RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved, VTU Affiliated & NAAC 'A' Grade Accredited)

DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING

(Accredited by NBA for the Academic Years 2018-19, 2019-20 & 2020-21)

ITYUKTA

2019

AN EPITOME OF INNOVATION

its
chatbots
kubernetes
virtual reality
larry page
wearables
mbs

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 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. ITUYKTA 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 9th edition of ITYUKTA. This edition brings the recent trends and achievements in technology. I would like to thank all our students for their contribution towards ITYKUTA. 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 endeavours.

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 has started Centre of Excellence in Data Science to provide a platform to enhance the quality in teaching-learning process and achieve technological benchmarks. Department of ISE in association with CSE department organized two International Conferences on Data Engineering and Communication Systems (ICDECS) during 2011 and 2015 respectively. Students of the department have secured twelve ranks in 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 conducted to ITYUKTA. The newsletter is released annually during May/ I would like to thank the management, the Director, the Principal, the Staffs and the Students for their continuous support in binging out this newsletter.

Dr. M V SUDHAMANI
Professor & HOD

"I believe that at the end of the century the use of the words and general educated opinion will have altered so much that one will be able to speak of machines thinking without expecting to be contradicted."

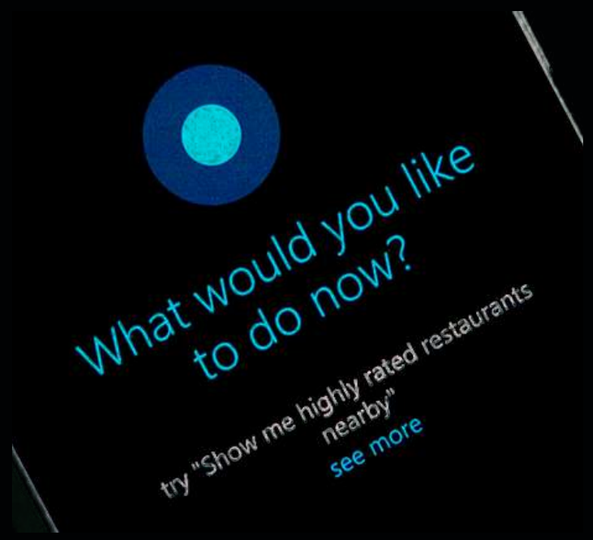
-ALAN TURING

Contents

HOW CHATBOTS WORKS

- SANNIDHI BHAT, 4th Sem

Have you ever wondered how Google assistant recognises you and answers your questions? Not only Google assistant even Amazon's Alexa, Apple's Siri, or Microsoft's Cortana answer all your queries with ease. All of them are nothing but chatbots with voice recognition and text recognition. A chatbot is a computer program that fundamentally simulates human conversations. It allows a form of interface between a person and a machine, the communication which happens via messages or voice command. There's an application layer, a database, and API's to call external services.



When it is asked a question, the chatbot will respond based on the knowledge database available to it at that point of time. If the discussion introduces a concept it is not programmed to understand, it will either deflect the discussion or potentially pass the communication to a human operator. Either way, it will also learn from present interaction as well as from future interactions. For example, if you ask a chatbot, "What's the weather?", it would give a response according to the latest weather reports it has access to. The complexity of a chatbot is determined by the sophistication of its underlying software and the data it can access. Disparate normal app inputs, human language tends to be messy and indefinite. That's where the NLP (Natural Language Processing) engine comes in. Made up of a number of different libraries, the NLP engine does the work of identifying and extracting entities, which are relevant pieces of information provided by the user, using libraries for common Natural Language Processing tasks like tokenization and named entity recognition .alized assistant rather than a text-powered version of a simple web app your bot needs to understand context and intent. To establish context and intent, some additional NLP tasks that allow the NLP engine to understand the relationships between words are required. Part-of-speech tagging takes a sentence and identifies nouns, verbs, adjectives, etc. while dependency parsing identifies phrases, subjects, and objects. For example, the sentence "please deliver a large veggie pizza with no mushrooms" might confuse a more basic bot that can only process simple commands, but our dependency parser would hopefully recognize that "no mushrooms" is meant to modify "veggie pizza." Understanding context and intent allows bots to understand and act upon a much wider array of actions, or even ask the user additional queries until they understand the request. From there, you can add more complex NLP tasks like sentiment analysis, which can identify when a user is becoming frustrated and perhaps escalate the interaction to a human

customer service representative. When it comes to building an NLP engine, there are a lot of options out there, depending on the functionality your bot requires and the language you are using to build it. Python is often celebrated for its robust machine learning libraries, which include NLTK, SpaCy, and Pattern, all of which provide support for basic NLP tasks, as well as some more advanced applications like deep learning. There are NLP applications, programming interfaces, and services that are utilized to develop chatbots. And make it possible for all sort of businesses – small, medium or large-scale industries. The primary point here is that smart bots can help increase the customer base by enhancing the customer support services, thereby helping to increase sales. Humans are constantly fascinated with auto-operating AI-driven gadgets. Chatbots, the blend of immediate response reactivity and consistent connectivity makes them an engaging change to the web applications trend.

FASCINATING FACTS

Fact 1: 1.4 Billion People Use Messaging Apps

The top four messaging apps are bigger than the top four social networks, according to BI Intelligence. More than 1.4 billion people used messaging apps in 2016, according to eMarketer. By 2019, more than 25 percent of the world's population (roughly 1.75 billion people) will be using mobile messaging apps.

Fact 2: People Are Ready to Talk to Chatbots

According to a report (Humanity in the Machine) from media and marketing services company Mindshare, 63 percent of people would consider messaging an online chatbot to communicate with a business or brand. A surveyconducted by myclever Agency found that they would use chatbots to obtain "quick emergency answers."

AUGMENTED REALITY

- KETAKI VINOD PATIL, 6th Sem

What are the possible real time application of Augmented Reality?

Augmented reality has been explored for many applications, from entertainment to medicine, education to business. Augmented reality's application areas include archaeology, architecture, commerce and education, video games, visual art, medical. Some of the earliest cited examples include augmented reality used to support surgery by providing virtual overlays to guide medical practitioners to AR content for astronomy and welding.

Few examples of augmented reality implemented in real world:

Pokémon Go is an augmented reality game. The game is the result of a collaboration between Niantic and Nintendo . It uses the mobile device GPS to locate, capture, battle, and train virtual creatures, called Pokémon, which appear as if they are in the player's real-world location. Though the game got enormous positive response initially, but it suffered major setback due to technical glitches.

