MIET
Muhamed Institute of Education & Technology
INSTITUTIONS
Since 1984

E- FOCUS

COMPUTER SCIENCE & ENGINEERING

2018-19

Message from the Chairman

Er . A . Mohamed Yunus

Chairman – M.I.E.T. Institutions.

Being the current world not a hasty track, the responsibility of creating a high-quality educational institution is challenging and embellished with a host of initiatives which validate them over an extended time span. Moreover, in a world where time and space are compacted, there is a massive defy for success which necessitates knowledge, which is current, pertinent and based on real experience. In this situation, the education plays a paramount role in moulding, shaping and preparing youngsters to face the challenges of the future world. We at M.I.E.T., motivate and empower our students to be enduring learners, critical thinkers and prolific members of an ever-changing global society.

Also, the students are encouraged to channelize their potential in the pursuit of fineness in a holistic and student-centered environment. Moreover, M.I.E.T strives hard to sensitize its students to the needs of the community and inculcate values like truthfulness, fortitude and acceptance of individual differences. I am confident that M.I.E.T will always be a bonfire of light guiding the fate of its students, while blistering kindness and compassion as it ascends high in its pursuit of academic excellence and accomplishment of our motto “Humanize, Equalize, Spiritualize”.

To ensure the same, we have an excellent portfolio of industry professionals and academicians on our faculty, who provide a holistic view of the shades of engineering and managerial operations to our students. The students are prepared to enrich their careers by endowing them with the necessary talent and critical thinking to become self-directed learners and prolific citizens contributing positively to the society.

Message from the Principal

Dr . X . Susan Christina, M.E., Ph.D.
Principal – MIET Engineering College

In a fast developing nation like ours, the technical education proves to be the backbone and stepping stone to move into the domicile of a developed nation. It is well acknowledged that Engineers are vital to augment the economy and society. Manifestly their knowledge and skills are in high demand across a range of sectors, from manufacturing to financial services. So it becomes the imperative responsibility of the technical institutions to harvest talented engineering professionals to meet the current and future demand across the globe.

Our M.I.E.T. Engineering College has been enthusiastically contributing in the mission of transforming the rural India into developed nation by administering the institution with a high degree of innovation, creativity, human intelligence and passion towards excellence.

It gives me massive pleasure to welcome you to the M.I.E.T. Engineering College which has a wonderful green campus and is equipped with state-of-art infrastructure. It was established during the year 1998 and ever since its inception; it is promoting excellence in various disciplines of engineering education through highly qualified dedicated faculty members and magnificent infrastructure. We have well equipped laboratories, Research and development cell, Training and placement department, workshops, auditoriums, seminar halls and library to aid the students in achieving highest standards in academics, research and professional skills. It ensures the young engineers and budding managers to enhance their capacity to innovate and their problem solving skills besides helping them to develop their critical thinking, communication and soft skills those prove to be very crucial along with their sound academic knowledge. However the main focus of the Institution is to enrich our students with comprehensive overall knowledge, wisdom, practical exposure and training both at the academic level and in the highly competitive global professional market. Students are also encouraged to display their flair in co-curricular and extracurricular activities conducted both inside and out the campus. M.I.E.T. ultimately ensures that the students prove themselves to be not only well qualified engineers and managers but also very accountable and epitome citizens for the nation.

Message from the HOD

Dr.V.Chandrasekar
HOD/CSE

I am extremely happy to bring out this message for our Department magazine released for the academic year 2018 – 2019. This magazine provides a platform for students and staff to share information, spread the latest technical knowledge and cultivate right ways that will equip all of us to stay competent in our respective fields of study and research. I welcome all the students & their parents to the Department of Computer Science and Engineering. Computer Science and Engineering is an essence of today's world. We are committed to providing not only the technical education to our students but also the leadership qualities through which they can create employment to others.

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. The outside world will come to know about the caliber of the students and the faculty through this magazine.

EDITORIAL BOARD

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VISION AND MISSION OF THE INSTITUTION AND THE DEPARTMENT

VISION OF THE INSTITUTION

To be a center of excellence in Technical Education through Technical, Ethical and Professionals skills for meeting the diverse needs of the Society, in particular Muslim minority community and the Nation.

