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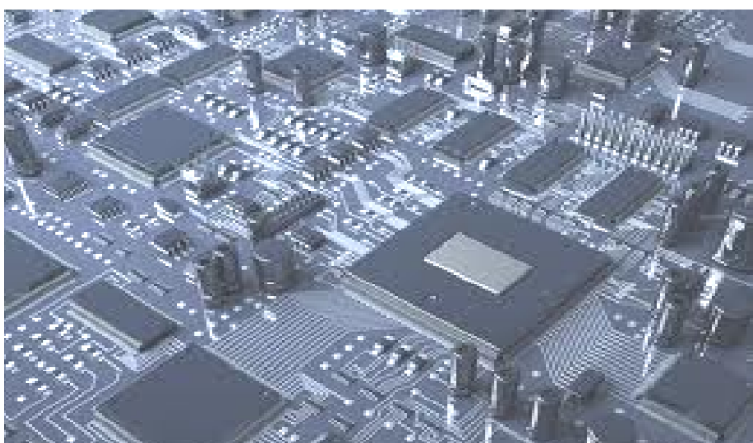


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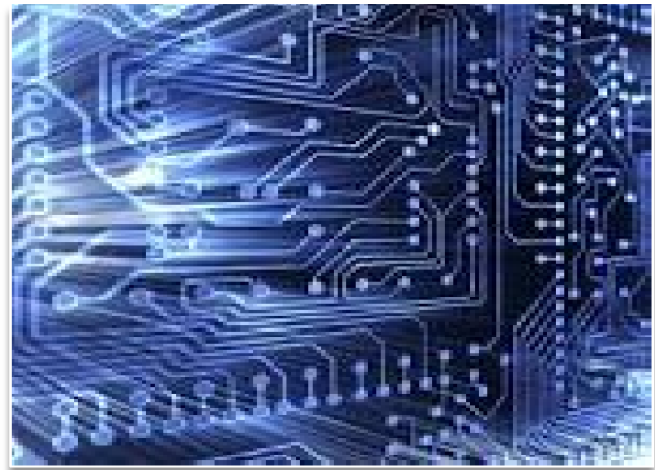
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From the editorial desk



I am happy that our department is publishing it's second volume of *e-blitz*, the online magazine.

I wish great success to this volume.

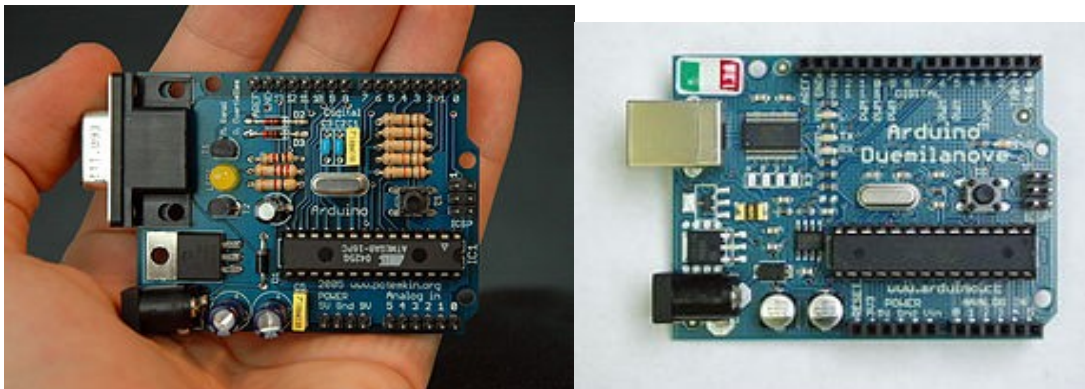
With best wishes,

Dr. Syed Hasan Saeed

HoD, Electronics & Communication Engineering

Arduino

Arduino is a popular open-source single-board microcontroller, descendant of the open-source Wiring platform, designed to make the process of using electronics in multidisciplinary projects more accessible. The hardware consists of a simple open hardware design for the Arduino board with an Atmel AVR processor and on-board input/output support. The software consists of a standard programming language compiler and the boot loader that runs on the board. Arduino hardware is programmed using a Wiring-based language (syntax and libraries), similar to C++ with some slight simplifications and modifications, and a Processing-based integrated development environment. Current versions can be purchased pre-assembled; hardware design information is available for those who would like to assemble an Arduino by hand. Additionally, variations of the Italian-made Arduino with varying levels of compatibility have been released by third parties; some of them are programmed using the Arduino software.



