



RNS INSTITUTE OF TECHNOLOGY
DEPARTMENT OF INFORMATION SCIENCE &
ENGINEERING

IT YUKTA
2018 *an epitome of innovation*





Dr. R.N.Shetty
Chairman, R N Shetty Trust

MESSAGE FROM DIRECTOR



It gives me immense satisfaction by knowing that ITYUKTA has promoted co-curricular activities just like how RNSIT promotes education and quality learning. ITYUKTA has always encouraged students to go beyond the ordinary and share their perspectives with fellow students. The newsletter promises excellent technical articles which has not only kept the students but also the faculty spellbound. I am proud to say that our students step in to learn, explore, then step out with self-confidence and knowledge. ITYUKTA has played a major role in achieving this.

Dr. H N Shivashankar
Director, RNSIT

MESSAGE FROM PRINCIPAL

I heartily congratulate the department of ISE for their newest release 8th edition of ITYUKTA. This edition brings you the recent trends and advancements in technology. I would like to thank all our students for their contribution towards ITYUKTA. I also appreciate the efforts of Dr. M V Sudhamani, the Chief Editor, and other members of the editorial team who have worked hard to ensure that the newsletter remains a treasure trove of knowledge. I wish them good luck in their endeavors.

Dr. M K Venkatesha
Principal, RNSIT



MESSAGE FROM HOD

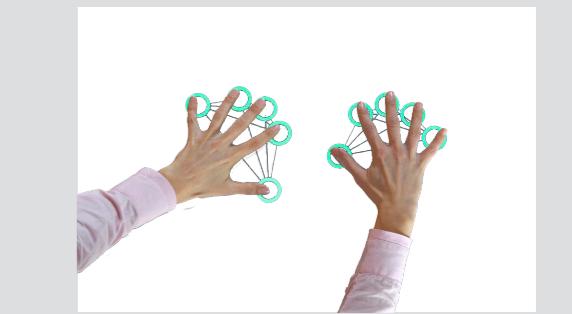


The Department of Information Science & Engineering is composed of an Undergraduate program in Information Science & Engineering with an intake of 120, and a Postgraduate program in Computer Network Engineering with an intake of 18. The Department has been accredited by the National Board of Accreditation (NBA) in September 2011. Department have started Center of Excellence in Data Science to provide a platform to enhance the quality in teaching-learning process and achieve the technological benchmarks. Department of ISE in association with CSE department organized two International conferences on Data Engineering and Communication System (ICDECS) during 2011 and

2015 respectively. Students of the department have secured twelve ranks in the VTU examinations and I personally and on behalf of faculties, heartily congratulate them. I appreciate the efforts of students in conduction of the department Techno-Cultural Fest ITYUKTA, inter-college paper presentation PRASTHUTHI, Project Open House Presentation PROP'18 conducted with CSE and the editorial team members of newsletter ITYUKTA for their hard work. I congratulate the authors who have contributed to ITYUKTA. The newsletter is released annually during May. I would like to thank the management, the Director, the Principal, the staff and students for their continuous support in bringing out this newsletter.

Dr. M V SUDHAMANI
Professor & HOD

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THE AMERICAN ENTREPRENEUR

- By Sai Abhishek 4TH SEM

He was born on Jan 12th in Albuquerque in New Mexico, U.S. Jeff studied at Miami Palmetto High School and also worked in the McDonald's during his study in the high school. He received a silver knight award and also a high school valedictorian and a national merit scholar. Jeff graduated from the Princeton University with 4.2 grade having Bachelor of Science degrees in Electrical Engineering and Computer Science Engineering.

THE RISING OF AMAZON

Jeff resigned his job at D.E. Shaw Company and started a online book store at his garage on July 5th 1994 and named his company 'AMAZON'. Jeff had successfully expanded his enterprise to all the means of shopping needs and is the most trusted online store in quality and service feedback across the world. Amazon also introduced many smart home devices like the Alexa which is most successful. Jeff's net worth is around 126.5 billion and also remarked himself as the richest person in the world multiple times. Jeff also owns other ventures like the 'Washington Post' and 'Blue Origin'.

Some CEOs golf in their spare time. Bezos spends his extra hours on:

THE WASHINGTON POST

Monthly page views more than tripled, to 890 million, since Bezos bought the company in 2013. The storied publication has launched a variety of digital products, including an outside contributor section to rival the Huffington Post, and an internal web-traffic optimization tool called Bandito.

BLUE ORIGIN

Based in an old Boeing plant in Kent, Wash., it has developed a spacecraft, the New Shepard, which launched into suborbital space and returned to earth. Blue Origin plans to begin flying people to the edge of space by 2017. Bezos intends to be in an early wave of passengers, after the company's test engineers.

BEZOS EXPEDITIONS

The Amazon CEO's investment arm has staked a variety of startups, including public companies such as Workday, Twitter, and Juno Therapeutics; private "unicorns" like Airbnb, Uber, and Nextdoor; and smaller companies in diverse fields, such as Vessel (entertainment), Everfi (education), and Glassybaby (collectibles).

ACHIEVEMENTS

In 1999, Jeff received his first major award when Time named him "Person of the Year". In 2008, he was selected by U.S. News & World Report as one of America's best leaders. Jeff was awarded an honorary Doctorate in Science and Technology from Carnegie Mellon University in 2008. In 2011, The Economist gave Bezos and Gregg Zehr an Innovation Award for the Amazon Kindle. In 2012, Bezos was named Businessperson of the Year by 'Fortune'. In 2014, he was ranked the best-performing CEO in the world by 'Harvard Business Review'. He has also figured in Fortune's list of 50

great leaders of the world for three straight years, topping the list in 2015. In 2016, Bezos received a \$250,000 prize for winning the Heinlein Prize for Advances in Space Commercialization, which he donated to the Students for the Exploration and Development of Space. In February 2018, Bezos was elected to the National Academy of Engineering for "leadership and innovation in space exploration, autonomous systems, and building a commercial pathway for human space flight". In March 2018, he was awarded the Buzz Aldrin Space Exploration Award in recognition of his work with Blue Origin.



JEFFREY PRESTON BEZOS is an American technology entrepreneur, investor and a philanthropist who is the founder, chairman and chief executive officer of the world largest successful store "AMAZON"



FACE RECOGNITION

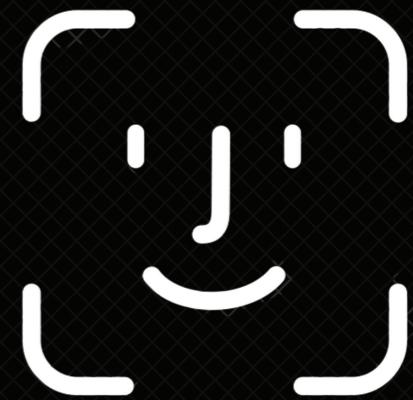
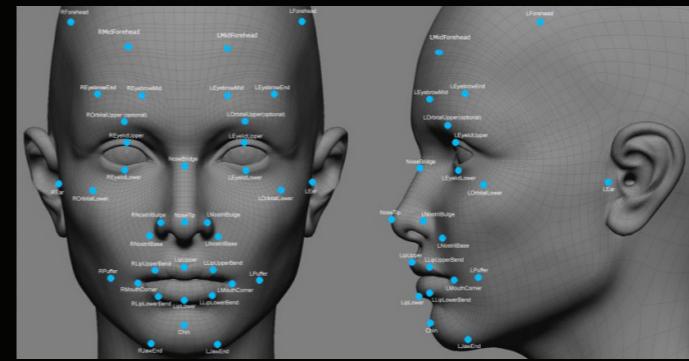
- By Sai Abhishek, 4TH SEM

A Facial Recognition system is the most trending technology present leading to a secure environment. Facial recognition has a greater impact in the security systems and can be compared to other biometrics such as fingerprints or iris recognition systems. Some face recognition algorithms identify facial features by extracting landmarks, or features, from an image of the subject's face. For example, an algorithm may analyze the relative position, size, and/or shape of the eyes, nose, cheekbones, and jaw. These features are then used to search for other images with matching features. Other algorithms normalize a gallery of face images and then compress the face data, only saving the data in the image that is useful for face recognition. A probe image is then compared with the face data.

One of the earliest successful systems is based on template matching technique applied to a set of salient facial features, providing a sort of compressed face representation. Recognition algorithms can be divided into two main approaches, geometric, which looks at distinguishing features, or photometric, which is a statistical approach that distills an image into values and compares the values with templates to eliminate variances. Popular recognition algorithms include principal component analysis using Eigen faces, linear discriminant analysis, elastic bunch graph matching using the Fisher face algorithm, the hidden Markov model, the multi-linear subspace learning using tensor representation, and the neuronal motivated dynamic link matching.

TECHNIQUES FOR FACE RECOGNITION

Some face recognition algorithms identify facial features by extracting landmarks, or features, from an image of the subject's face. For example, an algorithm may analyze the relative position, size, and/or shape of the eyes, nose, cheekbones, and jaw. These features are then used to search for other images with matching features.



Three-dimensional face recognition technique uses 3D sensors to capture information about the shape of a face. This information is then used to identify distinctive features on the surface of a face, such as the contour of the eye sockets, nose, and chin.

One advantage of 3D face recognition is that it is not affected by changes in lighting like other techniques. It can also identify a face from a range of viewing angles, including a profile view.

FACE-ID

Apple introduced Face ID on the flagship iPhone X as a biometric authentication successor to the Touch ID, a fingerprint based system. Face ID has a facial recognition sensor that consists of two parts: a "Romeo" module that projects more than 30,000 infrared dots onto the user's face, and a "Juliet" module that reads the pattern. The pattern is sent to a local "Secure Enclave" in the device's central processing unit (CPU) to confirm a match with the phone owner's face. The facial pattern is not accessible by Apple. The system will not work with eyes closed, in an effort to prevent unauthorized access.

SOCIAL MEDIA

Social media platforms have adopted facial recognition capabilities to diversify their functionalities in order to attract a wider user base amidst stiff competition from different applications.

