost-per-bit IP-based services; fiber optic wireless connections and a truly global wireless communications system operating in frequency ranges that surpass all other telecommunication companies on planet Earth. 4G will consist of a hierarchy of quality/bandwidth modes, organized somewhat like this: Voice, low-to-medium resolution images, moderate data rates. High quality audio, images with good quality on small screens (handset, PDA, laptop PC). This can be achieved with WiMax, cable, satellite and DSL in supporting roles. Wide coverage with HDTV quality images, hundreds of Mbps data rates. Broadcast HDTV, digital cable,

satellite and next generations of WiMax/WiBro support this level of quality. Local distribution of HDTV quality images, hundreds of Mbps data rates. UWB, 60 GHz systems, and other developing technologies can address this application area. Some of the other applications of 4G are given as follows: Virtual Presence: This means that the 4G provides user services at all times, even if the user is off-site. Virtual navigation: 4G provides users with virtual navigation through which a user can access a database of a street, building, etc. Tele-geoprocessing application: This is a combination of GIS (Geographical Information System) and GPS (Global Positioning System) in which a user can get the location by querying. Tele-Medicine and Education: 4G will support remote health monitoring of patient. For people who are interested in lifelong education, 4G provides a good opportunity.

## 7. CONCLUSION

4G is more than a cellular technology. It combines the cellular and WLANs to create the ultimate network. 4G networks are fully compatible with each other and offer truly global and local roaming. As wireless carriers explore the most efficient ways to deploy 4G services, they will face numerous challenges. However, with the range of solutions that will be available at their disposal, they will also have to opportunity to shorten their return on investment, improve operating efficiency, and increase revenues. The key is to align business challenges with infrastructure choices. 4G seems to be a very promising generation of wireless communication that will change the people's life in the wireless world. 4G is expected to be launched by 2010 and the world is looking forward for the most intelligent technology that would connect the entire globe.

**Conceptualized and Conceived by –**

| Akshay Prabhu | Jeel Patel | Akanksha Rai | Priyanka Singh |
|---|---|---|---|
| UG Student | UG Student | UG Student | UG Student |
| TCET SE ETRX | TCET SE ETRX | TCET SE ETRX | TCET SE ETRX |

# 4. Extra and Co-Curricular Activities

## 4.1 Industrial Visit

### 4.1.1 A Brief Report on IETE-TCET Students' Chapter Official Industrial Visit (IV) 2016-17

**Event Details:** Official Annual Industrial Visit in order to make students familiar with industrial environment.

**Duration:** 3rd January - 11th January, 2017

**Venue:** Alleppey, Munnar And Cochin.

**Participants:** Students of second and third year from Electronics department.

**Objectives:**

1. To improve learning and practical thinking.
2. To improve interaction with experts from industry, R&D etc. to enhance teaching- learning process.
3. To narrow gap between industrial and college environment.
4. To develop new ideas, practical knowledge, clear view of industry processes etc.

**Staff Involved:**

1. Dr. S. C. Patil – Deputy HOD, Associate Professor
2. Prof. Vaibhav Gijare – Assistant Professor
3. Prof. Sumit Kumar - Assistant Professor
4. Prof. Jalpa Pandya – Assistant Professor

| Sr. No. | Name of Faculty | Venue/ Committee | Responsibilities |
|---|---|---|---|
| 1 | Dr. S. C. Patil | Deputy HOD, Associate | To coordinate with students and guide them. |
| 2 | Prof. Vaibhav Gijare | Assistant Professor | To coordinate with students and guide them. |
| 3 | Prof. Sumit Kumar | Assistant Professor | To maintain Discipline throughout the time. |
| 4 | Prof. Jalpa Pandya | Assistant Professor | To maintain Discipline throughout the time. |

**Tour Organizing Committee (from Ashish Tours), Details as follows;**

| Sr. No | Name of Escort | Venue/ Committee | Responsibilities |
|---|---|---|---|
| 1 | Mr. Vinay | Overall Coordinators/ Representative from Ashish Tours | Arrange for food and hotels.<br>Look after any need.<br>Guide throughout the IV. |
| 2 | Mr. Umesh | Overall Coordinators/ Representative from Ashish Tours | |