MISSION OF THE INSTITUTION

- To impart Quality Education, Training and Research in the fields of Engineering and Technology.
- To provide a conducive learning environment that enables the students to achieve professional and personal growth.
- To expose the contemporary issues of society, ethical practices and to create environmental awareness.
- To provide the required infrastructural facilities for developing the professional and innovative skills.

VISION OF THE DEPARTMENT

To attain excellence in Computer Science and Engineering field so as to address societal problems through active research, maintaining ethical standards.

MISSION OF THE DEPARTMENT

M1. To empower with technical skills to solve the real time problems through interdisciplinary approach.

M2. Expose to international ethical practices.

M3. Provide personality development for an effective leader and individual member of a team.

DEPARTMENT EVENTS

DEVELOPMENT OF SOFTWARE

On 18-07-18, the department organized an Industrial Visit on **"Development of Software"** to Purple Pro InfoTech (PPIT) which is a fast growing organization who offers a wide variety of services to match business organization who offers a wide variety of services to match business needs and having 8 years of experience in Medical equipment providing. Students accompanied by faculties P.Manikandan, R.Venkatesan, A.Barveen, G.Megala and we believe that was a sparkle for great future entrepreneurs.

The second year CSE students accompanied by B.Rama, R.Deepa, P.Ramesh and M.K.Mohamed Faizal to the same company in the first week of August 2018.

To develop the student's Technical skill to meet out with respect to industrial perspective, the department organized the Industrial Visit for III year students on 25-07-2018 for "**Website Design and Development and necessity of Optimization in current trends**" to Lansa informatic Pvt Limited, Coimbatore. Faculty members S.Shanmugapriya, M.Jilsath Begum, S.Manikandan and P.Christopher guided the students in all aspects.

SEMINAR ON ETHICAL HACKING

Seminar was organized on "**Ethical Hacking"** on 07/08/2018 for the Final year students. An expert in Ethical hacking, **Mr.Vivek, CEO of Ozone Cyber Security, Kerala** has delivered a lecture and also shown a live demonstration about how ethical hacking was done **.** Students benefitted by understanding how ethical hacking benefits many organizations computer and individual system by providing security with effective manner before the attack takes place. He also specified the WannaCry ransomware attack which was happened on May 2017 the worldwide cyber attack by the WannaCry ransomwarecryptoworm, which targeted computers running the Microsoft Windows operating system by encrypting data and demanding ransom payments in the Bitcoin cryptocurrency.

Seminar on "**Realization of AWT and Swings in JAVA**" on 19-07-2018 for the second year CSE Students. **Mr.Saravana Raman, M.Tech,(Ph.D), Associate Professor/HOD, Department of Computer Science & Engineering, Shri Angalamman College of Engg &**

Tech., Trichy was the key note speaker for the session**.** He fashioned awareness among students about the learning of Java software, Abstract Window Toolkit and Swings.

Seminar on "**Web Services and application Protocol** " on 29-09-2018 for the Third year CSE Students. **Mr.A.Ramsankar M.E., Senior Associate Cognizant, Coimbatore** was the key note speaker for the session**.** He exemplified about the need and the significance of Web services and AJAX and also he conferred the applications and placement questions and scope of java and J2EE.

CSI STUDENT CHAPTER INAUGURAL

The Department of Computer Science and Engineering, M.I.E.T Engineering College has organized an inaugural function for "**Computer Society of India Student Chapter"** on 28.12.18 at 10.30 A.M.

Er.A.Mohamed Yunus, Chairman, M.I.E.T Educational Institutions delivered the presidential address. **Dr. X.Susan Christina, Principal** M.I.E.T Engineering College delivered the special address, **Dr.T.Karthikeyan, Director, Planning & Development** felicitated the gathering.

Dr.V.Chandrasekar, HOD/CSE delivered the welcome address and **Mrs.S.Shanmugapriya**, Faculty co-ordinator, **CSI** delivered about the benefits of CSI and informed the forth coming activities.