Virtual dressing rooms have been developed for e-commerce. It works by superimposing the 3D model or picture of a garment or accessory within the live video feed of the customer. The superimposed 3D model or picture of the garment or accessory will then track to movements of the customer so it appears as if the customer is wearing the virtual item in the video view.

IRCAD have developed a system for laparoscopic liver surgery that uses augmented reality to view sub-surface tumors and vessels.

What is Augmented Reality?

Augmented reality (AR) is an interactive experience of a real-world environment where the objects that reside in the real-world are enhanced by computer-generated perceptual information. The overlaid sensory information can be constructive or destructive and is seamlessly interwoven with the physical world such that it is perceived as an immersive aspect of the real environment. In this way, augmented reality alters one's ongoing perception of a real-world environment. Augmented reality is related to two largely synonymous terms: mixed reality and computer-mediated reality.

The primary value of augmented reality is how it brings components of the digital world into a person's perception of the real world, not as a simple display of data, but through the integration of immersive sensations that are perceived as natural parts of an environment. The first commercial augmented reality experiences were used largely in the entertainment and gaming businesses, but is now expanding to other industries such as knowledge sharing, educating, managing the information flood and organizing distant meetings. Augmented reality is also transforming the world of education, where content may be accessed by scanning or viewing an image with a mobile device

Why use Augmented Reality?

Augmented reality is used to enhance natural environments or situations and offer perceptually enriched experiences. With the help of advanced AR technologies (e.g. adding computer vision and object

recognition) the information about the surrounding real world of the user becomes interactive and digitally manipulable. Information about the environment and its objects is overlaid on the real world. This information can be virtual or real, e.g. seeing other real sensed or measured information such as electromagnetic radio waves overlaid in exact alignment with where they actually are in space. Augmented reality also has a lot of potential in the gathering and sharing of tacit knowledge. Augmentation techniques are typically performed in real time and in semantic context with environmental elements. Immersive perceptual information is sometimes combined with supplemental information like scores over a live video feed of a sporting event. This combines the benefits of both augmented reality technology and heads up display technology (HUD).

MOBILE BIOMETRIC SYSTEM

-KALPAJ PISE, 4th Sem

In the modern day world, where everyone is in a hurry to get to the finish line of whichever field they choose to move ahead in, the work needs to be completed in a snap's span. The computers were invented and used for the very purpose of speed and efficiency perks. We then evolved to mobile technology, which include advantages such as inert location coverage, wider network area in addition to the faster communication processes through wireless frames.

The use of technology as a whole is increasing day by day. We all depend on technology, and we use various technologies to accomplish specific tasks in our lives. Today we have various emerging technologies that influence our lives in different ways. It is being implemented in almost every aspect of our lives and business function. As much good technological developments

ADVANCEMENT IN REAL TIME WORLD

have brought in, it is inevitably also helping the bad.

As we move ahead with technology advancing exponentially with time, the authenticity and identity of every individual is at question. Setting up a new identity and moving away from a said world to another is very easy these days. Identity thefts have become so common and the mere existence of an individual is put at stake with no mistake at his end. Such cases can be avoided by using the simple 'old school' technique of finger print analysis or in more advance terminologies, Biometric systems.

Biometrics is any use of biological data in technology. Biometric systems focusing exclusively on the identification of humans have become the major kind of biometric system in today's IT world. Governments, businesses and organizations can use biometric systems to get more information about individuals or about a populace as a whole. The programs use data about humans to identify specific individuals. They are used for various kinds of security in different applications. This system, embedded in the Mobile technology gives rise to Mobile Biometric Systems.

Mobile biometric systems refers to mobile applications of biometrics, which can include embedded readers and sensors, as well as mobile apps, which exploit biometrics. This also includes handheld systems, as well as systems based on a smartphone or tablet.

The use of multiple biometric authentication systems for human identification is the next step. Multimodal Biometric Authentication systems take input from a single or multiple biometric devices for measurement of two

or more different biometric characteristics to ensure authentication accuracy.
It is seen that having a single form of biometrics for authentication is no longer an effective option for many companies.

Mobile Biometric systems are used at multiple facilities for multiple purposes and with the latest development being the biometric driver identification systems, Biometrics have entered the world of transport as well. The market for biometric driver identification systems will grow from $10 billion in 2018 by an estimated 25 percent in 2019, driven by demand for enhanced safety and driving experience.

SURVEY & FACTS

"Global Biometric Authentication and Identification Market: Focus on Modality (Face, Eye, Fingerprint, Palm, and Vein), Motility, Application, and Technology Trends Analysis and Forecast: 2018-2023" identifies significantly higher demand for biometric technology in consumer goods as a major market driver.

the world's largest biometrics database containing the faces, all 10 fingerprints and two iris scans of each of 1.16 billion people. The database is just one strategy in the country's larger plan to issue unique ID numbers for residents.

kubernetes

-CHIRAYU GUPTA, 6th Sem

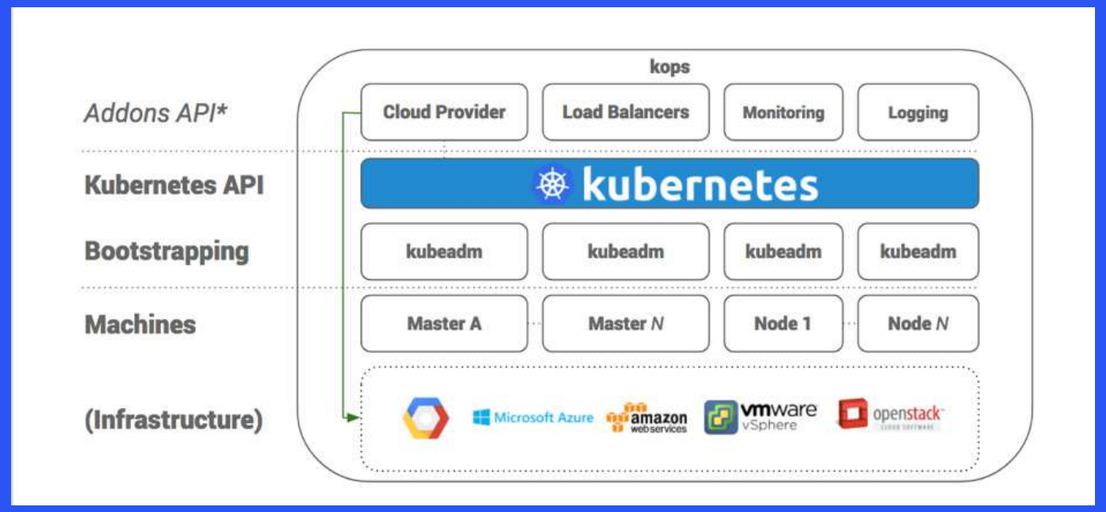
Kubernetes is a popular open source platform for container orchestration—that is, for the management of applications built out of multiple, largely self-contained runtimes called containers. Containers have become increasingly popular since the Docker containerization project launched in 2013, but large, distributed containerized applications can become increasingly difficult to coordinate. By making containerized applications dramatically easier to manage at scale, Kubernetes has become a key part of the container revolution.