**Attendees:-**

**Planning:-**

| Sr. No. | Name |
|---|---|
| 1 | Second Year Electronics Students (25) |
| 2 | Third Year Electronics Students (53) |
| 3 | Internal Faculty Member (4) |

At commencement of the even semester, IETE -TCET core committee was given the task to plan the official industrial visit by Electronics department and IETE-TCET chapter. Guidelines were given by HOD ETRX and IETE branch counselors and which were mandatory to follow while planning the visit.
The place decided was Alleppey-Munnar-Cochin. We searched renowned companies like Keltron, HK enterprise, KEL, Hykon etc. We discussed the places and also industries with our HOD & IETE-Branch Counselor.
The Three industries that we decided to visit were Kolukkumalai Tea Factory, Hykon, KEL.
We contacted Ashish tour operators and gave them our plan of visit and also asked them to get permission from industries.
After discussing with operators we finalized the 9 Day tour to Kerala from 3rd January - 11th January, 2017. Total cost of the tour (inclusive of all the taxes) was Rs.10,700, /- per student. A sum of Rs. 1,000 was also collected to support any medical emergencies during the tour.

**Description:-**

Schedule of the program is attached.

**Day - 1**

All the students assembled at Lokmanya Tilak Terminus around 10:00a.m. To board the (16345) Netravati Express. Departure time of the train was 11:40a.m. The students were briefed again about important things, discipline and other unforeseen factors by the faculty and also by the tour operator.

Lunch and Dinner was provided by the tour operator. The journey was an overnight en-route. Students started to play various games due to which the interaction between various small groups increased and the crowd started gelling up with each other. Students continued their fun and activity so that they don't get bored.

**Day - 2**

We reached Alleppey at around 4.00p.m. From here we commuted by bus to the Orchid Residency at Kottayam. We had Dinner at the Hotel at 08.30 p.m.

**Day – 3**

We had our Breakfast at 08.00 a.m. afterwards we got ready for Kumarakom Backwaters.

We then returned back to Orchid Residency For lunch at 2.00Pm. and departed for Munnar At 3.30Pm. We had a Halt of 15 mins Mid-Way at around 5.30 Pm. for snacks and Reached Munnar's Tea castle Hotel at 9.00Pm and had Dinner at 9.30 Pm.

**Day – 4**

After having breakfast, we went for a Jeep Ride to Kolukkumalai. We boarded the jeep at Suryanelli. 10 Jeeps were booked at the cost of Rs. 2,000/- per Jeep. We took an off-road ride up hill of 12 Km. to reach Kolukkumalai. The road was amidst the tea plantation. We took a halt a point 2000m above Sea level for refreshments for 30mins. We then proceeded to Kolukkumalai tea factory.

**Kolukkumalai Tea Factory**

The Kolukkumalai factory is an original tea factory built by the British during the 1940's and the equipment and process dates back to those days! Not a lot has changed over the years! It is hard to imagine how the heavy machinery and

equipment must have travelled by ship all the way from the factories in the UK brought to the plains and hauled up the steep hills to set up the factory! These enterprising pioneers of the hills must have set up the factory at such a remote slope halfway up the second highest peak in South India for a reason.

The tea grown on these slopes are special as the quality of tea improves with altitude and the orthodox process of manufacture helps retain all it's flavor! The tea produced at the factory is much sort after for it's distinctive flavor and aroma.

The factory can only be accessed by jeep up a windy estate road from Suryanelli village, with lovely views of the valley and hills. The only other option is to do it on foot but can take a while! Most hotels in Munnar and Chinnakanal offer the trip to the factory along with a jeep ride which is an experience in itself! Should you wish to have more details of the visit or the price and inclusions please contact

## Mattupetty Dam

After visiting the Tea plantations we had some snacks in bus and departed for Mattupetty Dam at 2.30 P.M.
we reached Mattupetty dam at 5.00P.M. And had some free time for Shopping. After some sight-seeing we had some refreshments and departed for hotel Tea Castle at 6.30P.M. And reached Hotel at 7.30P.M.