Hardware Implementation

An Arduino board consists of an 8-bit Atmel AVR microcontroller with complementary components to facilitate programming and incorporation into other circuits. An important aspect of the Arduino is the standard way that connectors are exposed, allowing the CPU board to be connected to a variety of interchangeable add-on modules known as shields. Serial Arduino

boards contain a simple inverter circuit to convert between RS-232-level and TTL-level signals. Current Arduino boards are programmed via USB, implemented using USB-to-serial adapter chips such as the FTDI FT232. The Arduino Nano, and Arduino-compatible Bare Bones Board and Boarduino boards may provide male header pins on the underside of the board to be plugged into solderless breadboard.

Laraib Rahman,

First Year, EC-1

Blackberry



Today, the suave BlackBerry phone has become a common feature of the corporate world with executives, managers being able to browse the internet, check mail on their mobile itself. BlackBerry is a line of wireless handheld devices that was introduced in 1999 as a two-way

pager. In 2002, the more commonly known Smartphone BlackBerry was released, which supports push e-mail, mobile telephone, text messaging, web browsing. It was developed by a Canadian company named Research in Motion (RIM). It can also handle PDA (personal digital assistant) applications. The blackberry phone has a QWERTY keypad and a scroll ball at the centre for navigating. Early BlackBerry devices used Intel 80386 -based processors. The latest BlackBerry 9000 series is equipped with Intel XScale 624MHz CPU, which makes it the fastest Black-Berry to date. Many times one thinks about the weird name that this particular phone has been christened with. Yes, blackberry sounds like a fruit rather than a handheld phone. Well there is a story behind that. What happened is the company RIM asked Lexicon Branding, a branding firm in California to help name their most profitable product. Lexicon president David Placek says, as an afterthought, that he steered away from conventional names that were directly linked to the word "e-mail," since consumer research shows that word can increase clients' blood pressure. Instead, his team was looking for something "more natural, more entertaining and more joyful that might decrease blood pressure." When someone pointed out the typical tiny buttons on RIM's device looked like seeds, Lexicon began exploring different fruity names: strawberry, melon and an assortment of vegetables were all bandied about, with no success. The company finally settled on blackberry because the word is pleasing to most ears and the device, at the time, was black. Never expected such a thing!!

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.



How was it called BLACKBERRY!!!!

Today, the suave Blackberry phone has become a common feature of the corporate world with executives, managers being able to browse the internet, check mail on their mobile itself. BlackBerry is a line of wireless handheld devices that was introduced in 1999 as a two-way pager. In 2002, the more commonly known Smartphone BlackBerry was released, which supports push e-mail, mobile telephone, text messaging, web browsing. It was developed by a Canadian company named Research in Motion (RIM). It can also handle PDA (personal digital assistant) applications. The blackberry phone has a QWERTY keypad and a scroll ball at the centre for navigating. Early BlackBerry devices used Intel 80386 -based processors. The latest BlackBerry 9000 series is equipped with Intel XScale 624MHz CPU, which makes it the fastest Black- Berry to date. Many times one thinks about the weird name that this particular phone has been christened with. Yes, blackberry sounds like a fruit rather than a handheld phone. Well

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The fascinating FIBER OPTICS!!!!

Ever seen the dazzling lights emanating from bundle of wire? 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....(continued on page 5)

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” or "Car Whisperer" have turned up as Bluetooth- specific security issues. Blue jacking 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. Blue bugging 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.

CAUTION!

Always use your left ear while using 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!