WHAT IS KUBERENTES?

Kubernetes is an open source project that has become one of the most popular container orchestration tools around; it allows you to deploy and manage multi-container applications at scale. While in practice Kubernetes is most often used with Docker, the most popular containerization platform, it can also work with any container system that conforms to the Open Container Initiative (OCI) standards for container image formats and runtimes. And because Kubernetes is open source, with relatively few restrictions on how it can be used, it can be used freely by anyone who wants to run containers, most anywhere they want to run them-on-premises, in the public cloud, or both.

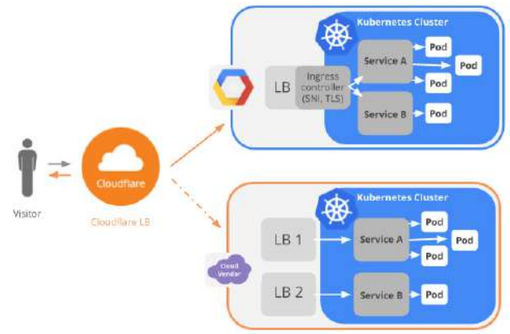
What is Container Orchestration?

Containers support VM-like separation of concerns but with far less overhead and far greater flexibility. As a result, containers have reshaped the way people work towards developing, deploying, and maintaining software. In a containerized architecture, the different services that constitute an application are packaged into separate containers and deployed across a cluster of physical or virtual machines. But this gave rise to the need for container orchestration—a tool that automates the deployment, management, scaling, networking, and availability of container-based applications.



Kubernetes Architecture: How Kubernetes Works?

Kubernetes's architecture makes use of various concepts and abstractions. Some of these are variations on existing, familiar notions, but others are specific to Kubernetes.



Kubernetes clusters

The highest-level Kubernetes abstraction, the cluster, refers to the group of machines running Kubernetes (itself a clustered application) and the containers managed by it. A Kubernetes cluster must have a master, the system that commands and controls all the other Kubernetes machines in the cluster. A highly available Kubernetes cluster replicates the master's facilities across multiple machines. But only one master at a time runs the job scheduler and controller-manager.

Kubernetes nodes and pods

Each cluster contains Kubernetes nodes. Nodes might be physical machines or VMs. Again, the idea is abstraction: Whatever the app is running on, Kubernetes handles deployment on that substrate. Kubernetes even makes it possible to ensure that certain containers run only on VMs or only on bare metal.Nodes run pods, the most basic Kubernetes objects that can be created or managed. Each pod represents a single instance of an application or running process in Kubernetes, and consists of one or more containers. Kubernetes starts, stops, and replicates all containers in a pod as a group. Pods keep the user's attention on the application, rather than on the containers themselves. Details about how Kubernetes needs to be configured, from the state of pods on up, is kept in Etcd (a distributed key-value store).

Pods are created and destroyed on nodes as needed to conform to the desired state specified by the user in the pod definition. Kubernetes provides an abstraction called a controller for dealing with the logistics of how pods are spun up, rolled out, and spun down. Controllers come in a few different flavors depending on the kind of application being managed. For instance, the recently introduced "Stateful Set" controller is used to deal with applications that need persistent state. Another kind of controller, the deployment, is used to scale an app up or down, update an app to a new version, or roll back an app to a known-good version if there's a problem.

Kubernetes Advantages

Because Kubernetes introduces new abstractions and concepts, and because the learning curve for Kubernetes is high, it's only normal to ask what the long-term payoffs are for using Kubernetes. Here's a rundown of some of the specific ways running apps inside Kubernetes becomes easier.

- Kubernetes manages app health, replication, load balancing, and hardware resource allocation for you.
- Kubernetes eases the deployment of preconfigured applications with Helm charts.
- Kubernetes simplifies management of storage, secrets, and other application-related resources.
- Kubernetes applications can run in hybrid and multi-cloud environments.

WEARABLE TECHNOLOGIES

- SHIVAM TIWARI, 4th Sem

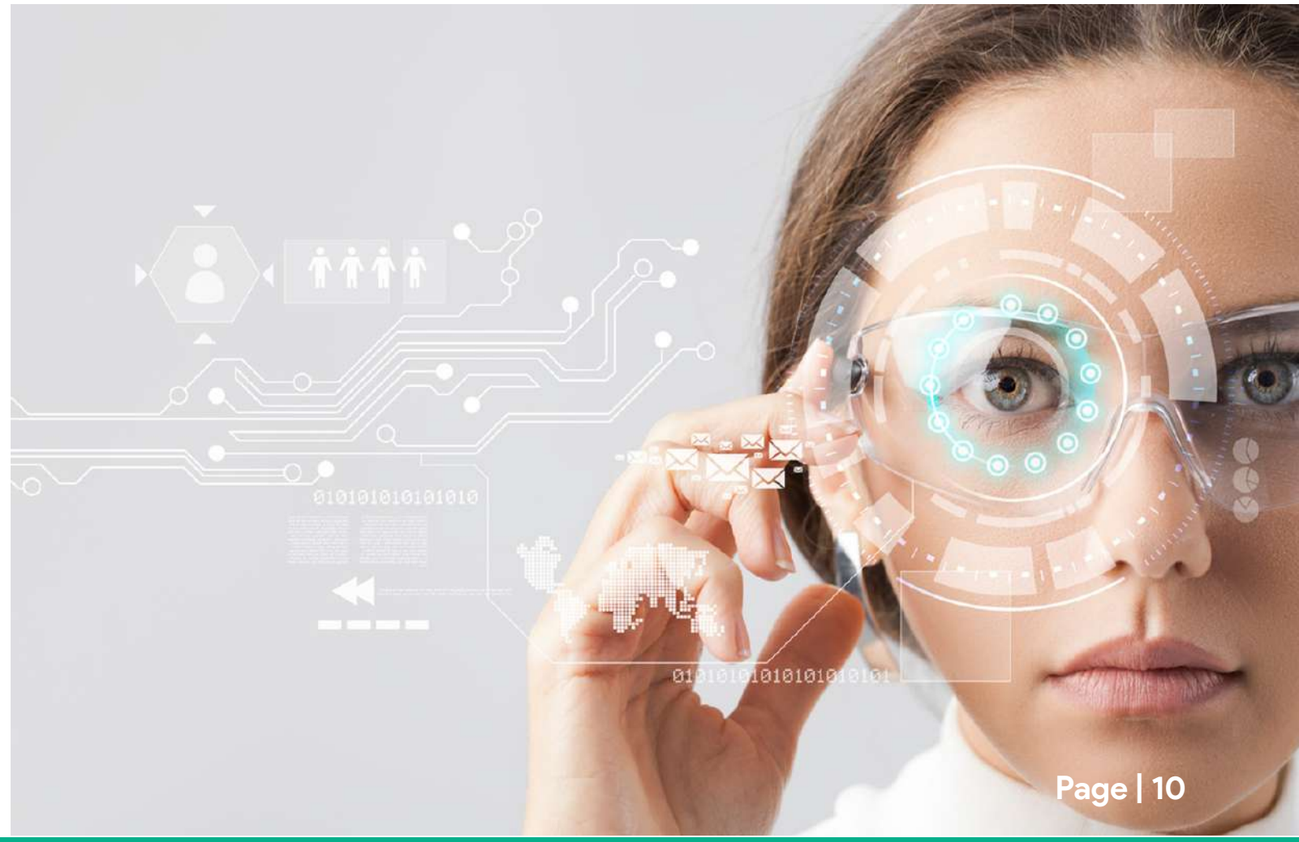
Move yourself a few years back and you probably never had the thought that you'd be wearing a watch that not only tells you the time but also helps you to see the notifications that lands on your phone or to keep track of your fitness activities but that's what happened, isn't it?

