



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

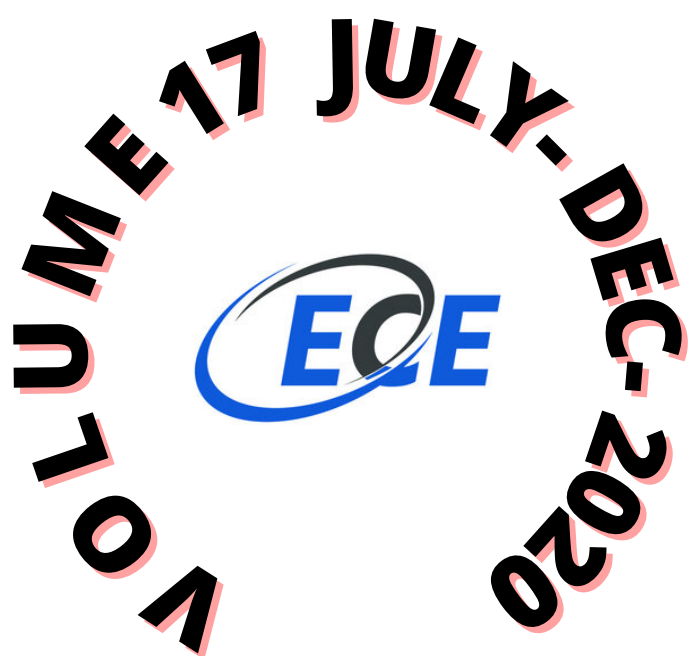
To be a focal centre for academic excellence in competing global standards and dynamics in the field of Electronics and Communication Engineering with research and services focusing on effective communication skills, entrepreneurial, ethical and social concern.

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.



SV College of Engineering Tirupati

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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.

Smart Quill

Lyndsay Williams of Microsoft Research's Cambridge UK lab is the inventor of the Smartquill, a pen that can remember the words that it is used to write, and then transform them into computer text. The idea that "it would be neat to put all of a handheld-PDA type computer in a pen," came to the inventor in her sleep. "It's the pen for the new millennium," she says.

Encouraged by Nigel Ballard, a leading consultant to the mobile computer industry, Williams took her prototype to the British Telecommunications Research Lab, where she was promptly hired and given money and institutional support for her project.

The prototype, called SmartQuill, has been developed by world-leading research laboratories run by BT (formerly British Telecom) at Martlesham, eastern England. It is claimed to be the biggest revolution in handwriting since the invention of the pen.

The sleek and stylish prototype pen is different from other electronic pens on the market today in that users don't have to write on a special pad in order to record what they write. User could use any surface for writing such as paper, tablet, screen or even air. The SmartQuill isn't all space-age, though -- it contains an ink cartridge so that users can see what they write down on paper. SmartQuill contains sensors that record movement by using the earth's gravity system, irrespective of the platform used. The pen records the information inserted by the user. Your words of wisdom can also be uploaded to your PC through the "digital inkwell", while the files that you might want to view on the pen are downloaded to SmartQuill as well.

It is an interesting idea, and it even comes with one attribute that makes entire history of pens pale by comparison-if someone else picks your SmartQuill and tries to write with it- it won't. Because user can train the pen to recognize a particular handwriting. Hence SmartQuill recognizes only the owner's handwriting. SmartQuill is a computer housed within a pen which allows you to do what a normal personal organizer does. It's really mobile because of its smaller size and one handed use. People could use the pen in the office to replace a keyboard, but the main attraction will be for users who usually take notes by hand on the road and type them up when returning to the office. SmartQuill will let them skip the step of typing up their notes.

WORKING

SmartQuill is slightly larger than an ordinary fountain pen. Users can enter information into these applications by pushing a button on the pen and writing down what they would like to enter. The SmartQuill does not need a screen to work. The really clever bit of the technology is its ability to read handwriting not only on paper but on any flat surface - horizontal or vertical.

