TECHSPARK

Learning to fly

All the calculations show it can't work. There's only one thing to do: make it work.

GPCET

Pioneering Innovative Education

G PULLAIAH COLLEGE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF CSE | Nandikotkur Road | Kurnool | www.gpcet.ac.in

TECHSPARK

2015-16

VISION

To deliver the qualitative, innovative and ethical computer science technocrats who strive for the benefit of society

MISSION

Nurturing the future leaders in academia, information technology, industry and entrepreneurial pursuit, through a contemporary curriculum of theory and application that develops the ability to solve problems individually and in teams.

Program Educational Objectives (PEO's):
A graduate of the Computer Science and Engineering Program should:

PEO 1 :Apply principles of Computer science and engineering with analytical thinking and problem solving skills for developing software systems.

PEO 2 :Adapt to rapidly changing industry needs by acquiring required technical skills .

PEO 3:Assess real time problems and develop suitable technological solutions to full fill the needs of society.

PEO 4: Develop leadership skills and engage in life-long learning to meet the changing global needs.

TECH SPARK
2015-16

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Tech Vedha is an annual magazine, brought out by G Pullaiah college Of Engineering & Technology, Department of CSE, Kurnool. If you have any queries or feedback, address them to info@gpcet.ac.in.

FELICITATIONS

Message from Chairman

Mr. G V M Mohan Kumar
Chairman, GPCET

It is often said "Give me a copy of your College magazine, I will tell you about the quality of your college." I strongly believe in this statement. For, a magazine carries the contributions reflecting ethos and aspirations of the students, faculty and other team members of an institution.

I am happy to know that GPCET is bringing out its first college magazine this year. I went through the articles and poems published in this magazine.

They amply demonstrate the communication skills, poetic prowess, imagination and creativity, humor and humanism, technical competence, and patriotism of the contributors. I wish this maiden attempt all success. Let there be more contributions in English in future.

Principal's Message

Dr P Nageswara Rao

It is a great pleasure to see the creative expressions of students who had contributed to TechVedha.

GPCET has grown abundantly in the recent past. It continues to sustain its growth. People reading this magazine will realize the tremendous changes that are happening in the gpcet campus. The magazine is presenting a glimpse of the growth of the institution on many fronts. The college has been simply unstoppable in its progress as it has been actively involved in various activities that have brought to light the hidden talents of the college students and staff.

FELICITATIONS

From the Department of CSE

Dr Prem Kumar S
HoD – CSE

It is my pleasure to congratulate the team that has taken the initiative for producing this magazine. It is great to find a considerable number of articles, poems and drawings that certainly prove that our staff and students are adequately equipped and possess necessary skill sets to express their talent.

Reading this magazine would definitely be an inspiration and motivation for all students and staff to contribute even more to the forthcoming issues. I hope that everyone would continue to give their full efforts to keep the momentum and continue to enhance the standards of the magazine.

EDITORS' NOTE

Dear readers

It gives us great pleasure to bring you the first issue of Tech Vedha, the college magazine of GPCET. The name and fame of an institute depends on the caliber and achievements of the students and teachers. The role of a teacher is to be a facilitator in nurturing the skills and talents of students.

This magazine is a platform to exhibit the literary skills and innovative ideas of teachers and students. Tech Vedha presents the achievements of students and contributions of teachers.

We would like to place on record our gratitude and heartfelt thanks to all those who have contributed to make this effort a success. We profusely thank the management for giving support and encouragement and a free hand in this endeavor. Last but not the least we are thankful to all the authors who have sent their articles. We truly hope that the pages that follow will make an interesting read.

Dr S Prem Kumar
Professor / HOD / CSE

P Kiran Rao
Assistant Professor / CSE

College

G Pullaiah College Of Engineering & Technology, Kurnool has come a long way since its modest beginning in 2007. The 13 acre lush campus with a state of the art built up area of over 5 lakh sq.ft., welcomes about 1000 students every year, in various branches including ECE, CSE, EEE, Civil, Mech and PG courses M.Tech (CSE), M.Tech (ECE), M.Tech(EEE), MBA.

Situated in a picturesque location at Nandikotkur, Kurnool, GPCET offers a great ambience for wholesome development of students. The college is emerging as one of the top notch engineering colleges, affiliated to JNTU. The ISO 9001:2008 Certification and Accreditation by AICTE further substantiate the high standards of excellence that the institution has set for itself. With an ever growing enthusiasm for education and research, GPCET is committed to excellence in education. It has stringent recruitment policies, high standards for academic performance, outstanding infrastructure and proactive placement initiatives.