After we reached hotel, where the temperature was close to 19°C, we started packing our luggage and preparing for next day's 125 Km. long journey to Cochin

## Day – 5

In the morning we had breakfast at 7.30 A.M. and were ready to checkout the hotel by 8.30 A.M. we had our luggage's loaded in the bus and ready to depart for Cochin. Since we were 30min behind the scheduled time and had industrial visit as a priority, we had to skip the time allotted for shopping.

After Travelling for 5 hrs. we reached Thrissur, where lunch was planned. We had lunch at Dominos, where
168 pizzas were pre ordered and were consumed on the way to industry so as to reach industry on time

## Hykon India Pvt. Ltd

Hykon Is a brand name associated with Power Electronics
and testing instruments it manufactures inverters and
small Scale Transformers

Inverters

Students were taken to the assembling unit of Hykon House where assembling of inverters takes place. Assembling of Whole inverter is divided into 4-Stages

1. PCB Designing
2. Raw Material Part
3. Production
4. PCB Wiring and Transformers

The company is capable to manufactur 1500 PCB's in 3 Months

To manufacture 600V inverter, the PCB's are designed by R&D department. Then the designed PCB is connected to Transformer and heat sink. The even feature solar charger portable inverters as an additional feature in this inverter there is D- MOSFET which Supports operation of Inverter and helps in adjusting Variable AC- DC voltages. We also saw an alternative function transformer which works as both Step-up as well as Step-Down Transformer.

**Transformers**

These Transformers has two types of core lamination E and I, also winding is according to the required KVA. The transformers the manufacture are only step-down Transformers.

**Marketing Info of the Company**

The HYKON house has its assembling unit here but its PCB's are provided by the R&D cell and rest is done here.The Manufacturing cost for Inverters is Rs.3000 – Rs. 3500/- depending on the model whether the inverter is Solar or Non- Solar, and sold at a profit margin of Rs. 6000 to Rs. 6500/-

The company are planning to recruit more employees as government orders are on hike Also the company is soon Starting to manufacture stabilizers

After completing Industrial Visit we left for hotel which was situated in Ernakulam town

We reached Hotel Presidency at 7.45 P.M. which close to Ernakulam Town Railway Station. After allotting Rooms to group of Students, We had Dinner and overnight stay at Hotel.

**Day – 6**

After a hectic schedule of previous day we planned to ease the day and decided to skip Athripally Waterfall and spend some more time at St. Francis Church, Chinese Fishing Nets, Jewish Synagogue

The day started with breakfast at 8.30 A.M. and left for cruise ride at 10.00A.M.

**Day – 7**

After Breakfast at 8.00 A.M. we departed to visit KEL ELECTRONICS, we reached the industry at 11.00 A.M. and they were divided in group of 25 to visit the industry.

**KERALA ELECTRICAL & ALLIED ENGINEERING Co. Ltd. – Transformer Division**

The transformer Division of KEL at Mamala, Ernakulam was established in 1969, with the technical Support of
'BHEL', to manufacture supreme quality transformers, for various state Electrical Boards, Government department, Public and Private Sector companies. This division is ISO 9001 Certified.

The transformer division with an annual production capacity of 6,00,000 kVA soon after its inception, emerged as a major player in designing and manufacturing distribution transformer of ratings up to 5,000 kVA, 33 kV Class

The KEL factory is one of the first few Transformers Factories
In India, to get ISO 9001 Certification. This division of Kerala Electrical and allied engineering Co. Ltd Manufactures:-

Transformers
Transformer Coil
Wires
Windings (According to Customer's Needs)

In the evening we visited Lulu Mall Which is Asia's Biggest Mall
As each company have different specification of transformers as per their needs,
KEL manufactures customized transformer.


**Day -8**

08.30 A.M Breakfast. 11.30 A.M Lunch at the hotel Presidency

We had our Departed for Ernakulam Junction station at 12.30 P.M and Boarded (16346) Netravati Express. Departure time was 2.00 P.M. Lunch & Dinner en-route.

