Electrical Engineering Students Association (EESA), IIT Bombay is organizing its annual technical festival in the field of wireless and cellular technology. Aagomani 2009 is being held at Electrical Engineering Department, IIT Bombay on the 10th and 11th of October 2009. With lectures from top level executives of leading wireless and telecom industry and academicians from renowned institutes like IIT Bombay, we aim to gain an in-depth knowledge of the upcoming technologies, trends and innovations in the ever so popular field of wireless. Aimed at both students and professionals, the 2 day event shall provide us with tools to understand what it takes to survive in an industry where innovation is a necessity, not a choice. Wireless World is the need of today and is one of the most talked about topics with new technologies being developed so frequently. The need to stay ahead in the competition and create devices which live up to the needs and requirements of the new-age generation is the challenge that lies ahead.

Anuj Jain, General Secretary, EESA

“People want to talk to other people – not a house, or an office, or a car. Given a choice, people will demand the freedom to communicate wherever they are, unfettered by the infamous copper wire. It is that freedom we sought to vividly demonstrate in 1973”

- Martin Cooper (the first man to make a mobile call)

The two day event includes:

- Workshop on “Information Security and Ethical Hacking” by Innobuzz Knowledge Solutions and on “How to make a Transmitter”
- Events: On the spot hardware implementation, Quiz, Paper presentation
- Lectures from prominent researchers
- Exhibitions on Wireless products

What can be 5G !!!!

An old man’s phone detects that it hasn’t moved for more than 2 hours during the man’s regular waking hours. It issues an audible alarm, but no response! So it emits a signal that triggers a RFID chip implanted inside his body. The RFID chip responds by verifying the identity of the man and also a brief burst of telemetry that indicates that he is experiencing heart beat irregularities and his blood pressure is dangerously low. The phone quickly sends an automated text message to a medical alarm system, including not only the identity and the health data of the owner but also the fact that the man is not in his own apartment but in a reading room of a library. This is what I think of a “Fifth Generation” world, also sometimes referred as the 5G world.... (continued on page 2)
The development of the mobile phone device as a ubiquitous part of daily work and personal life presents the opportunity to examine how technology drivers are pushing for the integration of real life with mobile technology in future. A few years ago, this kind of scenario would have sounded mindless, but right now it just looks like the next advance in present mobile technology. Our perception about what new technology is to come has changed from being called "science fiction" to just being addressed as "not yet invented".

At the data transfer rates of the earliest cellular phones on the so-called 1G network, our "e-Bible" could be downloaded in about 1.75 hours, although no mobile device at that time could display or even store that amount of data. On a present day 3G mobile network, the download time drops to approximately 6 seconds. On a 4G network (anticipated to be launched in 2010), that time drops to 0.06 seconds. What could be the data rates and download speeds that we can expect for a 5G technology which is still in the phase of conceptualization?

Gene Roddenberry’s Star Trek writers hit upon a very valid fact that as technology complexity increases, the ability to automate instructions also increases. Star Trek gadgets reflect the actual path of interaction between humans and technology. Just as we saw in the Old man’s story, with the flip of a dial or the push of a single button or just plain automation, an entire complex automation may be invoked. And this is what I expect from my "Fifth Generation" world – A Star Trek.
Bluetooth is an application widely used today. Bluetooth enabled cell phones, laptops, PCs, Stereos have come to the fore during the last half a decade. It facilitates rapid data transfer at a short range. A Bluetooth connection is wireless and automatic and extremely user friendly. The etymology of the word Bluetooth is that it derives the name from anglicized version of 10th century Danish King Harald Blataand (940-981). The king ruled Denmark and Norway and united the Scandinavia. In the same vein Bluetooth saw the union of PC and mobile industry. All these were short-range radio link programs. The Bluetooth logo is the Germanic rune (Hagall) and (Berkanan) merged together. Infrared communications have a couple of drawbacks. First, infrared is a "line of sight" technology i.e. you have to point the remote control at the television to operate. The second drawback is that infrared is almost always a "one to one" technology meaning it can be paired only to one device at a time. But this guards it against interference.

The older Bluetooth 1.0 standard has a maximum transfer speed of 1 megabit per second (Mbps), while Bluetooth 2.0 can manage up to 3 Mbps.

A trick that Bluetooth devices use to avoid interfering with other systems is by sending out very weak signals of about 1 mW cutting chances of interference. By comparison, the most powerful cell phones can transmit a signal of 3 W. The low power limits the range of a Bluetooth device to about 10 meters...

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Tricks with BLUETOOTH !!!!

The fascinating FIBER OPTICS !!!!

Ever seen the dazzling lights emanating from bundle of wires. The light has the brilliance of fluorescence. It is indeed a spectacle to the eye. This is the usual manner in which one encounters the FIBER OPTIC for the first time. Inasmuch curious as we are, we then naturally wonder about this peculiar fiber optic cable and are left even more surprised by its wondrous applications. Indeed there is always more to it than what meets the eye.

An optical fiber is a strand of optically pure glass (sometimes even plastic) as thin as a hair that can carry light over long distances. It is widely used in communications, for sensing, lighting and numerous purposes. A typical optic fiber is made by a process called Modified Chemical Vapor Deposition (MCVD). The principle of working of the optical fiber is Total internal Reflection. This makes it act as a waveguide. If one takes a close look at a single fiber, one will see a core of thin glass where light actually travels. The core is covered by a cladding.

Optic fiber is excellent for communication as light in it suffers little attenuation and can even be modulated at frequencies as high as 111GHz...

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This is a futuristic mobile phone. It uses the idea of cryptex. Opus Dei has been needing a mobile phone to call their very own since the demise of the Knights Templar. If only designer Mark Schomann was catholic and lived 600 years ago, this baton style mobile phone might have saved them from a Dan brown style disaster.