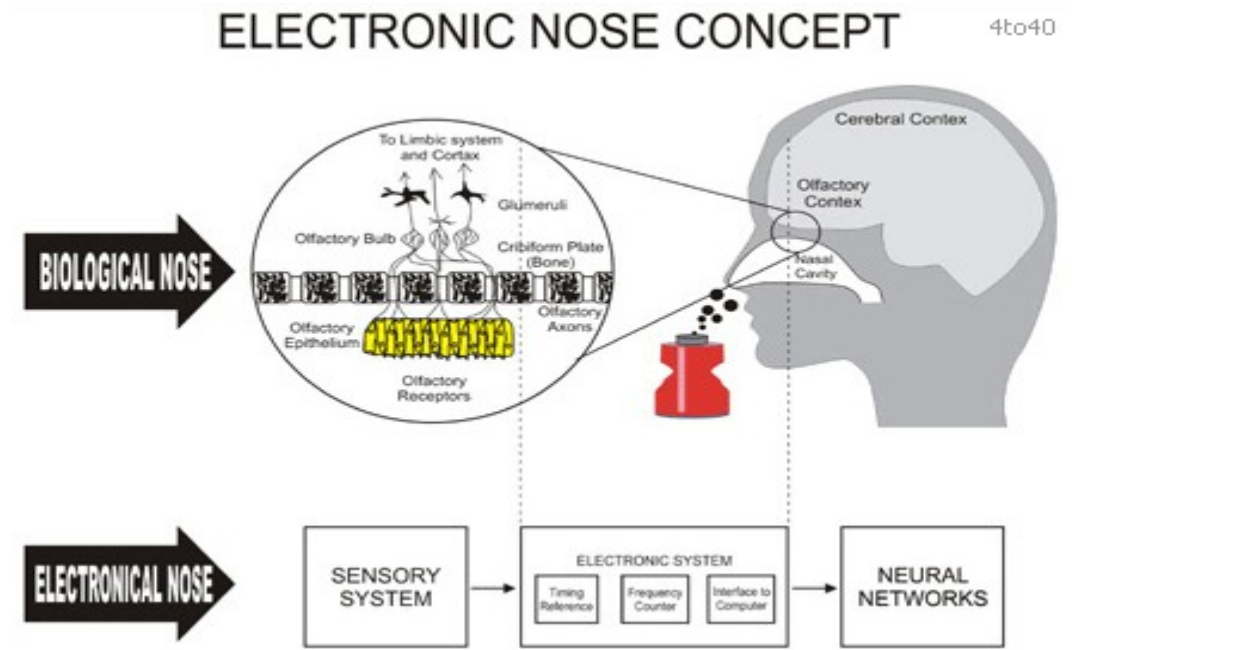
Tayyab Ali

L.I. ECE Department

Integral University, Lucknow

ELECTRONIC NOSE

An electronic nose is a device intended to detect odours or flavours. Over the last decade, "electronic sensing" or "e-sensing" technologies have undergone important developments from a technical and commercial point of view. The expression "electronic sensing" refers to the capability of reproducing human senses using sensor arrays and pattern recognition systems. Since 1982, research has been conducted to develop technologies, commonly referred to as electronic noses, that could detect and recognize odours and flavours. The stages of the recognition process are similar to human olfaction and are performed for identification, comparison, quantification and other applications, including data storage and retrieval. However, hedonic evaluation is a specificity of the human nose given that it is related to subjective opinions. These devices have undergone much development and are now used to fulfil industrial needs.



Working of E Nose-

WORKING PRINCIPLE: The electronic nose was developed in order to mimic human olfaction that functions as a non-separative mechanism: i.e. an odor / flavor is perceived as a global fingerprint. Essentially the instrument consists of head space sampling, sensor array, and pattern recognition modules, to generate signal pattern that are used for characterizing odors. Electronic noses include three major parts: a sample delivery system, a detection system, a computing system. The more commonly used sensors for electronic noses include

Metal-oxide-semiconductor (MOSFET) devices : A transistor used for amplifying or switching electronic signals. This works on the principle that molecules entering the sensor area will be charged either positively or negatively, which should have a direct effect on the electric field inside the MOSFET. Thus, introducing each additional charged particle will directly affect the transistor in a unique way, producing a change in the MOSFET signal that can then be

interpreted by pattern recognition computer systems. So, essentially each detectable molecule will have its own unique signal for a computer system to interpret.

Conducting polymers : Organic polymers that conduct electricity.

Quartz crystal microbalance : A way of measuring mass per unit area by measuring the change in frequency of a quartz crystal resonator. This can be stored in a database and used for future reference.

Surface acoustic wave (SAW) : A class of micro electro mechanical systems (MEMS) which rely on the modulation of surface acoustic waves to sense a physical phenomenon.

Applications: Electronic nose instruments are used by research and development laboratories, quality control laboratories and process & production departments for various purposes:

In quality control laboratories for at line quality control such as:

1. Conformity of raw materials, intermediate and final products
2. Batch to batch consistency
3. Detection of contamination, spoilage, adulteration
4. Origin or vendor selection
5. Monitoring of storage conditions.
6. In process and production departments
7. Managing raw material variability
8. Comparison with a reference product
9. Measurement and comparison of the effects of manufacturing process on products
10. Following-up cleaning in place process efficiency

