K.L.N. College of Engineering

i'Storm

Department of Information Technology

SPECIAL INTEREST GROUP

LIVE WITH TECHNOLOGY

PRINCIPAL MESSAGE

It is a matter of great pride and satisfaction for K.L.N. COLLEGE OF ENGINEERING to bring out the News Letter '**I'STORM**' Released from the Department of Information Technology. The College has made tremendous progress in all areas-academic, non-academics, capacity building relevant to staff and students. The College has achieved another milestone in getting NBA (National Board of Accreditation).I am confident that this issue of Department News Letter will send a positive signal to the staff, students and the person who are interested in the Technical education and Technology based activities. A News Letter is like a mirror which reflects the clear picture of all sorts of activities undertaken by a Department and develops writing skills among students in particular and teaching faculty in general. I congratulate the Editorial Board of this News Letter who have played wonderful role in accomplishing the task in Record time. I express my deep sense of gratitude to Dr.N.Balaji, HOD/IT under whose guidance this Technical work has been undertaken and completed within the stipulated time. Also my heartfelt Congratulations to staff members and Students for their fruitful effort. With Best Wishes.

PRINCIPAL

Dr.A.V. RAMPRASAD

THE EDITOR'S DESK

It gives me immense pleasure to note that response to this newsletter of our department **i'STORM** has been overwhelming. The wide-spectrum of articles in different sections gives me a sense of pride that our students and professors possess creative potential and original thinking in ample measures. Each article is entertaining, interesting and absorbing. I applaud the contributors for their stimulated thoughts and varied hues in articles contributed by them. Commendable job has also been done by the Editorial Board in planning for and producing the Newsletter. My congratulations to the team who took the responsibility for the arduous task most effectively. I am hopeful that this small piece of technical work shall not only develop the taste for reading among students but also develop a sense belonging to the institution as well.

H.O.D (I.T)

Dr.N.Balaji

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OUR COLLEGE :

Vision

To become a Premier Institute of National Repute by Providing Quality Education, Successful Graduation, Potential Employability and Advanced Research & Development through Academic Excellence.

Mission

To Develop and Make Students Competent Professional in the Dynamic Environment in the field of Engineering, Technology and Management by emphasizing Research, Social Concern and Ethical Values through Quality Education System.

OUR DEPARTMENT:

Vision

To emerge as a centre of excellence through innovative technical education and research in Information Technology.

Mission

To produce competent information technology professionals to face the industrial and societal challenges by imparting quality education with ethical values.

Program Educational Objectives

The Educational Objectives of Information Technology Program represents major accomplishments that we expect from our graduates to have achieved three to five years after graduation. More specifically our graduates are expected.

1. *To excel in industrial or graduate work in information technology and allied fields.*

2. *To practice their professions conforming to ethical values and environmental friendly policies.*

3. *To be able to have an exposure in emerging cutting edge technologies and adapt to ever changing technologies.*

4. *To work in international and multi – disciplinary environments.*

Program Specific Outcomes

1. *Ability to apply the fundamentals of mathematics, science, engineering, information and computing technologies to identify, analyze, design develop, test, debug and obtain solutions for complex engineering problems.*

2. *Ability to select and apply appropriate modern tools and cutting edge technologies in the field of Information and communication to meet the industrial and societal requirements with public health and safety considerations.*

3. *Ability to analyze the multidisciplinary problems and function effectively in various teams for developing innovative solutions with environmental concerns and apply ethical principles in their career.*

4. *Ability to acquire leadership and communication skills to manage projects and engage in lifelong technical learning to keep in pace with the changes in technologies.*

Program Outcome

1. ***Engineering knowledge:*** *Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.*
2. ***Problem analysis:*** *Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.*
3. ***Design/development of solutions:*** *Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.*
4. ***Conduct investigations of complex problems:*** *Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.*
5. ***Modern tool usage:*** *Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.*
6. ***The engineer and society:*** *Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.*
7. ***Environment and sustainability****: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.*
8. ***Ethics:*** *Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.*
9. ***Individual and team work:*** *Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.*
10. ***Communication:*** *Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.*
11. ***Project management and finance:*** *Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.*
12. ***Life-long learning:*** *Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.*

ICON OF THE MONTH

Azim Premji, Chairman, Wipro

Azim Premji has led Wipro since late 1960's. Then a $2 million hydrogenated cooking fat company, Wipro Limited is today a $5.7 billion revenue IT, BPO and R&D Services organization with presence in over 50 countries. Mr. Premji started at Wipro with one basic idea – to build an organization which was deeply committed to Values, with the firm belief that success in business would be its inevitable, eventual outcome. Unflinching commitment to Values continues to remain at the core of Wipro. Mr. Premji strongly believes that ordinary people are capable of extraordinary things and that the key to this is creating highly charged teams. He takes a personal interest in developing teams and leaders and invests significant time as a faculty in Wipro's leadership development programs. In Mr. Premji's view, the Wipro brand promise of "Applying Thought" is the driving force for delivering value for customers – which is the heart of business success. This has driven Wipro's pioneering efforts in Quality, culminating in the "Wipro Way", which integrates the methods and practices of Six Sigma, PCMM, CMMi and Lean. It also drives Wipro's focus on applying Innovation for direct customer benefits – improving their time-to-market, enhancing their predictability & reliability, and cutting their costs. Mr. Premji is firmly committed to the belief that business organizations have a deep social responsibility - and that this responsibility must be discharged by conducting ethical and fair business, by active involvement with fundamental societal issues and by building an ecologically sustainable business. Wipro is deeply involved in trying to improve Quality of school education through its "Wipro Applying Thought in Schools" initiative, in local community causes through "Wipro Cares" and is determinedly committed to a journey which weaves ecological sensitivity in every aspect of its business and organization.

