Student Achievements

SHRE SHAKTHY
91.8%

HEMANTH KUMAR B
87%

HARSHITHA M
86.6%

SHREYAS N
85%

PRAJWAL N
80.7%

G POORNIMA
77%

KARTHIK R
76.2%

PAVAN KUMAR E
76%

SAGAR S N
73.5%

NITHIN KUMAR GM
73.2%

PRAMODH HR
71.63%

PRATHAP CV
71.54%

Hemanth Kumar of II Sem BCA had participated in **CODE TRACKING** on 28.02.2018 and won **1st Prize** which was organised by **JSS WOMEN's COLLEGE, Mysuru.**

Hemanth Kumar & Shre Shakthy of II Sem BCA had participated in Coding Event on 06.02.2018 was organised **by De Paul College Fest, Mysuru.**

Ronica Dechamma, G Poornima, Shre Shakthy & Shudharshan G of II Sem BCA gave the Presentation on **"National Science Day"** Organised by **NIE First Grade College, Mysuru.**

~~ Editorial Team ~~

MR.CHETHAN H

MRS.SAVITHA KV

MRS.SUKSHMA RD

HEMANTH KUMAR B

SHREYAS N

TECHZONE

A IT Magazine - Department of Computer Science

HINDUSTAN FIRST GRADE COLLEGE

A Unit of Hindustan Group of Institute, Chennai

Vol-1 **20th December 2018** **Page-01**

Principals' Desk ....✍

It is a great pleasure to write a few words about the IT magazine "TECH ZONE" brought out by the Department of Computer Science. I take this opportunity to thank the department for initiating TECH ZONE and identifying the hidden talents among the students. Today, the role of a college is not only to pursue academic excellence but also to motivate and empower the students to be lifelong learners, critical thinkers, and productive members of an ever-changing global society. Learning is not a process limited to colleges nor does it end with the conclusion of college curriculum. HFGC is encouraging and supporting the students in the formation years of their professional life.

I am extremely happy to write that the students have contributed very good articles about current technologies under the guidance of their teachers. I hope the readers of this issue would receive them all positively.

I convey my best compliments to the members of staff & students of the department of Computer Science for their endeavours in this regard, wishing many more endeavours of this kind for knowledge enhancement.

Dr. Sujatha Krishnamurthy

Message by Vice Principals ....✍

I am delighted to express my views on the release of the IT magazine "TECHZONE". I appreciate the dynamic team of students and staff members of BCA for their continuous efforts in bringing out this newsletter.

It gives me immense pleasure in seeing the articles by students on latest trends in the IT field.

I wish the newsletter will carry many more useful information's and I hope students will make use of these opportunities to express their views and update their knowledge.

My best wishes to the Inaugural issue and hope this inspirational legacy is taken forward by the future students of HFGC.

Mr. Chethan H

PHOTO GALLERY

A talk on Big Data & Android App Development on 21.08.2017 By **HP**

Special Lecture on "Evolution of Computer from 1960 to 2018 India and also current job trend in Software Industry" on **01.02.2018** by **Mr. B S Vishwanath Rao,** Rtd, HAL Computer Engineer, Director of IT Dept., Vikranth Tyres.

Mysore City Inter College Tournament organized by University of Mysore, our Students stood has Runner up

Industrial Visit to BEML, a Public Sector Unit at Mysore on 08.09.2018

Yuva Sambrama on 30.09.2018

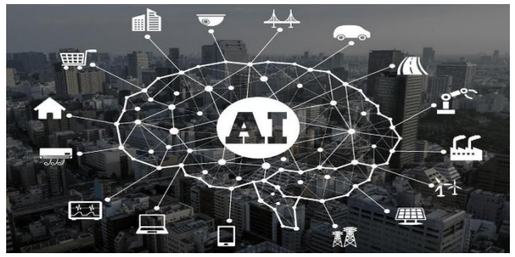
Yuva dasara on 13.10.2018

Won **3rd prize** for Group Dance and **2nd prize** for Duet Dance in **ANTARAGNI -2018** Fest at Sree Cauvery First Grade College, Mysuru on 24.02.2018.

Prof. Siddesha S, Professor, J.C. Engineering college delivered a Special Lecture on **"Future Trends in IT"** on - 23.07.2018.

Industrial Visit to **Larsen &Toubro** on 06.09.2018 - B.Com and BCA Students

Artificial Intelligence (AI)



AI (artificial intelligence) is the simulation of human intelligence processes by machines, especially computer systems. These processes include learning (the acquisition of information and rules for using the information), reasoning (using rules to reach approximate or definite conclusions) and self-correction. Particular applications of AI include expert systems, speech recognition and machine vision.

Types of Artificial Intelligence

AI can be categorized in any number of ways, but here are two examples. The first classifies AI systems as either weak AI or strong AI. Weak AI, also known as narrow AI, is an AI system that is designed and trained for a particular task. Virtual personal assistants, such as Apple's Siri, are a form of weak AI. Strong AI, also known as artificial general intelligence, is an AI system with generalized human cognitive abilities so that when presented with an unfamiliar task, it has enough intelligence to find a solution. The Turing Test, developed by mathematician Alan Turing in 1950, is a method used to determine if a computer can actually think like a human, although the method is controversial.