11. Scale-up monitoring

12. Cleaning in place monitoring.

Possible and future applications in the fields of health and security : The detection of dangerous and harmful bacteria, such as software that has been specifically developed to recognise the smell of the MRSA (Methicillin-resistant Staphylococcus Aureus). It is also able to recognise methicillin susceptible S. aureus (MSSA) among many other substances. It has been theorised that if carefully placed in hospital ventilation systems, it could detect and therefore prevent contamination of other patients or equipment by many highly contagious pathogens. The detection of lung cancer or other medical conditions by detecting the VOC's (volatile organic compounds) that indicate the medical condition. The quality control of food products as it could be conveniently placed in food packaging to clearly indicate when food has started to rot or used in the field to detect bacterial or insect contamination. Nasal implants could warn of the presence of natural gas, for those who had anosmia or a weak sense of smell.

Possible and future applications in the field of crime prevention and security : The ability of the electronic nose to detect odourless chemicals makes it ideal for use in the police force, such as the ability to detect drug odours despite other airborne odours capable of confusing police dogs. However this is unlikely in the mean time as the cost of the electronic nose is too great and until its price drops significantly it is unlikely to happen. It may also be used as a bomb detection method in airports. Through careful placement of several or more electronic noses and effective computer systems you could triangulate the location of bombs to within a few metres of their location in less than a few seconds. For identification of volatile organic compounds in air, water and soil samples.

For environmental protection : Various application notes describe analysis in areas such as flavor and fragrance, food and beverage, packaging, pharmaceutical, cosmetic and perfumes, and chemical companies. More recently they can also address public concerns in terms of olfactive nuisance monitoring with networks of on-field devices.

Since emission rates on a site can be extremely variable for some sources, the electronic nose can provide a tool to track fluctuations and trends and assess the situation in real time. It improves understanding of critical sources, leading to pro-active odor management. Real time modeling will present the current situation, allowing the operator to understand which periods and conditions are putting the facility at risk. Also, existing commercial systems can be programmed to have active alerts based on set points (odor concentration modeled at receptors/alert points or odor concentration at a nose/source) to initiate appropriate actions.

Shubham Chowdhry

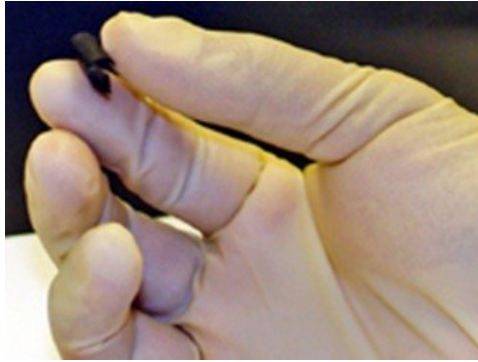
Electronics and Communication (EC-3), First year.

PAPER BATTERY

Paper batteries may be folded, cut or otherwise shaped for different applications without any loss of integrity or efficiency. Cutting one in half halves its energy production. Stacking them multiplies power output. Early prototypes of the device are able to produce 2.5 volt s of electricity from a sample the size of a postage stamp.

How a paper battery works:

While a conventional battery contains a number of separate components, the paper battery integrates all of the battery components in a single structure, making it more energy efficient.



A Paper Battery:

Construction: A very brief explanation has been provided.

- Cathode: Carbon Nano Tube (CNT)
- Anode: Lithium metal (Li⁺)
- Electrolyte: All electrolytes (incl. bio electrolytes like blood, sweat and urine)
- Separator: Paper (Cellulose)

The process of construction can be understood in the following steps:

Firstly, a common Xerox paper of desired shape and size is taken.

Next, by conformal coating using a simple Mayer rod method, the specially formulated ink with suitable substrates (known as CNT ink) is spread over the paper sample. The strong capillary force in paper enables high contacting surface area between the paper and nanotubes after the solvent is absorbed and dried out in an oven. A thin lithium film is laminated over the exposed cellulose surface which completes our paper battery. This paper battery is then connected to the aluminum current collectors which connect it to the external load. The working of a paper battery is similar to an electrochemical battery except with the constructional differences. The paper battery is designed to use a paper-thin sheet of cellulose (which is the major constituent of regular paper, among other things) infused with aligned carbon nanotubes. The nanotubes act as electrodes, allowing the storage devices to conduct electricity. The battery will currently provide

a low, steady power output, as well as a super capacitor's quick burst of energy. While a conventional battery contains a number of separate components, the paper battery integrates all of the battery components in a single structure, making it more energy efficient and lighter.