Snapchat's animated lenses, which used facial recognition technology, revolutionized and redefined the selfie, by allowing users to add filters to change the way they look. The selection of filters changes every day.

NATIONAL SECURITY

The U.S. Department of State operates one of the largest face recognition systems in the world with a database of 117 million American adults, with photos typically drawn from driver's license photos. Although it is still far from completion, it is being put to use in certain cities to give clues as to who was in the photo. The FBI uses the photos as an investigative tool not for positive identification.

The FBI has also instituted its Next Generation Identification program to include face recognition, as well as more traditional biometrics like fingerprints and iris scans, which can pull from both criminal and civil databases.

INTERNET OF THINGS

- By Madhuri M.G. Rao, 4th SEM

The Internet of Things is the concept of everyday objects from industrial machines to wearable devices using built-in sensors to gather data and take action on that data across a network. It's similar to a building that uses sensors to automatically alter the room's temperature. The Internet of Things is the future of technology that can make our lives more efficient.

The term "Internet of Things" was coined in the late 1990s by entrepreneur Kevin Ashton. Ashton, who's one of the founders of the Auto-ID Center at MIT, was part of a team that discovered how to link objects to the Internet through an RFID tag. He said he first used the phrase "Internet of Things" in a presentation he made in 1999—and the term has stuck around ever since.

Every device that's connected to the internet can have its application in Internet of Things by analyzing the stream of data that is used by the device. Intelligent transport solutions speed up traffic flows, reduces the fuel consumption, prioritize vehicle repair schedules and can save lives.

Data-driven systems are being built into the infrastructure of "smart cities", making it easier for municipalities to run waste management, law enforcement and other programs more efficiently.



You're low on milk. When you're on your way home from work, you get an alert from your refrigerator reminding you to stop by the store. Your home security system, which already enables you to remotely control your locks and thermostats, can cool down your home and open your windows, based on your preferences. The IoT is more than just a convenience for consumers. It offers new sources of data and business operating models that can boost productivity in a variety of industries.

HEALTHCARE

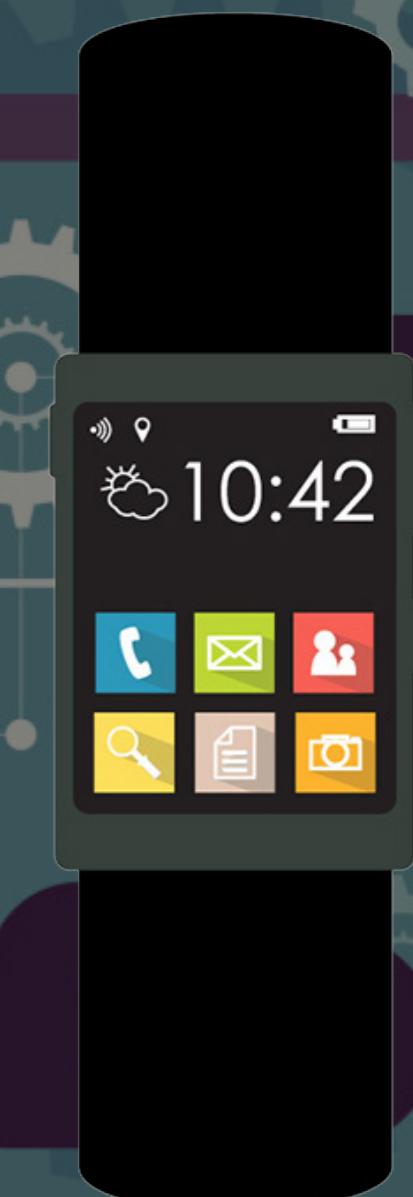
Many people have already adopted wearable devices to help monitor exercise, sleep and other health habits, and these items gives a lot of impact towards healthcare. Patient monitoring devices, electronic records and other smart accessories can help save lives.

RETAIL

Both consumers and stores can benefit from IoT. Stores, for example, might use IoT for inventory tracking or security purposes. Consumers may end up with personalized shopping experiences through data collected by sensors or cameras. (e.g. – amazon go store in Seattle)

TRANSPORTATION

While cars aren't at the point of driving themselves, they're undoubtedly more technologically advanced than ever. The IoT also impacts transportation on a larger scale: delivery companies can track their fleet using GPS solutions. And roadways can be monitored via sensors to keep the mass as safe as possible. Internet of Things can change the complete overview of the technology, it can increase the economy of the country, growth in the industries and a lot more.



DIGITAL CURRENCY

BITCOIN



- By Sneha.K, 4th SEM

What is digital Currency?

Nowadays technology has developed to such an extent that a person can transfer money via electronic payments i.e. by using net banking, Paytm app etc. In early ages it was difficult to transfer money because a person must visit a bank in person and there was a huge procedure i.e. to fill a form, pay the amount to be transferred and wait for days to get the money transferred but in today's world we can transfer money in a flash.

Bitcoin is a very promising concept in the electronic payment system introduced on 9th January 2009. In 2017 an analysis was made and it estimated that over 2.9 to 5.8 million unique users are using Bitcoin. It was introduced by an unknown person or a group of people named Satoshi Nakamoto from Japan. The word Bitcoin was introduced on 31st October 2008 and Satoshi Nakamoto presented an abstract view and gave a general idea of how this Bitcoin works in a white paper popularly known as The Bitcoin White paper.



It is CyberCash, currency without a physical form. Exchange of money take place through computer, smart phones etc. Bitcoin is one such example. There are other examples listed below. Examples: Litecoin, Ethereum, Dash, Ripple etc.

What is Bitcoin?

To explain Bitcoin in short form isn't that easy, in simple words it is an information technology that provides with decentralized payment, tool for storage of money transactions and provides security. As designed recently, it is open source software that allows users to easily come to an agreement and transfer money without involving a third party. There is no transaction charges applied for sending or receiving money. Unlike other payment apps, Bitcoin is not administered by any centralized authority. Many programmers came forward to improve this software. It has no physical form. Bitcoin is a decentralized Cryptocurrency. Cryptocurrency is nothing but a digital asset which works as a medium of money exchange and makes use of Cryptography (to prevent public or third parties from reading a person's personal information).

One Bitcoin equals
612,760.65 Indian
rupees.

Peer to peer Network

Nowadays, transferring money to person might include third parties. In this case there might be chance that our money can be hacked by the party if it isn't a trustworthy financial institute. There is a problem called "Double-Spending" where there is a risk of using digital currency twice by reproducing digital information easily. Physical currencies do not have such problems as it cannot be replicated easily. For this reason, Peer-to-Peer network is used. It is a technical payment system that allows users to send and receive money without involving any intermediate financial institutions.

Future of Bitcoin

The Bitcoin creators' intention was to develop a decentralized cash payment system so as to avoid double-spending problem. They had to face many problems as there was no centralized authority to monitor the activities. But they came up with blockchain technology. Bitcoin technology is an important development in financial technology economy.

It is said that Bitcoin is going to gain popularity



Bitcoin Mining

Bitcoin Mining: usually printing and distribution of paper money is under the control of central government. But there is no such government to control the distribution of Bitcoin. That's why US Treasury calls Bitcoin as decentralized currency. Hence it uses MINING process. Now you might wonder what is MINING process. It provides a smart way to issue currency. It is an important part of Bitcoin network as it provides safety and security to Bitcoin network. It is a process of adding

individual's transaction history to Bitcoin public ledger. Public ledger is nothing but an electronic financial book that contains past transactions history in the form of a chain of blocks called blockchain. This keeps the track of transaction of an individual transferring money from his/her account to avoid double spending problem and to check whether the transaction is valid or not.

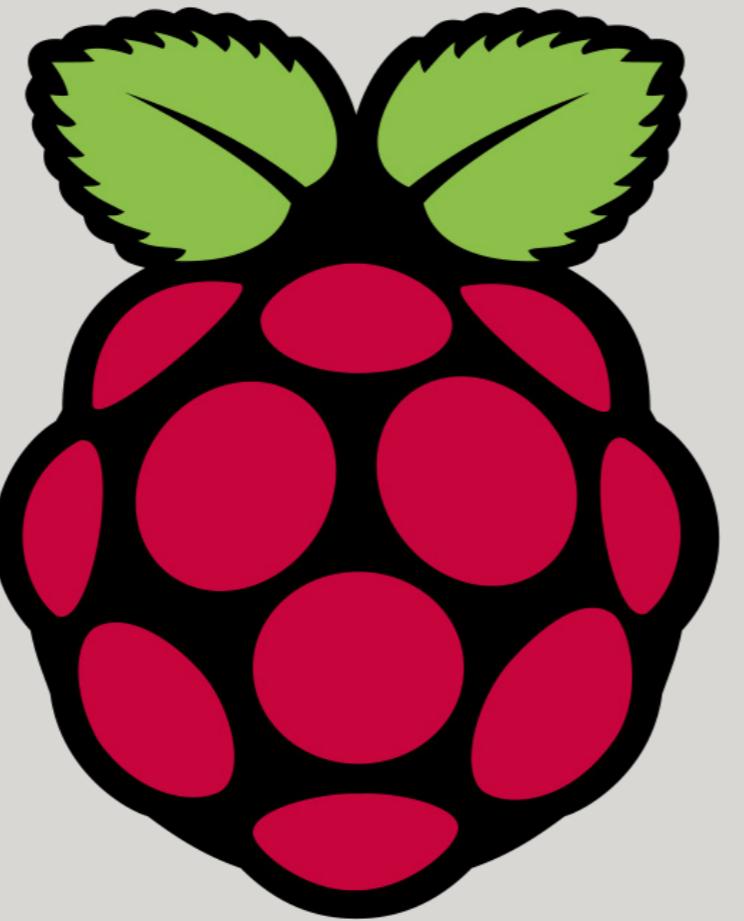
RASPBERRY PI

- By Sushma P.R , 4th SEM

Computer on your Palm

As of a name Raspberry Pi is not only a fruit, rather a credit card-sized single-board computer that plugs into your TV and keyboard which does job same as desktop. Raspberry pi foundation created this tiny computer to create software and hardware projects using python.