Over the years, Azim Premji has received many honors and accolades, which he believes are recognitions for each person who has contributed to Wipro. Business Week listed him amongst the top 30 entrepreneurs in world history (July 2007), they also featured him on their cover with the sobriquet "India's Tech King" (October 2003). Financial Times included him in the global list of 25 people who are "dramatically reshaping the way people live, work or think" and have done most to bring about significant and lasting social, political or cultural changes (October 2005, November 2004). Time listed him (April 2004) as one amongst 100 most influential people in the world. He was named by Fortune (August 2003) as one of the 25 most powerful business leaders outside the US, Forbes (March 2003) listed him as one of ten people globally, who have the most "power to effect change". He was adjudged as the Business Leader of the Year 2004 by the Economic Times. In 2005 he became the first Indian recipient of the Faraday Medal. Wesleyan University, USA, Indian Institute of Technology, Roorkee, Manipal Academy of Higher Education, Aligarh University and Visveswaraya Technological University have all conferred honorary doctorates on him, while XLRI, Jamshedpur has conferred the Sir Jehangir

Ghandy Medal for Industrial and Social Peace. In 2000, the Institute of Electronics and Telecommunication Engineers conferred its highest honor - the Honorary Fellowship. The US-India Business Council has honored him with the "Global Vision" award. He is a non-executive Director on the Board of the Reserve Bank of India. He is also a member of the Prime Minister's Committee for Trade and Industry in India. In January 2005, the Government of India conferred upon him the Padma Bhushana, one of the highest civilian awards in the country. In the year 2001, Mr. Premji established the Azim Premji Foundation, a not-for-profit organization with a Vision of significantly contributing to quality primary education for every child, in order to build a just, equitable, humane & sustainable society. The financial resources to this foundation have been personally contributed by Mr. Premji. The Foundation has established a network of institutions that are working in the areas of education and related development areas with strong focus on developing talent and building knowledge. These institutions include Azim Premji Unimversity, Field Institutes, Azim Premji Schools and the Institute for Assessment and Accreditation. In October 2006, the Foundation was recognized as the Corporate Citizen of the year by the Economic Times.

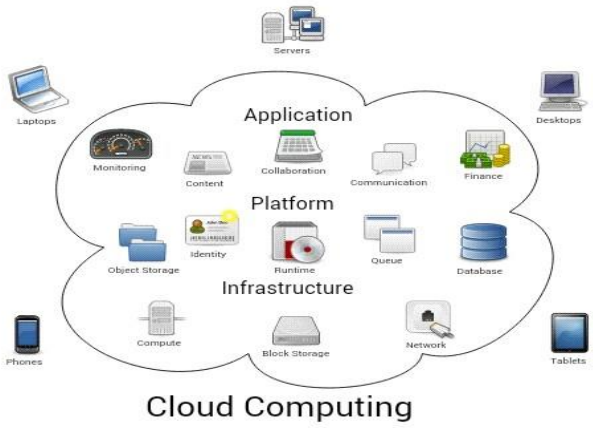
Azim Premji is a graduate in Electrical Engineering from Stanford University, USA.

-M.Deepika (2nd year)

CLOUD COMPUTING

Cloud computing metaphor: For a user, the network elements representing the provider-rendered services are invisible, as if obscured by a cloud. Cloud computing is a model for enabling ubiquitous network access to a shared pool of configurable computing resources.

Cloud computing and storage solutions provide users and enterprises with various capabilities to store and process their data in third-party data centers. It relies on sharing of resources to achieve coherence and economies of scale, similar to a utility (like the electricity grid) over a network. At the foundation of cloud computing is the broader concept of converged infrastructure and shared services.



Cloud Computing

Cloud computing, or in simpler shorthand just "the cloud", also focuses on maximizing the effectiveness of the shared resources. Cloud resources are usually not only shared by multiple users but are also dynamically reallocated per demand. This can work for allocating resources to users. For example, a cloud computer facility that serves European users during European business hours with a specific application (e.g., email) may reallocate the same resources to serve North American users during North America's business hours with a different application (e.g., a web server). This approach helps maximize the use of computing power while reducing the overall cost of resources by using less power, air conditioning, rack space, etc. to maintain the system. With cloud computing, multiple users can access a single server to retrieve and update their data without purchasing licenses for different applications.

The term "moving to cloud" also refers to an organization moving away from a traditional CAPEX model (buy the dedicated hardware and depreciate it over a period of time) to the OPEX model (use a shared cloud infrastructure and pay as one uses it).

Proponents claim that cloud computing allows companies to avoid upfront infrastructure costs, and focus on projects that differentiate their businesses instead of on infrastructure. Proponents also claim that cloud computing allows enterprises to get their applications up and running faster,

with improved manageability and less maintenance, and enables IT to more rapidly adjust resources to meet fluctuating and unpredictable business demand. Cloud providers typically use a "pay as you go" model. This can lead to unexpectedly high charges if administrators do not adapt to the cloud pricing model.

The present availability of high-capacity networks, low-cost computers and storage devices as well as the widespread adoption of hardware virtualization, service-oriented architecture, and autonomic and utility computing have led to a growth in cloud computing. Companies can scale up as computing needs increase and then scale down again as demands decrease. Cloud vendors are experiencing growth rates of 50% per annum.

Cloud computing sample architecture:

Cloud architecture, the systems architecture of the software systems involved in the delivery of cloud computing, typically involves multiple cloud components communicating with each other over a loose coupling mechanism such as a messaging queue. Elastic provision implies intelligence in the use of tight or loose coupling as applied to mechanisms such as these and others.

Cloud engineering:

Cloud engineering is the application of engineering disciplines to cloud computing. It and governance brings a systematic approach to the high-level concerns of commercialization, standardization, in conceiving, developing, operating and maintaining cloud computing systems. It is a multidisciplinary method encompassing contributions from diverse areas such as systems, software, web, performance, information, security, platform, risk, and quality engineering.