CHETAN SRIVASTAV

First Year, EC-1

‘5G’ TECHNOLOGY: THE RISING FEVER

The great 4G rollout is still happening and although adoption, let alone coverage, is by no means complete technology stands still for no one. already there are many in and around the wireless industry who are examining the prospects of ‘5g’ the fifth generation of mobile connectivity. While 4G according to its new definition ,is not even here yet ,we already talking of what is yonder , beyond the big blue mountain .dr. borkar provides some futuristic food for thought: “consistent with the general historical trend of a new technology standard every ten years ,it is expected that ‘5g’ specifications will likely be in the place “2018-20 timeframe”.

The framework for ‘5g’ includes higher efficiency operation with lower battery consumption ,higher system reliability ,more uniform , high data rates across the coverage area , low infrastructure deployment costs and higher spectral efficiency and capacity.

“5G”:more faster ,more smarter : “5g” may be the wireless technology that ends the current confusion in which a single provider has both specific spectrum allocation and specific wireless technology. there would be a clear benefit in offering a unified global standard and ‘smart radio’ technology would allow devices to simply hop on to any available spectrum.

this fifth generation technology which is on hand held phone offering more power and features than atleast 1000 lunar modules . a user can also hook their '5g' technology cellphones with their laptop to get broadband internet access.

one of the most compelling concepts included in the '5g'discussion has been that of "pervasive network". simply put, smartphones would no longer be restricted to a single network , or even need to be actively switched between available networks. in a large sense, ths would be the basis for the integration of any number of devices in the "internet of things", but such wide spread connectivity will require '5g' to feature intelligent distribution , so that your washing machines's firmware update.

The "spectrum crunch" : more importantly , there's a very real worry that current wireless technologies will become insufficient to handle increasing consumer data demands , the popularity of mobile video is specially taxing on bandwidth , as is the general movement of data storage to a cloud –based model already major [provider are fighting each other and the federal government for addition spectrum allocation. in a sense ,anything "that replaces 4g will be 5g".

broadcom introduces '5g' wi-fi combo chips for smartphones and tablets-

bcm4335 integrates a complete "5g" wi-fi system-including mac,phy and rf- with bluetooth 4.0, software on a single chip using 40nm cmos process.

broadcom corporation (nasdaq : brcm), global innovation leader in semiconductor solution for wired and wireless communication, today introduces bcm4335, the industry first complete 5g wi-fi combo chips for smartphones,tablets,ultrabooks,other mobile devices. the new solution further broadcoms wireless connectivity leaderships and establishes as the first chip vendor to sample solution based on the 802.11ac standard for every major wi-fi segment. the 5g wi-fi, the fifth generation of wi-fi based on the ieee 802.11ac standard, it is a major evolutionary step from the existing 802.11a/b/g/n networks. broadcom introduces its family of '5g' wi-fi for access points and pcs at ces in january 2012.

evolution of networks (2g-5g) : there's a rough consensus that 2020 is going to be the year of '5g'. on average , wireless generations have been spaced about a decade apart, along wireless (1g) first appeared in 1981 , 2g digital wireless in 1992, 3g began rolling out in 2001 and 4g started to become available in 2011. this makes an interesting exception to the usual increase frequency of technological advancement.

SHEREEN ZUBERI

First Year, EC-3

Invited Article

Biomedical Engineering: An Apprehensive Note, Mentioning its Importance, Utility, Advantages, Wide scope & Prospects of Employment

The population of our country has been increasing rapidly and huge number of students after taking degree of graduates and post graduates from various colleges and universities are roaming here and there for want of employment either in government sector or private firms. This is due to lack of technical and vocational education as well as practical training in most of the educational institutions.

It is found that Biomedical Engineering has played an important and vital role in the sphere of medical and health directly for human being. Its importance and utility is also being felt by the engineering students now a days both from the point of view of securing higher technical education as well as possibility of maximum opportunities of employment, which is a great need in twenty first century for young and literate generation.

Previously, many reputed Biomedical companies used to appoint Electronics Engineers and used to train them for Biomedical equipments as this branch of engineering was not in picture in India. But it was difficult for pure electronics engineer to be acquainted with knowledge of human anatomy, physiology and various body parameters. Because of, 'Biomedical Engineering' starting as a separate branch of engineering, this problem is resolved as Biomedical Engineer is aware of both the streams of medical as well as electronics and other divisions of Engineering.

Biomedical Engineering is a link between the medical field and electronic engineering including other major divisions of engineering. It is one of the fastest growing fields. As people are becoming more conscious about their health and doctors going deeper into research, the demand for better biomedical instruments is increasing rapidly. The instruments are designed to give maximum utility to the doctor and comfort to patient.