Raspberry pi was created in February 2012 in UK. Originally setup to promote teach basic of computers in schools and colleges. A lot of computer companies were named after fruit like apricot acorn. Raspberry also followed the suit and was designed to run on python platform. Pi stands for Python Interpreter. Python is the official programming language that Raspberry Pi use.



COMPONENTS OF A RASPBERRY PI

Memory - Raspberry Pi model aboard is designed with 256MB of SDRAM and model B is designed with 51MB. The range of memory in Raspberry Pi 256MB-512MB.

ARM CPU/GPU - Central Processing Unit is the brain of Raspberry Pi. It is Broadcom BCM 2835 system of ARM processing unit and Video core 4 graphics processing unit. CPU handles computation and logical instructions that to be performed. GPU is specialized chip in Raspberry Pi board and is designed to speed up the operation of calculations. GPU handles graphic output.

GPIO - General purpose input output connection points that are used to associate with the electronic boards and it allows real hardware hobbyist the opportunity to tinker.

Audio out - Standard 3.55 millimeter jack for connection of audio output devices.

USB - This is common connection port for all peripheral devices of all types.

HDMI - It is a connector that allows to hook up to high definition television.

Power - 5V micro USB power connector into which we can plug our power supply.

UART - The universal asynchronous receiver / transmitter is a serial input output port. That can be used to transfer serial data in the form of text and it is useful for converting the debugging code.

SD card slot - This is an SD card slot where we can insert SD card with an operating system.

Ethernet - Connector that allows wired network on model B.

Does this fascinate what you can actually do with this small computer?

The answer is ton! It can be used for many tasks that your computer does, like games, word processing, spreadsheets and also play HD videos SD card inserted into slot on board acts as hard drive for Raspberry Pi. The Raspberry Pi supports Linux, mac, ARM operating system. We can use USB external hard drive or USB drive as alternative source. It is powered by a USB and the video output can be used, or more modern monitor. This gives basic abilities of a computer. Raspberry Pi comes in two models, they are model A and model B. The main difference is Ethernet cable. Model A consumes more power as compared to B.

FUTURE OF RASPBERRY PI

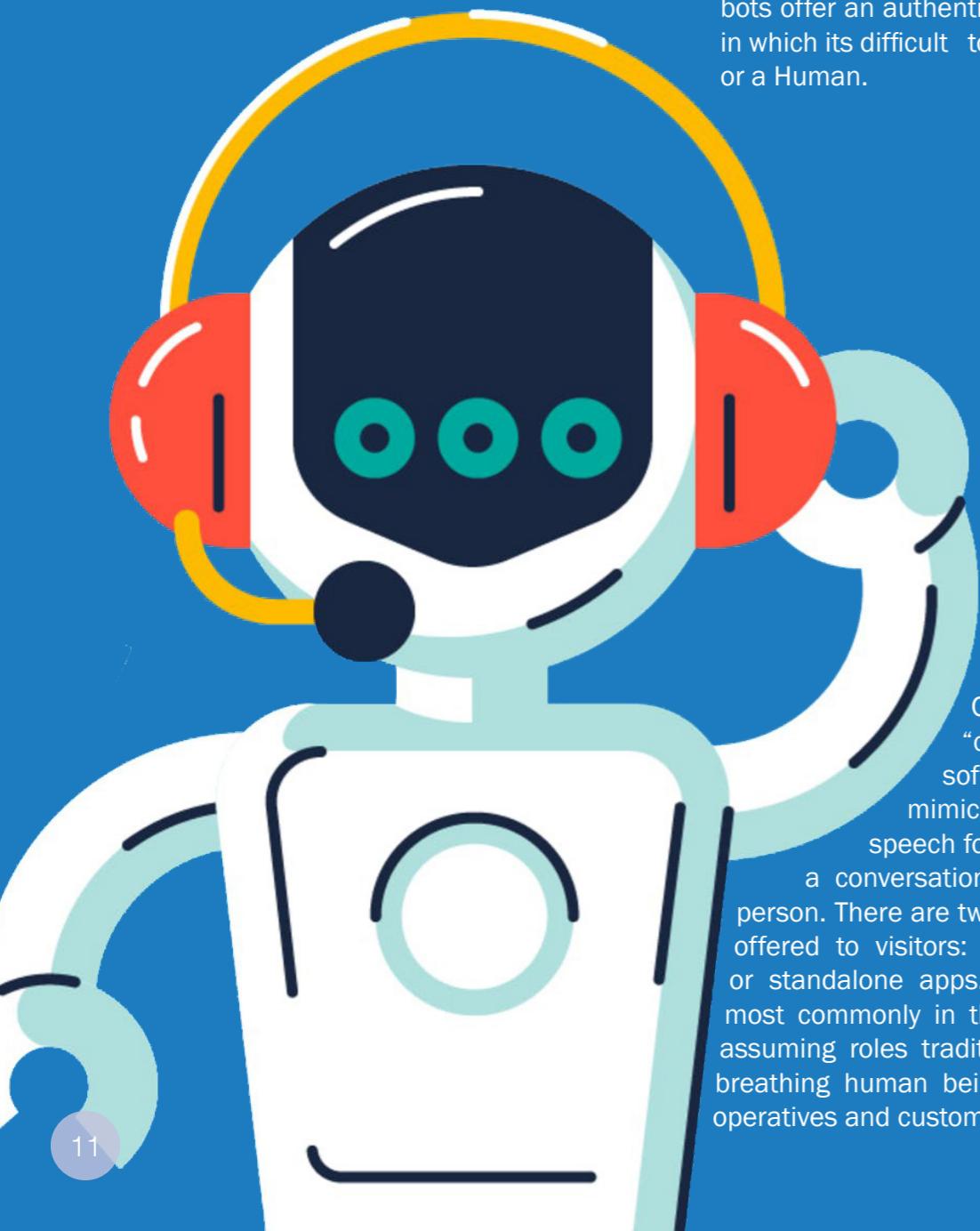
Smartphone industries are going to be the most benefited from Raspberry Pi. How means there will be an era where technology becomes simpler and bewitchingly low-cost. And this is where Raspberry Pi leave a solid imprint. These customizable, ultra-flexible, easy-to-build motherboards make drastic difference. Still not ready to agree? Several smart phones like OnePlus3 uses pi, giving high-end devices a run for their money. And success of Raspberry Pi has promoted useful spawns like Orange Pi. Raspberry Pi team is focusing on improvement of software mettle and more.

APPLICATIONS

Wireless print server- If we have old printer that can't be connected wirelessly what we need is Raspberry Pi connected to home network and print server software. Retro gaming machine-the Raspberry Pi Zero is particularly adept at being slipped into small spaces for gaming projects. Robot controller -the ideal version used is pi Zero W for lightweight robots. Stop motion camera, time lapse camera, FM radio station, Web server, photograph the night sky many more future enhancements are there.

Natural Language Processing

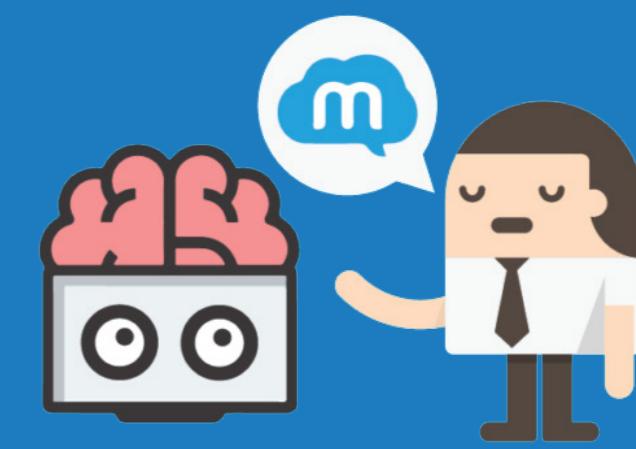
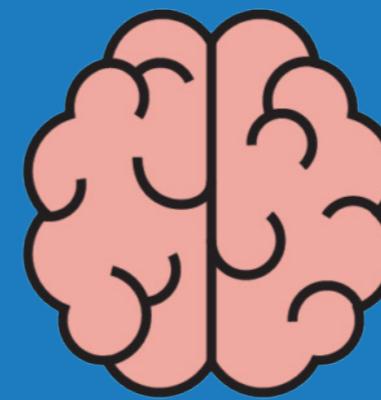
- By Varun J, 4th SEM



Natural Language Processing is a branch of Computer Science which is mainly concerned in converting a speech of a human into a machine code. It is one of important concept of machine learning. It makes the computer to perform useful task by using the natural language used by the humans. The input and output of NLP is in the form of text or speech.

HOW CHAT BOTS WORK?

The core of the chatbot technology lies in NLP or Natural Language Processing, the same technology forms basis of voice recognition systems used by virtual assistance such as Google Now, Apple's Siri, Microsoft's Cortana. Chat Bots process on the text or a speech which is given by the user as input before responding according to the complex series of algorithm that identifies and interprets what user has said(input). It also generates a series of responses based on the information. Some chat bots offer an authentic conversational experience, in which it's difficult to determine if an agent is a bot or a Human.



ROLE OF CHAT BOTS IN BUSINESS

Chat bot is a fairly new concept, but their popularity is exponentially growing every day. Chat bots are the computer programs designed to interact with the people using textual context via chat interface. Now many business organizations have started recognizing the potential of chatbots and they have started to implement them in their business E.g. order processing, customer support, data driven marketing etc.

Order processing

Food industries have already started using chatbots in food processing. Companies such as domino's pizza, Taco Bell have their chat bots which help them to engage with their customers. These chatbots communicate with the customer to help them to place their order. These chat bots are programmed in such way which offer the customer additional add-ons on their existing order and also helps them in replacing one ingredient with another. They also collect feedback from customer which helps the following company to find out their flaws and improve their business.