**Day -9**

Breakfast was served at 08.30 A.M in the train, we all Arrived at Thane Railway Station at 6.10 P.M. And reached final Destination Lokmanya Tilak Terminus at 7.10 P.M. and departed with a loads of happy memories.

## SWOT ANALYSIS

### Strengths:

1. The places that were chosen, has a very healthy environment in spite of being an industrial manufacturing area.

2. The industries selected for the visit had a very healthy working environment which made it easier for the students to visit the factories.

### Weakness:

1. The arrangement of seats in train was not grouped which made the travelling a little inconvenient as some students had their assigned seats in other far coaches.
2. Due to hectic and tiring itinerary we were unable to visit Ervikulam National Park.
3. Due to some communication hindrances, Tour Operator was unable to book all rooms in one hotel hence 4 out of 22 required rooms were booked in another hotel for one night at Munnar

### Opportunities:

1. Visiting companies like Kerala Electrical & allied Engineering, Hykon India Pvt. Ltd. was a very good opportunity for students to see how steels and electronic components are manufactured on the assembly line, giving precise information about its entire assembly process.

### Threats:

Too much travelling led to motion sickness in students.

## Learning

Planned learning during the Industrial Visit

IETE-TCET Students' Chapter organized the industrial visit with an intention to provide students an edge of industrial environment and its proceeding. Following are some of the core principles and knowledge which was intended to impart into the participating students:

Fraternity: Students of different divisions were taken together and were made to live together. They had their own beliefs, intelligence, faith and even religions. With lots of diversity in their thinking and ideas all the students enjoyed at same place by doing same thing. Students were made to mix up in the hotel rooms which again helped them in gelling up within themselves. By the end of Day-9 each student knew the name of everyone else and feeling comfortable with each other.

Industrial Procedures: Visiting industries of different sectors, different in operation, product, vision, mission etc. gave students the knowledge of corporate world.

Improved way of learning: Students mostly stick to their syllabus and prescribed practical during their academic curriculum, this industrial visit made them think in other way too.

## Outcome

Resulted learning and changes after the Industrial Visit

Friendship and feel of belonging: As the students were made to live together throughout the trip and also made to interact they developed a sense of unity and compatibility amongst them.

Practical Knowledge: Students saw the exact condition of place where they are also supposed to live and work. They got to know how a company works and what all difficulty they might face when they exactly enter in corporate world.

New edge to learning: All students during their college days do not take much effort to go beyond their syllabus but due to a glimpse of outside world they developed a new edge in their learning process. Students started thinking that the processes and other fact that they study are much lagging with current scenario and they need to enhance their cone of learning and seeing the world.

Students at KEL


**At Tea Factory-Kolukkumalai**

# 4.1.2 A Brief Report On Local Industrial Visit (2016- 17) of Department of Electronics Engineering

**Event Details:** Official Local industrial Visit to make the students familiarize with the industry standards.

**Date:** 10th March 2017

**Venue:** Supersonic: Ultrasonic Cleaning System- Goregaon (East)Mumbai400067

**Participants:** Students of second and third year from Electronics Department

**Objectives:**

1. To improve learning and practical thinking.
2. To improve interaction with experts from industry, R&D etc. to enhance teaching- learning process.
3. To narrow gap between industrial and college environment.
4. To develop new ideas, practical knowledge, clear view of industry processes etc.

**Staff Involved:**

1. Dr. S. C. Patil – Deputy HOD, Associate Professor
2. Prof. Archana Belge – Assistant Professor

| Sr No. | Name of Faculty | Venue/Committee | Responsibilities |
|---|---|---|---|
| 1 | Dr. S. C. Patil | Deputy HOD, Associate Professor | To coordinate with students and guide them. |
| 2 | Prof. Archana Belge | Assistant Professor | To maintain Discipline throughout the time. |

**Attendees:**

| Sr. No. | Name |
|---|---|
| 1] | Second Year Electronics Students [ 14 ] |
| 2] | Third Year Electronics Students [ 6 ] |
| 3] | Internal Faculty Member [ 2 ] |