The approaches to biomedical engineering are guided by the electronic transduction of physical, chemical and electronic actions making up a physiological event, the complex operation and inter relation of the physiological systems making up the human anatomy. The biomedical field not only relates the medical aspect of electronics and instrumentation but also provides a vital link between the other major divisions of engineering. A biomedical engineer uses traditional engineering expertise to analyse and solve problems in biology and medicine, providing an overall enhancement of health care. Students choose the biomedical engineering field to be of service to people, to partake of the excitement of working with living systems, and to apply advanced technology to the complex problems of medical care. The biomedical engineer works with other health care professionals including physicians, nurses, therapists and technicians. Biomedical engineers may be called upon in a wide range of capacities : to design instruments, devices and software, to bring together knowledge from many technical sources to develop new procedures, or to conduct research needed to solve clinical problems.

In this field there is continual change and creation of new areas due to rapid advancement in technology; however, some of the well established special areas within the field of biomedical engineering are, bioinstrumentation, biomaterials, biomechanics, cellular, tissue, and genetic engineering, clinical engineering, medical imaging, orthopedic surgery, rehabilitation engineering and system physiology, biostatistics, biochemistry and analytical instruments, electronics , communication and computers. These special areas frequently depend on each other. Often the biomedical engineer who works in an applied field will use knowledge gathered by biomedical engineer working in other areas. For an example, the design of an artificial hip is greatly aided by studies on anatomy, bone mechanics, gait analysis and biomaterial compatibility. The forces that are applied to the hip can be considered in the design and material selection for the prosthesis. Similarly, the design of the systems to electrically stimulate paralysed muscle to move in a controlled way uses knowledge of the behavior of the human musculoskeletal system. The selection of appropriate materials used in these devices falls within the realm of the biomaterials engineer. The design of an ECG (Electrocardiogram) machine involves a thorough knowledge of electronics and physiology of human heart. Telecommunication

theory has been widely used in the Bio-medical field. Transmission of frozen ECG's through telephone lines has been carried out successfully. Computers have invaded the field of biomedical instrumentation. Most of the instruments now available in the market are PC based or at least provide a communication port for interfacing with the PC. This quick and successful introduction of computers in medicine has led to the automation of most instruments in the market. The use of computers in medicine is increasing along with the use of other electronic equipment. Their presence in the hospital was very uncommon in character. However some areas such as pharmacy, clinical pathology laboratories, the blood bank, patient admitting and billing offices tend themselves more easily to computer implementation because of the nature and structure of their activity. Biomedical Engineers are employed in Universities, in Industry, in Hospitals, in research facilities of educational and medical institutions, in teaching and in government regulatory agencies. They often serve a coordinating or interfacing function, using their background in both the engineering and medical fields. In industry, they may create designs where an in depth understanding of living systems and of technology is essential. They may be involved in performance testing of new or proposed products. Government positions often involve product testing and safety, as well as establishing safety standards for devices. In the hospital, the biomedical engineer may provide advice on the selection and use of medical equipment, as well as supervising its performance testing and maintenance. They may also build customized devices for special health care or research needs. In research institutions, biomedical engineer supervise laboratories and equipment, and participate in or direct research activities in collaboration with other researchers with such backgrounds as medicine, physiology and nursing. Some biomedical engineers are also technical advisors for marketing departments of companies and some are in management positions.

Hence Biomedical Engineering is a multi faculty, interdisciplinary course which has multi various utility.

Dr. Shahanaz Ayub

Dr. Shahanaz Ayub is Associate Professor & Head of the department at Bundelkhand Institute Engineering & Technology, Jhansi. Her research area of interest is Biomedical

Engineering & Biomedical Signal Processing. She has guided more than ten post graduate engineering students.

Introduction to Telemedicine and scope of Wireless Technology in e-Health care

‘Telemedicine’ means medicine at a distance. It is the delivery of health care over long distances using core medical knowledge combined with advances in communication standards and computer technology. Various aspects of this field include regular medical procedure of diagnosis, treatment, and documentation as well as academic medicine (research, education, and training). Selected features of telemedicine have been in place since the advent of electronic communication systems and have been improving with the introduction of new communication standards time by time, typically aiding the delivery of health care in remote locations. Initial installation costs, reimbursement policies, liability issues, insufficient standards (IEEE 802.23 is still in draft phase!), and technological limitations have constrained its further development and utilization. But its applicability to providing medical care in remote areas made it an indispensable technique. Only recently have advances in information technology and the potential for global communications positioned telemedicine as a serious force in clinical and academic medicine.