Customer Support

Most of the business organizations have problems in solving their customer queries as the number of the customers increase the number of queries also increases. As most of the customers would like to resolve their query talking to the right person which is time consuming. So the companies have come up with chatbots which is used to solve and answer most of the basic questions which in turn help the staff members to deal with complex issues. Since most of the customers would prefer to resolve their

queries through chat rather than phone, chatbots does the work for staff members with great ease. Moreover, chatbots can be programmed to be polite and use a proper tone of voice with customers. All that's required is to supply a chatbot with information about customers, such as age, gender, social status and other details.

LIMITATIONS OF CHAT BOTS

Complex Interface - Chatbots are often seen to be complicated and require a lot of time to understand user's requirement. It is also the poor processing which is not able to filter results in time that can annoy people.

Inability to Understand - Due to fixed programs, chatbots can be stuck if an unsaved query is presented in front of them. This can lead to customer dissatisfaction and result in loss. It is also the multiple messaging that can be taxing for users and deteriorate the overall experience on the website.

Time-Consuming - Chatbots are installed with the motive to speed-up the response and improve customer interaction. However, due to limited data-availability and time required for self-updating, this process appears more time-taking and expensive. Therefore, in place of attending several customers at a time, chatbots appear confused about how to communicate with people.

Increased Installation Cost - Chatbots are useful programs that help you save a lot of manpower by ensuring the all-time availability and serving to several clients at once. But unlike humans, every chatbot needs to be programmed differently for a new business which increases the initial installation cost. This also increases the time needed to prepare for the program and plan everything effectively. Considering the last-minute changes that can always happen, this is a risky investment as updating the program will invite added costs to it.

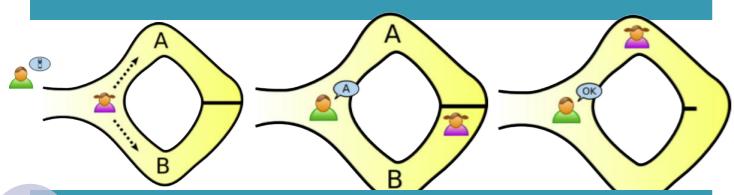
SHAFI GOLDWASSER

- By Varsha J , 4th SEM

Shafi was born in 1958 in New York City. Her parents were Israeli, Shafi attended grade school in Tel Aviv. In high school she was especially interested in physics, mathematics and literature. After her schooling she returned to the U.S. and became an undergraduate in the mathematics department at Carnegie Mellon University. She later showed keen interest in computer science and programming, also she excelled in discrete mathematics course. She also worked at CMU on 50-processor and multiprocessor systematic non-residues, RSA, and coin-tossing.

The first problem which she had to deal was, how to hide partial information in "mental poker". She worked with Micali, and invented Hybrid technique, which shows that the single data bit encryption, is the essential way to secure the whole information.

Upon graduating from Berkeley in 1984, Shafi went to the Massachusetts Institute of Technology, first as a postdoc, and then as a faculty member. She became the RSA Professor of Electrical Engineering and Computer Science in 1997. In 1992, she began a parallel career as a Professor of Computer Science and Applied Mathematics at the Weizmann Institute of Science in Israel. Shafi investigated whether the notion of a pseudorandom number generator could be generalized so that one could generate exponentially many bits pseudorandomly.



"Winner of noble prize in computing"



WHAT HAS SHE DONE?

Have you ever wonder how the data stored in your computer remains safe? Banks, government offices etc holds larger amount of personal data and information. The most crucial part of data handling is its security and maintenance. To handle this problem efficiently data cryptography plays a major role. Shafi Goldwasser has made fundamental contributions to cryptography, computational complexity, computational number theory and probabilistic algorithms.



WHAT IS ZERO KNOWLEDGE INTERACTIVE PROOFS?

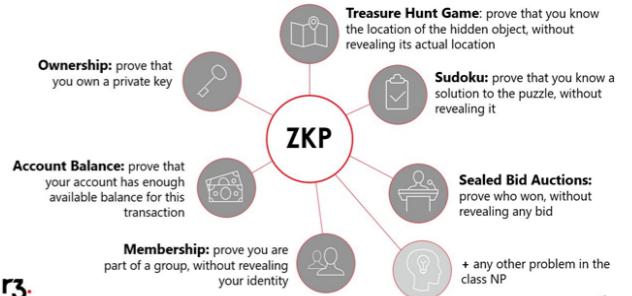
Interactive zero-knowledge proofs are a method where the prover possess some secret information, and he has to prove to the verifier about the information without revealing the secret information. In other words it is a method by which one party can prove to another party that she knows a value x , without conveying any information apart from the fact that she knows the value x . Zero-knowledge proofs were first conceived in 1985 by Shafi Goldwasser, Silvio Micali, and Charles Rackoff in their paper "The Knowledge Complexity of Interactive Proof-Systems". They also gave the first zero-knowledge proof for a concrete problem, that of deciding quadratic nonresidues mod m . Together with a paper by László Babai and Shlomo Moran, this landmark paper invented interactive proof systems, for which all five authors won the first Gödel Prize in 1993.

In their own words, Goldwasser, Micali, and Rackoff say:

"Of particular interest is the case where this additional knowledge is essentially 0 and we show that [it] is possible to interactively prove that a number is quadratic non residue mod m releasing 0 additional knowledge. This is surprising as no efficient algorithm for deciding quadratic residuosity mod m is known when m 's factorization is not given. Moreover, all known NP proofs for this problem exhibit the prime factorization of m . This indicates that adding interaction to the proving process, may decrease the amount of knowledge that must be communicated in order to prove a theorem."

Zero knowledge proof is used in solving puzzles regarding privacy. JP Morgan's Quorum introduced the first integration of zero knowledge security layer into its enterprise blockchain. Later the multinational banking and financial service corporation announced the development of zero knowledge range proof, claiming that it is more efficient than Ethereum network

Applications of ZKP



ACHIEVEMENTS

On the algorithmic side, with Goldreich and Dana Ron, Shafi introduced the subject of "property testing" for combinatorial properties. Interactive proofs also play a major role in her recent research about how a user can delegate computation to a very fast but untrusted "cloud" computer. This is one of the most important research areas in cryptography today. Shafi, with Yael Tauman Kalai and Guy Rothblum, showed how to efficiently delegate the computation of small-depth functions. Shafi has recently explored different models for how to achieve "code obfuscation". Shafi introduced yet another new paradigm for general function obfuscation called "token-based obfuscation".

AWARDS

Shafi Goldwasser has twice won the Gödel Prize in theoretical computer science: first in 1993 and again in 2001. Other awards include the ACM Grace Murray Hopper Award (1996) for outstanding young computer professional of the year and the RSA Award in Mathematics (1998) for outstanding mathematical contributions to cryptography. In 2001 she was elected to the American Academy of Arts and Sciences, in 2004 she was elected to the National Academy of Science, and in 2005 to the National Academy of Engineering. She was selected as an IACR Fellow in 2007. She is the recipient of The Franklin Institute's 2010 Benjamin Franklin Medal in Computer and Cognitive Science. She received the IEEE Emanuel R. Piore Award in 2011. She received the 2018 Frontier of Knowledge award together with Micali, Rivest and Shamir. She was elected as an ACM Fellow in 2017.

You would have definitely heard and of course used it also....ok let me just brief you about it in a formal way

ARTIFICIAL INTELLIGENCE

Artificial intelligence (AI, also machine intelligence, MI) is intelligence demonstrated by machines, in contrast to the natural intelligence (NI) displayed by humans and other animals. In computer science AI research is defined as the study of "intelligent agents": any device that perceives its environment and takes actions that maximize its chance of successfully achieving its goals. Colloquially, the term "artificial intelligence" is applied when a machine mimics "cognitive" functions that humans associate with other human minds, such as "learning" and "problem solving".

There are many such AI machines but let's look into Google assistant which is one of the most popular smart device.

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-By Sree Raksha P, 4th SEM

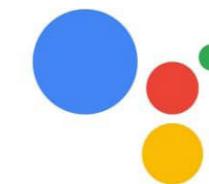
There are many such AI machines but let's look into Google assistant which is one of the most popular smart device....



GOOGLE ASSISTANT

The Google Assistant is a virtual personal assistant developed by Google that is primarily available on mobile and smart home devices. Unlike Google Now, the Google Assistant can engage in two-way conversations.

Assistant initially debuted in May 2016 as part of Google's messaging app Allo, and its voice-activated speaker Google Home. After a period of exclusivity on the Pixel and Pixel XL smart phones, it began to be deployed on other Android devices in February 2017, including third-party smart phones and Android Wear, and was released as a standalone app on the iOS operating system in May. Alongside the announcement of a software development kit in April 2017, the Assistant has been, and is being, further extended to support a large variety of devices, including cars and smart home appliances. The functionality of the Assistant can also be enhanced by third-party developers.

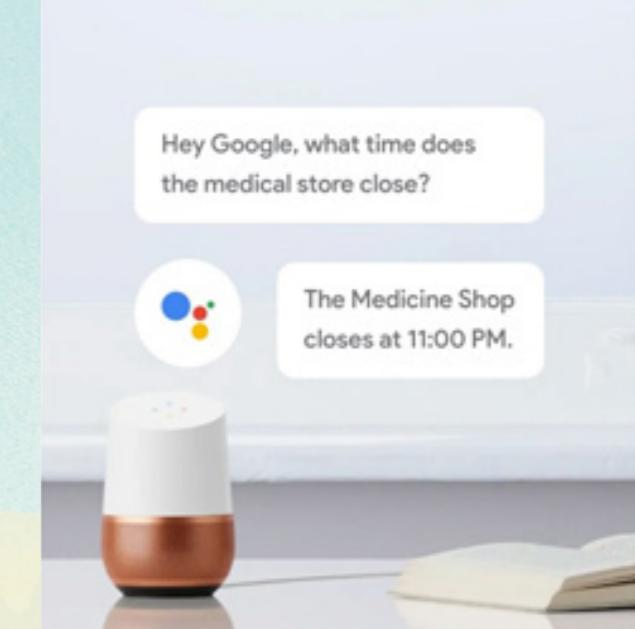


Hi, how can I help?