There is also a small three-line screen to read the information stored in the pen; users can scroll down the screen by tilting the pen slightly. The user trains the pen to recognize a particular handwriting style - no matter how messy it is, as long as it is consistent, the pen can recognize it. The handwritten notes are stored on hard disk of the pen.

The pen is then plugged into an electronic "inkwell", text data is transmitted to a desktop computer, printer, or modem or to a mobile telephone to send files electronically. Up to 10 pages of notes can be stored locally on the pen. A tiny light at the tip allows writing in the dark. When the pen is kept idle for some time, power gets automatically off.

FEATURES

- Display technology used in SmartQuill
- Handwriting recognition and signature verification
- Display scrolls using tilt sensors
- Communication with other devices
- Memory and power

ACCELEROMETER TECHNOLOGY

This technology uses a device called Accelerometer which is used for measuring motion. A tiny accelerometer in a pen could be used to detect the stops and starts, arcs and loops of handwriting, and transmit this information to a small microprocessor that would make sense of it as text. There's also the possibility of viewing a full page of text through a special monocular magnified "virtual" screen that could be built into the end of the pen.-----**D Poojitha- 17BF1A0444**

Automatic Number Plate Recognition

Automatic Number Plate Recognition or ANPR is a technology that uses pattern recognition to 'read' vehicle number plates." work by tracking vehicles' travel time between two fixed points, and therefore calculate the average speed "In simple terms ANPR cameras 'photograph' the number plates of the vehicles that pass them. This 'photograph' is then fed in a computer system to find out details about the driver and owner of the vehicle and details about the vehicle itself "ANPR consists of cameras linked to a computer.

"As a vehicle passes, ANPR 'reads' Vehicle Registration Marks - more commonly known as number plates - from digital images, captured through cameras located either in a mobile unit, in-built in traffic vehicles or via Closed Circuit Television (CCTV).

"The digital image is converted into data, which is processed through the ANPR system.

ANPR is used for Detecting crime through the use of intelligence monitoring.

- o Identifying stolen vehicles.
- o Detecting vehicle document crime
- o electronic toll collection etc.

There are six primary algorithms that the software requires for identifying a licence plate:

1. Plate localisation - responsible for finding and isolating the plate on the picture
2. Plate orientation and sizing - compensates for the skew of the plate and adjusts the dimensions to the required size
3. Normalisation - adjusts the brightness and contrast of the image
4. Character segmentation - finds the individual characters on the plates
5. Optical character recognition
6. Syntactical/Geometrical analysis - check characters and positions against country specific rules
7. Poor image resolution, usually because the plate is too far away but sometimes resulting from the use of a low-quality camera.
8. Blurry images, particularly motion blur and most likely on mobile units.----- **E Bhanulatha-**

17BF1A0451

Battery Less Phones

If we just date back to January 9, 2007, it's the date when the world first witnessed a smart phone, and in fact, the first 'Touch screen phone'. Mr. Jobs, the owner of Apple Inclusive launched the "I-phone" aiming to turn everyone's life uncomplicated. And then, it has been ten years since the launch of the smart phone, and in these 10 years, the world has observed a revolutionary change in the era of smart phones. One of the most drastic changes was witnessed in the batteries of these smart phones, ranging from 1000mAh to 5000mAh on an average. In the past couple of years, intense usage of smart phones for various purposes has resulted in battery draining at a rapid rate.

A. Perspective for Battery Less Phones

A lot of discrepancies about the battery's performance were going on around the world. The issue about the battery's anomalous drain lead to the research of innovative stuff, which furthermore lead to the invention of these Battery Less Mobiles. Smart Phones these days are a real help for the human race, the way they are used to reduce our burden and anxiety by saving our time is just unexplainable, And to the fact that everyone knows about the battery affair, people still purchase phones to stay connected to the world, and hence, these battery less phones were created to replace the battery's draining issue and to offer an effective method of staying connected to the world.

