



# ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY,

Mangalwari Bazar Road, Sadar, Nagpur.



## Department of Electronics & Telecommunication Engineering

### From HOD's Desk

**Prof. Mohammad Nasiruddin**  
Associate Prof. and  
Head of Department

The department was established in the year 1999 with an undergraduate programme Electronics and Telecommunication (ETC) and the post graduate programme in Electronics & Communication Engineering (ECE) added in the year 2014. The department faculty works with excellent team spirit in different technical areas like Communication, Signal Processing, VLSI, Embedded System, Wireless Sensor Network, Wireless Communication which leads to key research publications and consultancy. Department takes pride in having sophisticated equipments, fully equipped advanced laboratories and updated computer labs with internet facility. Different activities are regularly conducted under the banner of student forum "X-stream" in view of inculcating team spirit and enhancing self-confidence of students.

**Our mission :** (1) To create conducive academic culture for learning and identifying career goals. (2) To provide quality technical education, research opportunities and imbibe entrepreneurship skills contributing to the socio-economic growth of the Nation. (3) To inculcate values and skills, that will empower our students towards development through technology.

We are committed to the mission of making our students as trained professionals, who will be capable to put the generated knowledge into professional use. The department strives to provide a conducive environment for the students to develop analytical and practical skills and apply them to real world problems. To motivate the students, department organizes regular training for software as well as hardware and besides this, regularly conduct Workshops, National & International Conferences.

### Message from EDITORS...

It gives us immense pleasure in sending our best wishes to represent "X-PRESS 2K16", a departmental news letter and we are confident that the news letter will give impetus to research culture amongst students with emphasis on entrepreneurship.

We are thankful to the Principal Prof. Dr. Sajid Anwar and the Head of our Department Prof. M. Nasiruddin for believing in and giving us this opportunity.



**Prof. Rahil Khan,**  
Assistant Professor,  
Dept. of ETC



**Prof. S. Rizwan Ali,**  
Assistant Professor,  
Dept. of ETC

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# FOLD-UP SMARTPHONE SCREENS COULD FINALLY MAKE THEIR BIG DEBUT



**Ankita Balpande**  
VI Sem, ETC - A

The rumors have been swirling for months. Though they couldn't be confirmed, their persistence suggests that something significant may be coming from - Samsung, possibly as early as this year: a foldable mobile.

Today, the world of mobiles consists of two major realms - tablets and smart phones. Tablets are good for reading magazines and books, typing long messages on a linked keyboard, looking at pictures, and surfing the Web. Smart phones are good for texting and talking. Engineers have long dreamed of merging the two.

Such a device would morph from one to the other by folding: Open, it's a tablet, but by bending or folding it in half you'd transform it into a phone. "You can expect to open up your phone and double the screen real estate," says Roel Vertegaal, a computer scientist at Queen's - University in Ontario. Besides the versatility, you'd have interesting new - possibilities - imagine bending your phone to flip ahead in an e-book, just as you would flex a novel's covers to jump ahead a few pages

Samsung has pursued flexible designs for at least four years, going so far as to develop "artificial muscles" that push and pull a Smartphone's components into new positions to prevent damage as it bends. Now, according to media reports, the company may finally be ready to share those technologies with the world and



save users the hassle of carrying both a phone and a tablet.

"Having that bimodality in a device would, I think, be really game changing," says mobile analyst Wayne Lam at IHS Market. "You're not only creating a new form factor for the phone, but you're also cannibalizing other product categories."

Competitors are thinking along similar elastic lines. At a trade show last summer, Lenovo showed off a concept product for a Smartphone that folded around a user's wrist into a wearable device. Throughout 2016, a Chinese manufacturer named Moxi Group promised a limited release of its own high-end flexible Smartphone.

