DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

RISE-MAGAZINE

Recent Innovations In Sophisticated Electronics

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DEPARTMENT PROFILE

Electronics and Communication Engineering has emerged as the major driving force in the present day Information Technology revolution. It is acting as a bridge between different disciplines of engineering and technology. It has penetrated into other prominent sectors such as health care, instrumentation, agriculture, automation, signal processing, remote sensing etc.., The recent developments such as IoT, Artificial Intelligence and the mercurial advancements in the field of communication.

Vision

To be a focal centre for academic excellence in competing global standards and dynamics in the field of Electronics and Communication Engineering with research and services focusing on effective communication skills, entrepreneurial, ethical and social concern.

Mission

To impart quality technical education in Electronics and Communication Engineering with well established infrastructure, state- of- the art laboratories, core instructions and cognizant faculty.

To prepare the young and dynamic Electronics and Communication Engineers professionally deft and intellectually adept with knowledge, behaviour and information competency.

To enable the learners for changing trends in the field of Electronics and Communication Engineering with a focus on career guidance, placements and higher education by Industry-Institute relationship.

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PROGRAM EDUCATIONAL OBJECTIVES

PEO 1. Graduates should be cognizant in basic science, fundamental engineering stream along with core related domains in ECE and Allied fields.

PEO 2. Graduates should understand issues related to design, problem solving, and intellectually adept with knowledge, behavior and information competency.

PEO 3. Graduates should demonstrate their technical, communication, research, aptitudes along with leadership skills in professional environment to empower employability, higher education and entrepreneurs successfully through industry-institute interaction.

PEO 4. Graduate should be motivated with high ethical, human values and team work towards development of the societ.

PROGRAM OUTCOMES

ENGINEERING KNOWLEDGE: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PROBLEM ANALYSIS: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

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.

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.

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.

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.

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.

ETHICS: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

INDIVIDUAL AND TEAM WORK: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

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.

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.

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.

PROGRAM SPECIFIC OUTCOMES

PSO 1. An ability to get an employment in Electronics and Communication Engineering field and related industries and to participate & succeed in competitive examinations like GRE, GATE,TOEFL, PSUs, etc.

PSO 2. Should be able to design and test various electronic systems that perform analog and digital processing functions.

General Packet Radio Service

Wireless phone use is taking off around the world. Many of us would no longer know how to cope without our cell phones. Always being connected offers us flexibility in our lifestyles, makes us more productive in our jobs, and makes us feel more secure.

So far, voice has been the primary wireless application. But with the Internet continuing to influence an increasing proportion of our daily lives, and more of our work being away from the office, it is inevitable that the demand for wireless data is going to ignite. Already, in those countries that have cellular-data services readily available, the number of cellular subscribers taking advantage of data has reached significant proportions.

But to move forward, the question is whether current cellular-data services are sufficient, or whether the networks need to deliver greater capabilities. The fact is that with proper application configuration, use of middleware, and new wireless-optimized protocols, today's cellular-data can offer tremendous productivity enhancements. But for those potential users who have stood on the sidelines, subsequent generations of cellular data should overcome all of their objections. These new services will roll out both as enhancements to existing second-generation cellular networks, and an entirely new third generation of cellular technology.

In 1999, the primary cellular based data services were Cellular Digital Packet Data (CDPD), circuit-switched data services for GSM networks, and circuit-switched data service for CDMA networks. All of these services offer speeds in the 9.6 Kbps to 14.4 Kbps range. The basic reason for such low speeds is that in today's cellular systems, data is allocated to the same radio bandwidth as a voice call.

Since voice encoders (vocoders) in current cellular networks digitize voice in the range of 8 to 13 Kbps, that's about the amount available for data. Back then, 9.6 Kbps was considered more than adequate. Today, it can seem slow with graphical or multimedia content, though it is more than adequate for text-based applications and carefully configured applications.