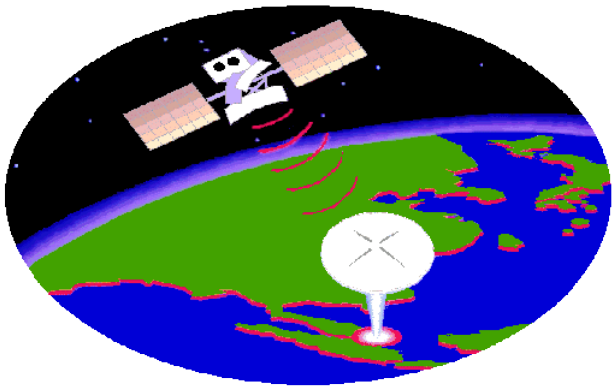
-P.U.Vishali (2nd year)

Remote Sensing

We perceive the surrounding world through our five senses. Some senses (touch and taste) require contact of our sensing organs with the objects. However, we acquire much information about our surrounding through the senses of sight and hearing which do not require close contact between the sensing organs and the external objects. In another word, we are performing Remote Sensing all the time.

Generally, remote sensing refers to the activities of recording/observing/perceiving (sensing) objects or events at far away (remote) places. In remote sensing, the sensors are not in direct contact with the objects or events being observed. The information needs a physical carrier to travel from the objects/events to the sensors through an intervening medium. The electromagnetic radiation is normally used as an information carrier in remote sensing. The output of a remote sensing system is usually an image representing the scene being observed. A further step of image analysis and interpretation is required in order to extract useful information from the image. The human visual system is an example of a remote sensing system in this general sense.

In a more restricted sense, remote sensing usually refers to the technology of acquiring information about the earth's surface (land and ocean) and atmosphere using sensors onboard airborne (aircraft, balloons) or space borne (satellites, space shuttles) platforms.



Effects of Atmosphere:

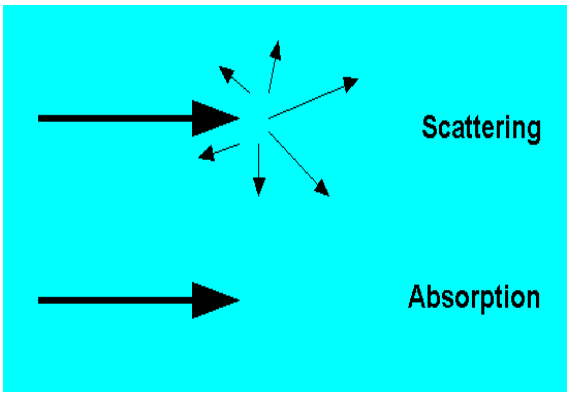
In satellite remote sensing of the earth, the sensors are looking through a layer of atmosphere separating the sensors from the Earth's surface being observed. Hence, it is essential to understand the effects of atmosphere on the electromagnetic radiation travelling from the Earth to the sensor through the atmosphere. The atmospheric constituents cause wavelength dependent absorption and scattering of radiation. These effects degrade the quality of images. Some of the atmospheric effects can be corrected before the images are subjected to further analysis and interpretation.

A consequence of atmospheric absorption is that certain wavelength bands in the electromagnetic spectrum are strongly absorbed and effectively blocked by the atmosphere. The wavelength regions in the electromagnetic spectrum usable for remote sensing are determined by their ability to penetrate atmosphere. These regions are known as the atmospheric transmission windows. Remote sensing systems are often designed to operate within one or more of the atmospheric windows. These windows exist in the microwave region, some wavelength bands in the infrared, the entire visible region and part of the near ultraviolet regions. Although the atmosphere is practically transparent to x-rays and gamma rays, these radiations are not normally used in remote sensing of the earth.

Optical and Infrared Remote Sensing:

In Optical Remote Sensing, optical sensors detect solar radiation reflected or scattered from the earth, forming images resembling photographs taken by a camera high up in space. The wavelength region usually extends from the visible and near infrared (commonly abbreviated as VNIR) to the short-wave infrared (SWIR).

Different materials such as water, soil, vegetation, buildings and roads reflect visible and infrared light in different ways. They have different colors and brightness when seen under the sun. The interpretation of optical images requires the knowledge of the spectral reflectance signatures of the various materials (natural or man-made) covering the surface of the earth.



Applications:

Natural resource management is a broad field covering many different application areas as diverse as monitoring fish stocks to effects of natural disasters (hazard assessment).

Remote sensing can be used for applications in several different areas, including:

- Geology and Mineral exploration
- Hazard assessment
- Oceanography
- Agriculture and forestry
- Land degradation
- Environmental monitoring.

Each sensor was designed with a specific purpose. With optical sensors, the design focuses on the spectral bands to be collected. With radar imaging, the incidence angle and microwave band used plays an important role in defining which applications the sensor is best suited for.

-P.R.Yaamini (2nd year)

LAPTOPS AND DESKTOP WILL BE INTERACTIVE

In an era of slick gadgets, PCs are the dinosaurs, ensnared in wire clutter, sporting tired 2D cameras and stricken with the occasional blue screen of death. Technology coming up in 2015, though, is set to make PCs more interactive, fun and perhaps nosier than you'd like them to be. Apple's iPad changed the way people viewed computers and spurred PC innovation. Hardware makers drew ideas from mobile devices, gaming consoles and even 3D printers to rethink the PC, and the resulting new technologies will have a profound effect on how laptops and desktops are used next year and into the future. Computerworld's Best Places to Work in IT 2015: Company Listings

The complete listings: Computerworld's 100 Best Places to Work in IT for 2015 A compact list of the 56 large, 18 midsize and 26 small organizations that ranked as Computerworld's. Perhaps the most interesting idea is Intel's "wire-free" PC, in which wireless technology will replace display, charging and data transfer cables. Chip maker Intel next year will show an experimental laptop that has no ports, and relies completely on wireless technology to connect to monitors and external storage devices. Interactive computers will have 3D cameras that behave more like eyes, with the ability to recognize objects and measure distances. Sensory input through sound, voice and touch will help PCs respond to and anticipate our needs.