You turn the dial of every element to the desired cipher. Once you entered the number, you turn the first segment “to phone” (Green LED). If you want to hang up the call, you turn the first segment to “hang up” (Red LED). The phone works without any buttons and without a display, like old dial phones.

Nistha Tandiya, 5th Year Student

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Bluetooth can connect up to eight devices simultaneously. Bluetooth uses a technique called Spread-Spectrum Frequency Hopping that makes it rare for interference to occur. It communicates on a frequency of 2.45 gigahertz (actually between 2.402 GHz and 2.480 GHz, to be exact) creating a personal-area network (PAN), or piconet. In this technique, a device will use 79 individual, randomly chosen frequencies within a designated range, changing from one to another on a regular basis. In the case of Bluetooth, the transmitters change frequencies 1,600 times every second, meaning that more devices can make full use of a limited slice of the radio spectrum. Also if at all any interference occurs it will not last long. Bluetooth can be either half-duplex or full-duplex communication.

Problems like "blue jacking," "blue bugging" and "Car Whisperer" have turned up as Bluetooth-specific security issues. Bluejacking involves Bluetooth users sending a business card (just a text message, really) to other Bluetooth users within a 10-meter (32-foot) radius. If the user doesn’t realize what the message is, he might allow the contact to be added to his address book, and the contact can send him messages that might be automatically opened because they’re coming from a known contact. Bluebugging is more of a problem, because it allows hackers to remotely access a user’s phone and use its features, including placing calls and sending text messages, and the user doesn’t realize it’s happening. The Car Whisperer is a piece of software that allows hackers to send audio to and receive audio from a Bluetooth-enabled car stereo.

Shantanu Kelkar, 3rd Year Student

Sophism: What is better than eternal bliss?
Nothing.

But a slice of bread is better than nothing.

So, a slice of bread is better than eternal bliss!
During the 1870’s, two well known inventors, Alexander Graham Bell and Elisha Gray, both independently designed devices that could transmit sound along electrical cables. Both devices were registered at the patent office within hours of each other. There followed a bitter legal battle over the invention of the telephone, which Bell subsequently won.

According to Bell’s notebook entry for that date, he describes his most successful experiment using his new piece of equipment, the telephone. Bell spoke to his assistant Watson, who was in the next room, through the instrument and said “Mr. Watson, come here, I want to speak to you”.

Alexander Graham Bell was born on 3rd March 1847 in Edinburgh, Scotland. His family were leading authorities in elocution and speech correction. He was groomed and educated to follow a career in the same speciality. By the age of just 29 in 1876 he had invented and patented the telephone. His thorough knowledge of sound and acoustics helped immensely during the development of his telephone, and gave him the edge over others working on similar projects at that time. Bell was an intellectual of quality rarely found since his death. He was a man always striving for success and searching for new ideas to nurture and develop.

Avishek Majumdar, 5th Year Student

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Also there is much less interference unlike a copper wire. For communication, a single optic fiber can carry many data lines using wavelength division multiplexing. Also it cannot carry voltage, hence making it safer in high voltage region and immune to lightning (something where copper wires fail miserably). The fiber has sections which are doped i.e. with special coating. It is “pumped” with laser. As original signal travels through, it degrades. When the degraded signal comes into the doped coating, the energy from the laser allows the doped molecules to become lasers themselves. The doped molecules then emit a new, stronger light signal with the same characteristics as the incoming weak light signal. This is phenomenon is called optical regeneration.

Fiber optic being very flexible is also used by doctors for imaging optics. It is often used in endoscopy to obtain images where there is no straight ‘line of sight’. Industrial endoscopes too exploit it to inspect interiors of engines and machines which are not easily visible

The most enticing of all is its use as an illuminating device. Only with a single source one can light up a room with optic fiber. In some buildings it is used as a light guide to channel sunlight into a room. Also fiber optic lamps exuding blue, green, red light adorn living rooms and sparkle the surroundings and the ceiling. The famous Swarovski showrooms too illuminate their crystal showrooms using optic fiber to make it a glittering ensemble. The fibers find application in remote sensing such as aero plane jet engines or internal temperature of transformer. Many sensors can be multiplexed along the length of a multi-mode fiber by using different wavelengths of light for each sensor.

Thanks to the amalgamation of applied science and engineering, we have this great marvel to connect, illuminate and sparkle the world around us !!!

Shantanu Kelkar, 3rd Year Student

The longest phone cable is a submarine cable called FLAG (Fiber-optic Link Around the Globe), spanning 16,800 miles from Japan to UK and can carry 600,000 calls at a time

HiFi, a touchscreen phone which transforms into a pair of headphones for music and in-call use: A concept mobile by LG
FACT FILE !!!!

EMERGENCY NUMBER

The Emergency Number worldwide for Mobile is 112. If you find yourself out of coverage area of your mobile network and there is an emergency, dial 112 and the mobile will search any existing network to establish the emergency number for you, and interestingly, this number 112 can be dialed even while the keypad is locked or you have no balance.

HIDDEN BATTERY POWER

Nokia handsets come with a reserve battery. To activate, press the keys *3370#. Your cell will restart with this reserve power and the instrument will show a 50% increase in battery. This reserve will get charged when you charge your cell next time.

LOCKED THE KEYS IN CAR?

Your car has remote keys? This may come in handy someday. Good reason to own a cell phone: If you lock your keys in the car and the spare keys are home, call someone on your cell phone. Hold your cell phone about a foot from your car door and have the other person at your home press the unlock button, holding it near the phone on their end. Your car will unlock.

CAUTION

Always use your left ear while using a cell phone, because if you use the right one it will affect the brain directly. This is a true fact from Apollo medical team. Please forward to all your well wishers!

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