It is a ‘technique’ which collectively harness the advancement in communication, signal processing and instrumentation (biomedical). It is an umbrella term for various remote applications of medical care, including remote diagnosis and clinical management (patient records), treatment and medical education. Similarly, Tele-care involves the provision of nursing and community support to a patient at a distance. The fundamental basis is the transmission of clinical information from one location to another, almost always by electronic means. For example, Tele-radiology involves capturing a digital X-ray image and transmitting it to a different site for display. Telepathology requires a system which can capture an image from a microscope, transmit it and display the image

at a remote site. Tele-consulting (e.g. Telepsychiatry) involves video conferencing equipment installed at both the local site and the remote site so that the doctor and patient can see and talk to each other. Medical imaging is the technique and process used to create images of the human body (or parts) for clinical purposes (medical procedures related to diagnostics) or medical science (including the study of normal anatomy and physiology for pure academic purposes). Telemedicine applications are a valid method to improve the quality of the delivered assistance to remote stations. 'Mobile telemedicine' is in particular useful both in places where standard point to point dedicated cable link is not available, and when emergency care is required in remote villages. This is because we cannot treat those residing in villages as second citizens and deny them right to sound medical care just because of their location. In order to build a global architecture for providing remote Tele-consulting, collaborative diagnosis and emergency situations handling, many different technologies are required. Measurement and recording techniques which are not primarily designed to produce images, such as electroencephalography (EEG), magneto encephalography (MEG), electrocardiography (EKG) and others, but which produce data susceptible to be represented as maps (i.e. containing positional information), can be seen as forms of medical imaging.

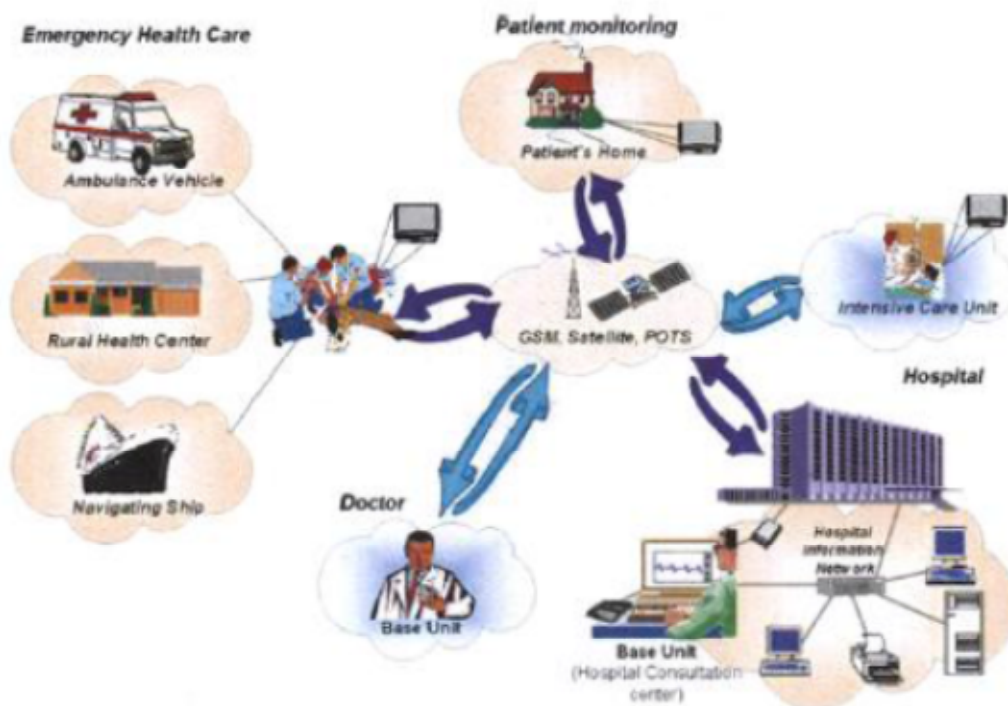
Applicability of various wireless standards in this field is immense. IEEE 802.11 standard defines connectivity through wireless LAN (WLAN). Telemedicine system requires an acceptable quality of service (QoS) and cost. IEEE 802.11 wireless LAN standard has been developed to provide scalable and low cost network .For mobile assistance MANET is very

important and interesting network for providing remote medical assistance. A self configurable network with proper data security is backbone for providing telemedicine services. One scenario may be seen as a geographical area having mobile nodes which correspond to the mobile individuals equipped with communication device and connected to a hub. From this hub, time to time monitoring can be done and in case of emergency hub is alerted about the patient's conditions. This scenario is limited to some part of a city or to a village. IEEE 802.16 (WiMAX) standard is capable of providing high data transfer rate (CT scan images, MRI images, real time video transmission in tele-consultancy) during emergency situations. However due to high radiation of antennas,

e-Blitz

devices operating on these standards cannot be attached on an individual's body for 24 hours monitoring.