VIRTUAL ASSISTANTS OF FUTURE

Over the course of our research, it became apparent that the VA is likely to start off life on the mobile (where Google Now, Siri and Cortana currently live) with research finding that initially 40 percent of interactions would take place on the phone.

As smart watches bring access to digital information and connectivity closer to the user, the next step will be to strip back the physical hardware as far as possible, with the intelligence of the VA existing in the cloud, getting pulled in, and pushing its way into our lives on multiple devices on our bodies and in our offices, homes, and vehicles. 81 percent of those surveyed wanted the VA to be voice controlled, demonstrating the urge for the hardware to be a secondary concern.



And of course what not....it becomes a part of our daily work!!!

ARTIFICIAL INTELLIGENCE

- By Catherine Winslet , 4th SEM

Artificial intelligence (A.I.) is an area of computer science that focuses on the creation of machines that work and react like humans. From Siri to self-driving cars, it is any device that perceives its environment and takes actions to increase its chance of achieving its goals successfully.

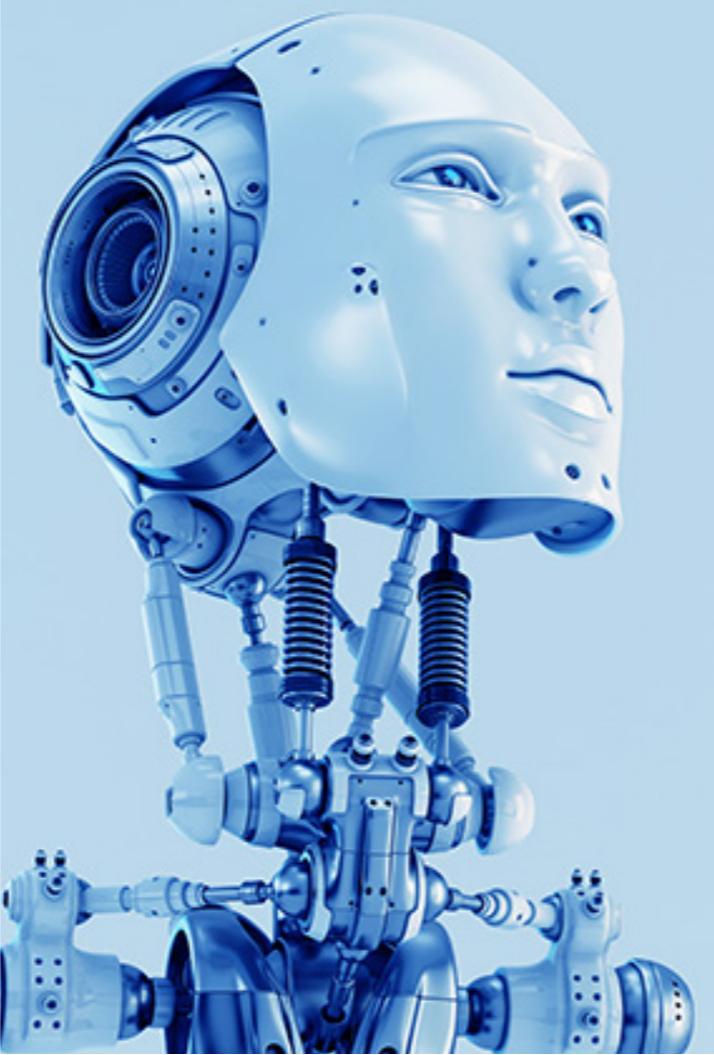
In daily life, we interact with A.I. more than we realize. As popular as it may seem, this technology isn't new. For the past half a century, it's been an idea ahead of its time. The term A.I. was coined by John McCarthy in 1956.

By the late 1990s, A.I. researchers had developed methods for dealing with uncertain or incomplete information, using concepts from probability. In addition, some projects attempt to gather the "commonsense knowledge" known to the average person. Commonsense knowledge is based on objects, properties and relations between objects, situation and causes. A representation of "what exists" is an ontology.



Artificial intelligence today is properly known as narrow A.I. (or weak A.I.), in that it is designed to perform narrow tasks like facial recognition, internet searches or driving a car. However, the long-term goal of many researchers is to create general A.I. (AGI or strong A.I.). While narrow A.I. may outperform humans at whatever its

specific task is, like playing chess or solving equations, AGI would outperform humans at nearly every cognitive task. AI researches aim on making machines think like human or to imitate the human brain. Cognitive neuroscientists and computer scientists seek the answer to similar. They have a complex system made of components. To the neuroscientists, it's called neurons and to the computer scientists, it's called units, both conducting experiments to try to determine what those components calculate. The machine programs learn very quickly when given lots of data, which is what enables them to learn at such a fine level. While it is not possible to dissect human neurons at such



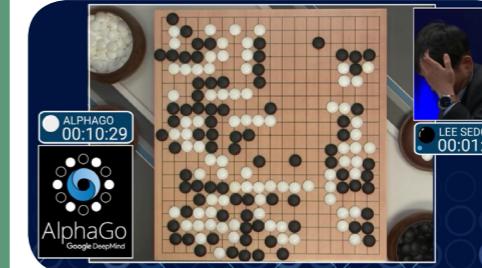
MACHINE LEARNING, DEEP LEARNING AND IBM WATSON

Machine learning is a core part of AI. Many people are familiar with machine learning from shopping on the internet and being served ads related to their purchase. This happens because recommendation engines use machine learning to personalize online ad delivery in almost real time.

Like a human, a machine retains information and becomes smarter overtime. Machines analyze thousands of examples to build an algorithm. It then tweaks the algorithm to achieve its goal.

A machine achieves this by cognitive learning which is all about teaching computers to learn without having to explicitly program them. This type of "unsupervised learning" requires an ability to identify patterns in a stream of inputs.

Another category of machine learning is "supervised algorithms" which require humans to provide both input and desired output, in addition to feedback about the accuracy of predictions.



acceptable level of accuracy. The number of processing layers through which data must pass is what inspired the term deep. Many organizations employ deep learning for particular applications. Facebook's A.I. performs tasks like automatically tagging uploaded



IBM Watson

Watson is a question-answering computer system capable of answering questions in natural language. Watson is an idea of Cognitive computing programmed based on rules and logic. When humans seek to understand something, we go through: Observation, evaluation and decision making. Watson does the same by using similar processes to reason in a much faster speed. Watson even understands idioms like 'it's raining cat and dogs' or 'feeling blue' which are particularly challenging. When it comes to texts, Watson doesn't look for keyword matches or synonyms like search engines. It actually reads and interprets texts like a person and uses that understanding to draw logical responses.

In 2011, the Watson computer system competed on "Jeopardy!" against two legendary champions winning the first place prize of \$1 million.



NEW BENGALURU NEW INDIA

- By Supriya P, 4th SEM

We came across a competition named New Bengaluru New India. We knew that this was a unique project and inspired us to work on this competition. So we immediately formed a team of five and registered for the event. It was unique because it involved students to give solutions to the major problems faced in Bengaluru.

A group of enthusiastic youth took interest in volunteering this project and involving the students of various colleges. This competition is essentially created for awareness of the major problems faced in Bengaluru. There were eight topics given to choose from. The topics involved subjects like Traffic Congestion, Garbage, Corruption, Law and Order and Safety of Women. Our group consists of five members Abhishek, Varsha, Sushma, Sandhya and Supriya together known as 'Alexis'. With four girls in a group of five, the topic 'Safety of women' felt appropriate to work on. We

brainstormed ideas and researched about it together. This project enriched the spirit of teamwork. It opened up our creative senses and allowed us to think out of the box. It was so surprising to see how many solutions we came up with. The presentation was submitted finally after putting it all together for a few weeks.

With no expectations, we managed to pull off second place. The organizers invited us to present our ideas before our ex-Chief Minister Sri B S Yediyurappa. It was truly an honour for us to be a part of such a programme viz., "Charche with B S Yediyurappa". Sandhya and I, Supriya got the opportunity to take part in it and represent our college. There were many other winners who came from different colleges and it was great to meet different students with the same vision. We introduced and presented our views before the other winners. The information given

by other participants was excellent and we learnt so many things which we would not have learnt behind our desks.

The "Charche" was incredibly informative and an eye opening experience. We headed back with so many good memories. We are thankful for this initiative which put its effort to spread awareness among the youth. Also a big thank you to Prime Minister Sri Narendra Modi ji for supporting such a constructive cause.



IoT and MECHATRONICS

- By Sandhya H V, 4th SEM

Imagine a scenario where every device in your possession converses with each other. For instance, your alarm clock communicates with the coffee machine and prepares the perfect brew for you just when you need the morning dose. The lights of your room adjust according to your mood. This is all IoT is all about. Sensors sensing the internal and external environment and reacting appropriately.

Typically, Internet of Things (IoT) is an ecosystem of connected physical objects that are accessible through the internet without manual intervention. The embedded technology in the objects helps them to interact with internal states or the external environment, which in turn affects the decisions taken. When devices/objects can represent themselves digitally, they can be controlled efficiently and from anywhere.

Approaching Mechatronics, it is a multidisciplinary field of science that includes a combination of mechanical engineering, electronics, computer engineering, telecommunications

engineering, systems engineering and control engineering.

The word "Mechatronics" was coined by Tetsuro Mori, a Japanese engineer of Yaskawa Electric Corporation. The word "Mechatronics" was registered as trademark by the company in Japan.