Wireless charging:

Place a laptop on a table, and it'll automatically start charging. No wires needed, no need to carry a power brick. That's how Intel views wireless charging for laptops, which could become a reality next year. Intel wants to make wireless chargers as easy to find as a Wi-Fi signal, and wants to bring the technology to cafes, restaurants, airports and other public places so laptops can be recharged without power adapters. The first laptops with wireless charging could come out next year, and Intel has shown a few prototypes laptop being recharged on a table. Interactive computers .Computers will become more perceptual with a combination of gesture, voice and visual recognition technologies being installed in PCs. Starting next year, 2D cameras in PCs will be replaced by Intel's RealSense 3D cameras, which will be able to recognize objects and even measure distances between items. The camera's Kinect-like gesture recognition capabilities will also make PC gaming hands free and interactive. Intel has lofty goals, aiming to combine visual, voice and sound input to recognize human moods and reading habits. While those won't happen in the coming year, the 3D camera will certainly make Skype chats more fun.

Biometric sensors :

Soon, your body could log you into an e-mail account. By the end of this year, Intel will be providing software so users can log in to websites via biometric authentication. It serves two purposes: biometric authentication is relatively reliable and secure, and users won't have to remember dozens of passwords for different sites. Apple already uses biometric authentication to authorize credit card payments through its Apple Pay service, and Intel wants to bring a similar concept to PCs. Expect the fingerprint reader to become more useful starting next year.

-K.Nithya (2nd year)

The big five IT trends of next half decades:

In today's ever more technology-centric world, the stodgy IT department isn't considered the home of innovation and business leadership. Yet that might have to change as some of the biggest advances in the history of technology make their way into the front lines of service delivery. Here's an exploration of the top

five IT trends in the next half decade, including some of the latest industry data, and what the major opportunities and challenges are in this article. Moreover, workers are now demanding many of these innovations and expecting their organizations to provide something close in capability to what they can get nearly for free (or actually for free) on their own devices and networks. Managers and executives, albeit mostly on the business side, are typically pushing for 1) service delivery on next-generation mobile devices like the iPad, 2) much easier to use IT solutions, and 3) access to better, more collaborative and useful intranet capabilities.

"Easy", highly mobile, and "social" are the mantras of this new generation of IT. So too is the rapid acquisition and delivery of business solutions. There is a growing realization amongst workers and management that technology, though increasingly complex in it, can be wielded far more rapidly and efficiently than their currently parochial capabilities are providing.

But this is not a blame game. IT is not necessarily at fault, or atleast only indirectly. Instead, it seems to be the entire structure and process through which organizations absorb and metabolize technology. It's centralized. It's controlled. It's top-down. There are exceptions, but in most organizations, technology decisions are made at high levels and then pushed across the organization. This transmission process is slow and unpredictable. It's also often not supported on the ground where reality reaches the business.

Unfortunately, the slow-pace of IT adoption, hindered by traditional project management practices, endless customization processes, IT backlogs, security concerns, and a dozen other drags on delivery performance, is only part of the problem. The fact that the technology world is largely no longer driven by the enterprise world (as it used to be for decades) is another major reason that technology and business is having a harder time these days aligning.

Next generation smart devices-mobiles and tablets:

It's obvious to the casual observer these days that smart mobile devices based on iOS, Android, and even Blackberry OS/QNX are seeing widespread use. But comparing projected worldwide sales of tablets and PCs tells an even more dramatic story

Social media – social business and enterprise 2.0:

While mobile phones technically have a broader reach than any communications device, social media has already surpassed that workhorse of the modern enterprise, e-mail. Increasingly, the world is using social networks and other social media-based services to stay in touch, communicate, and collaborate. Now key aspects of the CRM process are being overhauled to reflect a fundamentally social world and expecting to see stellar growth in the next year

Cloud computing:

Of all the technology trends on this list, cloud computing is one of the more interesting and in my opinion, now least controversial. While there are far more reasons to adopt cloud technologies than just cost reduction, according to Mike Vizard perceptions of performance issues and lack of visibility into the stack remain one of the top issues for large enterprises

Consumerization of IT:

I've previously made the point that the source of innovation for technology is coming largely from the consumer world, which also sets the pace.

Big data:

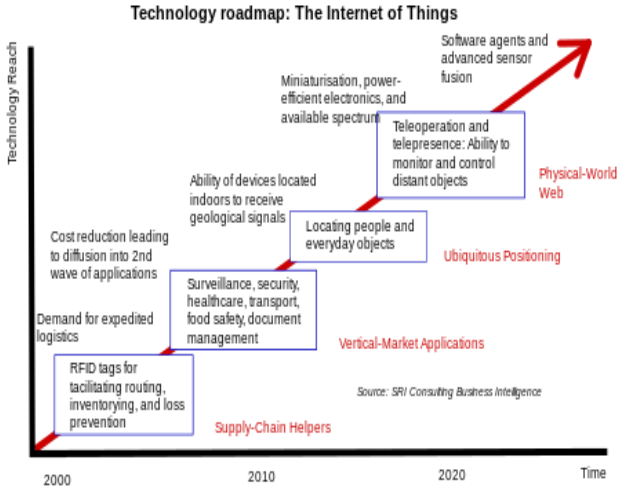
Businesses are drowning in data more than ever before yet have surprisingly little access to it. In turn, business cycles are growing shorter and shorter, making it necessary to "see" the stream of new and existing business data and process it quickly enough to make critical decisions. The term "big data" was coined to describe new technologies and techniques that can handle an order of magnitude or

two more data than enterprises are today, something existing RDBMS technology can't do it in a scalable manner or cost-effectively.

-R.B.Sulosh Meena (2nd year)

The Internet of Things

The Internet of Things (IoT , sometimes Internet of Everything) is the network of physical objects or "things" embedded with electronics, software, sensors, and connectivity to enable objects to exchange data with the manufacturer, operator and/or other connected devices based on the infrastructure of International Telecommunication Union's Global Standards Initiative The Internet of Things allows objects to be sensed and controlled remotely across existing network infrastructure, creating opportunities for more direct integration between the physical world and computer-based systems, and resulting in improved efficiency, accuracy and economic benefit. The term “Internet of Things” was coined by British entrepreneur Kevin Ashton in 1999.