There are two basic ways that the cellular industry is currently delivering data services. One approach is with smart phones, which are cellular phones that include a microbrowser. With these, you can view specially formatted Internet information. The other approach is through wireless modems, supplied either in PC Card format or by using a cell phone with a cable connection to a computer.

The GPRS services will reflect the GSM services with an exception that the GPRS will have a tremendous transmission rate which will make a good impact in the most of the existing services and a possibility of introduction of new services as operators and users (business/private) appreciate the newly introduced technology.

Services such as the Internet, videoconferencing and on-line shopping will be as smooth as talking on the phone, moreover we'll be able to access these services whether we are at work, at home or traveling. In the new information age, the mobile phone will deliver much than just voice calls. It will become a multi-media communications device, capable of sending and receiving graphic images and video.

The most common methods used for data transfer are circuit-switching and packet-switching. With circuit-switched transmission the dedicated circuit is first established across a sequence of links and then the whole channel is allocated to a single user for the whole duration of the call. With packet switched transmission, the data is first cut in to small parts called packages which are then sent in sequence to the receiver, which again builds the packages back together.

This ensures that the same link resources can be shared at the same time buy many different users. The link is used only when the user has something to send. When there is no data to be sent the link is free to be used by another call. Packet switching is ideal for bursty traffic, e.g. voice.

-----N Eshwar- 17BF1A04D1

Wireless Intelligent Network

(WIN) is a concept being developed by the Telecommunications Industry Association (TIA) Standards Committee TR45.2. The charter of this committee is to drive intelligent network (IN) capabilities, based on interim standard (IS)-41, into wireless networks. IS-41 is a standard currently being embraced by wireless providers because it facilitates roaming. Basing WIN standards on this protocol enables a graceful evolution to an IN without making current network infrastructure obsolete.

Today's wireless subscribers are much more sophisticated telecommunications users than they were five years ago. No longer satisfied with just completing a clear call, today's subscribers demand innovative ways to use the wireless phone. They want multiple services that allow them to handle or select incoming calls in a variety of ways.

Enhanced services are very important to wireless customers. They have come to expect, for instance, services such as caller ID and voice messaging bundled in the package when they buy and activate a cellular or personal communications service (PCS) phone. Whether prepaid, voice/data messaging, Internet surfing, or location-sensitive billing, enhanced services will become an important differentiator in an already crowded, competitive service-provider market.

Enhanced services will also entice potentially new subscribers to sign up for service and will drive up airtime through increased usage of PCS or cellular services. As the wireless market becomes increasingly competitive, rapid deployment of enhanced services becomes critical to a successful wireless strategy.

Intelligent network (IN) solutions have revolutionized wireline networks. Rapid creation and deployment of services has become the hallmark of a wireline network based on IN concepts. Wireless intelligent network (WIN) will bring those same successful strategies into the wireless networks.

Benefits of Intelligent Networks

The main benefit of intelligent networks is the ability to improve existing services and develop new sources of revenue. To meet these objectives, providers require the ability to accomplish the following:

Introduce new services rapidly

IN provides the capability to provision new services or modify existing services throughout the network with physical intervention.

Provide service customization

Service providers require the ability to change the service logic rapidly and efficiently. Customers are also demanding control of their own services to meet their individual needs.

Establish vendor independence

A major criterion for service providers is that the software must be developed quickly and inexpensively. To accomplish this, suppliers must integrate commercially available software to create the applications required by service providers.

Create open interfaces

Open interfaces allow service providers to introduce network elements quickly for individualized customer services. AIN technology uses the embedded base of stored program-controlled switching systems and the SS7 network. The AIN technology also allows for the separation of service-specific functions and data from other network resources. This feature reduces the dependency on switching system vendors for software development and delivery schedules. Service providers have more freedom to create and customize services.

The SCP contains programmable service-independent capabilities (or service logic) that is under the control of service providers. The SCP also contains service-specific data that allows service providers and their customers to customize services. AIN is a logical technology, which can help service providers meet local number portability. AIN LNP solutions are so flexible that AIN provides service without the burden of costly network additions to the service providers.