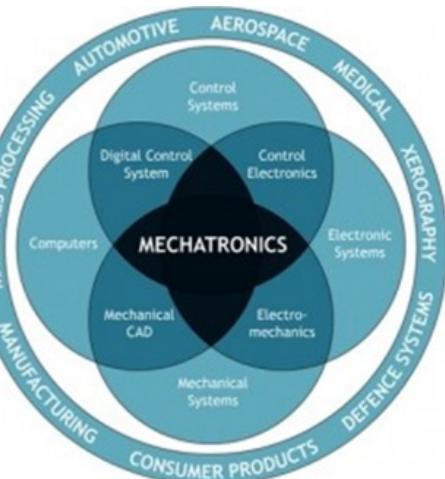
With the integration of processes and equipment enabled by IoT, the design phase is shortened with cross-discipline communication, design development and project management tools. Procurement and build cycles are condensed due to the need for fewer components. So, it can be considered a win-win situation at all times.

Pros

There are innumerable advantages of the association of IoT and Mechatronics,

few being:

Lower cost and enhanced functionality, less wiring and connectors, less labor invested, reduced troubleshooting, dynamic conditions can be easily monitored and reported to a workstation, tablet or mobile phone, ease of use, maintenance and increase in overall life. All of which combine to increase the bottom line, creating more opportunity and increase



financial returns.

Cons

Frankly, there are hardly any minus points to this advancement. If thought hard, then complexity of the technology and fear of safety breach would come into picture. Nevertheless, a solution for every glitch is available which just has to be discovered.

Inference

Essentially, IoT in Mechatronics is incorporated in almost all fields in an inconceivable manner. Be it homes, cities, cars, even modern warfare missiles are being designed upon this topic of interest. It contributes in making our lives simple, efficient and organized.

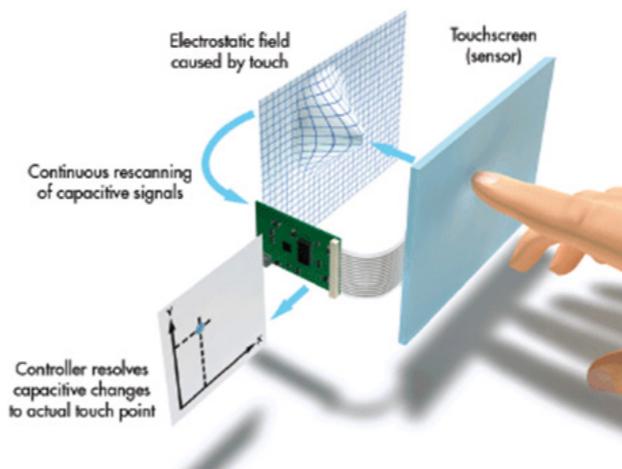
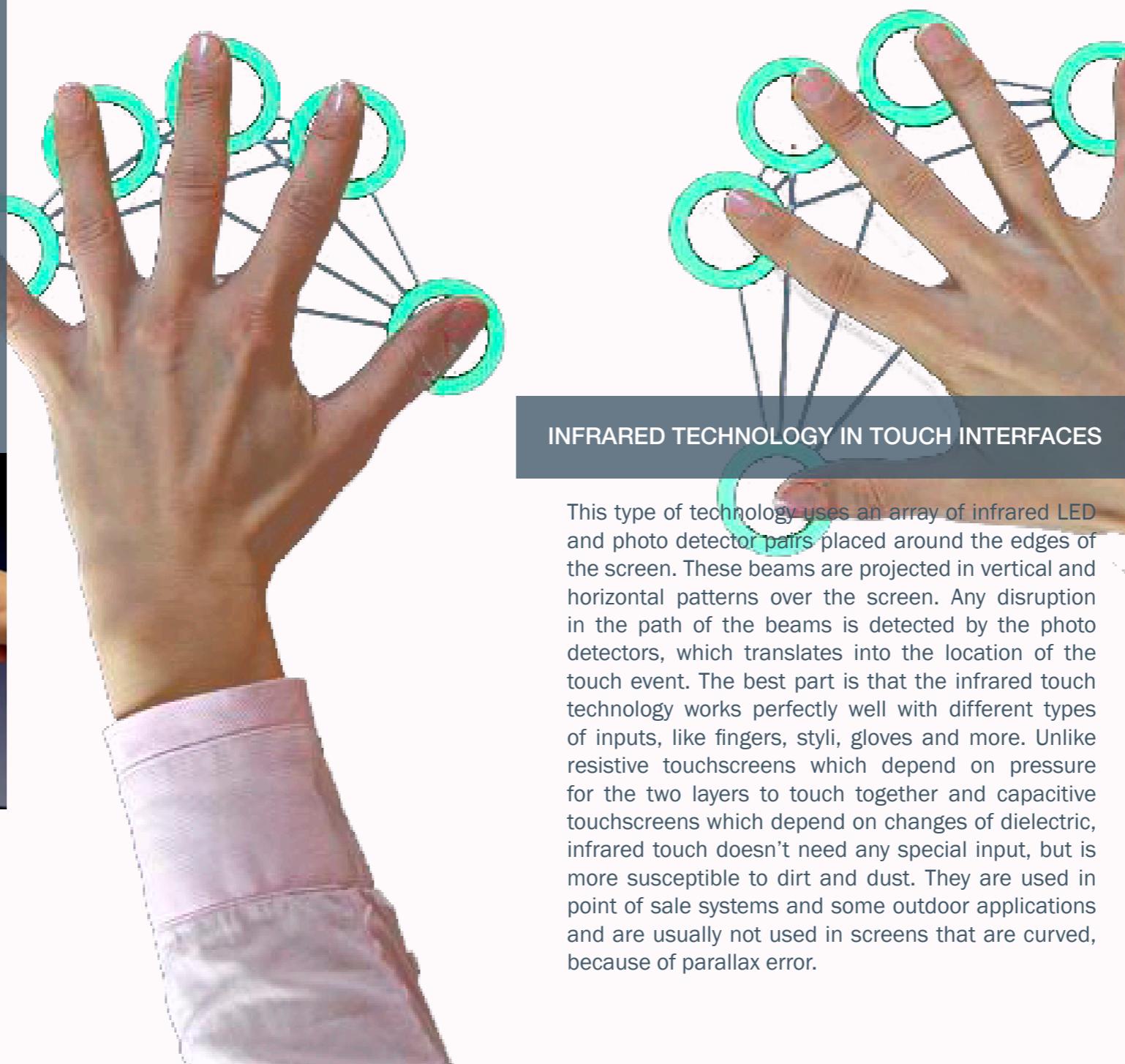
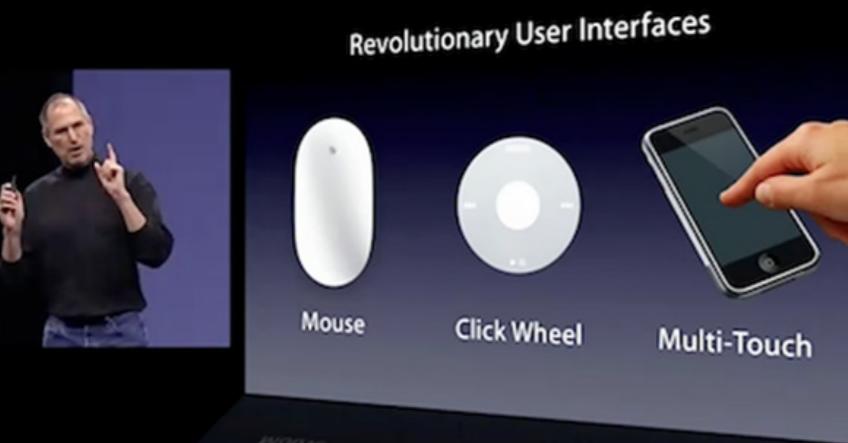
In the end, all that we can say is this collaboration of IoT and Mechatronics take us in a path of infinite possibilities. It will lead the world to be a universal power, and it will rocket the innovation and research through the space and to the end of universe. It will be the main spark for industry 4.0.

MULTI TOUCH INTERFACE

-By Chetan Balaji, 4th SEM

Multi touch is the leading technology which is observed in the past decade, it played an important role for interactive communication with the users. Multi-touch is a technology that enables a surface (a trackpad or touchscreen) to recognize the presence of more than one or more than two points of contact with the surface. This technology originated at MIT, University of Toronto, Carnegie Mellon University and Bell Labs in the 1970s. Multi-touch was in use as early as 1985. Apple popularized multi-touch in its iPhone and iPod touch, especially for zooming in and out of screen images, known as "pinch-to-zoom". Expanding a photo by sliding thumb and forefinger apart and pinching them together to restore the original size was greeted with delight when people first saw that feature.

Multi-touch has been implemented in several different ways, depending on the size and type of interface. The most popular form are mobile devices, tablets, touch tables and walls. Both touch tables and touch walls project an image through acrylic or glass, and then back-light the image with LEDs. Touch surfaces can also be made pressure-sensitive by the addition of a pressure-sensitive coating that flexes differently depending on how firmly it is pressed, altering the reflection.

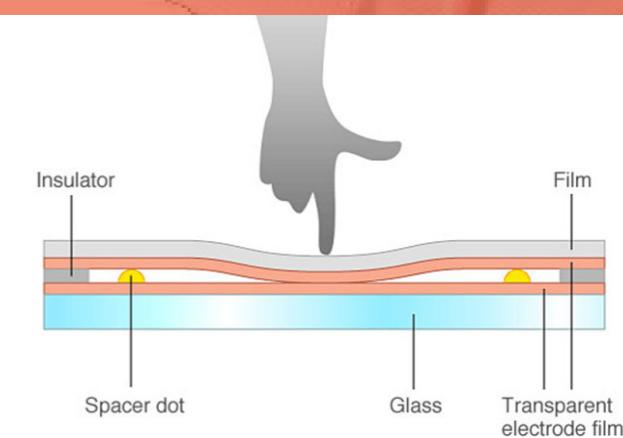


CAPACITIVE TECHNOLOGY

Capacitive touchscreen displays rely on the electrical properties of the human body to detect when and where on a display the user touches. Because of this, capacitive displays can be controlled with very light touches of a finger and generally cannot be used with a mechanical stylus or a gloved hand. Here, an electrically charged layer is placed on the glass panel, which loses some of its charge when a conductor such as a human finger touches it. The loss of charge is then measured by circuits at each corner of the screen, which calculates the relative distance and difference in charges by a reference charge, thus determining the location of input. This information is then relayed to the software/driver that translates it into touch input for the device. This is called surface capacitance, and is used in low cost applications like touchscreen help kiosks, point of sale units, vending machines.