Chief Guest, Dr.Gopinath Ganapathy, Registrar, Bharathidasan University, Trichy **Guest of Honor**, **Dr.Ravimaran Shanmugam**, Immediate Past Chairman, CSI Local Chapter, Trichy **Special Guest, Dr.B.Sekar**, Past secretary of CSI Local chapter and Vice President of Internet Users Club have inaugurated the **Computer Society of India Student Chapter** function.

In this session, Dr.Gopinath Ganapathy motivated the students to choose any of the interested fields such as Automation, Application Development, etc. to develop themselves to succeed in the chosen domain and to become an Entrepreneur. He motivates the point that china will be the technical competitor for us. So he asked the young students in India to enrich their technical knowledge and competent with china technology.

Dr. Ravimaran Shanmugam encouraged students to participate a minimum of 3 conferences and technical events per semester. So that student can gain a vast knowledge on

different domains in their field of engineering. He also insisted the faculties to motivate the students in entrepreneur activities.

Dr.B.Sekar insisted the students to be updated according to the current trends because learning curriculum is alone not enough for self development. Students should know the needs and expectations of industries and learn new technologies.

WORKSHOP

One day workshop on Ethical Hacking in association with CSI and Ozone Cyber Security, Ernakulum Kerala was held in the Seminar Hall on March 1, 2019.

During the workshop, Mr.Vivek, CEO, Ozone Cyber Security, starts the session with the techniques of password hacking, system hacking, data hacking and data recovery in various operating systems such as Kali Linux, Windows 7.

At the end of the session students were learnt about the security issues and how to protect the data from hackers.

TISCA '19

(Triggering Innovation in Significant Computing Advancement)

The Department of Computer Science and Engineering, has conducted **a National Level Technical Symposium –** in association with CSI & TISCA '19 on **23-02-2019 (Saturday)**

Er. A. Mohamed Yunus, Chairman, M.I.E.T Educational Institution presided over the function. **Dr. X. Susan Christina,** Principal, M.I.E.T. Engineering College, Trichy felicitated the Gathering and **Dr.T.Karthikeyan**, Director, Planning and Development addressed the students, **R. Karishma**, Student, III year CSE presented the annual report. The Souvenir was released during this grand occasion.

Mr. V. Ramachandran, General Manger, Kothari Sugars and Chemicals Limited, Trichy delivered the Inaugural address. Many events were organized throughout the day in which the students from various Engineering colleges participated actively. Models related with current era were created by the students of our College displayed in this symposium.

In paper presentation event, 35 papers were received from various engineering colleges. After scrutinizing the papers by the event coordinators and HOD, 12 papers were selected for final presentation.

Guest speaker Dr.K. Rajbabu., Deputy Manger, BHEL, Trichy and Dr.K.Geetha, Professor / CSE are the judges for the paper presentation session.

The winners were honoured with prizes and certificates. Dr.K. Rajbabu., Deputy Manger, BHEL, Trichy and Dr.V.Chandrasekar HOD/CSE distributed the prizes and Ms.Priyanka of III CSE proposed the vote of thanks.

On the same day the project expo was also conducted for the students to encourage their technical and presentation skills.

FACULTY DEVELOPMENT PROGRAM ON INTRODUCTION TO BIG DATA ANALYTICS

MIET Engineering College conducted two days Faculty Development Programme on 13th & 14th May 2019 in **Concert with ICT Academy on Introduction to Big Data Analytics** for the faculties of Information & Communication Engineering (CSE, ECE & EEE). **Alhaj.Er. A. Mohamed Yunus,** Chairman, M.I.E.T Educational Institution presided over the function. **Dr.X.Susan Christina,** Principal welcomed the gathering and Dr.T.Karthikeyan, Director, Planning and Development gave the felicitation address. Dr.K.Geetha Prof/CSE briefed about the ICT academy and introduced the trainer Ms.D.Kamatchi Devi of ICT academy.