Wearable technologies are one of the most important fields which have evolved from these continuous technological advancements. Although there is no clear and agreed definition in the extant literature, in the simplest form wearable technologies can be defined as "the technological devices that are worn on a user's body". Nowadays wearables are not limited to watches only but there are smart shoes, smart glasses and what not. And may be, who knows, the time is not far away when the t-shirt you'll be wearing will have a tech embedded in it.

The rate at which the wearables are being used is ever growing. According to ABI Research Company, the number of consumers having a wearable in the year of 2018 was over 170 million and Jupiter Research Company estimated the revenue from wearable technology to be more than $ 19 billion. It is also expected that the tech industry will see a growth of revenue up to $ 31 billion by the year 2020. Well not only that, in recent surveys it was shown that Wearable technology provides substantial benefits for job satisfaction and productivity, that is, employees who are armed with wearable devices in the workplace increase their productivity by 8.5 percent and their job satisfaction by 3.5 percent.

The scope of wearable technologies is very broad and amorphous, and determining the characteristics and specifications of wearable technologies is very thorny. Therefore, to understand the classification of wearable technologies based on the basic characteristics will be very beneficial. According to the literature, the wearable technologies may be divided into three main categories. These categories can be called as wearable health technologies, wearable textile technologies and wearable consumer electronics. The most commonly used ones are wristwear that accounts for smartwatches and fitness trackers. The reason why they are so widely used is the comfortable design and wide application. A smartwatch may look like to be any other watch but it has an OS installed which can do much more than what an ordinary watch is capable of. They act as an extra interface for your smartphone and allows you to do some of the basic task of your smartphone. A smartwatch may even do some of your fitness tracker task like keeping track of heart rate or steps taken.

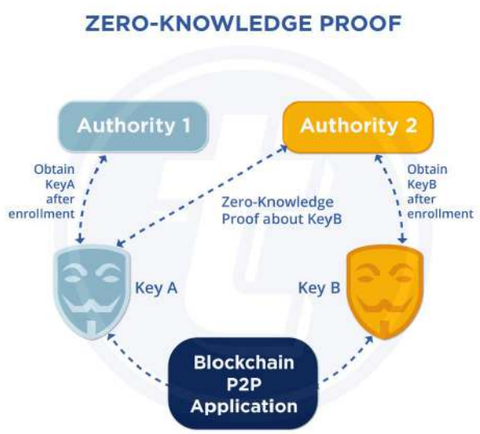
These are produced by many companies like pebble which are mainly into smartwatches and other smartphone manufacturers like Apple and Samsung. That being said about smartwatches, fitness trackers have their own advantages over smartwatches. There is various type of fitness devices that may be worn around your chest, wrist, ankle or neck. But the most commonly used one is the on worn on your wrist. These devices not only tell you the heart rate or steps taken but also provides you with information regarding calories burned, repetition of an exercise and other fitness related info. These devices are useful for any fitness enthusiast or even for the one who go for a walk in the morning. These are the new essentials of future.



ZERO-KNOWLEDGE PROOF

-SUSHMA P R, 6th Sem

You think you can tease someone by calling him having 'zero-knowledge'?!. You are wrong because this is era of zero knowledge protocol. Let us know about this interesting technology. As name suggests one can complete his task without worry by disclosing zero knowledge about your secrets yet assuring the other party of having knowledge. Here is definition of zero-knowledge proof, brainchild of Shafi Goldwasser, Silvio Micali, and Charles Rackoff in 1987 in their paper "The Knowledge Complexity of Interactive Proof-Systems".



"Zero-knowledge proofs let you validate the truth of something without revealing how you know that truth or sharing the content of this truth with the verifier. This principle is based on an algorithm that takes some data as input and returns either 'true' or 'false'."

Illustrations always help us to get the idea of a concept in base level. Two balls and a colour blind friend is one such example where colour blind friend is a verifier and you are prover. Your friend will have 2 identical balls of colour red and green which he can't distinguish and you can make out the difference. He will hide balls behind his back and asks you to guess whether he switched the balls by showing you each time. You having capacity to identify colour easily will tell him if he switched without him knowing the colour, which is analogy to secret in real world applic¬ation. The probability of success of false accuser of having knowledge can be reduced by increasing number of cross examinations with the verifiers. In the above example initially the probability of false accuser guessing correctly is 50% which reduces to zero probability with iterated examination.

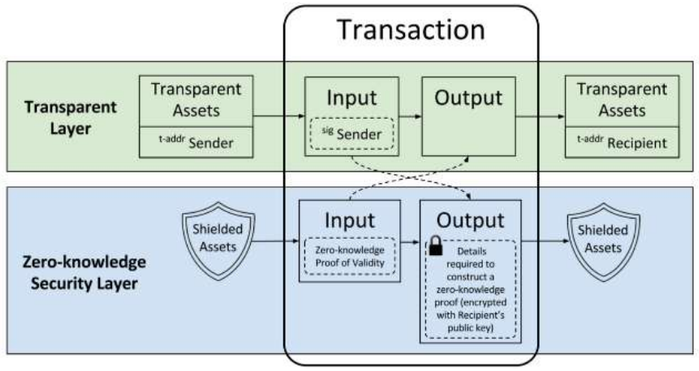
As the concept deepens the concept gets clearer and we specify the following three must possessed properties of zero-proof knowledge.