The students are well trained in their academic curriculum and also in skills that are required for the industry. They are given customized and employability training both in technical as well as in communication skills. A unique feature of GPCET is the Business English Certification (BEC) Club. Considering the importance of communication skills for the career growth of students, GPCET has initiated BEC course for all students. Students undergo BEC (preliminary) examination and get BEC certification of Cambridge University.

Our students do industry oriented mini-projects in their pre-final semester and gain experience and exposure on industry practices and challenges. For more details visit: www.gpcet.ac.in

ABOUT FOUNDER

Founder

I appreciate your evincing zeal in our college. I feel elated to inform that GPCET is one of the emerging giants in Technical Colleges in the region. The college has all ingredients a Technocrat should possess GPCET is committed to serve the needs of industry and corporate sectors. We offer undergraduate programmes in B.Tech (ECE/CSE/EEE/CIVIL/ME), and post graduate programmes in MBA, MCA and M.Tech all recognized by JNTUA. Besides the technical skills, a student is imparted soft skills.

The four storied campuses are enabled with Wi-Fi and e-classrooms which are the platform for learning. Interactive lecture sessions, weekend seminars, Technical forums mould an ordinary student into on extraordinary personality. The invincible strength of GPCET is its erudite and dedicated faculty. I believe, as a leader, that such a blend of academicians is just a differentiating factor of our college. The student centric and conceptual base of teaching will no doubt be a fortifying factor. This alone enables them to face any challenge in life. The GPCET assiduously keep faith in promoting humanistic approach to our students.

Article

4G Broadband

Syeda Deeba Sultana
III CSE

The early days of home Internet access required using a modem connected to a computer to dial a number and maintain a connection. It was cumbersome and slow. The faster modems became, the more people realized how painfully sluggish data transmission had been in the days of 300 baud. Eventually, home users who could afford a jump in price could get Broadband access via digital subscriber lines (DSL), cable and satellite. Technology changes from day-to-day; this is also happening in case of networking. So many breakthroughs in the realm of science forced the way of networking from wired to wireless, which is very inexpensive and efficient. A new technology that provides dynamic connectivity to a network through wireless which is called as Wi-Fi (Wireless Fidelity), works on the principle of Radio transmission, but Wi-Fi is accessible only to a limited area, In this paper we are going to present about a technology which breaks the problems like limited area connectivity and also ECO Friendly, this can be possible with the help of WiMax(Worldwide Interoperability for Microwave Access), which supports the concept of Internet everywhere. However people are connected by opening up the Internet to create a more spontaneous and empowering broadband experience. If we have been in an airport, coffee shop, library or hotel recently, chances that we been right in the middle of a wireless network. Many people also use wireless networking, also called Wi-Fi or 802.11 networking. In the near future, wireless networking

may become so widespread that you can access the Internet just about anywhere at any time, without using wires, wireless networks are easy to set up and inexpensive.

Wireless network uses radio waves, just like cell phones, televisions and radios do. In fact, communication across a wireless network is a lot like two-way radio communication

1. A computer's wireless adapter translates data into a radio signal and transmits it using an antenna.

2. A wireless router receives the signal and decodes it. It sends the information to the Internet using a physical, wired Ethernet connection.

The process also works in reverse, with the router receiving information from the Internet, translating it into a radio signal and sending it to the computer's wireless adapter

Need for WiMax

WiMAX outdistances Wi-Fi by miles, WiMAX is short for Worldwide Interoperability for Microwave Access, and it also goes by the IEEE name 802.16, WiMAX would receive data from the WiMAX transmitting station, probably using encrypted data keys to prevent unauthorized users from stealing access this is the main advantage. In this way network security is also embedded.