During the programme the practical foundation level training was provided which enabled the immediate and effective participation of big data technology and other analytics project. It included four major modules that provided the complete knowledge about bigdata concepts, tools that are used to process big data, source of data generation & the applications of big data, the analytic methods used to find the new insights of existing data.

STUDENT ENHANCEMENT PROGRAMME

Research and development lab has been setup for High-end innovation centre for Internet of Things.

POLICE TRAINING PROGRAM

The six days training program was conducted for the police trainees to learn the basics of computers by **A.Barveen, G.Megala, P.Ramesh, R.Deepa, P.Christopher,** and **Ashok kumar.**

CERTIFICATE OF MERIT

The following faculty members have produced 100 percentage results in the Anna university examination held during April 2018. **Mrs.A.Barveen, Mr.R.Venkatesan, Mr.P.Manikandan, Mr.P.Christopher.**They received the merit certificate from the Principal and the Head of the Department.

SPOKEN TUTORIAL

The Spoken Tutorial Online course has been offered to CSE department students for this academic year **2018-2019 Even** Semester. There were around 88 students attended the online exam. From those attended candidates, 45 students received the E-Certificates for clearing the online exam.

BEST PROJECT

The following projects were selected as a best project for the academic year 2018-2019.

1. **S.Lavanya, R.Punitha and R.Preethi have done their project entitled "**Smart soil parameters estimation system using electronic node based wireless sensor network "under the guidance of P.Christopher.
2. **G.Durgadevi and G.Bhuvaneswari have done their project entitled "**Freakish Driver Oversee System Using Vision Based Approach" under the guidance of S. Manikandan
3. **V.Sivasankari and Z.Yasmin have done their project entitled "**Smart Exclusive Security System for Chick" under the guidance of B.Rama.
4. **Sanofar Raj Mohamed, K.Tamilselvi and S.Shameema Shanas have done their project entitled "**Mobile based automated E-ration system using OTP security" under the guidance of B.Rama.
5. **P.Rajkumar, M.Syed Abdul Razak and M.Muruganandam have done their project entitled "**A human Behavior analysis for Ambient-assisted living recognition" under the guidance of R.Venkatesan.

ABSTRACT

SMART SOIL PARAMETERS ESTIMATION SYSTEM USING ELECTRONIC NODE BASED WIRELESS SENSOR NETWORK

S.Lavanya, R.Punitha, R.Preethi

Agriculture is one of the important business the normally affected the mankind life. From the ancient to the agricultural revolution in India, farming is the way that human used to harvest plants and consumed them in their daily life. This method presents the design of a wireless sensor network (WSN) system for smart estimation of soil conditions. In spite of, soil nutrients testing methodologies are still a concern as most of them are time consuming and require laborious sampling which is expensive. In this project, electronic node (e-node) based wireless sensor network is designed particularly to solve this issue. Soil sensing stations installed in a precision agriculture farm can generate real time soil data online to keep track of soil status based on volatile organic compounds (VOCs). Principal component analysis (PCA) has successfully classified VOCs indicating different level of soil fertility based on soil organic matter (SOM). VOCs pattern obtained from our e-node is in accordance with the laboratory soil test report on total organic matter thus confirming the potential of e-node technology to identify the soil VOCs model that will be useful for soil nutrient management in precision agriculture. This feature eliminates the need to perform time-consuming laboratory analysis to continuously monitor the value of this nutrient. And also extend the framework to connect with database for farmers to post the products. These products details are send to members to buy online with favourable prices. The framework‘s aim is to support farmers in the design of their production systems at the farm level.

FREAKISH DRIVER OVERSEE SYSTEM USING VISION BASED APPROACH

G.Durgadevi and G.Bhuvaneswari

Drowsiness and fatigue of automobile drivers reduce the drivers' abilities of vehicle control, natural reflex, recognition and perception. Such diminished vigilance level of drivers is observed at night driving or overdriving, causing accident and pose severe threat to mankind and society. Therefore it is very much necessary in this recent trend in automobile industry to incorporate driver assistance system that can detect drowsiness and fatigue of the drivers. This project presents a nonintrusive prototype computer vision system for monitoring a driver's vigilance in real time. Eye tracking is one of the key technologies for future driver assistance systems since human eyes contain much information about the driver's condition such as gaze, attention level, and fatigue level. One problem common to many eye tracking methods proposed so far is their sensitivity to lighting condition change. This tends to significantly limit their scope for automotive applications. Localization and tracking of the eye can be useful in face alignment. This project describes real time eye detection and tracking method that works under variable and realistic lighting conditions. It is based on a hardware system for the real-time acquisition of a driver's images using camera and the software implementation for monitoring eye that can avoid the accidents. We can implement this project in real time using C#.NET as front end and SQL SERVER as back end.