------R Meghana- 17BF1A04H6

Integrated Voice and Data

IBM has created evolutionary solutions for data networks in anticipation of the dynamic trends and business advantages of integrating voice onto data networks. IBM's strategy is to provide high quality equipment and services with cost saving implementations that enable networks either to be upgraded using the installed base or architected to start simple and grow fast in cost-effective steps while accommodating new technologies or standards.

Voice and data integration is currently a hot topic within the business community, with its promise of major cost savings and consolidation of data and voice infrastructures. But there remains some skepticism and the old adage 'if it ain't broke, don't fix it' certainly has a few adherents. However, while PBX based telephone systems have certainly proved their worth in the past, there is growing evidence that the demands of modern business will increasingly necessitate the implementation of integrated voice and data systems. Up to now, small sites were the ones that showed themselves willing to adopt the new standard, but now it is the large enterprise sites with existing PBX based systems that are beginning to be seduced by the significant business and cost benefits that a migration to VoIP technology can bring.

Voice and data integration, or convergence, is the next mission-critical, must-have technology, according to many telecommunications experts. As businesses upgrade their networks or build new infrastructure, many are turning to integrated networking solutions that use packet-switched networks to accommodate voice and video in addition to data.

Examples of integrated solutions include Frame Relay, ATM (Asynchronous Transfer Mode) and voice over IP. From a pure business perspective, moving toward integration seems wise, especially as competition becomes more fierce and operating costs continue to rise. Networking voice and data can help your business to be more productive and efficient, enabling you to use the same technology and personnel for different operations.**------P Sai Rathna- 17BF1A04G2**

Gi-Fi Next Generation Wireless Technology

Wi-Fi (ieee-802.11b) and Wi-Max (ieee-802.16e) have captured our attention. As there is no recent developments? which?? transfer data at faster rate..as video information transfer taking lot of time. This leads to introduction of Gi-Fi technology .It offers some advantages over Wi-Fi, a similar? wireless technology ,in that it offers faster information rate in Gbps ,less power consumption and low cost for short range transmissions.

Gi-Fi?? which is developed on a integrated wireless trnsceiverchip.In which a small anteena used and both transmitter- receiver integrated on a single chip.which is fabricated using the complementary metal oxide semiconductor (CMOS)process.?? Because of Gi-Fi?? transfer of large videos, files will be with in seconds.

Gi-Fi will helps to push wireless communications to faster drive. For many years cables ruled the world. Optical fibers played a dominant role for its higher bit rates and faster transmission. But the installation of cables caused a greater difficulty and thus led to wireless access. The foremost of this is Bluetooth which can cover 9-10mts. Wi-Fi followed it having coverage area of 91mts. No doubt, introduction of Wi-Fi wireless networks has proved a revolutionary solution to ?last mile? problem. However, the standard?s original limitations for data exchange rate and range, number of channels, high cost of the infrastructure have not yet made it possible for Wi-Fi to become a total threat to cellular networks on the one hand, and hard-wire networks, on the other. But the man?s continuous quest for even better technology despite the substantial advantages of present technologies led to the introduction of new, more up-to-date standards for data exchange rate i.e., Gi-Fi.

Gi-Fi or Gigabit Wireless is the world?s first transceiver integrated on a single chip that operates at 60GHz on the CMOS process. It will allow wireless transfer of audio and video data up to 5gigabits per second, ten times the current maximum wireless transfer rate, at one-tenth of the cost, usually within a range of 10 meters. It utilizes a 5mm square chip and a 1mm wide antenna burning less than 2watts of power to transmit data wirelessly over short distances, much like Bluetooth.

The development will enable the truly wireless office and home of the future. As the integrated transceiver is extremely small, it can be embedded into devices.**----- P Tej Kumar- 17BF1A04H1**