Intelligence:

Ambient intelligence and autonomous control are not part of the original concept of the Internet of Things. Ambient intelligence and autonomous control do not necessarily require Internet structures, either. However, there is a shift in research to integrate the concepts of the Internet of Things and autonomous control, with initial outcomes towards this direction considering objects as the driving force for autonomous IoT. In the future the Internet of Things may be a non-deterministic and open network in which auto-organized or intelligent entities (Web services, SOA components), virtual objects (avatars) will be interoperable and able to act independently (pursuing their own objectives or shared ones) depending on the context, circumstances or environments. Autonomous behavior through collecting and reasoning context information plays a significant role in IoT. Modern IoT products and solutions in the marketplace use variety of different technologies to support such context-aware automation.

Embedded intelligence presents an "AI-oriented" perspective of Internet of Things, which can be more clearly defined as: leveraging the capacity to collect and analyze the digital traces left by people when interacting with widely deployed smart things to discover knowledge about human life, environment interaction, as well as social inters connection and related behaviors.

-T.N.Sai Chitra (2nd year)

WIRELESS NETWORKS

Hop-by-Hop Message Authentication and Source Privacy:

Message authentication is one of the most effective ways to thwart unauthorized and corrupted messages from being forwarded in wireless sensor networks (WSNs). For this reason, many message authentication schemes have been developed, based on either symmetric-key cryptosystems or public-key cryptosystems. Most of them, however, have the limitations of high computational and communication overhead in addition to lack of scalability and resilience to node compromise attacks. To address these issues, a polynomial-based scheme was recently introduced. However, this scheme and its extensions all have the weakness of a built-in threshold determined by the degree of the polynomial: when the number of messages

transmitted is larger than this threshold, the adversary can fully recover the polynomial. In this paper, we propose a scalable authentication scheme based on elliptic curve cryptography (ECC). While enabling intermediate nodes authentication, our proposed scheme allows any node to transmit an unlimited number of messages without suffering the threshold problem. In addition, our scheme can also provide message source privacy. Both theoretical analysis and simulation results demonstrate that our proposed scheme is more efficient than the polynomial-based approach in terms of computational and communication overhead under comparable security levels while providing message source privacy.

Secure and Efficient Data Transmission for Cluster-Based:

Secure data transmission is a critical issue for wireless sensor networks (WSNs). Clustering is an effective and practical way to enhance the system performance of WSNs. In this paper, we study a secure data transmission for cluster-based WSNs (CWSNs), where the clusters are formed dynamically and periodically. We propose two secure and efficient data transmission (SET) protocols for CWSNs, called SET-IBS and SET-IBOOS, by using the identity-based digital signature (IBS) scheme and the identity-based online/offline digital signature (IBOOS) scheme, respectively. In SET-IBS, security relies on the hardness of the Diffie-Hellman problem in the pairing domain. SET-IBOOS further reduces the computational overhead for protocol security, which is crucial for WSNs, while its security relies on the hardness of the discrete logarithm problem. We show the feasibility of the SET-IBS and SET-IBOOS protocols with respect to the security requirements and security analysis against various attacks. The calculations and simulations are provided to illustrate the efficiency of the proposed protocols. The results show that the proposed protocols have better performance than the existing secure protocols for CWSNs, in terms of security overhead and energy consumption.

Neighbor Table Based Shortcut Tree Routing in ZigBee:

The ZigBee tree routing is widely used in many resource-limited devices and applications, since it does not require any routing table and route discovery overhead to send a packet to the destination. However, the ZigBee tree routing has the fundamental limitation that a packet follows the tree topology; thus, it cannot provide the optimal routing path. In this paper, we propose the shortcut tree routing (STR) protocol that provides the near optimal routing path as well as maintains the advantages of the ZigBee tree routing such as no route discovery overhead and low memory consumption. The main idea of the shortcut tree routing is to calculate remaining hops from an arbitrary source to the destination using the hierarchical addressing scheme in ZigBee, and each source or intermediate node forwards a packet to the neighbor node with the smallest remaining hops in its neighbor table. The shortcut tree routing is fully distributed and compatible with ZigBee standard in that it only utilizes addressing scheme and neighbor table without any changes of the specification. The mathematical analysis proves that the 1-hop neighbor information improves overall network performances by providing an efficient routing path and distributing the traffic load concentrated on the tree links. In the performance evaluation, we show that the shortcut tree routing achieves the comparable performance to AODV with limited overhead of neighbor table maintenance as well as overwhelms the ZigBee tree routing in all the network conditions such as network density, network configurations, traffic type, and the network traffic.

-B.Sathyajothi (2nd year)

Pervasive Computing Technology system and Application

Pervasive Computing:

Pervasive Computing will be accomplished through interdisciplinary, multi-faceted technology developments in the areas of:

- Information access
- Text retrieval
- Multimedia document retrieval
- Automatic indexing
- Pervasive devices
- Palm top computers
- Smart badges
- Electronic books
- User sensitive devices

Research focus:

A number of leading technological organizations are exploring pervasive computing. Xerox's Palo Alto Research Center (PARC), for example, has been working on pervasive computing applications since the 1980s. Although new technologies are emerging, the most crucial objective is not, necessarily, to develop new technologies. IBM's project Planet Blue, for example, is largely focused on finding ways to integrate existing technologies with a wireless infrastructure. Carnegie Mellon University's Human Computer Interaction Institute (HCII) is working on similar research in their Project Aura, whose stated goal is "to provide each user with an invisible halo of computing and information services that persists regardless of location." The Massachusetts Institute of Technology (MIT) has a project called Oxygen. MIT named their project after that substance because they envision a future of ubiquitous computing devices as freely available and easily accessible as oxygen is today.

Applications:

Today the uses of Internet are limited as its users look for read-mostly information. As we move to a world where the Internet is used as an infrastructure for embedded computing, all this will change. We can hypothesize that the individual utility of mobile communication, wireless appliances and the respective mobile services - pervasive technologies in general - will be exploited through a digital environment that is –

Aware of their presence

Sensitive, adaptive and responsive to their needs, habits and emotions

Ubiquitously accessible via natural interaction.