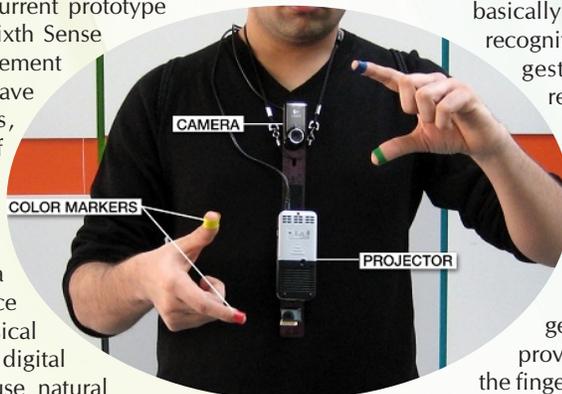
## SIXTH SENSE TECHNOLOGY

### Abstract

Sixth Sense Technology integrates digital information into the physical world and its objects, making the entire world your computer. It can turn any surface into a touch-screen for computing, controlled by simple hand gestures. It is not a technology which is aimed at changing human habits but causing computers and other machines to adapt to human needs. Sixth Sense device is a mini-projector coupled with a camera and a cell phone-which acts as the computer and your connection to the Cloud, all the information stored on the web. The current prototype costs around \$350. The Sixth Sense prototype is used to implement several applications that have shown the usefulness, viability and flexibility of the system.

### Introduction of Sixth Sense Technology

'Sixth Sense' is a wearable gestural interface that augments the physical world around us with digital information and lets us use natural hand gestures to interact with that information the hardware components are coupled in a pendant like mobile wearable device. The Sixth Sense prototype is comprised of a pocket projector, a mirror, colored marker and a camera. The camera, mirror and projector is connected wirelessly to a blue tooth smart phone device that can easily fit into the user's pocket. A software then



processes the data that is collected by the capturing device and produces analysis .The software that is used in sixth sense device is open source type.

### Gesture Recognition

It is a technology which is aimed at interpreting human gestures with the help of mathematical algorithms. Gesture recognition technique basically focuses on the emotion recognition from the face and hand gesture recognition. Gender recognition technique enables

humans to interact with computers in a more direct way without using any external interfacing devices. It can provide a much better alternative to text user interfaces and graphical user interface which requires the need of a keyboard or mouse to interact with the computer.

Interfaces which solely depends on the gestures requires precise hand pose tracking. In the early versions of gesture recognition process special type of hand gloves which provide information about hand position orientation and flux of the fingers. In the Sixth Sense devices colored bands are used for this purpose. Once hand pose has been captured the gestures can be recognized using different techniques. Neural network approaches or statistical templates are the commonly used techniques used for the recognition purposes. This technique have an high accuracy usually showing accuracy of more than 95%. Time dependent neural network will also be used for real time recognition of the gestures.



**Priyanka Yadav**  
VI Sem, ETC - B

# Futuristic plan for NY includes LED bridge lighting in color



**NEW YORK (AP)** - Gov. Andrew Cuomo unveiled a far-reaching futuristic plan for the city that includes color LED illumination of bridges, completely automated toll booths and driver facial recognition cameras for tighter anti-terrorism security.

"So much in today's world is about the immediate, it's about the here and now, it's about Twitter, it's about Instagram and focusing on getting one day to the next," said the Democratic governor, who presented what he calls his New York Crossings Project at the New-York Historical Society on Wednesday. "The reality is, it's the long view that matters, and what are they going to say 10 years from now and 20 years from now and 30 years from now about what we accomplished while we were here?"

But in the immediate future, about 150 members of the National Guard and another 150 state troopers are to be stationed full time at entrances and exits of bridges and tunnels leading to the city, starting in January. Cuomo said recent terrorist explosions in New York and New Jersey have renewed the need to bolster such emergency measures.

Special heavy-duty trucks will be at the ready to barricade access to the crossings in emergencies.

The LED illumination work on eight bridges is to begin in January, when the first totally automated tolls will be installed in the Hugh L. Carey Tunnel from Brooklyn to Manhattan and the Queens-Midtown Tunnel connecting Manhattan with Queens. Within about a year, cars that don't operate with the E-ZPass electronic payment system will be billed using photographed images of their license plates.