Store and forward method is another popular method which can be utilized in round the day observation. IP based store and forward protocols have been developed which transmit the patient's health report on regular intervals over the network to the hub for experts to make diagnosis and raise alarm in emergency situations and alert the patient beforehand. A hub can be installed in a hospital for constant monitoring of its remote clients. IEEE 802.15.4 and IEEE 802.15.6 standards, though low data rate, the devices (sensors) compatible with these standards can be worn on a person's body for constant monitoring. These solve the problem of high radiation antennas used in other faster wireless standards. They serve as nearly non-invasive in context of acceptable medical standards. These sensors may be BP, Glucose, heartbeat monitor and many other personal health measurement devices which collect information time to time and forwards it to the hub or expert panel station time to time.



Various telemedicine assistance scenarios

In case of emergency the situation can be foresighted by proper analysis of data and medical assistance can be sent in time. This can be done by timely alarm raising by hub

station. This Body Area Network (BAN) monitoring system is an important scenario for monitoring of old age people living in cities and also for remote health monitoring of those living in far remote areas. Once alarm is been raised and need for tele-consultancy is sensed the hub can connect the

assistance providing medical expert to the person in distress through backbone network which may be cellular network also. The evolution of 4G standard paves way for an efficient and high data rate transfer of medical images, videos and data (temperature, ECG, EEG, X-Ray etc.). It provides a data rate of high as 20Mbps for mobile stations which is suitable for real time consultancy and transfer of high quality medical scan images. Improvement in data compression methods in field of digital image processing provides the necessary boost to the popularity of remote diagnosis. War time emergencies can also be addressed through these new technological advancements and a sound medical assistance can be provided to a wounded soldier.

Moreover, the use of wireless communication in field of telemedicine is immense. Important issues include the data security and maintaining a desired quality of service for both telemedicine and regular traffic. Data association is a major issue with BANs.

SHASHWAT PATHAK

Shaswat Pathak is a research scholar in department of Electronics & Communication Engineering at M.N.N.I.T., Allahabad. His research area of interest is Next Generation Wireless Network.

Departmental Activities

National Workshop

1. National workshop organized on industrial Automation with Logicon Automation by EC department on 22-23 Feb, 2013. The venue for this event was Seminar hall, Civil Engineering Block. The chief guest was Vice Chancellor in addition to this it was attended by Prof. A.A. Zilli, Prof. S.M.Iqbal & Prof. Masiur Rahman. The guest speakers were Mr. Gayan Chand (D.G.M. Instrumentation, Bhagaulin Sugar Factory), Mr. Pradeep Kumar (Manager Low Voltage Drive ABB Systems) & Mr. Prakash Jha (Head Logicon Automation).
2. National workshop on “Recent Trends in Embedded System Design (ESD-2013)” organized by Department of Electronics And Communication, ZHCET AMU Aligarh on 2 March 2013. It was attended by Mr. Ayan Mustafa Khan and Mr. Piyush Charan.

GATE-2013 Qualifiers

Name	Year
Zeeshan Akhtar	EC-2 , 2009-2013
Aditya Raj	EC-1 , 2009-2013
Nusrat Jahan	EC-2 , 2009-2013
Piyush Pandey	EC-2 , 2009-2013
Shivi Pandey	EC-2 , 2009-2013
Manmohan Singh	EC-1 , 2009-2013

Admission of students in M.TECH

Ashish Kumar

Manmohan Singh

Workshop Attended

1. Mr. Shailandra Kumar Singh had attended a course conducted by NITTTR (National Institute of Technical Teacher's Training and Research), Chandigarh from 27 – 31 May, 2013 on MATLAB : Introduction and Application.
2. Mr. Piyush Charan had attended the summer school on “MOBILE COMPUTING AND COMMUNICATION (MCC-2013)” at NIT Hamirpur from 17-21 June, 2013