

Department of  
**COMPUTER SCIENCE & ENGINEERING**

# TECH-EXPLORER

Technical Magazine

2019-20 Half Yearly Technical Magazine Volume No:V (July 2019 - Dec 2019)

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Artificial Intelligence  
Quntum Computing  
Virtual Reality  
Internet of Things  
Machine Learning

## EDITORIAL BOARD

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# NARAYANA

ENGINEERING COLLEGE:: NELLORE



## Vision of the institute

To be one of the nation's premier Institutions for Technical and Management Education and a key contributor for Technological and Socio-economic Development of the Nation.

## Mission of the institute

To produce technically competent Engineers and Managers by maintaining high academic standards, world class infrastructure and core instructions.

To enhance innovative skills and multi disciplinary approach of students through well experienced faculty and industry interactions.

To inculcate global perspective and attitude of students to face real world challenges by developing leadership qualities, lifelong learning abilities and ethical values.

## Vision of the Department

To be a choice for education in the area of Computer Science and Engineering, serve as a valuable resource for IT industry & society and exhibit creativity, innovation and ethics to cater the global challenges.

## Mission of the Department

M1: To educate learners by adapting innovative pedagogies for enhancing their cognitive skills, technical competence and lifelong learning.

M2: To provide training programs and guidance to learners through industry institute partnerships, social awareness programs, internships, competitions and project works to inculcate research skills to address the global challenges.

M3: To provide opportunities for students to practice professional, social and ethical responsibilities using IT expertise with a blend of leadership and entrepreneurial skills.

## Program Educational Objectives (PEOs)

**PEO-1 :** Procure employment/progress towards higher degree and practice successfully in the CS/IT profession. (Successful Career Goals).

**PEO-2 :** Address complex problems by adapting to rapidly changing IT technologies. (Professional Competency).

**PEO-3 :** Gain respect and trust of others as effective and ethical team member by demonstrating professionalism and functioning effectively in team-oriented and open-ended activities in industry and society. (Leadership, Ethics and Contribution to Society).



## (PROGRAM SPECIFIC OUTCOMES) PSOs

**Domain Specific Knowledge:** Apply the relevant techniques to develop solutions in the domains of algorithms, system software, computer programming, multimedia, web, data and networking.

**Software Product Development:** Apply the design and deployment principles to deliver a quality software product for the success of business of varying complexity.

## (PROGRAM OUTCOMES) POs

**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, review 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 multi disciplinary 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 multi disciplinary 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.

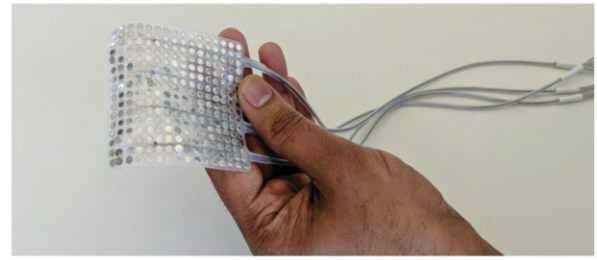


## COMPUTER PROGRAM CONVERTS BRAIN SIGNALS TO A SYNTHETIC VOICE

A new computer program translates brain signals into language. The technology tracks the electrical messages passed to muscles in and around the mouth to decode what the brain is trying to say. Further tests are needed, but the developers say it could be used to design brain implants to help people who have suffered a stroke or brain disease communicate.

We want to create technologies that can reproduce speech directly from human brain activity, Edward Chang, a neurosurgeon at the University of California, San Francisco, who led the research, said during a press conference. This study provides a proof of principle that this is possible. He and his colleagues describe the results in *Nature* today.

The technique is highly invasive and relies on electrodes placed deep in the brain. As such, it has only been tested so far on five people with epilepsy who have had the electrodes fitted as part of their treatment. These people could—and did—speak during the tests, and this allowed the computer to work out the associated brain signals. The scientists must now check if it works in people who cannot speak.



It's still an open question whether you will be able to get enough brain data from people who can't speak to build your decoder, but he says the study is elegant and sophisticated and the results show promise. Speech is one of the most complex motor actions in the human body. It requires precise neural control and coordination of muscles across the lips, tongue, jaw, and larynx. To decode this activity, the scientists used the implanted electrodes to track signals sent from the brain when the volunteers read aloud a series of sentences. A computer algorithm analyzed these instructions using a pre-existing model of how the vocal tract moves to make sounds.