* Completeness- if the statement is true the honest verifier will get convinced without any doubt the fact provided by the prover.

* Soundness-if the statement is false no cheating prover can convince the verifier that it is true, except with small probability.

* Zero-knowledge-if the statement is true, the verifier will only be left with assertion and not the knowledge prover possess. This assertion is sufficient for a provider to create a scenario showing prover will possess the secret and can produce a transcript that looks like an interaction between provider and verifier in question.

Among the three the third proofs makes the protocol zero –knowledge rest two contributing for generalized interaction proof system.



Applications

The power of knowledge is appreciated in practical world where its essence is put to test. To apply booming technology which is highly complex and theoretical is appreciable venture. Let us look into practical applications of it.

Anonymous Verifiable Voting

Accounting recent Lok Sabha election voting percentage is an unhappy factor which aggregated around 50%, there is an urge to make voting digitize without compromising security. Here comes ZKP's as solutions to it where votes are recorded on public block chain, no need of trusted third party to verify the result. Voters will cast their ballet without revealing their identity and ZKP's keep count of voters providing it to electoral commission.

Nuclear Disarmament

The future application of nuclear disarmament is proposed by the Princeton Plasma Physics Laboratory and Princeton University in 2016. It may include inspectors verifying the object whether it is a nuclear weapon without recording, revealing the internal parts and working which might be a secret.

Privacy on Public Blockchain

A company for instance which implies public block chain to track their supply chain wishes to keep his valuable supplier information secured. Lying a base work for such specified requirement is achieved by ZKP's layered implementation. Apps used ZKP are Z-cash

Conclusion

ZKP for sure is a promising technology for spectrum of problems. It has established its usage from tech-based companies to digitized voting. The application of this complex protocol itself is surety for its efficiency and thus will be emerging trend in many digital transactions ranging from data on public chain to credentials of person or private information of an organization.

WHAT IS VIRTUAL REALITY ?

Virtual reality (VR) is an interactive computer-generated experience taking place within a simulated environment. It incorporates mainly auditory and visual feedback, but may also allow other types of sensory feedback. This environment can be indistinguishable to the real-world environment or it can be astounding.

Current VR technology commonly uses virtual reality headsets or multi- projected environments, sometimes in combination with physical environments or props, to generate realistic images, sounds and other sensations that simulate a user's physical presence in a virtual or imaginary environment. A person using virtual reality equipment is able to "look around" the artificial world, move around in it, and interact with virtual features or items. The effect is commonly created by VR headsets consisting of a head-mounted display with a small screen in front of their eyes, but can also be created through specially designed rooms with multiple large screens. Other forms of VR include augmented reality and mixed reality systems.

VIRTUAL REALITY

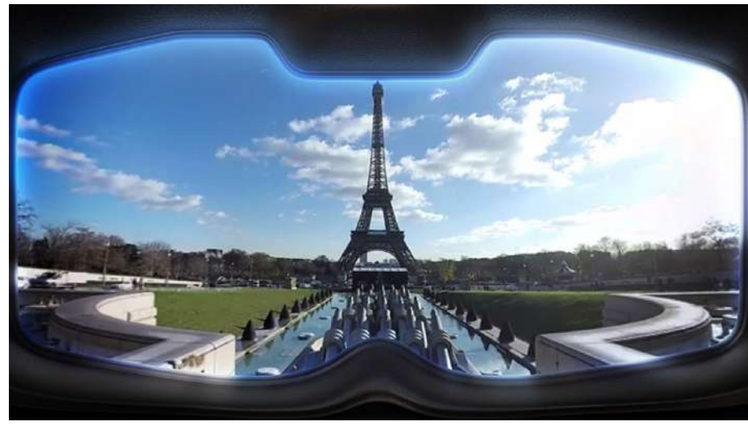
-SAI ABHISHEK, 6th Sem

What are the forms and methods of Virtual Reality?

One method by which virtual reality can be realized is simulation-based virtual reality. Driving simulators, for example, give the driver an on board the impression of actually driving an actual vehicle by predicting vehicular motion caused by driver input and feeding back corresponding visual, motion and audio cues to the driver.

With avatar image -based virtual reality(graphical representation of user's alter ego or character), people can join the virtual environment in the form of real video as well as an avatar.

which provide separate images for each eye for stereoscopic graphics rendering a 3D virtual world, a binaural audio system, positional and rotational real-time head tracking for six degrees of movement.



In projector-based virtual reality, creation of the real-world environment plays a vital role in various applications, such as robot navigation, construction modelling, and airplane simulation. Image-based virtual reality system has been gaining popularity in computer graphics and computer vision communities.

A head-mounted display (HMD) completely immerses the user in a virtual world. A virtual reality headset typically includes two small high resolution OLED or LCD monitors

What are the possible real time application of Virtual Reality?

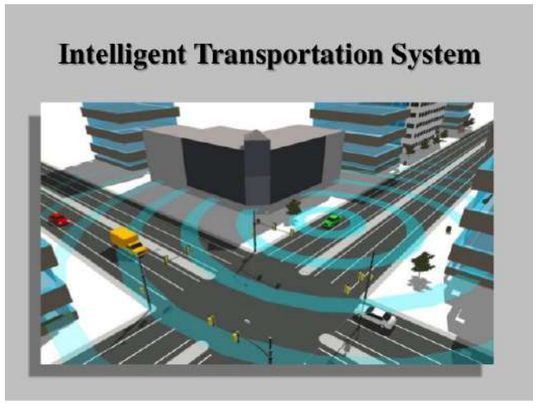
Virtual reality is most commonly used in entertainment applications such as video gaming and 3D cinema. In social sciences and psychology, virtual reality offers a cost-effective tool to study and replicate interactions. In medicine, simulated VR surgical environments under the supervision of experts can provide effective and repeatable training at a low cost. VR can simulate real workspaces for workplace occupational safety and health purposes, educational purposes, and training purposes. It can be used to provide virtual environments for the learners where they can develop their skills without real-world consequence of failing.