Seven city bridges are operated by the Metropolitan Transportation Authority, and the eighth, the George Washington Bridge, is operated by the Port Authority of New York and New Jersey. About 800,000 vehicles use MTA bridges and tunnels daily. The target date for completion of the lighting has not been set.

The Crossings Project includes another new element: safeguarding the tunnels from the kinds of devastating floods that followed Superstorm Sandy in 2012 with concrete barriers acting as temporary seals on both ends.

"From speeding up commutes and reducing emissions on key roadways with automatic tolling to bolstering resiliency on our bridges and tunnels and increasing security at key checkpoints," Cuomo said, "this transformational project will revolutionize transportation in New York and ensure that our state is built to lead for generations to come."

Funding for the changes is allocated as part of the MTA's \$27 billion capital plan.



**Nusrat Khan**  
IV Sem, ETC - A

# FORGET SELFIE STICKS: THIS DRONE CAPTURES PHOTOS AND VIDEOS IN MIDAIR



The AirSelfie drone can capture photos and videos in midair.

Instead of extending your arm or using a selfie stick to snap shots of you and your crew, you could use a new pocket-size drone — dubbed the "AirSelfie" — to help you

remotely capture aerial photos and videos.

The AirSelfie is the brainchild of Italian entrepreneur Edoardo Stroppiana, who came up with the idea in 2014. "AirSelfie is specifically designed and produced for people who used to think drone cameras are extremely complicated to use — too expensive and bulky," Stroppiana said.

The AirSelfie is equipped with a 5-megapixel camera that can shoot full high-definition (HD) 1080p video, as well as a 4GB microSD card. Using the AirSelfie, people, groups and companies can take pictures of themselves, their backgrounds and their projects from distances, heights and angles that they never could using their arms or a stick, Stroppiana said. [5 Technologies for the Selfie-Obsessed]

The drone's four rotors help it fly up to 65 feet (20 meters) in the air. The flying camera measures only about 3.72 by 2.65 by 0.42 inches (9.45 by 6.73 by 1.07 centimeters) — "smaller than a smartphone," Stroppiana said — and weighs 1.83 ounces (52 grams).

The drone uses sonar to measure its altitude and keeps itself stable with the help of a tiny extra camera to monitor its surroundings for signs of jitter. It is also equipped with gyroscopes, barometers and geomagnetic sensors that help it navigate as it flies, said AirSelfie Holdings Ltd. in London, the company that Stroppiana co-founded in 2016 to manufacture the drone.

The AirSelfie is controlled via a free iOS or Android app. The app can make the drone take off; adjust its height and direction; let it hover autonomously; and help users take an HD aerial shot or video with just a push of a button. Users can also activate a 10-second timer, giving people enough time to hide their phones so they don't appear in the picture or video. The drone can take up to eight consecutive shots, the company said.



**Manali S. Wani**  
VI Sem, ETC - A



**Krishna Shahu**  
VI Sem, ETC - A

## TREATING DEPRESSION WITH TDCS: STARTUP YBRAIN AIMS FOR THE MAINSTREAM

A doctor's prescription for clinical depression could one day sound like this: In the comfort of your own home, slip on a brain-zapping headband a few times per week. For 20 minutes, send a tiny stream of electricity through your brain.

The treatment would be delivered by a user-friendly type of brain stimulation called TDCS (transcranial direct current stimulation), which has recently become a hot topic in neuroscience research. Now it's beginning to make the transition from lab to doctor's office. And a South Korean startup called Ybrain thinks its stylish TDCS headband, specifically designed to treat depression, will be the product that brings TDCS into the clinical mainstream.