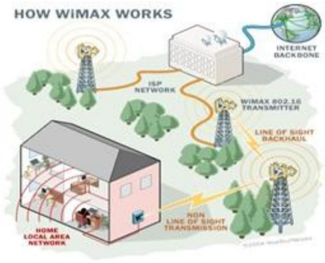
WiMAX has the potential to do to broadband Internet access what cell phones have done to phone access. In the same way that many people have given up their "land lines" in favor of cell phones, WiMAX could replace cable and DSL services, providing universal Internet access just about anywhere you go. WiMAX will also be as painless as Wi-Fi -- turning your computer on will automatically connect you to the closest available WiMAX antenna A WiMAX tower station can connect directly to the Internet using a high-bandwidth, wired connection (for example, a T3 line). It can also connect to another WiMAX tower using a line-of-

sight, microwave link. This connection to a second tower (often referred to as a backhaul), along with the ability of a single tower to cover up to 3,000 square miles, is what allows WiMAX to provide coverage to remote rural areas.

Wi-Fi-style access will be limited to a 4-to-6 mile radius (perhaps 25 square miles or 65 square km of coverage, which is similar in range to a cell-phone zone). Through the stronger line-of-sight antennas, the WiMAX transmitting station would send data to WiMAX-enabled computers or routers set up within the transmitter's 30-mile radius (2,800 square miles or 9,300 square km of coverage). This is what allows WiMAX to achieve its maximum range

WiMax Scenario

Internet service provider sets up a WiMAX base station 10 miles from our home. we would buy a WiMAX-enabled computer or upgrade our old computer to add WiMAX capability. we would receive a special encryption code that would give you access to the base station. The base station would beam data from the Internet to our computer (at speeds potentially higher than today's cable modems), for which we would pay the provider a monthly fee. The cost for this service could be much lower than current high-speed Internet-subscription fees because the provider never had to run cables. The WiMAX protocol is designed to accommodate several different methods of data transmission, one of which is Voice Over Internet Protocol (VoIP). VoIP allows people to make local, long-distance and even international calls through a broadband Internet connection, bypassing phone companies entirely. If WiMAX-compatible computers become very common, the use of VoIP could increase dramatically. Almost anyone with a laptop could make VoIP calls.



XOHM (4G Technology):

XOHM is coming – providing next-generation mobile broadband across your city. With XOHM, you no longer need to find a hotspot for a broadband internet experience – the hotspot comes with you. There are no compromises here – even if it's streaming fullscreen video. And with XOHM, you have one account and it's always available. No long-term contracts – you can pay by the day, the month or the year

XOHM won't just connect WiMAX-enabled products to the internet it'll allow them to connect across the network to each other. We expect this to open exciting new experiences beyond just getting online with the potential to change how we communicate, enjoy, and achieve - for example:

• Health: a mobile health monitor could track and transmit a user's vitals and alert a hospital or caregiver in case of an emergency.

• Sports: a runner's performance could be monitored by WiMAX-enabled chips built into her shoes to be shared with coaches, peers or spectators.

• Home Entertainment: While you're out of town, your WiMAX-enabled DVR could send a reminder to your phone that your favorite TV show is about to start - command it to record the show to watch later via your WiMAX-enabled portable video player

Next Generation Internet

Get ready to experience how spontaneous the internet can be. With XOHM mobile broadband, you'll be able to:

Stream movies, Watch a video, Download music, Share photos , Play games, Instant Message, E-mail, Surf the web Or whatever you want - around your home, office or on the go, wherever there's XOHM coverage - all on the same connection.

Article

3D Television

Mr R Sandeep Kumar
Department of CSE

Three-dimensional TV is expected to be the next revolution in the TV history. They implemented a 3D TV prototype system with real-time acquisition transmission, & 3D display of dynamic scenes. They developed a distributed scalable architecture to manage the high computation & bandwidth demands. 3D display shows high-resolution stereoscopic color images for multiple viewpoints without special glasses. This is first real time end-to-end 3D TV system with enough views & resolution to provide a truly immersive 3D experience. Japan plans to make this futuristic television a commercial reality by 2020as part of abroad national project that will bring together researchers from the government, technology companies and academia. The targeted "virtual reality" television would allow people to view high definition images in 3D from any angle, in addition to being able to touch and smell the objects being projected upwards from a screen to the floor.

The evolution of visual media such as cinema and television is one of the major hallmarks of our modern civilization. In many ways, these visual media now define our modern life style. Many of us are curious: what is our life style going to be in a few years? What kind of films and television are we going to see? Although cinema and television both evolved over decades, there were stages, which, in fact, were once seen as revolutions:

1) at first, films were silent, then sound was added;

2) cinema and television were initially black-and-white, then color was introduced;
3) computer imaging and digital special effects have been the latest major novelty.