SMART EXCLUSIVE SECURITY SYSTEM FOR CHICK

V.Sivasankari and Z.Yasmin

Recently personal security has become a sensitive issue. Small kids, ladies, as well as aged people need to have their secure against kidnapping, rape, chain snatching respectively. There are different areas and scopes of security. Recent social incidents gave us motivation to develop personal security system. Kids, aged people and ladies mostly not able to fight against criminal for self-security. Today's world is full of rush and most of the women work independently to support their family. They have to work till late night. For such women, safety is the most important requirement. The security issue for such women comes forward because cases of harassment and rapes on those women are increasing. Best suitable system for those women will be a portable system which the women will be able to carry will her and easy to use. Portable system will generate a shock which will make to attacking person to get back. After generation of shock the message will be sent with the help of Global System for Mobile Communication (GSM) on the particular number stored and the location of those women is traced with the help of Global Positioning System (GPS). If the message is not checked by the particular number mentioned, the system will continuously give the call until the message is checked by the particular number mentioned.

MOBILE BASED AUTOMATED E-RATION SYSTEM USING OTP SECURITY

Sanofar Raj Mohamed, K.Tamilselvi and S.Shameema Shanas

The ration distribution system is one of the largest government‟s economic policies in India. Its main motto is to provide food grains (sugar, wheat, rice, kerosene etc.) to the people at affordable rates. Civil supply distribution system in today's scenario faces lots of challenges &controversial issues like illegal smuggling of goods and corruption. These controversies include wrong entries in the manual register of centre containing wrong stock information of the commodities that are supplied or delivered to the consumer ,other times the actual goods provided by the government for the distribution doesn't reach the common people effectively as the information. The manual system is facing many problems such as, a Card holder doesn’t know about the arrivals of goods. Card holders waiting time for collecting ration by standing in queue for hours together. Lots of fraudulent activities in the ration dispensing societies. Maintenance of records in the form of hardcopy is difficult. So, the proposed system has the following, it is used to notify card holders about the arrival of goods, to purchase goods online and collect it from ration centre in the allotted time. It is also used to maintain the amount of goods sold, making payment in a secure manner by maintaining record, tallying amount of goods sold and profit earned from it, which prevents smuggling.

A HUMAN BEHAVIOR ANALYSIS FOR AMBIENT-ASSISTED LIVING RECOGNITION

P.Rajkumar, M.Syed Abdul Razak and M.Muruganandam

To present a unified framework for human action and activity recognition. Human Activities can be roughly classified into two types. 1). Large number of person's presents, but only a few of them are active. 2). There are a small number of persons presents, but the majority of them are active. To summarize a set of events and to search for particular events because they contain various pieces of context information. Tree based interaction mining algorithms are designed to analyze the structures of the trees and to extract interaction flow patterns. The system has been used by a variety of groups during face-to-face meetings. It compares the effectiveness of the new and traditional style interfaces with respect to these requirements.

ARTICLES

HUMANS AND MACHINES CAN IMPROVE ACCURACY WHEN THEY WORK TOGETHER

Whether artificial intelligence systems steal humans' jobs or create new work opportunities, people will need to work together with them.

Researchers use sensors and computers to monitor how the brain itself processes decision-making. Together with another brain-computer interface scholar, they looked at one example of possible human-machine collaboration – situations when police and security staff are asked to keep a lookout for a particular person, or people, in a crowded environment, such as an airport.