INTELLIGENT TRANSPORTATION SYSTEM

-AMEY ADITYA ,4th Sem

Population and economic growth have led to the outburst of a lot of vehicles on the urban streets of India. India has experienced a tremendous increase in number of registered vehicles that are over 210 million as of 2015. Apart from the Economy, the rural to urban migration has led to an upsurge in demand for the vehicles and transportation infrastructure. The current technologies and facilities are not capable enough to tackle this vehicular growth leading to congestion and resulted in posing greater challenges to the authorities in the urban cities.

Intelligent Transportation system (ITS) is a well-known method to deal with the current issue or nevertheless make is more efficient. ITS aims are reducing traffic congestion, control environmental degradation



systems, faster travel time, better safety for the users, and better infrastructure for the community¬. India is a country with a population density of 387 people per square kilometre, ITS must function is a slightly different way. Along with Traffic management systems, Traveller Information systems, vehicle control systems, public transportation systems and commercial vehicle operations system, other small issues like, complete dependency on roads as a means of transport, efficient pedestrian systems, better laws against proper parking and lane disciple should be dealt with.

TRAFFIC MANAGEMENT SYSTEM

TRAFFIC MONITORING SYSTEM

Traffic monitoring system provides a way of centralizing the control of traffic lights across the city using better sensor technology, more reliable communication channels and advanced information processing capabilities. With the help of this technology, the traffic in any part of the city can be noticed and moderated as required. Artificial intelligence can be used to identify the moving traffic and prioritize that particular route. Thermal imaging cameras can be utilized to detect the density of vehicles in any particular lane. Automated number plate readers can be used to automatically generate tickets to the violators. Use of all these Technologies will result in real-time monitoring capabilities which can be used to anticipate the incoming traffic and reduce congestions at further junctions. New data processing techniques can be used to set variable speed limits and facilitate faster and smoother movements. By centralizing the traffic management system, integrated Corridor management techniques can be applied in a cooperative way to both freeway networks (ex: Ramp meters) and to signalized arterial networks (ex: Advanced signal timing algorithms). This will greatly reduce the amount of idling. This system also facilitates the spreading of the traffic from a peak centre to larger area.

TRAVELLER INFORMATION SYSTEM

To make things more convenient for the driver, a wide variety of information systems for travellers is made available with the help of ITS. Route guidance system, maybe on board, off-board or smart phone navigations, have to me made efficient. As a centralized system can provide real time information about the traffic ahead, dynamic message sign boards can be implied to give the travellers more information on their route ahead. A road weather information system can be used which measure real-time atmospheric parameters, pavement conditions, water levels and visibility which can pose to be of great importance to the commuters. Geo-locations systems coupled with the route guidance system allow users to find specific locations allowing users to cut down excessive driving. Electronic payments systems should become more prevalent, allowing payment of tolls and fees with-out actually stopping at any station for financial transaction. This could result in lesser congestions at the highways and expressways.

PUBLIC TRANSPORATATION SYSTEMS

Public transportation forms an integral part of Indian society. Buses contribute to 90% of transportation in the cities and Mumbai sub-urban handles 6.3 million commuters daily. So, having an efficient public transportation system is a key in ITS. The application of ITS in public transportation system improves the services by improving the reliability and efficiency of operations. Through data analysis, the agencies can provide better information to the passengers and take concrete decisions for overall operation and management. Providing facilities of surveillance, automated vehicle location system, passenger information system, automated fare collection system, Internet facilities can encourage people to use more of these than their own vehicles. The use of public transportation is a major contribution

towards environmental conversation, which is a major domain of ITS. The dependency on public road transportation should be reduced by investing more into projects like metro which reduce the travel time by more than half.

LARRY PAGE

-Jahnvi S, 4th Sem

Lawrence Edward Page was born on March 26, 1973. He is an American computer scientist and Internet entrepreneur who co-founded Google with Sergey Brin. His mother was Jewish, and his maternal grandfather later made aliyah to Israel, but Page does not declare to follow any formal religion. His father, Carl Victor Page, Sr., earned a PhD in computer science from the University of Michigan, when the field was being established, and BBC reporter Will Smale has described him as a "pioneer in computer science and artificial intelligence". He was a computer science professor at Michigan State University and Page's mother, Gloria, was an instructor in computer programming at Lyman Briggs College and at Michigan State University. Page is the chief executive officer of Alphabet Inc. (Google's parent company). After stepping aside as Google CEO in August 2001, in favor of Eric Schmidt, he re-assumed the role in April 2011. He announced his intention to step aside a second time in July 2015, to become CEO of Alphabet, under which Google's assets would be reorganized. Under Page, Alphabet is seeking to deliver major advancements in a variety of industries.

As of December 2018, Page was the 8th-richest person in the world, with a net worth of $51.3 billion.[8] Forbes placed him 10th in the list "Billionaires 2019".

Have you ever wondered what "GOOGLE" means?

The word "google" is a creative spelling of "googol" which means one followed by hundred zeroes or more colloquially an unfathomable number.

Lawrence Edward Page aka Larry Page born on March 26, 1973, is an American computer scientist and Internet entrepreneur who co-founded Google in 1998 with fellow Stanford Ph.D. student Sergey Brin.

THE COURSE OF DEVELOPING INTEREST :

While kids played in the grounds during childhood, Larry used to pour in a lot of time over books and magazines. He engrossed himself in an environment filled with computer, science and technology magazines. Page holds a Bachelor of Science in computer engineering from the University of Michigan, with honors and a Master of Science in computer science from Stanford University.

INNOVATION OF GOOGLE :