Ybrain founder and CEO Kiwon Lee made his pitch earlier this month at the NYC Neuromodulation conference, where doctors and researchers working on the cutting edge of brain stimulation met to compare notes and chart the field's progress. When his turn came at the podium, Lee predicted that his device will receive regulatory approval in Korea this March. He also laid out his very optimistic game plan for worldwide market domination.

TDCS is seen as an exciting new type of treatment in part because the gear is cheap, portable, and easy to use. The systems use electrodes placed at particular locations on the scalp to channel a few milliamps of current through a specific brain region, and they can be powered by a 9-volt battery. Last year there were nearly 700 papers published about TDCS, with studies on every topic imaginable: Researchers experimented with physical rehab for stroke patients, memory improvement for people with Alzheimer's and craving reduction for

### Three types of potential benefits:

- **Price:** Because TDCS is relatively cheap, Brunoni says, private medical plans would likely prefer it to more expensive treatments like TMS.
- **Ease of use:** Brunoni says that companies such as Soterix and Ybrain "are developing very safe and reliable devices that would allow home-use with almost zero risk."
- **Short-term treatment:** TDCS treatment for depression would likely start with an intense phase of treatment.

In South Korea, Ybrain is betting that these benefits and its slick consumer-friendly design will speed adoption of its device. "It's designed for home use," says Ybrain CEO Lee, "so physician can electronically prescribe the device and patients can bring it to their homes."

To make the medical gadget easy to use and failsafe, designers kept it simple. "The device has just a power button, no interface," Lee says. "The patient turns it on and puts the device on their head, and it automatically starts the stimulation based on the doctor's prescription." So if the doctor prescribed one 20-minute session of 2 milliamps per day, the gadget wouldn't allow more than the prescribed limit.

The Ybrain system comes with a smartphone app that regularly asks the patient to rank their mood on a depression scale, and sends this info to their doctor along with device usage data. These features enable the doctor to monitor the treatment's effects. Not incidentally, this setup also enable Ybrain to collect efficacy data the company can use when it applies for regulatory approval in Europe and the United States.



## GRAPHENE ALLOWS THIS NEW SOLAR PANEL TO GENERATE POWER FROM RAINDROPS

Solar Panels are great, allowing you to generate electricity just by keeping it out in the sun. Problem is, the sun isn't always out, with clouds and rain replacing it for a good part of each year. A new

Graphene-Coated Solar Panel overcomes this limitation by using raindrops that come in contact with its surface to generate electricity.

Developed by a team of scientists from Qingdao, China, the new solar cell prototype will generate power from sunlight like the panels we see in wide use today. Unlike them, it has a single, atom-thick layer of graphene across its surface, which allows it to harness raindrops into usable power.

The Graphene-Coated Solar Panel uses conventional solar cell technology when producing energy using sunlight, so it works much like the solar panels laid out across roofs in many homes and industrial facilities. With the sun tucked away

coating goes to work, separating the ammonium, calcium, and sodium ions in the rain from the water. These ions cling to the electrons in the graphene, forming a dual-layer pseudo-capacitor system that produces electricity from the difference in potential between each layer.

While the team has been able to show the system to work, it's not likely we're seeing these solar panels come out soon. They are, for all intents and purposes, quite inefficient, functioning at a mere 6.5 percent efficiency in optimal solar conditions – a far cry from the 20 percent efficiency of today's high-end solar panels. Still, it's a good start for a promising technology.



**Jovita Bonifos**  
VI Sem, ETC-A

# THE GOOGLE DRIVERLESS CAR

The Lexus RX450h Google driverless car



**Shoab Sheikh**  
VI Sem, ETC - A

Driving a car is an art, maybe that's why the government waits until you're 18 years old (or 16 in some countries) to give you chance to earn a driver's license. Not only should you be able to direct the car, but also have a keen sense of safety. Nevertheless, all the

rules and regulations enforced to ensure safety fail to eradicate the occurrence of accidents. On a different note, the smaller details like the speed, gear changing, and fuel consumption can affect the environment around you in the form of emissions of gases. When more of fuel is burnt than required, there is more of incomplete combustion of gases causing the emission of gases like carbon monoxide (not to mention that you get lower mileage too). This happens at very low and very high speeds. Therefore driving a car at an optimum condition involves a balance of delicate forces. It requires good understanding and experience of the working of a car. But what if a team of brilliant engineers devised a way to automate this complicated process?