**G. Sowmya**

16711A0518, IV CSE

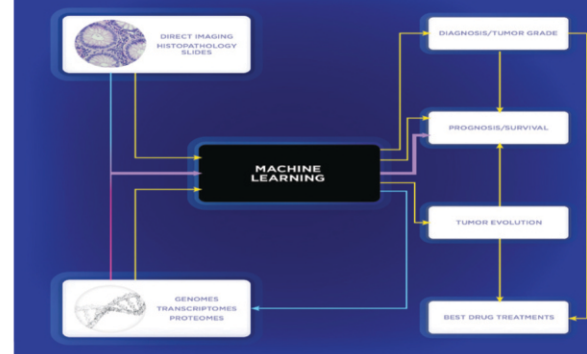
## ALL USES IMAGES AND OMICS TO DECODE TO DECODE CANCER

Finding and treating cancer before it progresses too far can be key to increased survival. When it comes to cervical cancer, for example, early detection leads to five-year survival rates of more than 90 percent. Doctors can fry, freeze, or excise precancerous cells in the top four millimeters of the cervix's transformation zone, a ring of tissue surrounding the cervix where cancer most often arises. Once the cancer metastasizes, however, survival rates drop to 56 percent or lower over five years.

Early treatment is common place in developed nations, where women get regular Pap smears to check for abnormal cervical cells and tests for the human papillomavirus that causes the cancer. But in the developing world, such screenings are rare. There is a cheaper test—health care workers coat a woman's cervix in acetic acid, looking for telltale white areas that could indicate cancer—but this technique is so inaccurate, says medical epidemiologist Mark Schiffman of the National Cancer Institute. As a result, some healthy women undergo treatment while others might have their precancerous cells missed, leading to cancer that requires more-radical treatments, such as chemotherapy, radiation, or hysterectomy.

### How AI Takes On Cancer

Scientists have been using two main forms of clinical data to predict cancer outcomes: images (either photographs, as in the case of skin cancer, or pathology slides) and -omes of various sorts. Applying ever-more sophisticated machine learning approaches to these datasets can yield accurate diagnoses and prognoses, and even infer how tumors evolve (yellow arrows). Now, scientists are finding that images can predict -omics (blue arrows). Combining the two data sources gives researchers even better predictions of how long a cancer patient will live (thick purple arrows). The ultimate goal of these algorithms, currently under development in basic biology labs, is to help doctors select treatments and forecast survival.



**G. Sailu**

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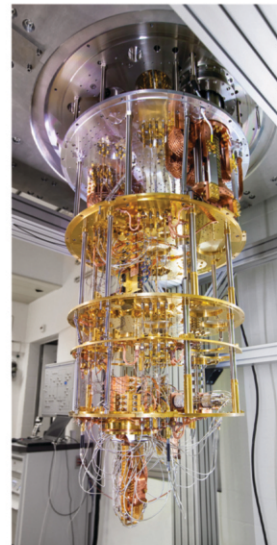
## FIRST UNIVERSAL PROGRAMMABLE QUNTUM COMPUTER

A quantum computer is a model of how to build a computer. The idea is that quantum computers can use certain phenomena from quantum mechanics, such as superposition and entanglement, to perform operations on data. The basic principle behind quantum computation is that quantum properties can be used to represent data and perform operations on it. A theoretical model is the quantum Turing machine, also known as the universal quantum computer.

When quantum computers eventually reach larger scales, they'll probably remain pretty precious resources, locked away in research institutions just like our classical supercomputers. So anyone who wants to perform quantum calculations will likely have to do it in the cloud, remotely accessing a quantum server somewhere else. A new double-blind cryptography method would ensure that these calculations remain secret. It uses the uncertain, unusual nature of quantum mechanics as a double advantage.

Imagine you're a developer and you have some code you'd like to run on a quantum computer. And imagine there's a quantum computer maker who says you can run your code.

Here's how it would work: You, the developer, prepare some quantum bits, in this case photons that have a polarity (vertical or horizontal) known only to you. Then you would send these to the remote quantum server. The computer would entangle the qubits with even more



qubits, using a quantum entangling gate — but the computer wouldn't know the nature of the entangled states, just that they are in fact entangled. The server is blind to the entanglement state, and anyone tapping into the server would be blind, too.

Blind quantum computation is more secure than classical blind computation.

**M. Asritha**

16711A0540, IV CSE

## VIRTUAL REALITY - THE FUTURE SCOPE



The virtual reality (VR) business kept on creating throughout the following couple of decades, yet offer was restricted to just the most driven specialists and early connectors because of the cost of parts, and the PCs that fuelled them.

The tech world can't quit discussing VR because of the most recent wearable tech items; VR is more open than any other time in recent memory. In any case, however regularly traded, VR inundates you in an advanced situation you associate with.

VR is well known in computer games, VR influencer and organizer trusts that VR will long be utilized for different purposes.

These include further social associations and completely immersive encounters. It'll be intriguing to perceive how these progressions the way we collaborate with PCs.

### Virtual Reality- The Future Is Here!

We're simply beginning to break the surface with VR. The development of all-encompassing video and photograph is making it simple to transport watchers to places they would never physically be. Despite the fact that VR's present essential utilize is gaming, it has critical potential for business utilize. Top worldwide tech organizations like Apple, Samsung, Microsoft, Google, IBM, HP, Intel and Foxconn have just put resources into VR.