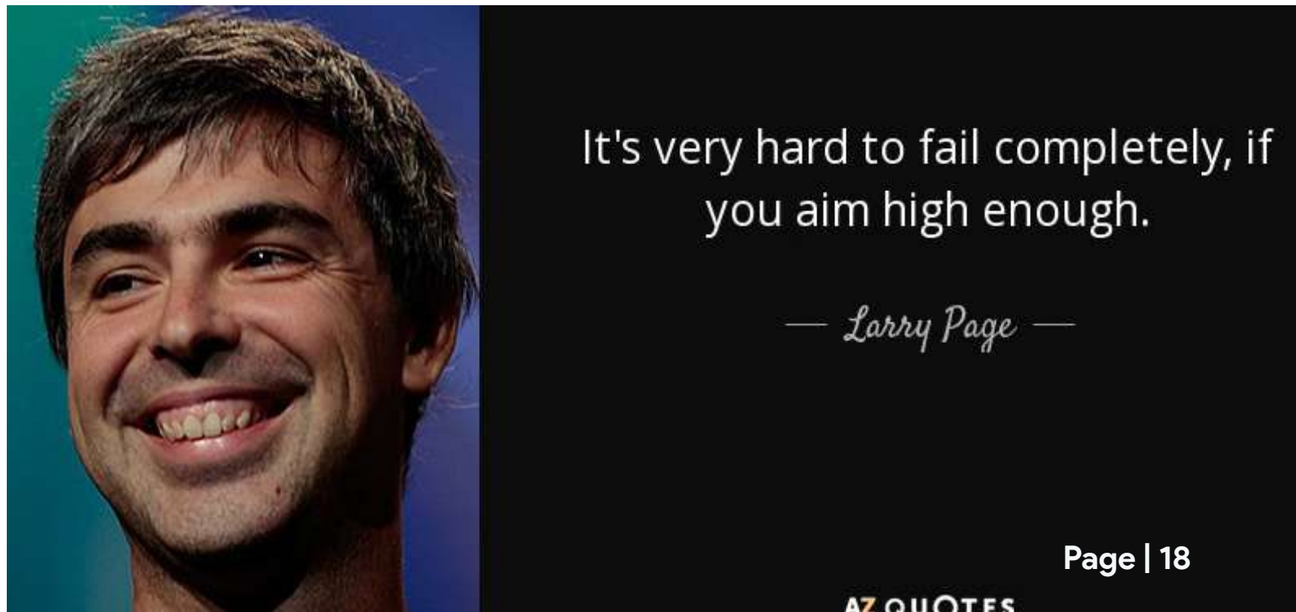
In the course of understanding world wide web's link structure as a huge graph, he started off a research project named "Backrub" with Sergey Brin , with the help of his supervisor Terry Winograd and Rajeev Motwani. Rajeev Motwani ,an Indian who completed his Bachelor in Technology in Computer Science from the IIT Kanpur in 1983 and got his Ph.D. in Computer Science from the University of California, Berkeley in 1988. Motwani was best known for mentoring numerous Stanford graduate students, including Google co-founders Larry Page and Brin and was also a special adviser to Sequoia Capital and invested in companies including PayPal and Google. Motwani and Page have contributed to various fundamentals to computer science like search and information retrieval, streaming databases and data mining, and robotics. In these areas, they considered questions as philosophical as what makes problems inherently intractable, and as practical as finding similar images and documents from a database. BackRub was written in Java and Python and was run on several Sun Ultras and Intel Pentiums running Linux. Finally, Page invented an algorithm called "PageRank "used to rank web pages in their search engine results. It works by counting the number and quality of links to a page to determine a rough estimate of how important the website is. The underlying assumption is that more important websites are likely to receive more links from other websites.

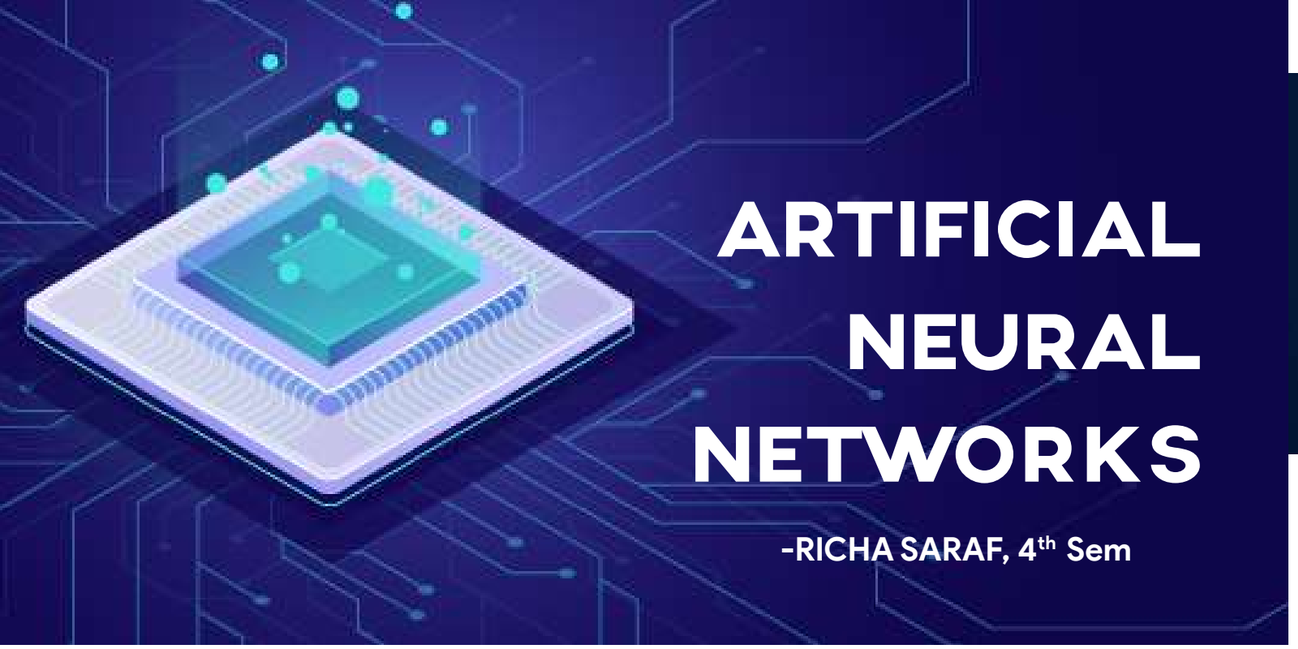
Soliciting funds from friends and family,

In 1998, Brin and Page incorporated Google, Inc. Page appointed himself as CEO, while Brin served as Google's president. The pair's mission was "to organize the world's information and make it universally accessible and useful. By June 2000, Google had indexed one billion Internet URLs , making it the most comprehensive search engine on the Web at the time. The company cited NEC Research Institute stated that "Google provides access to 560 million full-text indexed web pages and 500 million partially indexed URLs."

ACHIEVEMENTS AND AWARDS

- In 2000, Google earned a Webby Award, a People's Voice Award for technical achievement, and in 2001, was awarded Outstanding Search Service, Best Image Search Engine, Best Design, Most Webmaster Friendly Search Engine, and Best Search Feature at the Search Engine Watch Awards."
- In 2002, Page, along with Sergey Brin, was named to the MIT Technology Review TR100, as one of the top 100 innovators in the world under the age of 35.
- In 2011, he was ranked 24th on the Forbes list of billionaires and as the 11th richest person in the United States.