It seems like a straightforward request, but it is actually really hard to do. A security officer has to monitor several surveillance cameras for many hours every day, looking for suspects. Repetitive tasks like these are prone to human errors.

Some people suggest these tasks should be automated, as machines do not get bored, tired or distracted over time. However, computer vision algorithms tasked to recognize faces could also make mistakes. As my research has found, together, machines and humans could do much better.

Two types of artificial intelligence

Two AI systems developed that could help identify target faces in crowded scenes. The first is a facial recognition algorithm. It analyzes images from a security camera, identifies which parts of the images are faces and compares those faces with an image of the person that is sought. When it identifies a match, this algorithm also reports how sure it is of that decision.

The second system is a brain-computer interface that uses sensors on a person's scalp, looking for neural activity related to confidence in decisions.

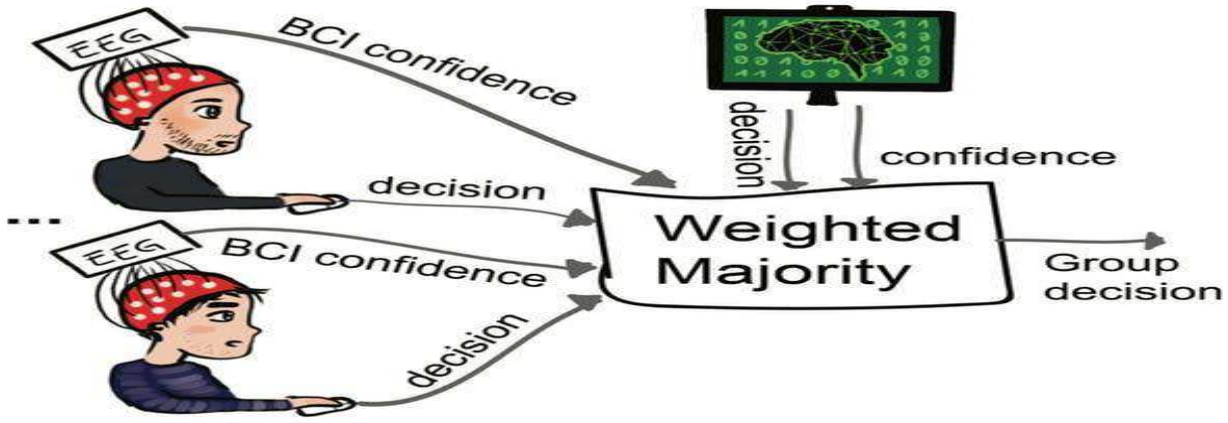
People and computers were asked to look at images like this briefly and then identify whether they had seen a particular face. ChokePoint data, NICTA

An experiment conducted with 10 human participants, showing each of them 288 pictures of crowded indoor environments. Each picture was shown for only 300 milliseconds – about as long as it takes an eye to blink – after which the person was asked to decide whether or not they had seen a particular person's face. On average, they were able to correctly discriminate between images with and without the target in 72 percent of the images.

When entirely autonomous AI system performed the same tasks, it correctly classified 84 percent of the images.

Human-AI collaboration

All the humans and the standalone algorithm were seeing the same images, so it sought to improve the decision-making by combining the actions of more than one of them at a time.



Factoring humans' decisions, and confidence level in those choices, together with algorithmic judgments, yields a more accurate result than people or machines can deliver independently.

To merge several decisions into one, individual responses are weighted by decision confidence – the algorithm's self-estimated confidence, and the measurements from the humans' brain readings, transformed with a machine-learning algorithm. It found that an average group of just

humans, regardless of how large the group was, did better than the average human alone – but was less accurate than the algorithm alone.

However, groups that included at least five people and the algorithm were statistically significantly better than humans or machine alone.

Keeping people in the loop

Pairing people with computers is getting easier. Accurate computer vision and image processing software programs are common in airports and other situations. Costs are dropping for consumer systems that read brain activity, and they provide reliable data.

Working together can also help address concerns about the ethics and bias of algorithmic decisions, as well as legal questions about accountability.