**Description:**

As rightly said by Confucius, "I hear and I forget, I see and I remember, I do and I understand". Practical learning plays a very important role in the life of an engineer and industry is the best place which is filled with entire practical atmosphere. Industrial visits are organized to make the students familiar with the practicalities involved in the working of an industry. Industrial exposure will also make us aware internal working environment of organization as well as practical application of what we have learnt in classrooms. To fulfill this objective, a local industrial visit was organized by the Electronics Department for its second and third year students. We left the college at 2:25 p.m. and took an auto rickshaw to reach the industry situated at Goregaon. We reached the industry at around 2:45 p.m. We were introduced to Mr. Prashant Vanjare who made us familiar with equipments at his industry. Prashant Sir started the

session by telling us the benefits of ultrasound cleaning techniques over the conventional methods available. Ultrasonic Cleaning Systems as he said works on the principle of Cavitation effect. Then he showed us Ultrasound Crate Cleaning machine which is used to clean the crates used in the industry. The jetting time for this machine is 120 seconds and the driving time for this machine is 15 seconds.

Photograph 2- Ultrasonic Cleaning System tank with Basket

Sir said that most ultrasonic cleaning machines are damaged due to voltage fluctuations but their machines include an inbuilt voltage stabilizer circuit to stabilize the operating conditions. Normally the cleaning media used is water + some alkaline solvent or trichloroethylene. Trichloroethylene is a good medium but it has limited industrial use as it is hazardous to health. The heart of an ultrasonic cleaner is the

ultrasonic generator circuit which produces the ultrasonic waves required for the cleaning purposes.

Photograph 3- Ultrasonic Cleaning System tank –Generator Circuit

Photograph 4- Ultrasonic Cleaning System tank –Small bucket cleaner

Then we were introduced to the ultrasonic bath which consists of a rectangular box like structure to clean various equipments used in the factories. This bath consists of the ultrasonic generator situated at the bottom of the bath and it also contains the float switch which is used to specify the minimum water level.

Photograph 5- Ultrasonic Cleaning System tank –Sensor arrangement at surface of tank

Ultrasonic bath is not a portable device. So to Ultrasonic immersible pads are used which are portable and can be easily installed anywhere where cleaning is required like in tanks.

Photograph 6- Ultrasonic Cleaning System tank –Sensor pad use at side of tank

transistor based circuits. He also said that their competitors in market still use the transistor based circuits. The cost of the ultrasonic cleaning system depends on the circuitry involved in the system and so it ranges for 1 lakh to 1 crore.Prakash Sir said that in the ultrasound generator circuits, they have used mosfets which is good and give a high efficiency as compared to the

**SWOT ANALYSIS:**

**Strengths:**

1. The places that were chosen, has a very healthy environment in spite of being an industrial manufacturing area.

2. The industries selected for the visit had a very healthy working environment which made it easier for the students to visit the factory

**Weakness:**

1. Due to rescheduling of academic calendar less number of students accommodate by the company

2. Due to short period, for all the students combine traveling arrangements not possible

**Opportunities:**

1 Visiting companies like Ultrasonic Cleaning System was a very good opportunity for students to see how sensor and valves used in the making of cleaning tank equipment electronic circuit that are manufactured and used for controlling of operation of Ultrasonic sensor ,temperature of the water in the tank

2 World 2nd rank company in the area of manufacturing the Ultrasonic Cleaning System

**Threats:**

Few students of TE found interest in local Visit compare to SE students may be due busy in other activities.

**Outcome:**

Industrial Visits are the vital part of the engineering courses as they help to bridge the gap between the classroom and the real world. Through industrial visits engineering students are opened to real world where they get to know what engineering is and what does a company wants them to do as an engineer. IVs also make us aware of the various industry regulations and practices. Our visit to Supersonics widened our scope of practical learning and made us comfortable with the various equipments used at the instruments. Our IV broadened our depth of knowledge and it was really exciting to see our theoretical being applied to the practical systems.

**Learning :**

Learning of small circuit that also turn to product but the need of industry get to be identified is necessary and is essential measure for student how want to become part of starter of industry after doing their graduation

Department of Electronics organized the local industrial visit with an intention to provide students an edge of industrial environment and its proceeding.