Increasingly, many of the chips around us will sense their environment in rudimentary but effective ways. For Example -

- Cell phones will ask the landline phonewhat its telephone number is and will forward our calls to it.

- Remote computers will monitor our health statistics and will determine when one is in trouble and will take appropriate action for rescue.

- Amplifiers will be implanted and used in the inner ear.

- New machines that scan, probe, penetrate and enhance our bodies will be used.
- Refrigerators will be connected to the Internet so one could find out, via cell phone or PDA, what is in it while one is at the store. A refrigerator may even sense when it is low on milk and order more directly from the supplier or rather than this, the connection will enable the manufacturer to monitor the appliance directly to ensure that it is working correctly and inform the owner when it is not.
- Stoves will conspire with the refrigerators to decide what recipe makes the best use of the available ingredients, and then guide us through preparation of the recipe with the aid of a network-connected food processor and blender. Or they will communicate to optimize the energy usage in our households.

- Cars will use the Internet to find an open parking space or the nearest vegetarian restaurant for their owners or to allow the manufacturer to diagnose problems before they happen, and either inform the owner of the needed service or automatically install the necessary (software) repair. Wrist watches will monitor our sugar.

- Digi-tickers or implanted heart monitors in heart patients will talk wirelssly to computers, which will be trained to keep an eye open for abnormalities.

-V.Yuvasri (2nd year)

ADAPTIVE SPEECH CONTROL FOR ELDERLY PEOPLEWITHOUT VARYING THE PITCH

Major sector of population consists of

a) Aged elder people with slight hearing impairment and less cognitive power

b) People who are profoundly deaf because of defective auditory hair cells

Many works had been done in improving hearing quality, Signal to Noise ratio improvement; spectralde noising and frequency domain speech processing for profoundly deaf people .In most of the work approach is to retrieve the original speech from noisy environment. In this project work attempt had been made to modify some of the parameters of original speech to make it comfortable to hear/understand.

There are two approaches

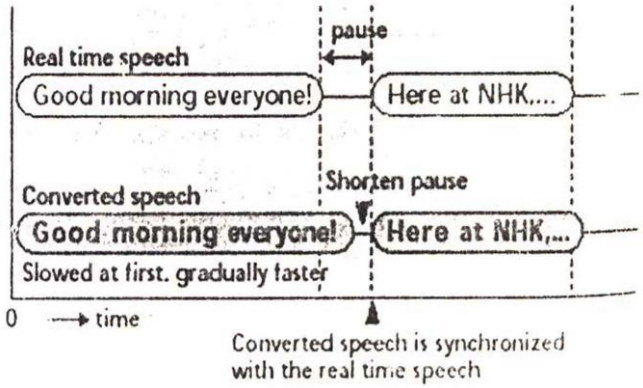
i) speech-speech

ii) speech-image

The first approach is to make speech comfortable to hear and understand .The set of people who could be benefited from this is elder people with slight hearing impairment and less cognitive storage capacity. The second one is to translate the speech to image in which identity about the speech signal would be visually explicit .Profoundly deaf people would be benefited from this.

Speech to speech:

The method is named as adaptive speech rate reduction with pitch synchronization without exceeding the original time'. It is a common complaint from elder people that speech of announcers of broadcasting service is too fast to catch and unable to understand .The direct solution is to uniformly expand the speech signal .But the speech will overrun the original program. To overcome this, algorithm expands the beginning of speech and contracts the pauses between words or sentences as much as possible without perceptual incongruities. The principles are outlined in.



Speech signal is a complex signal consists of many frequencies Pitch is the perception of frequency .If the frequency of speech is affected by expansion the pitch will also varies. Care should be taken that naturalness of speech is maintained. The ASRC (Adaptive Speech Rate Control Algorithm) is used to achieve this .The technique used for expansion and contraction is insertion and deletion of pitch period and to maintain perceptual naturalness.

Speech to image:

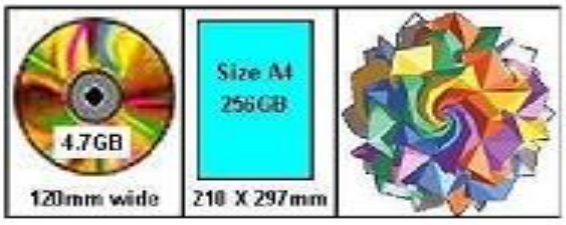
Sound is a time varying signal and information is fetched by proportional vibration of basilar membrane and understood by the brain with the support of auditory nerve .The identity of a sound signal is varying amplitude and pitch .In speech, the varying amplitude gives the information of what is talked and pitch gives the information about cues and who had talked. It is proposed in this work to modify the one dimensional time signal to one dimensional or two dimensional image signal .An intensive study should be undergone to arrive at effective mathematical transform which makes the image distinct and unique for relevant words by relevant person and to obtain a distinct image for sound produced by different sources.

-J.Renita Anjalin (2nd year)

RAINBOW TECHNOLOGY COLOR COMPUTING

Rainbow technology,a breakthrough in digital data storage enables us to store up to a massive 450GB on just a piece of paper. Rainbow Storage is a group of techniques to store digital data in some colors, color combinations and some symbols known as rainbow format, and therefore a rainbow picture will be generated. The technique is used to achieve high-density storage. With the help of Rainbow system we would be watching full-length high- definition videos from a piece of paper! The main attraction is the cheap paper. The Rainbow technology is feasible because printed text, readable by the human eye is a very wasteful use of the potential capacity of paper to store data. By printing the data encoded in a denser way much higher capacities can be achieved. Paper is, of course, bio-degradable, unlike CDs or DVDs. And sheets of paper also cost a fraction of the cost of a CD or DVD.