B. Battery Less Smart Phones Vs Battery Saving Applications

The multi task calculating apps can increase your battery's life, but to a very small extent. These apps maintain your phone's battery life by clearing other apps from the background and by suggesting you the precautions about how to use your phones effectively, but battery less phones are way different as the battery doesn't exist and hence they will be greatly helpful in the future, especially for upcoming generations [3]. So, this paper will completely focus on the methods about how to implement the technology as soon as possible and what could be the effective changes in it.

A. Conserves Electricity

Since the phone doesn't consist of a battery, it saves electricity to a great amount. As per a survey, it approximately costs a person around 5\$ a year to charge a phone. The amount may not seem that big, but it increases to 500 \$ for 10 years and around 5000\$ in a century. So now it can be easily figured that battery less phone can save electricity and money by large amounts.

B. Saves Time

From some of the latest facts and figures, it was estimated that a person usually spends approximately 2.5 hours in a day while waiting for the phone to charge. The amount of time increases to around 1000 hours in a year.

C. Low Power Consumption

As explained earlier, the battery free cell-phone consumes only 3.5 microwatts of power, which is captured from ambient power sources. On an average, it was found that charging your phone consumes 1kWh of power in a year. The power is quite low as compared to the time period of one year, Although if we imagine that if a normal mobile with battery consumes this much power, then how many years would it take for a battery less cell phone to use 1kWh of power? The answer goes even beyond hundred thousand years, so it saves power by a huge amount.

D. No Charging Issues

The fact is not hidden that charging a phone, again and again, annoys a person, the most. Charging a phone completely and plugging it once more after using it for some hours, displeases the user in emergency and crucial situations. With the battery less phone, anyone can operate the phone anytime and anywhere without worrying about the sudden drain of the battery.

It was extremely astonishing to witness that a group of researchers have finally developed a phone that uses no power, which means the phone has no battery and harnesses energy from ambient signals and light sources. Even Mr. Jobs, who designed the first ever smart phone, might have never thought that smart phones would be that smart that someday we would be able to use it without a rechargeable option, that is without a battery.----- **G Yeshwanth- 17BF1A0457**

Geriatric Care System Using Electronically Controlled Air Jacket

An event of fall is one of the common problems faced by the older adults that can cause injuries and lead to hospitalization. The event of a fall in the case of an elderly person is more likely to result in hospitalization when compared to children. This fear hinders the independence of older people preventing them from leading a normal life like other individuals. A dread of fall event also has dramatic psychological consequences in the older adult since it drastically reduces the self-confidence of the individual. This distress may also contribute to future falls with more severe impact and the mental and physical health of the individual. The consequences of a fall event also depend on the time delay in providing appropriate medical assistance.

Elderly individuals are the quickest growing section of the total populace. As indicated by the World Health Organization, 30 % of the older person fall at least once every year. Fall and fall-related injuries are responsible for 70% of accidental death in persons who are aged 75 years and above. A dread of fall additionally has emotional mental results on the psychological wellness of an elderly individual since it ruins the self-assurance of the person. Falls and fall-related injuries are the third cause of chronic disability. Along with this increase, the proportion of older adults who are frail and dependent is also likely to rise significantly.

Therefore, fall and fall-induced fractures are common among the oldsters, this shift in demographic patterns will lead to an exponential increase in numbers of individuals who experience the ill effects of injuries because of fall and fall-related occasions. Hip fractures account for most of the costs associated with fall and fall-induced fractures, particularly among older people. Also, older people who are living alone have the highest risk of delayed medical intervention. To address the consequences mentioned above of fall and fall-related injuries and the problem of deferred medical assistance, it is imperative to detect the falls as soon as they occur so that immediate assistance can be provided. Hence, the primary aim of this project is to detect and minimize the impact of fall when an old person falls and ensure timely medical assistance by sending the information of the fall event to the caregivers.-----**G Kiran Kumar Naidu- 17BF1A0456**