## Automation

Fifteen years back, if you had to withdraw cash, you had to travel far to a bank and stand in a line with a slip to withdraw cash. But lately, the same is being done even in remote locations by machines (ATMs – Automated Teller Machines) without any hassle. In the industries, most of the heavy machinery is automated (fully or partially) allowing for more accurate and speedier production. Automation is a growing trend in the present era. It is truly an engineering marvel since it involves a union of the different branches of engineering like computer science, electronics and mechanical to devise this technology. Electronic sensors sense the surroundings and send their response to microcontrollers which are programmed to give a desired response and actuators which actually carry out the response action.

## Google's Project

We know them as the most popular search engine in the World Wide Web. They are much more than that. They pioneer in inspiring innovation in the field of technology which is beyond their time. The google driverless car is a project by google which involves the development of technology to make a car self-dependent. The software that google use to automate cars is known as the "Google Chauffeur". They do not produce a separate car but install the required equipment onto a regular car. The project is currently being led by google engineer Sebastian Thrun (who is also the director of the Stanford Artificial Intelligence Laboratory and co-inventor of the google street view) under the aegis of Google X.



The Toyota Prius and Audi TT Quattro fitted with the Google driverless car

Google has equipped a group of ten cars with its tech consisting of three Lexus RX450h, One Audi TT and six Toyota Prius. The tests were conducted with expert drivers in the driver seat and Google's engineers in the passenger seat. They have driven a great deal of distance in varied topographical locations and traffic densities in the United States of America. The speed limits are stored in the brain of the control systems and the car comes with a manual override which passes on the control to a driver in case of any malfunction. By August 2012, google announced that it had completed 500,000 km of road testing. As of December 2013, four states in the USA have established laws permitting the use of autonomous cars, California, Florida, Nevada and Michigan



**Prerna Kachhwaha**  
VI sem, ETC - A

# ELECTRO-‘MUSCLES’ MADE FROM NATURAL FIBRES

Swedish researchers have made ‘muscles’ by coating natural fibres with electro-active polymers. The actuators, according to ‘Knitting and weaving artificial muscles’, a paper in Science Advances, typically deliver a few megapascals of stress, beating mammalian skeletal muscles



which score around 0.35MPa. However, they are slow at the moment, acting over several seconds.

Woven muscles exert more force, but knitted ones are stretchier and elongate more. “If we weave the fabric, for example, we can design it to produce a high force,” said scientist Nils-Krister Persson of the University of Borås. “In this case, the extension of the fabric is the same as that of the individual threads. But what happens is that the force developed is much higher when the threads are connected in parallel in the weave. This is the same as in our muscles. Alternatively, we can use an extremely stretchable knitted structure in order to increase the effective extension.”

A polymer called polypyrrole is behind the activity, it changes volume by when it is exposed to a few volts – through the number of ions and amount solvent in its bulk altering as a result of electro-chemical oxidation or reduction.

Coating a fibre – cellulose-based Lyocell – with this material results in a fibre with electrically-adjustable length. In this case, coating was in two stages – a seed layer of the conductive polymer PEDOT followed by polypyrrole. Testing was done in a liquid, with a bias of -1.0V and 0.5V.

“Our approach may make it possible in the long term to manufacture actuators in a simple way and hopefully at a reasonable cost by using already existing textile production technology.” said Edwin Jager of Linköping University, which worked with the University of Borås on the project. “What’s more interesting, however, is that it may open completely new applications in the future, such as integrating textile muscles into items of clothing.”