This boon to digital data storage is developed by Sainul Abideen, university technology student at the Muslim educational society Engineering College in Kerala.Rainbow Storage is a new technology that was first demonstrated in November 2006 by Sainul Abideen, a student from India, who received his MCA from MES Engineering College in Kuttipuram in Kerala's Malappuram district. It is a storage technology that is based upon the usage of printed shapes on a variety of different media, unlike the traditional magneto-optical standard, to store data. This is done by using various geometrical shapes and different colors on the surface used, which could be paper or plastic. It intends to be more environmentally efficient than optical media or magnetic media because if paper is used it is biodegradable, and, if either paper or plastic storage is adopted using this technology in favor of other less energy-efficient methods of storage, it will reduce the carbon footprint of whoever adopts it.



Geometrical shapes like triangles, circles and squares in different colors are used to store a large amount of data on ordinary paper or plastic surfaces in the system that the Rainbow Data Storage technology claims to use. Less environmental pollution by avoiding conventional methods is claimed because of the biodegradability of paper, low cost and high capacity or low density of printed shapes on plastic surfaces. It was also proposed to store data on what would be known as a "Rainbow Versatile Disk" (RVD) or plastic or paper cards of any form factor (the size that SIM cards occupy now) in order to allow easy adoption by current technologies. When considering the progression from punched card technology to this new Rainbow Storage, it isn't hard to see how new radical methods could be used to achieve the same results. However, the concept may be radical, and it may also work, but in practical terms, it is limited to only small sizes (in the Megabytes), in

contrast with more conventional forms of storage, such as today's Western Digital 640 Gigabyte hard drive.

How is it possible:

Data stored in rainbow format on an ordinary paper. It uses geometric shapes such as squares and hexagons to represent data patterns, instead of the usual binary method that uses ones and zeros to represent data. Besides, color is also used in the Rainbow system, to represent other data elements. Files such as text, images, sounds and video clips are encoded in "rainbow format" as colored circles, triangles, squares and so on, and printed as dense graphics on paper at a density of 2.7GB per square inch. An RVD therefore looks like a print-out of the modern art. The paper can then be read through a specially developed scanner and the contents decoded into their original digital format and viewed or played. The Rainbow technology is feasible because printed text, readable by the human eye is a very wasteful use of the potential capacity of paper to store data. By printing the data encoded in a denser way much higher capacities can be achieved. The retrieval of data is done by scanning the paper or the plastic sheet containing the data into a scanner and later reading it over monitor. Instead of using 0s and 1s, we use color dots where each color dot can represent minimum 8 bits (1 byte). The rainbow picture will be highly compressed and can be represented in any color medium. For retrieving the contents from the medium, picture can be captured and data can be generated from the color combinations. "Although environmental light differences and color shading is a problem, it can overcome up to a certain limit by using efficient mapping functions".

Comparison with other storage devices:

CD, DVD's a thing of past. Currently, of the several options available for data storage, DVDs are the best mode, but are yet expensive. Sainul has said that a CD or DVD consumes 16gms of polycarbonate, which is a petroleum by-product. While a CD costs Rs. 15, his paper or plastic-made RVD will cost just about Rs. 1.50 and will even have 131 times more storage capacity. Using this technology an A4 sheet of paper could store 256GB of data. In comparison, a DVD can store 4.7GB of data. Paper is, of course, bio-degradable, unlike CDs or DVDs. And sheets of paper also cost a fraction of the cost of a CD or DVD.

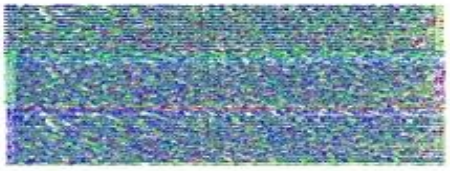
Principle: This technology is based on two principles:

Principle I : "Every color or color combinations can be converted in to some values and from the values the colors or color combinations can be regenerated".

Principle II: "Every different color or color combinations will produce different values".

Absolute Rainbow Dots:

Absolute rainbow dots are used to detect errors caused by scratches, and whether any fading has occurred. Absolute rainbow dots are predefined dots carrying a unique value. These dots can be inserted in the rainbow picture in pre-specified areas. If fading occurs these dot values will change accordingly, and at the reproduction stage this can be checked and corrected. Absolute rainbow dots will be microscopically small so that they occupy very little space in the rainbow picture. These will be colored differently so that each dot will have its own fixed unique value



Advantages:

Data can be stored on an ordinary paper. Abideen claims that huge data banks can be constructed out of Rainbow- based storage medium. Larger amount of data can be had on lesser space. The extremely low-cost technology will drastically reduce the cost of storage and provide for high speed storage too. Files in any format like movie files, songs, images, text can be stored using this technology. Biodegradable nature of the storage devices would do away with the e-waste pollution. The four main storage devices made using this technology are RVD, Disposable storage, Data Banks, Rainbow cards, and answer to the storage problems faced by the computer world. With the help of disposable storage, a high density data storage is made possible even on paper or plastic sheets, any type of computer files can be stored and distributed this way, so instead of giving cd's with the computer magazines, its content can be printed in a page, video albums, software etc., can be distributed at a very low cost with the help disposable storage .Rainbow cards can be used in mobile devices in place of DVDs &VCDs. In a square inch sized rainbow cards, (equivalent to the size of sim card)more than 5GB data can be stored. A major crisis faced in the design of the small digital devices is the huge size of the CD/DVD drives. The rainbow cards can solve this problem. Un-authorized copies of the films can be controlled to a certain limits using these cards. An UK-based company has already evinced interest in making rainbow cards Another theme put forward by rainbow technology is the Data Banks; it is huge server with a high storage capacity. As per a research project done in US in 2003 to store the available static data (films, songs, tutorials presentations etc.,) the server required will cost $500 crores (23000 crores).But by using data banks, a similar server can be made with Rs.35 lacks. All the available films and other static data can be used by paying cash with the internet. Almost 125.603 PB data storage is possible in a Data Bank. Sainul is busy with project Xpre3ssa now. It's a software package for regional languages. By using this, News papers, stories, novels etc can be made audible in it's own style.so online news papers and novels can be enjoyed through mobile phone with a GPRS connection. Sainul Abideen, a native of Karingappara , is a freelence software developer. Un-authorized copies of the films can be controlled to a certain limit using these cards. The Rainbow data storage technology claims to use geometrical shapes such as triangles, circles and squares of various colors to store a large amount of data on ordinary paper or plastic surfaces. This would provide several advantages over current forms of optical- or magnetic data storage like less environmental pollution due to the biodegradability of paper, low cost and high capacity. Data could be stored on "Rainbow Versatile Disk" (RVD) or plastic/paper cards of any form factor (like SIM cards).Interestingly, the 45-second video didn't say a lot, and if the Rainbow system can store up to 450 GB, then soon we would be watching full-length high-definition videos from a piece of paper!. One of the major advantages of the Rainbow system is the fact that it should cost a lot less to produce than the typical polycarbonate DVDs, CDs and now Blue-rays. Abideen claims that huge data banks can be constructed out of Rainbow-based storage medium. The main attraction seems to be the cheap paper.