**Following are some of the core principles and knowledge which was intended to impart into the participating students:**

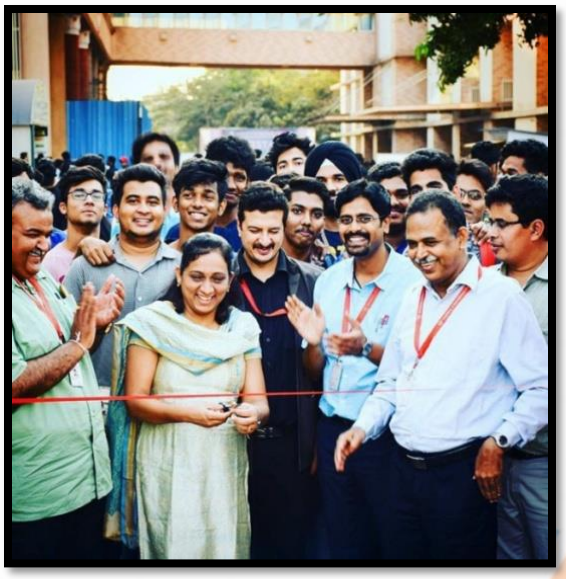
: Students had their own beliefs, intelligence, faith and even religions. With lots of diversity in their thinking and ideas all the students enjoyed the visit ..

Industrial Procedures: small scale manufacturing using different in operation, product, vision, mission would be helpful

**Improved way of learning**: Students mostly stick to their syllabus and prescribed practical during their academic curriculum, this industrial visit made them think in other way too.

# 4.2 Glimpse of Sojourn'17

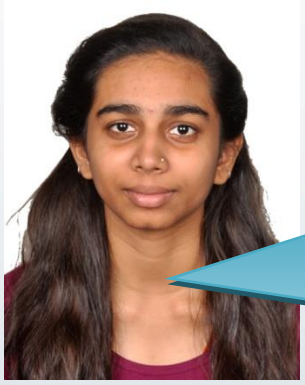

# 4.3 Glimpse of Enertia'17



# 4.4 ALUMNI THOUGHT'S

''Hello! This is Ravi and I am currently working in Accenture as an associate software engineer. My company deals with Procurement Analysis and projects I am involved presently are inter talent pool, IDC.There are many challenges as a fresher that I and every other person doing a job does face but for me the major challenge has been the transition from electronics to IT. But the most rewarding thing about my job is the experience I am gaining. 5 years down the line...not thought of it but I want to do MBA in a good institute but before that I want to continue my job for atleast 2 years to assure what is apt for me.

Comparing my engineering life was more fun and easier than the work life which only revolves around work, work and only work. To my juniors one thing, enjoy your current college life you won't get these days back and also do some courses which will help you during your job/ professional study you opt in future."



"Hello Pals ! This is Radhika, TCET pass out batch 2016. I am currently planning for pursuing Master's in Embedded Systems. Main reason behind opting for Masters was the interest to study and understand the subject more deeply.

Also with knowledge the mullah follows. Also 10 years down the line I am planning to have my entrepreneurship venture. And to my juniors, enjoy your college life because after this everyone will be placed or studying somewhere and all of you will never be together in same way."

"Hello peeps, Vishal here. I am currently working with Zycus Online Procurement Solutions as an Associate Procurement Analyst. Challenge in corporate world here for me is client satisfaction and extended work hours but the rewarding part of my job is the salary I receive. If I could do it all over again I would get in an IIT but otherwise pretty much all same. To my juniors a small piece of advice, improve your communication skills and also your employability skills."

"My greetings to everyone!!! I, Arshis Umrigar an Ex-student of TCET pass out batch 2016. I am presently involved in higher studies. I want to study more deeply in the field of my interest.

So why Master's because more mullah at the end of 2 years??... Umm main motto behind it is to get better understanding of the subject and some money is always good. I see myself as a chip designer VSLI engineer in near future. One message for the Juniors, Study hard and have a good rapport with your teachers."