The humans were less accurate than the AI. However, the brain-computer interfaces observed that the people were more confident about their choices than the AI was. Combining those factors offered a useful mix of accuracy and confidence, in which humans usually influenced the group decision more than the automated system did. When there is no agreement between humans and AI, it is ethically simpler to let humans decide.

It has found a way in which machines and algorithms do not have to – and in fact should not – replace humans. Rather, they can work together with people to find the best of all possible outcomes.

By

G.MEGALA (AP/CSE)

POLICE USE OF FACIAL RECOGNITION TECHNOLOGY MUST BE GOVERNED BY STRONGER LEGISLATION

Automated facial recognition technology has been used at a number of crowd events in England and Wales over the past two years to identify suspects and prevent crime. The technology can recognize people by comparing their facial features in real time with an image already stored on a "watch list", which could be from a police database or social media account.

Such technology is becoming increasingly popular for police forces around the world. Where successful, it can have positive and headline-grabbing effects – for example tracing missing children in India. But facial recognition technology is controversial, with research showing that it can be inaccurate and discriminatory. San Francisco is even considering a complete ban on its use by police.

Several British police forces have ongoing facial recognition trials. New research into the legal challenges posed by the police use of facial recognition technology suggests that, from the data made publicly available, arrest rates are low and far outweighed by the number of incorrect matches made in live public surveillance operations. This creates a risk that innocent people may be stopped and searched, which may be a daunting experience.

Such trials are also costly. South Wales Police received a £2.6m government grant to test technology, and, so far, the Metropolitan Police has spent over £200,000 on its on-going trial.

The police have also been criticised for questionable practices in the use of facial recognition technology. The Metropolitan Police built and used a watch list of "fixated individuals" on Remembrance Sunday in 2017. Reports suggest these people were identified, in some cases, on criteria relating to their mental ill-health, raising concerns that the technology was used in a discriminatory manner.

In June 2017 at the UEFA Champions League final in Cardiff, South Wales Police reportedly deployed facial recognition technology using low-quality images provided by the football governing body, UEFA, and the system produced more than 2,000 false positive matches. Its accuracy improved in subsequent deployments, but false positive matches still frequently outnumber successful identifications.

Impact on human rights

When justifying their use of facial recognition technology in terms of its effectiveness in crime control and prevention, senior police figures tend to suggest they are mindful of human rights concerns, and that their deployments of the technology are lawful and proportionate. However, the courts have not yet tested these claims, and parliament has not debated the appropriate limits of this technology by the police.

Facial recognition technology breaches social norms of acceptable conduct in public space. When in public, we might expect to be subject to a passing glance from others, including police officers. But we expect to be free from sustained or intensive scrutiny, involving cross-referencing back to our social media feeds. Facial recognition technology allows the police to extract such personal information from us, and use this information in ways we cannot control.

The limited independent testing and research that has been done so far into facial recognition technology indicates that numerous systems misidentify ethnic minorities and women at higher rates than the rest of the population. South Wales Police has suggested, without publishing a detailed statistical breakdown, that its system does not suffer from these drawbacks. Despite calls for rigorous testing on the performance of facial recognition system from the scientific community, the Metropolitan Police has not published how its system has performed relative to the gender, ethnicity or age of those subject to its use.

This creates a risk that minority groups, who are already arrested at much higher rates than white people, will be further over-policed following false positive matches.

Need for tighter regulation

As questions over its accuracy remain, it's too early for the police to be using facial recognition technology surveillance in live policing operations. Accuracy isn't the only issue with the

technology though, and as it improves it's important to think about how facial recognition technology should be regulated. While police deployments of facial recognition technology must comply with the Data Protection Act 2018, and the Surveillance Camera Code of Practice, these legal regimes don't provide guidelines or rules specifically regulating its use by the police. As a result, the regulatory framework gives little indication or guidance about the proper threshold at which inclusion on a watch list is lawful.

In their trials, police forces have been collecting, comparing and storing data in different ways. In 2018 the UK's Information Commissioner expressed concern about the absence of national-level co-ordination and a comprehensive governance framework to oversee facial recognition deployment. Most images used to populate watch lists are gathered from police databases, often from when people are taken into custody. There is a particular risk that people with old and minor convictions, or even those who have been arrested or investigated but have no convictions at all, may find themselves stigmatized through facial recognition surveillance.