Through along these lines, Fullestop presents the infographic where you can see whole about virtual reality and their future arranging.

**B. Suvarna Bhavitha**

16711A0507, IV CSE



## A POWER - EFFECTIVE AUDIO ACQUISITION SYSTEM FOR SMART CITY APPLICATIONS

Acoustic noise has adverse effects on human activities. Aside from hearing impairment and stress-related illnesses, it can also interfere with spoken communication, reduce human performance and affect the quality of life. As urbanization is intensifying, the potential benefits of reducing noise pollution in smart-city environments are extensive. Noise levels can be collected and analyzed using a wireless sensor network which can monitor the noise level by using microphones. However, every wireless system struggles in terms of the battery requirements needed for continuous data collection and monitoring. In this paper, the design of a testbed for a smart microphone system is presented. To save power, a microcontroller and an Analog-to-Digital Converter (ADC) dynamically switch between high and low power modes in response to environmental noise. Specifically, the high powered components are triggered by a spike in the acoustic noise level. Three wireless technologies, WiFi (2.4 GHz), Bluetooth Low Energy (BLE) 4.0 and Zigbee were examined. According to the results, the power consumption of a node can be lowered by 97% when idle based on the testbed.

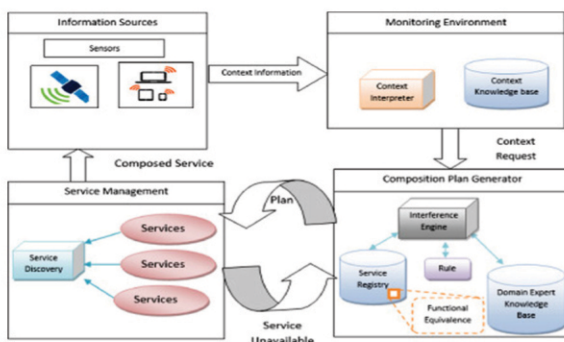
A common problem in urban cities is acoustic noise pollution. Noise pollution is an abundance of noise in a concentrated area that can harm humans both physically and mentally. To alleviate this problem, the first step is to understand and analyze what acoustic noise citizens are being exposed to daily. Smart cities enable the introduction of new technology to the public through different services that optimize resource usage, transportation, utilities and more. In a smart city, large amounts of data are collected and utilized. This is done to predict, analyze, and observe trends that happen throughout the city based on various sensors.

Audio data is an example of sensory information being collected. The amount of human comfort in different locations within a city can be found by analyzing noise levels collected by multiple microphones. By creating a tool that can visualize the levels of acoustic noise around the city, its people are given the ability to react and adjust accordingly.

**N. Bhavana**

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## FESC: FUNCTIONALLY EQUIVALENT SERVICE COMPOSITION



In the last few decades, researchers have focused on developing smart environment applications. In a smart environment, different kinds of smart devices are continuously working to make the lives of the inhabitants more comfortable. Smart environments are dynamic with respect to the context of user and availability of devices and services. A challenging problem is to satisfy a user's request in case a service is unavailable in such environments. In this paper, we develop a novel method that provides a functionally equivalent service corresponding to an unavailable service. A knowledge-based system using a meta-reasoner tree is used to obtain a functionally equivalent service. The proposed approach is validated using a smart cooking system.

Recent technological advances in handheld devices, sensors, and communication networks have transformed the vision of pervasive systems into a reality today. Pervasive systems are embedded with a context-aware component that automatically senses and adapts itself to the changes in the environment without user intervention. These systems assist the users by composing the services according to the context. There exist several state-of-the-art context-aware systems such as Anamika, Scooby, and AUTO.

Context is any information that can be used to characterize the situation of an entity. An entity is a person, place, object, or environment that is considered relevant to the interaction between a user and an application, including the user and applications themselves. Context-awareness means that the system is able to use context information.

**P. Haripriya**

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## Contactless Payment

With the use of NFC in the smart phones, they can be used in place of wallet, credit cards, debit cards etc. Cards with a direct physical contact interface are known as contact smart cards which receive power from the reader they are inserted in and exchange data with it using physical contacts while cards with a remote contactless interface are known as contactless smart cards which are waived from a very short distance so that electromagnetic wave from the reader will be used as the energy source, and wireless communication like NFC will be used for data exchange at the same time. SIM (Subscriber Identity Module) cards which are a must requirement in cell phones, in addition to authenticating users to the cellular network, contain a secure storage area, which provides necessary security conditions and performs data encryption and decryption. Mobile Network Operators (MNOs) and service providers such as banks use this area to provide value added services such as mobile financial services, e-government services, digital signature services, etc. to the users. Thus NFC is used for the electronic payment in which SIM card acts as a contactless smart card while the users smart phone acts as a mobile wallet