Hi! This is Priyanka Jain and am currently working in Endurance International Group, it is a web hosting company. I work as a web solutions specialist.

Climbing a corporate ladder trying to be the best and standing out of the crowd when competition is neck to neck is a challenge for everyone doing a job. In next 5 years I want to be done with MBA from a good business school.

I would define engineering life as the honeymoon phase while the working life will be all struggle where reality strikes in. And a piece of advice to my juniors would be enjoy your years here because there's a big bad corporate world waiting for you outside".

"Hello! This is Jay Dhoka. I am presently pursuing for Masters. My keen interest in electronics is the reason I opted for higher education rather than job. I am also planning to start with my Research firm soon. One thing for my pals planning for job or higher studies, whatever you do just be upto date"

"Hi! I Manish Yadav an ex-student of TCET am presently working in Lite Technology Co Pvt. Ltd. as a RnD engineer. Our company majorly deals with LED Lighting Solutions. I am currently involved in Home Automation using Networking projects.

The most challenging task for me is to meet the deadlines. But I am enjoying my work. In 5 years from now I am planning to startup my company.

A small piece of advice to my juniors, do focus on practical and extra advance technologies not in our curriculum for better understanding of the subject.

"Hey! I am Sadhana and am currently working with Accenture Solutions as an Application Development Associate. Our company work for EIRGRID which deals with electricity production and supply.

Like every beginning comes with challenges even I am facing a few of keeping updated about everything that's been going around in the company and proving oneself every now and then. But for me most rewarding part of my job is Friday night parties which brings ease to my hectic life. 5 years down the line?... Umm haven't given a thought but as a successful person in the industry I belong. To my juniors just one thing, 'Enjoy today because corporate world won't let you'.

# 5. Achievement's

## 5.1 Sports Achievements

### Basketball

| Sr no | Name of captain | Name of event | Duration of event | Achievement |
|---|---|---|---|---|
| 1. | Amit Singh | Athos'17,Intercollegiate tournament, FRCRCE, Bandra (W.), Mumbai | 19/1/17 to 21/1/17 | Runner up |
| 2. | | Enertia'17, Intercollegiate tournament, TCET, Kandivali (E.), Mumbai | 3/03/17 to 8/03/17 | Runner up |

### Boxing

| Sr no | Name | Name of event | Duration of event | Achievement |
|---|---|---|---|---|
| 1. | Shashank Dubey | Intra-boxing | September | Runner-up and boxing event held in tcet |

## Box-cricket (girls)

| Sr no | Name | Name of event | Duration of event | Achievement |
|---|---|---|---|---|
| 1. | Prajakta Pawar | Intra | Feb | winner |

## Cricket

| Sr no | Name | Name of event | Duration of event | Achievement |
|---|---|---|---|---|
| 1. | Jayesh Naik , Raj Indulkar , Rishabh Yadav | Intercollegiate tournament, SIES | 03/02/17 to 07/02/17 | Semi finalist |
| 2. | | Intercollegiate tournament, NMIMS, Mumbai | 11/02/17 to 17/02/17 | Runner up |
| 3. | | Intercollegiate tournament, spit,Mumbai | 21/02/17 to 25/02/17 | Semi finalist |
| 4. | | Intercollegiate tournament, ICT Mumbai | 20/03/17 to 24/03/17 | Winner |
| 5. | | Intercollegiate tournament, TCES Mumbai | 11/02/17 to 19/02/17 | Semi finalist |
| 6. | | Intercollegiate tournament,TNMC Mumbai | 22/02/17 to 27/02/11 | Semi finalist |

## Football

| Sr no | Name | Name of event | Duration of event | Achievement |
|---|---|---|---|---|
| 1. | Rishab Dey | Athos'17, Intercollegiate tournament, FRCRCE, Bandra (W), Mumbai | 19/1/17 to 21/1/17 | Runner up |

## Throwball

| Sr no | Name | Name of event | Achievement |
|---|---|---|---|
| 1. | Sayali Narkhade | T-spark 2017 | 1st place in Girls Throwball |
| 2. | Komal Mishra | | |
| 3. | Komal Singh | | |
| 4. | Mamta Parab | | |
| 5. | Sakshi Sultania | | |