Given the impact of facial recognition technology on human rights, its use by police should be limited, focusing only on serious crimes or threats to public safety, rather than being used as pervasively as public CCTV currently is. Inconsistent practices between police forces also suggest the need for a narrower regulatory framework. This should keep the size of watch lists small and improve the quality requirements of technology systems and the way images are compiled and stored for watch lists. As some police forces have already begun to embrace facial recognition surveillance, legislators must keep pace so that human rights are respected.

By

A.BARVEEN (AP/CSE)

QUANTUM COMPUTING

Quantum computers could spur the development of new breakthroughs in science, medications to save lives, machine learning methods to diagnose illnesses sooner, materials to make more efficient devices and structures, financial strategies to live well in retirement, and algorithms to quickly direct resources such as ambulances.

But what exactly is quantum computing, and what does it take to achieve these quantum breakthroughs? Here's what you need to know.

A new kind of computing

We experience the benefits of classical computing every day. However, there are challenges that today's systems will never be able to solve. For problems above a certain size and complexity, we don't have enough computational power on Earth to tackle them.

To stand a chance at solving some of these problems, we need a new kind of computing. Universal quantum computers leverage the quantum mechanical phenomena of superposition and entanglement to create states that scale exponentially with number of qubits, or quantum bits.

Quantum computing fundamentals

All computing systems rely on a fundamental ability to store and manipulate information. Current computers manipulate individual bits, which store information as binary 0 and 1 states. Quantum computers leverage quantum mechanical phenomena to manipulate information. To do this, they rely on quantum bits, or qubits.

Inside a quantum computer

There are a few different ways to create a qubit. One method uses superconductivity to create and maintain a quantum state. To work with these superconducting qubits for extended periods of time, they must be kept very cold. Any heat in the system can introduce error, which is why quantum computers operate at temperatures close to absolute zero, colder than the vacuum of space.

Quantum Computation

There are a few different ways quantum systems use quantum properties to compute. Let's investigate one type of algorithm designed for current quantum hardware, which uses quantum computing to find the "best" solution among many possible solutions.

This algorithm can be used to simulate a molecule by determining the lowest energy state among various molecular bond lengths. For each possible bond length, parts of the energy state

are represented on a quantum processor. Then, aspects of the quantum state are measured and related back to an energy in the molecule, for the given electronic configuration.

Repeating this process for different inter-atomic spacings eventually leads to the bond length with the lowest energy state, which represents the equilibrium molecular configuration.

In addition to algorithms for near-term quantum computing systems, researchers have designed algorithms for future quantum systems, often referred to as fault-tolerant quantum computers. These systems will need to perform many sequential quantum operations and run for long periods of time.

Scaling Quantum Systems

What does it take to create a fault-tolerant quantum system? To increase the computational power of a quantum computer, improvements are needed along two dimensions.

One is qubit count; the more qubits you have, the more states can in principle be manipulated and stored. The other is low error rates, which are needed to manipulate qubit states accurately and perform sequential operations that provide answers, not noise.

A useful metric for understanding quantum capability is quantum volume. It measures the relationship between number and quality of qubits, circuit connectivity, and error rates of operations. Developing systems with larger quantum volume will lead to discovering the first instances of applications where quantum computers can offer a computational advantage for solving real problems.

Future scope for Quantum in CSE

Well scientists have been trying to implement quantum technology in networking and cyber security. With quantum networking, the things we do online can get way better, practically the data wouldn't be transported, it will be teleported, quantum computing could be that fast.

Quantum security can turn a lot of tables because normal encryption can only generate a limited number of keys, but in a quantum computer since there are qubits, keys generated would be really indecipherable and would be nearly impossible for hackers to crack unless they have a quantum computer.

By

V.PRASANA

III Year CSE

GALLERY

MOU SIGNED WITH LIVEWIRE AND OZONE CYBER SECURITY

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