Features of Rainbow technology:

- Low cost
- High speed
- Biodegradable

Disadvantages:

This has the tendency to fade away hence the data loss may occur. With the extremely low cost of using this technology we can always afford to have multiple copies.

Once the Rainbow technology is in, soon we would be watching full-length high-definition videos from a piece of paper! With the popularity of the Rainbow Technology, computer or fashion magazines in future need not carry CDs in a pack. One of the major advantages of the Rainbow system is the fact that it should cost a lot less to produce than the typical polycarbonate DVDs, CDs and now Blu- rays.Huge data banks can be constructed out of Rainbow-based storage medium.

-Shanthi Priya (2nd year)

NIKOLAY NESHOV

European computer scientists have developed a way to "read" web addresses in images that could improve filters for blocking pornographic, gambling and other sites. They provide details in the new issue of the International Journal of Reasoning-based Intelligent Systems.

Internet marketers of all shades might add a website address, a URL, to a graphic or photo that might then be found through an image search engine. The user finding such an image may be interested in visiting said site, but will have to type out the URL into their browser's address bar to do so. Conversely, the URL might point to illicit content -- pornography, gambling sites, illegal drugs, terrorist propaganda. In that content, those in authority, whether parents and guardians of children or law enforcement, may wish to automatically blacklist such URLs.

Now, Nikolay Neshov of the Technical University of Sofia, Bulgaria and colleagues at the University of Karlstad, Sweden, and the University of Belgrade, Serbia, have developed a computer algorithm that can detect the presence of text overlaid on to an image or a still from a video, extract the text and convert it into an active URL for accessing or blocking a website.

Simple optical character recognition (OCR) does not work well with text overlaid on images as the background is usually complex, the text is likely to be of lower resolution and lower intensity and contrast than that seen in a scanned document or page, for instance. The new approach uses an identification extraction technique that finds anomalies in an image that would be present if text is overlaid. It then removes the details surrounding those anomalies leaving just the area occupied by any text -- the team calls this the binarisation process. This isolated text image can then be fed into an (OCR) system to convert the image of the text into actual text in the computer.
The team has successfully tested their algorithm on thousands of images with overlaid URLs. They were able to identify 619 URLs from a random selection of 1000 test images at a rate of three per second using their approach. Conventional OCR was faster but only found 83 URLs in the same 1000 images, an improvement from about 8% to more than 60%.

The researchers' initial motivation was to assist computer forensic investigations in which tens of thousands of illegal and illicit photos must be scanned and any associated websites identified quickly in an investigation. This is critical in investigations of child pornography and child sexual abuse, the team reports, but such work is often stymied by the vast numbers of images involved.

Given that internet search companies and other service providers are involved in various initiatives to identify and block illegal material on the internet, this new approach to URL extraction from images could be added to their arsenal of techniques for detecting such content as well as being useful in criminal investigations surrounding said content

-C.V.Shanthi (2nd year)

STUDENT'S CORNER

Verbal reasoning:

1. Pointing to a photograph, a man said, "I have no brother or sister but that man's father is my father's son." Whose photograph was it ?

1. His own
2. His Son
3. His Father
4. His Grandfater

Answer: Option **2**

Explanation:
Since the person who is telling has no brother or sister, so his father son is he himself. So the man in the photograph is his son.

2. Pointing towards a person in a photograph, Anjali said, "He is the only son of the father of my sister's brother." How is that person is related to Anjali ?

1. Anjali Father
2. Anjali Mother
3. Anjali Brother
4. Maternal Uncle

Answer: Option 3
Explanation:
Relation's given in the question may be analysed as follows:
Sister's brother - brother;
Brother's father - father;
Father's son - brother;
So he is Anjali Brother.

3. Pointing to a man, a woman said, "His mother is the only daughter of my mother." How is the woman related to the man ?

1. Mother
2. Daughter
3. Sister
4. Grand Mother

Answer: Option 1
Explanation:
Blood relation Analysis: only daughter of my mother-> means herself
So she is his mother.

4. Pointing to the photograph, Vipul said, "She is the daughter of my grandfather's only son." How is Vipul related to the girl in the photograph ?

1. Mother
2. Sister
3. Cousin
4. Grandmother

Answer: Option 2
Explanation:
Blood relation Analysis : My grandfather's only son->His father Daughter of his father -> His sister
So that girl is Vipul's sister.

BULLETINS:

Tree Plantation:

Our department planted saplings on 19.08.2015. It was done in the remembrance of our former president Dr.A.P.J.Abdul Kalam.

Seminar on wireless network:

Under ISTE student chapter, Kalvi institute conducted a workshop on wireless network for third year students on 01.09.15.

Seminar on cloud solution:

Under ISTE student chapter, a seminar was conducted on cloud solution for third year students. The seminar was handled by Mr.Pandian from Pass academy.

Workshop on Big data analytics:

IIPC sponsored a one day workshop on big data analytics for final year students on 8.8.15. The workshop was handled by G.S.Raman from KLNCIT.

Suggestions and Feedback Contact:
klnceitsig@gmail.com