## Chess

| Sr no | Name | Name of event | Achievement |
|---|---|---|---|
| 1. | Tanuj Dayal | T-spark 2017 | Winner |
| 2 | Yashvardhan Rathi | T-spark 2017 | Runner-up |

# 5.2 Technical & cultural

## B.E.

| Sr No. | Name | Roll No. | Level | Achievement |
|---|---|---|---|---|
| 1 | Sanket Yadav | 73 | Sojourn'17 (College) | 2nd place in intra group dance |
| 2 | Saryat Khan | 18 | Sojourn'17 (College) | 2nd place in intra group dance |
| 3 | Akshay Angwalkar | 17 | Sojourn'17 (College) | 2nd place in intra group dance |
| 4 | Ashwariya Rajak | 37 | Sojourn'17 (College) | 2nd place in intra group dance |
| 5 | Prajakta Pawar | 44 | Sports | Captain of BE cricket team |

## T.E

| Sr No. | Name | Roll No. | Level | Achievement |
|---|---|---|---|---|
| 1 | Aditi Jadhav | 79 | Sojourn'17 (College) | 2nd place in solo dance<br>2nd place in duet dance<br>2nd place in intra group dance |
| 2 | Komal singh | 43 | Sojourn'17 (College) | 1st place in solo singing. |
| 3 | Sahili Salvi | 37 | Sojourn'17 (College) | 2nd place in intra group dance |
| 4 | Komal Mishra | 24 | | |

| | | | | |
|---|---|---|---|---|
| 5 | Rahul Maurya<br>Priyanka Singh<br>Mahendra singh | 68<br>45<br>72 | Inter College | 1st place at St.Xaviers F.S<br>1st place at K J Somaiya F.S<br>1st place at R.D National F.S<br>1st place at TIMSR F.S<br>Runner-up at SPIT F.S<br>Runner-up at ICT F.S<br>Runner-up at Atharva F.S |
| 6 | Prerna Sharma | 41 | College | 1st place in Hackathon paper presentation |
| 7 | Nindya Sharma | 40 | | |
| 8 | Mansi Gandhi | 8 | | |
| 9 | Darshil Mehta | 23 | | |
| 10 | Jayneel Modi | 25 | Inter College | 1st place at St.Francis institute of technology group dance competition<br>1st place at Thakur Management college group dance competition<br>1st place at Nair Medical college group dance competition<br>1st place at Varthak college group dance competition<br>Runner up at SPIT group dance competition<br>Runner up at Atahrva college of engineering group dance competition |

## S.E

| Sr. No | Students Name | Achivement Sem IV Academic Year 2016-2017 | Category (Sports/Technical/ Non-Technical) |
|---|---|---|---|
| 1 | Ankita Singh | Paper Presentation (3rd prize)-Udan Festival | Technical |
| | | Street Play (Inter) | Non-Technical |
| 2 | Sarvesh Sawant | Paper Presentation (3rd prize)-Udan Festival | Technical |
| 3 | Rahul Kini | Paper Presentation (3rd prize)-Udan Festival | Technical |
| 4 | Hari Khatavkar | Paper Presentation (3rd prize)-Udan Festival | Technical |
| 5 | Rishab Sanadi | 1st place at St.Francis institute of technology group dance competition<br>1st place at Thakur Management college group dance competition<br>1st place at Nair Medical college group dance competition<br>Runner up at SPIT group dance competition | Non-Technical |
| 6 | Akshay Prabhu | Elocution Marathi (2nd prize)-Marathi Diwas | Non-Technical |

# 5.3 Examination Toppers

*Akshay Prabhu (SE ETRX)*

*(CGPA:- 10)*

**The Department of ETRX Congratulates him on this extraordinary Achievement**

**Anilkumar Yadav**

(1ST Topper TE ETRX)

**Vishal Jain**

(1ST Topper BE ETRX)

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DEPARTMENT OF ELECTRONICS ENGINEERING (ETRX)

Credit Based Grading Scheme(Revised - 2012) - University of Mumbai

CBGS-2012(R)