BASICS OF 3D TV

Human gains three-dimensional information from variety of cues. Two of the most important ones are binocular parallax & motion parallax.

A. Binocular Parallax

It means for any point you fixate the images on the two eyes must be slightly different. But the two different image so allow us to perceive a stable visual world. Binocular parallax defers to the ability of the eyes to see a solid object and a continuous surface behind that object even though the eyes see two different views.

B. Motion Parallax

It means information at the retina caused by relative movement of objects as the observer moves to the side (or his head moves sideways). Motion parallax varies depending on the distance of the observer from objects. The observer's movement also causes occlusion (covering of one object by another), and as movement changes so too does occlusion. This can give a powerful cue to the distance of objects from the observer.

C. Depth perception

It is the visual ability to perceive the world in three dimensions. It is a trait common to many higher animals. Depth perception allows the beholder to accurately gauge the distance to an object. The small distance between our eyes gives us stereoscopic depth

perception. The brain combines the two slightly different images into one 3D image. It works most effectively for distances up to 18 feet. For objects at a greater distance, our brain uses relative size and motion As shown in the figure, each eye captures its own view and the two separate images are sent on to the brain for processing. When the two images arrive simultaneously in the back of the brain, they are united into one picture. The mind combines the two images by matching up the similarities and adding in the small differences. The small differences between the two images add up to a big difference in the final picture ! The combined image is more than the sum of its parts. It is a three-dimensional stereo picture.

ARCHITECTURE OF 3D TV

The whole system consists mainly three blocks:

1 Aquisition

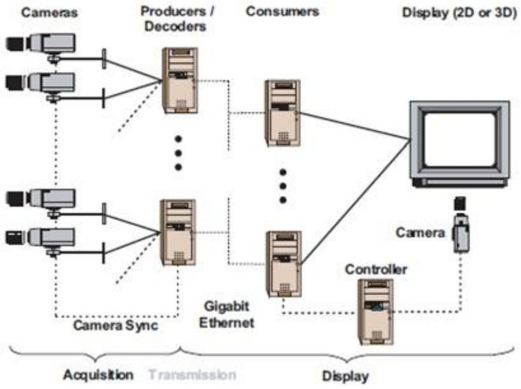
2. Transmission

3. Display Unit

A. Acquisition

The acquisition stage consists of an array of hardware-synchronized cameras. Small clusters of cameras are connected to the producer PCs. The producers capture live, uncompressed video streams & encode them using standard MPEG coding. The compressed video then broadcast on separate channels over a transmission network, which could be digital cable, satellite TV or the Internet.
Generally they are using 16 Basler A101fc color cameras with 1300X1030, 8 bits per pixel CCD sensors.

1) CCD Image Sensors: Charge coupled devices are electronic devices that are capable of transforming a light pattern (image) into an electric charge pattern (an electronic image).



2) MPEG-2 Encoding: MPEG-2 is an extension of the MPEG-1 international standard for digital compression of audio and video signals. MPEG-2 is directed at broadcast formats at higher data rates; it provides extra algorithmic 'tools' for efficiently coding interlaced video, supports a wide range of bit rates and provides for multichannel surround sound coding. MPEG- 2 aims to be a generic video coding system supporting a diverse range of applications. They have built a PCI card with custom programmable logic device (CPLD) that generates the synchronization signal for all the cameras. So, what is PCI card?

3) PCI Card:

There's one element the bus. Essentially, a bus is a channel or path between the components in a computer. We will concentrate on the bus known as the Peripheral Component Interconnect (PCI). We'll talk about what PCI is, how it operates and how it is used, and we'll look into the future of bus technology.

All 16 cameras are individually connected to the card, which is plugged into the one of the producer PCs. Although it is possible to use software synchronization, they consider precise hardware synchronization essential for dynamic scenes. Note that the price of the

acquisition cameras can be high, since they will be mostly used in TV studios. They arranged the 16 cameras in regularly spaced linear array.

3D DISPLAY

3This is a brief explanation that we hope sorts out some of the confusion about the many 3D display options that are available today. We'll tell you how they work, and what the relative tradeoffs of each technique are. Those of you that are just interested in comparing different Liquid Crystal Shutter glasses techniques can skip to the section at the end. Of course, we are always happy to answer your questions personally, and point you to other leading experts in the field. Figure shows a diagram of the multi-projector 3D displays with lenticular sheets.