Funding came from organisations including the Carl Trygger Foundation, the Swedish Research Council, the Smart Textiles Initiative (VINNOVA), the European Scientific Network for Artificial Muscles and the EU’s 7th Framework Programme.

## STUDENTS ACHIEVEMENT



**4th Sem University Rank Holders**



**6th Sem University Rank Holders**



**M-Tech University Rank Holder Students**



**Forum Installation**



**Seminar on Research Methodology M-TECH**



**Workshop on PCB Designing**



**Industrial Visit to RTTC Centre Nagpur**



**Seminar on Network Security**



**Seminar on Wireless Communication M-Tech**



**Workshop on Line Following Robot**



**Webinar on Microcontrollers**



**Parent Teacher Meeting**

# Details of Placement 2016-2017

Sr. No.	Name of the Students	Name of Co./Industry	Branch	No. of Students Placed	Sr. No.	Name of the Students	Name of Co./Industry	Branch	No. of Students Placed
1	Aafiya Abdul Kareem Hanafi	Vowel Web Sol.	ETC	12	3	Aafiya Abdul Kareem Hanafi	Quagnitia	ETC	9
	Aamena Syed Nazimuddin Syeda					Ashwini Jagdish Nasre			
	Akanksha Surendra Jain					Khushboo Jagdish Thakur			
	Arshiya Aslam Baig					Nadia Md. Anis Patel			
	Sana Zeba Siraj Md. Bakshi					Nagma Tabbasum Gaffar Shekh			
	Amber Sana Shamshad Shaikh					Saurabh Rajesh Tumane			
	Nuzhat Abdul Aziz Khan					Shraddha Sudesh Malik			
	Shaheen Shafi Ahmed Sheikh					Shrutika Ravindra Luhure			
	Zareen Hamid Sheikh					Lalit Manohar Girole			
	Sultan Mumtaz Ahmad				4	Chinmay Vishnupant Mahure	Amazon	ETC	3
	Sana Sajid Ali		M.Tech(E)			Salman Irshad Ahmad Azmi			
	Borkar Shishir					Sana Sajid Ali		M.Tech(E)	
2	Bushranaz Parvez Akhter	CMSIT SERV.	ETC	19	5	Ankita Dilip Sachdev	Altius	ETC	3
	Nehasarin Salim Pathan					Vejainti Rohit Kumar Sharma			
	Suroosh Syed Iftekhar Ali					Roshni Deepak Baghel			
	Lalit Manohar Girole				6	Ankita Dilip Sachdev	Epic Research	ETC	3
	Rohitsingh Rajendrasingh Baghel					Sana Zeba Siraj Md. Bakshi			
	Shashwat Maratrao Khobragade					Roshni Deepak Baghel			
	Sumair Abrar Miyan Deshmukh				7	Amber Sana Shamshad Shaikh	Ramakrishna Co.	ETC	1
	Vipin Shalikram Hajare				8	Roshni Deepak Baghel	Mphasis	ETC	1
	Aditya Anil Shivhare				9	Zareen Hamid Sheikh	Bugfree Solution	ETC	1
	Amit Bhimrao Dongre				10	Roshni Deepak Baghel	Perficiant	ETC	2
	Nemkumar Mahendra Meshram					Ankita Dilip Sachdev			
	Rohit Hemantrao Nindekar				11	Harshal Sukhdevrao Nagpure	ICICI Bank	ETC	6
	Krushanu Sunil Gaikwad					Salman Irshad Ahmad Azmi			
	Mohd. Saquib Mohd. Salim Ansari					Saurabh Rajesh Tumane			
	Gaurav Shrawan Kohad					Mohammad Abdul Ramiz		M.Tech(E)	
	Harshal Sukhdevrao Nagpure					Sana Sajid Ali			
	Saniya Rashmeen Vilayatullah Syed					Shishir Borkar			
	Mubashara Mehrosh Aslam Perwaiz								
	Aliya Israil Pathan								

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Principal along with Teaching & Non Teaching Staff