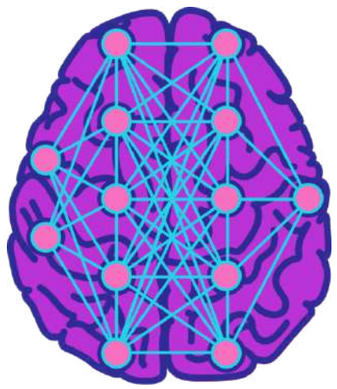


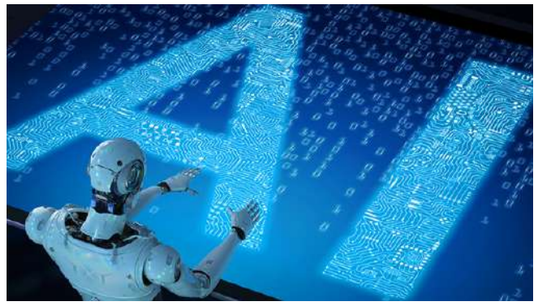
ARTIFICIAL NEURAL NETWORKS

-RICHA SARAF, 4th Sem

Over the past few years, the technology has become very vast and dynamic. Computers are a key component of this whole transformation. This is a very exhilarating time for technology as the traditional boundaries are now becoming hazy.

Another approach is required to give computers more 'human-like' abilities, capabilities to make judgements and to change opinions .For example: Let us consider Image recognition, they might learn to identify images that contain cats by examining example images that have been manually labelled as "cat" or "no cat" and the results are used to identify cats in other images. They do this without any prior knowledge about cats.





The artificial neural network is established on a collection of connected units or nodes called artificial neurons, that loosely models the neurons in a biological brain. Every connection, is just like a biological synapse in a biological brain that can transmit signals from one artificial neuron to another. An artificial neuron is the one that receives a signal, processes it and then signal other additional artificial neurons.

The fundamental goal of ANN approach was to resolve problems the same way that a human brain would. Nevertheless, over the time attention has moved from performing specific tasks leading to deviations from biology.

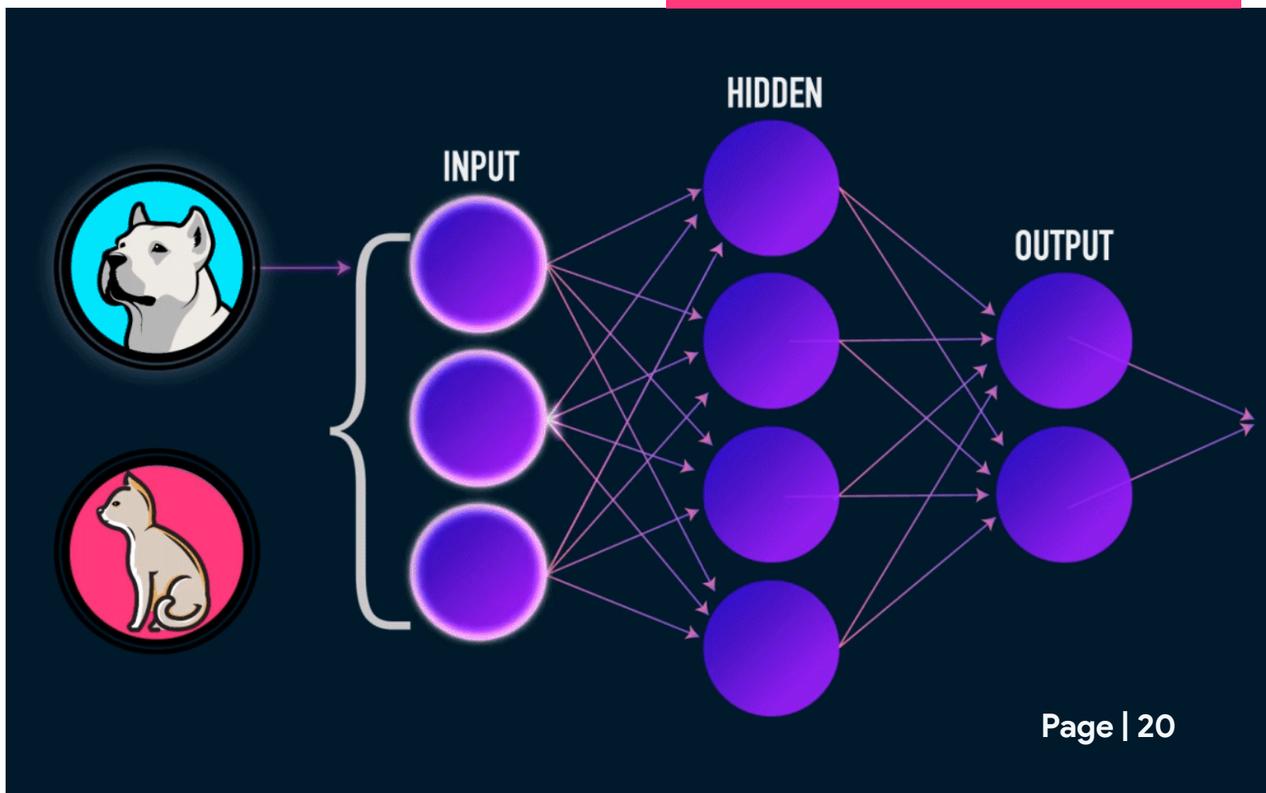
Artificial neural networks are one of the vital tools used in machine learning. As the "neural" part of their name suggests, they are

brain-inspired systems which are intended to reproduce the way that we humans learn. Neural networks consist of input and output layers, as well as (in most cases) a hidden layer consisting of units that modify the input into something that the output layer can use.

APPLICATIONS

Because of their ability to replicate and model nonlinear processes, Artificial neural networks have found many applications in a wide range of disciplines.

- Application areas include system identification and control (vehicle control, trajectory prediction process control, natural resource management).
- Pattern recognition and sequence recognition.
- Medical diagnosis, finance (e.g. automated trading systems), data mining, visualization, machine translation, social network filtering and e-mail spam filtering.
- Artificial neural networks have been used to diagnose cancers, including lung cancer, prostate cancer, colorectal cancer and to distinguish highly invasive cancer cell lines from less invasive lines using only cell shape information.
- Artificial neural networks have been employed with some success also in cybersecurity, with the objective to discriminate between legitimate activities and malicious ones.



SEMINARS

OUR RANK HOLDERS

MALOLA PRIYA
5th Rank
2008

VARSHA HOLLA
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

MADHUSHREE B P
1th Rank M.Tech
2018

SAHANA M
5th Rank M.Tech
2018

SHRUSTHISAGAR
5nd Rank B.E.
2018

SHUBHAM RAJ
98.87% in CAT
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 Ninth edition of the newsletter and co-operating with us.

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