RESISTIVE TECHNOLOGY

The traditional touch screen technology is analog resistive. Electrical resistance refers to how easily electricity can pass through a material. These panels work by detecting how much the resistance to current changes when a point is touched. This process is accomplished by having two separate layers. Typically, the bottom layer is made of glass and the top layer is a plastic film. When you push down on the film, it makes contact with the glass and completes a circuit.



QUANTUM COMPUTING

By Yeshaswini Shenoy 6th SEM

Quantum computing is computing using quantum-mechanical phenomena, such as superposition and entanglement. A quantum computer is a device that performs quantum computing. A quantum Turing machine is a theoretical model of such a computer, and is also known as the universal quantum computer. The field of quantum computing was initiated by the work of Paul Benioff and Yuri Manin in 1980, Richard Feynman in 1982, and David Deutsch in 1985.

Quantum computing takes advantage of the strange ability of subatomic particles to exist in more than one state at any time. Due to the way the tiniest of particles behave, operations can be done much more quickly and use less energy than classical computers. In classical computing, a bit is a single piece of information that can exist in two states – 1 or 0. , quantum computation uses quantum bits or qubits, which can be in superpositions of states.

Quantum computers operate on

completely different principles to existing computers, which makes them really well suited to solving particular mathematical problems, like finding very large prime numbers. Since prime numbers are so important in cryptography, it's likely that quantum computers would quickly be able to crack many of the systems that keep our online information secure. Because of these risks, researchers are already trying to develop technology that is resistant to

quantum hacking, and on the flipside of that, it's possible that quantum-based cryptographic systems would be much more secure than their conventional analogues. Quantum key distribution relies on interesting property of quantum mechanics: any attempt to observe or measure a quantum system will disturb it. Until recently, it seemed like Google was leading the pack when it came to creating a quantum computer that could surpass the abilities of conventional



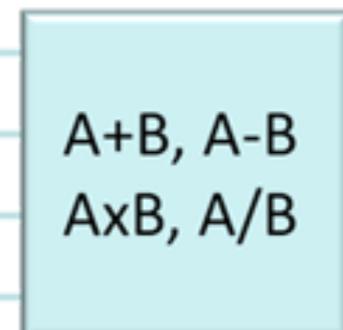
computers. Google said it intended to achieve something it's calling 'quantum supremacy' with a 49-qubit computer by the end of 2017. Now, quantum supremacy, which roughly refers to the point where a quantum computer can crunch sums that a conventional computer couldn't hope to simulate, isn't exactly a widely accepted term within the quantum community. Those sceptical of Google's quantum project – or at least the way it talks about quantum computing – argue that supremacy is essentially an arbitrary goal set by Google to make it look like it's making strides in quantum when really it's just meeting self-imposed targets. Whether it's an arbitrary goal or not, Google was pipped to the supremacy post by IBM in November 2017, when the company announced it had built a 50-qubit quantum computer. Even that, however, was far from stable, as the system could only hold its quantum microstate for 90 microseconds, a record, but far from the times needed to make quantum computing practically viable. Just because IBM has built a 50-qubit system, however, doesn't necessarily mean they've cracked supremacy and definitely doesn't mean that they've created a quantum computer that is anywhere near ready for practical use.

Where IBM has gone further than Google, however, is making quantum computers commercially available. Since 2016, it has offered researchers the chance to run experiments on a five-qubit quantum computer via the cloud and at the end of 2017 started making its 20-qubit system available online too. But quantum computing is by no means a two-horse race. Californian startup Rigetti is focusing on the stability of its own systems rather than just the number of qubits and it could be the first to build a quantum computer that people can actually use. D-Wave, a company based in Vancouver, Canada, has already created what it is calling a 2,000-qubit system although many researchers don't consider the D-wave systems to be true quantum computers. Intel, too, has skin in the game. In February 2018 the company announced that it had found a way of fabricating quantum chips from silicon, which would make it much easier to produce chips using existing manufacturing methods.

There are quantum computers already, but not of sufficient power to replace classical computers. A team of researchers from IQC and MIT hold the current world record for the most number of qubits used in an experiment. While practical quantum technologies are already emerging – including highly effective sensors, actuators and other devices. Although a fully functioning quantum computer is a longer-term goal, many fundamental and practical discoveries have been made in the name of quantum computing. Theorists are continually figuring out better ways to overcome decoherence, while experimentalists are gaining more and more control over the quantum world through various technologies and instruments. The pioneering work being done today is paving the way for the coming quantum era.

Bits strings in

0111011
0111111
0101100
1100100



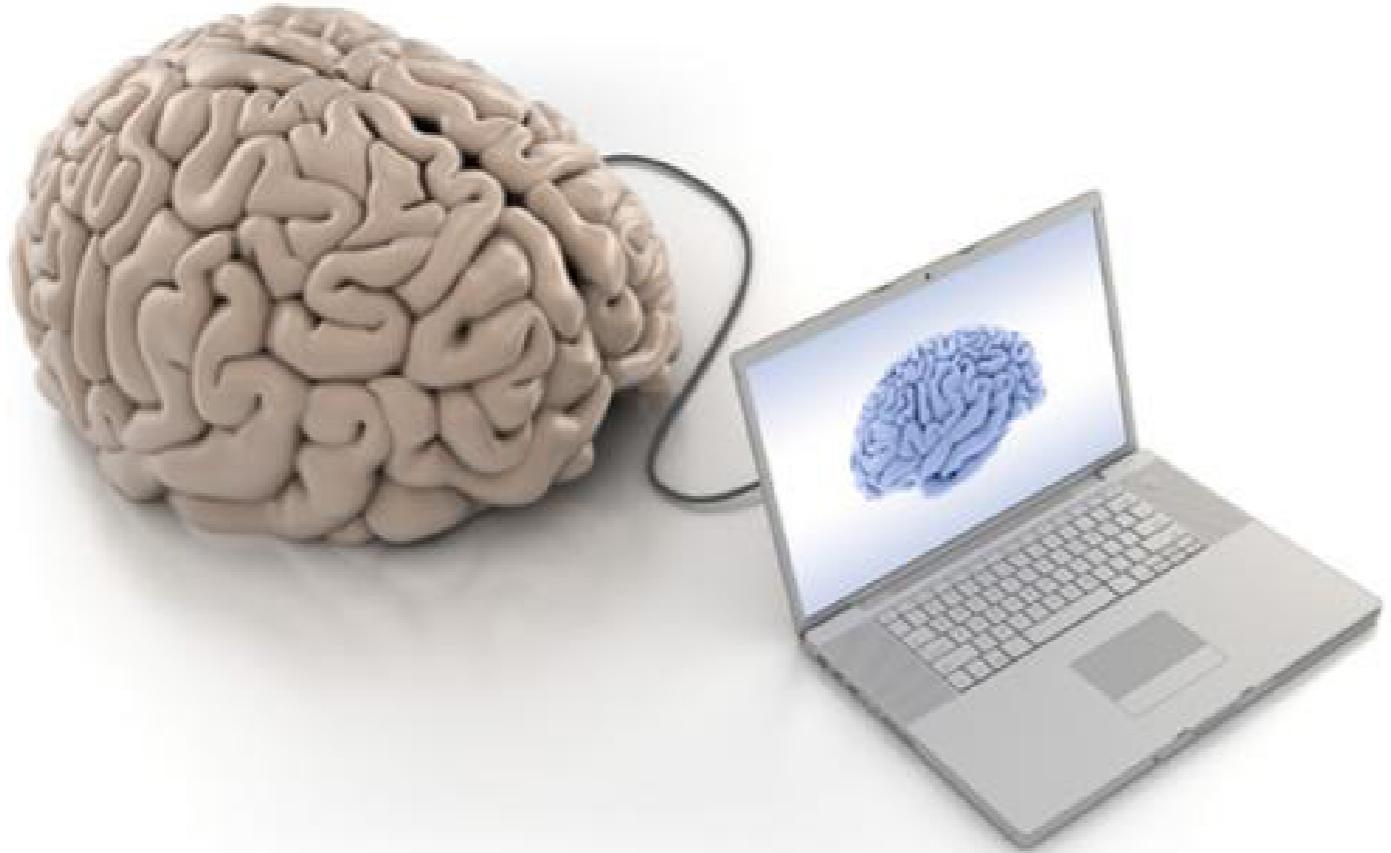
Bits strings out

10101011
10101000

Supply ARITHMETIC program

BRAIN COMPUTER INTERFACE

-By Praveen Gowda 6th SEM

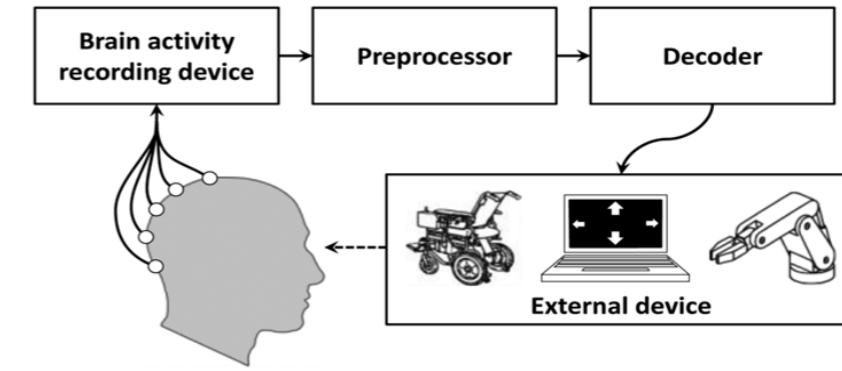


Brain-Computer Interface (BCI) is a fast-growing emergent technology in which researchers aim to build a direct channel between the human brain and the computer. It is a collaboration in which a brain accepts and controls a mechanical device as a natural part of its representation of the body. Most of these applications are related to disabled persons in which they can help them in living as normal people. This would be beneficial in many fields including the Artificial Intelligence and Computational Intelligence.