They use 16 NEC LT-170 projectors with 1024'768 native output resolution. This is less that the resolution of acquired & transmitted video, which has 1300'1030 pixels. However, HDTV projectors are much more expensive than commodity projectors. Commodity projector is a compact form factor. Out of eight consumer PCs one is dedicated as the controller. The consumers are identical to the producers except for a dual-output graphics card that is connected to two projectors. The graphic card is used only as an output device. For real-projection system as shown in the figure, two lenticular sheets are mounted back-to-back with optical diffuser material in the center. The front projection system uses only one lenticular sheet with a retro reflective front projection screen material from flexible fabric mounted on the back. Photographs show the rear and front projection

Article

Green Cloud

Mr D Jayanarayana Reddy
Department of CSE

Abstract

Green computing is defined as the study and practice of designing , manufacturing, using, and disposing of computers, servers, and associated subsystems-such as monitors, printers, storage devices, and networking and communications systems-efficiently and effectively with minimal or no impact on the environment." The goals of green computing are similar to green chemistry; reduce the use of hazardous materials, maximize energy efficiency during the product's lifetime, and promote the recyclability or biodegradability of defunct products and factory waste. Research continues into key areas such as making the use of computers as energy-efficient as possible, and designing algorithms and systems for efficiency-related computer technologies.

There are several approaches to green computing, namely

• Product longetivity

• Algorithmic efficeincy

• Resource allocation

• Virtualization

• Power management etc.

Need of Green Computing in Clouds

Modern data centers, operating under the Cloud computing model are hosting a variety of applications ranging from those that run for a few seconds (e.g. serving requests of web applications such as e-commerce and social networks portals with transient workloads) to those that run for longer periods of time (e.g. simulations or large data set processing) on shared hardware platforms. The need to manage multiple applications in a data center creates the challenge of on-demand resource provisioning and allocation in response to time-varying workloads. Normally, data center resources are statically allocated to applications, based on peak load characteristics, in order to maintain isolation and provide performance guarantees.

Until recently, high performance has been the sole concern in data center deployments and this demand has been fulfilled without paying much attention to energy consumption. The average data center consumes as much energy as 25,000 households. As energy costs are increasing while availability dwindles, there is a need to shift focus from optimizing data center resource management for pure performance to optimizing for energy efficiency while maintaining high service level performance. According to certain reports, the total estimated energy bill for data centers in 2010 is $11.5 billion and energy costs in a typical data center double every five years.

Dynamic Voltage frequency scaling technique (DVFS)

Every electronic circuitry will have an operating clock associated with it. The operating frequency of this clock is adjusted so that the supply voltage is regulated. Thus, this method heavily depends on the hardware and is not controllable according to the varying needs. The power savings are also low compared to other approaches. The power savings to cost incurred ratio is also low.

Resource allocation or virtual machine migration techniques

In a cloud computing environment, every physical machine hosts a number of virtual machines upon which the applications are run. These virtual machines can be transferred across the hosts according to the varying needs and available resources. The VM migration method focuses on transferring VMs in such a way that the power increase is least. The most power efficient nodes are selected and the VMs are transferred across to them. This method is dealt in detail later.

Gartner's Report

Top IT Trends in 2016

The emergence of Digital Business has sparked a shift in the relationship between man and machine. Throughout the year Gartner will focus on three categories that will highlight the idea of human-machine cooperation and growth:

Machines Are Taking a More-Active Role in Enhancing Human Endeavors:

Because the machines are more connected than ever before, they have an increased ability to supplement human jobs and to reduce the cost of operations.

Digitalized Things Are Making Assisted Economic Decisions:

The increased use of computing machines in decision making is extending into the realm of financial choices with increasing consistency. This makes one begin to think about how many of the economic decisions we make will be supported by, then automated through, digital technologies.

Renovating the Customer Experience Is a Digital Priority:

The practical digital business sees customer experience innovation as the next frontier, and half of all consumer goods product investments are likely to be directed toward improving the customer experience

Our Vision

To prepare professionally superior and ethically strong global manpower in technology and management to serve the nation and the world in the 21st Century

Courses Offered

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- ECE – Electronics Communication Engineering
- EEE – Electrical & Electronics Engineering
- CIVIL – Civil Engineering
- CSE – Computer Science Engineering
- IT – Information Technology
- MECH – Mechanical Engineering

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Hostel Facility for Girls

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