**K. Vinitha**

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## Transit and Ticketing

Contactless tickets, once introduced, will result in increase in speed and ease with which all consumers can use public transport like buses and access controlled environments like parking garages, transportation gates or get into events etc. Thus making travelling quite comfortable and fast. Also provides flexibility of choosing sources and destination compared to present format and decreases wastage of resources like paper and time making it an eco friendly option along with providing better monitoring thus giving way for transparency of the system NFC-enabled smart phones can be used as a room key in hotels making the check-in and check-out procedure free of standing in queues and waiting. Instead a person can directly enter their allotted rooms after making a booking and in return receiving a soft-key to their rooms.

### CONCLUSION:

Near Field Communication has already begun to shape the future of electronic gadgets in people's life. As the prices of chip manufacturing falls, the likelihood is that NFC-enabled mobile phones will become standard and their applications will become a part and parcel of life. According to a survey [17] it is found that NFC technology was preferred by people over other technologies including Bluetooth Beacons and QR codes. It is inferred that NFC technology works on the basis of RFID

technology which uses magnetic field induction as a medium to establish communication between electronic devices placed closely and operating at 13.56 MHz as it is unlicensed frequency and can transmit data at a maximum rate of 424kbps



**G. Preethi**

16711A0520, IV CSE

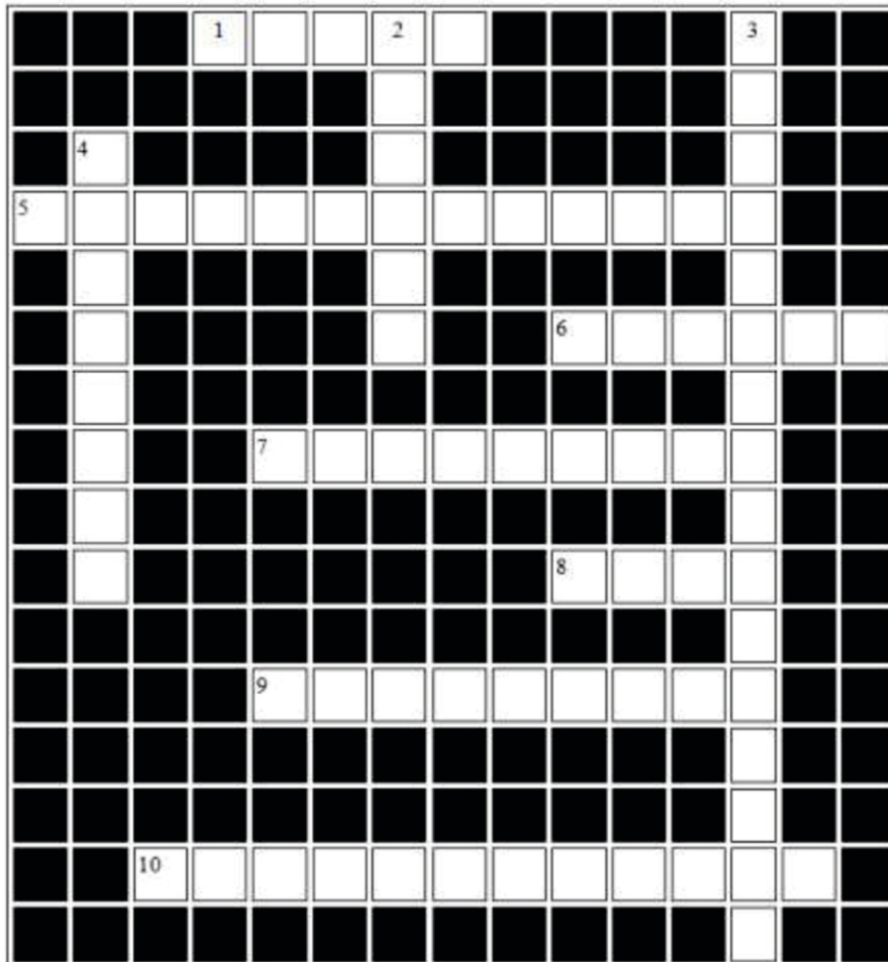
## CROSSWORD PUZZLES

## ACROSS

1. A \_\_\_\_\_ statement must be placed in between cases
5. Execute a loop a specific amount of times determined in advance
6. Classes require a main \_\_\_\_\_ in order to be an executable program
7. Variables that cannot change
8. Program used to code
9. Variable names must start with a \_\_\_\_\_ letter
10. Used when a task is needed to be done if the outcome of the comparison is false, you need to use the else part of this to be true

## DOWN

2. Stores information in contiguous memory blocks
3. Used to evaluate an expression and tries to match the result to several possible cases
4. Arrays are used to \_\_\_\_\_ a counted loop



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