Algorithms to reconstruct movements from motor cortex neurons, which control movement, were developed in 1970s. The first Intra-Cortical Brain-Computer Interface was built by implanting electrodes into monkeys. After conducting initial studies in rats during the 1990s, researchers developed BCI that decoded brain activity in

monkeys and used the devices to reproduce movement in monkeys and used the devices to reproduce monkey movements in robotic arms. Once the basic mechanism of converting thoughts to computerized or robotic action is perfected, the potential uses for the technology are almost limitless. Instead of a robotic hand, disabled users could have robotic braces attached to their own limbs, allowing them to move and directly interact with the environment.

Brain Computer Interface is a direct connection between computer and human brain. It is the most recent development of Human Computer Interface. Unlike the traditional input devices (keyboard, mouse, pen etc.), the BCI reads the waves produced from the brain at different locations in the human head, translates these signals into actions, and commands that can control the computer.



Invasive BCI Acquisition Techniques:

In invasive BCI techniques, special devices have to be used to capture the brain signals. Such devices are called Invasive BCI devices. Invasive BCI devices are inserted directly into the human brain by a critical surgery. The electro-corticogram are the obtained signals from these inserted electrodes. These devices have the highest quality of human brain signals but have the risk of forming scar tissue, causing the signal to become

weaker or even lost as the body reacts to a foreign object in the brain.

Partially Invasive BCI Acquisition Techniques:

Other devices that can capture the signal from the brain are the partially invasive BCI devices. Devices are inserted in the skull on the top of human brain. These devices have bit weaker quality of human brain signals than invasive BCIs and have less risk of forming scar tissue.

Non Invasive BCI Acquisition Techniques:

Non Invasive BCI devices are considered the safest type and low cost type of devices. However, these devices have weaker human brain signals than other BCI devices due to the skull. Most non-invasive techniques are constructed by recording ElectroEncephaloGraphs (EEG) from the scalp. Recent EEG Non Invasive BCI devices have better temporal resolution due to use up to 256 electrodes on the whole area of the human scalp.

APPLICATION

Regardless of the location of the electrodes, the basic mechanism is the same. The electrodes measure minute differences in the voltage between neurons. The signal is then amplified and filtered. Another way to measure brain activity is with a Magnetic Resonance Image (MRI). An MRI machine is a massive, complicated device. It produces very high-resolution images of brain activity.

Provide disabled people with communication, environment control, movement restoration, and enhanced control of devices such as wheelchairs,

vehicles, assistance robots for people with disabilities. It provides additional channel of control in computer games. Monitors attention long distance drivers or aircraft pilots, send out alert and warning for aircraft pilots.

As BCI technology further advances, brain tissue may one day give way to implanted silicon chips thereby creating a completely computerized simulation of the human brain that can be augmented at will.

GRAPH DATABASE

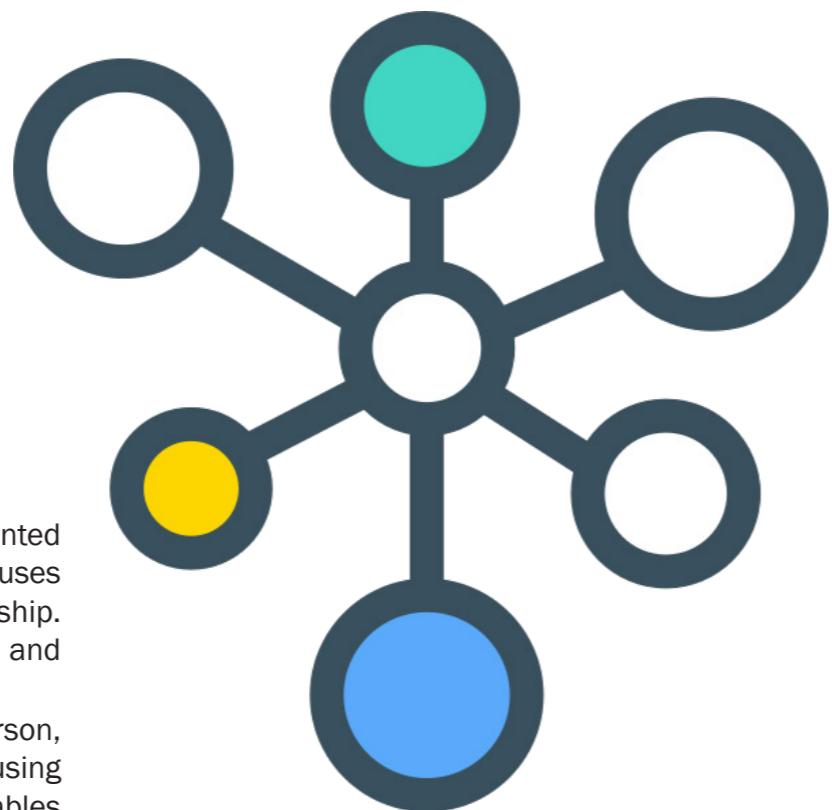
- By Sandesh Bafna, 6th SEM
Raj Yadav, 6th SEM

Graph database, also called a graph oriented database, is a type of no sql database that uses graph theory to store map and query relationship. Graph database make use of node, edge and property.

Node: An entity in real world, which can be person, document, company etc is represented using nodes, unlike relational databases where tables are used to store entity information.

Edge: These are lines between two nodes defining the relationship between them. It represents an abstraction that is not directly implemented in other systems.

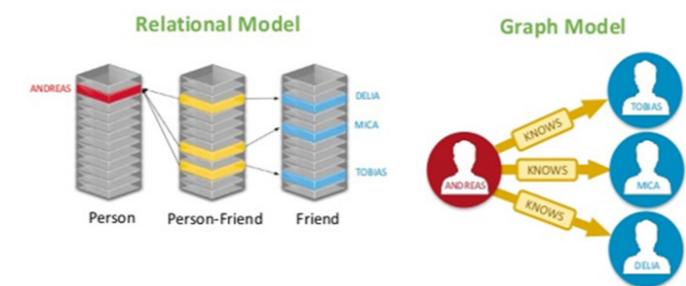
Property: These are same as fields in relational database. It can be defined on both node as well as edges. For example consider student as a node, so we can add various property like name, age, USN, branch etc.



WHY GRAPH DATABASE?

Graph databases address important challenges that we face today, in terms of data size and data complexity. The graph data model allows storage of all the connections of the node along with the node, so that there is no additional step in computing connected data apart from reading the node into memory. The graph data model also prescribes that relationships have properties. Property rich relationships are absolutely critical when trying to explore connected data. The same constructs are achieved in relational databases using foreign keys, joins and join tables. These relational constructs end up as a part of the domain model, but not of the physical storage model.

Relational Versus Graph Models



Graph database would gain huge popularity in coming future, because of its simplicity and user oriented development. It also provides business oriented support to increase the business like it allows retailer like wallmart to lure the customer for buying those product which can be delivered within the deadline which will be more profitable for retailers. Many companies have already started to using graph database approach like neo4j, oracleDB, allegroGraph and many more.

OUR RANK HOLDERS



MALOLA PRIYA
5th Rank
2008



VARSHA HILLA
2nd Rank
2010



SWATHI RAO
3rd Rank
2010



MADHUMITHA
7th Rank
2011



ANKIT AGARWAL
1st Rank
2012



GURUDATH B R
3rd Rank
2012



AMBIKA S KARANTH
8th Rank
2012



SHAKSHI D N
3rd Rank
2013



SMRITHI SINGH
8th Rank
2015



ASHVITHA B SHETTY
8th Rank, 123rd Gate Rank
2016



SWATHI SHETTY
3rd Rank
2017



MAHESH HEBBAR
147th Gate Rank
2017

ACTIVITIES UNDER DEPARTMENT OF ISE

- Orientation Program for IV, VI Semester Students – Talk by Mr. Prashanth Ganesh , Team Lead, Zeta Global, Chennai on 05th Feb 2018
- Technical Seminar on Java APIs for IV Semester Students – by Mr. Arafat Aboobucker, CTO, HUHY Technologies, Bengaluru, on 10th Feb 2018
- A Technical Talk and Awareness program on Cyber Crime and Cyber Laws for VI Semester Students by Mr. S. Badrinath, DySP, Crime Division in Criminal Investigation, Department of Police of Karnataka Police Services, Bengaluru on 17th Feb 2018.
- Inauguration of Centers of Excellence for Data Science and Machine Learning by Mr. R N Prasad, Chief Practice Officer, Confluence Consulting Circle, Mysuru as Chief Guest and Dr. Pethuru Raj, Chief Architect, SRE Division, Reliance Jio Infocom Ltd., Bengaluru as Guest of Honour on 24th Feb 2018
- A Technical talk on Data Science for IV & VI Semester students by Mr. Bhupesh Daheria , CEO, AEGIS School of Data Science, Mumbai on 26th Feb 2018
- AI & Machine Learning Workshop for VI semester students by Mr. Sunil S, Chief Architect, Valley Boot Camp, Bengaluru on 6th & 7th April 2018
- Augmentation Program on Software Development Life Cycle – An Industry Perspective by Mr. Sabapathy, CSI Nominated Member & Consultant, Computer Society of India, Bengaluru Chapter on 23rd April 2018
- Augmentation Program on Data Communication by Dr. H N Shivashankar, Director, RNSIT on 26th April 2018



MESSAGE FROM THE EDITORIAL TEAM

'ITYUKTA', a Sanskrit word, means Information. It is a platform for students to know about new trending technologies and also to share their knowledge about the latest trends in technologies. We have tried to throw light on interesting topics in the mess of science. We would like to thank the faculty, staff as well as students of Information Science And Engineering Department for giving us the opportunity to present the Eighth edition of the newsletter and co-operating with us.

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Dr. M V Sudhamani

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Srihari Katti	VI B
Varsha J	IV B