The second example comes from Arend Hintze, an assistant professor of integrative biology and computer science and engineering at Michigan State University. He categorizes AI into four types, from the kind of AI systems that exist today to sentient systems, which do not yet exist. His categories are as follows:

Type 1: Reactive Machines. An example is Deep Blue, the IBM chess program that beat Garry Kasparov in the 1990s. Deep Blue can identify pieces on the chess board and make predictions, but it has no memory and cannot use past experiences to inform future ones. It analyzes possible moves its own and its opponent and chooses the most strategic move.

Type 2: Limited Memory. These AI systems can use past experiences to inform future decisions. Some of the decision-making functions in self-driving cars are designed this way. Observations inform actions happening in the not-so-distant future, such as a car changing lanes. These observations are not stored permanently.

Type 3: Theory of Mind. This psychology term refers to the understanding that others have their own beliefs, desires and intentions that impact the decisions they make. This kind of AI does not yet exist.

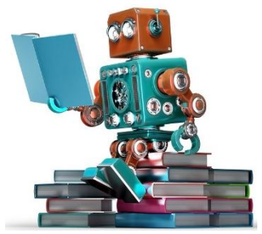
Type 4: Self-awareness. In this category, AI systems have a sense of self, have consciousness. Machines with self-awareness understand their current state and can use the information to infer what others are feeling. This type of AI does not yet exist.

Examples of AI Technology

AI is incorporated into a variety of different types of technology. Here are seven examples.

Automation: What makes a system or process function automatically. For example, robotic process automation (RPA) can be programmed to perform high-volume, repeatable tasks that humans normally performed. RPA is different from IT automation in that it can adapt to changing circumstances.

Machine learning: The science of getting a computer to act without programming. Deep learning is a subset of machine learning that, in very simple terms, can be thought of as the automation of predictive analytics.

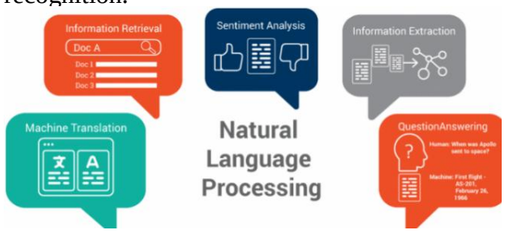


There are three types of machine learning algorithms:

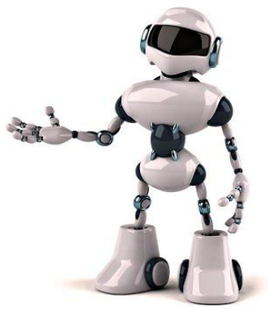
- **Supervised Learning:** Data sets are labelled so that patterns can be detected and used to label new data sets
- **Unsupervised Learning:** Data sets aren't labelled and are sorted according to similarities or differences
- **Reinforcement Learning:** Data sets aren't labelled but, after performing an action or several actions, the AI system is given feedback

Machine Vision: The science of allowing computers to see. This technology captures and analyzes visual information using a camera, analog-to-digital conversion and digital signal processing. It is often compared to human eyesight, but machine vision isn't bound by biology and can be programmed to see through walls, for example. It is used in a range of applications from signature identification to medical image analysis. Computer vision, which is focused on machine-based image processing, is often conflated with machine vision.

Natural Language Processing (NLP): The processing of human and not computer language by a computer program. One of the older and best-known examples of NLP is spam detection, which looks at the subject line and the text of an email and decides if it's junk. Current approaches to NLP are based on machine learning. NLP tasks include text translation, sentiment analysis and speech recognition.



Robotics: A field of engineering focused on the design and manufacturing of robots. Robots are often used to perform tasks that are difficult for humans to perform or perform consistently. They are used in assembly lines for car production or by NASA to move large objects in space. Researchers are also using machine learning to build robots that can interact in social settings.



Self-driving Cars: These use a combination of computer vision, image recognition and deep learning to build automated skill at piloting a vehicle while staying in a given lane and avoiding unexpected obstructions, such as pedestrians.

AI applications

Artificial intelligence has made its way into a number of areas. Here are six examples.

AI in Healthcare. The biggest bets are on improving patient outcomes and reducing costs. Companies are applying machine learning to make better and faster diagnoses than humans. One of the best-known healthcare technologies is IBM Watson. It understands natural language and is capable of responding to questions asked of it. The system mines patient data and other available data sources to form a hypothesis, which it then presents with a confidence scoring schema. Other AI applications include chatbots, a computer program used online to answer questions and assist customers, to help schedule follow-up appointments or aid patients through the billing process, and virtual health assistants that provide basic medical feedback.

AI in Business. Robotic process automation is being applied to highly repetitive tasks normally performed by humans. Machine learning algorithms are being integrated into analytics and CRM platforms to uncover information on how to better serve customers. Chatbots have been incorporated into websites to provide immediate service to customers. Automation of job positions has also become a talking point among academics and IT analysts.

AI in Education. AI can automate grading, giving educators more time. AI can assess students and adapt to their needs, helping them work at their own pace. AI tutors can provide additional support to students, ensuring they stay on track. AI could change where and how students learn, perhaps even replacing some teachers.

AI in Finance. AI in personal finance applications, such as Mint or Turbo Tax, is disrupting financial institutions. Applications such as these collect personal data and provide financial advice. Other programs, such as IBM Watson, have been applied to the process of buying a home. Today, software performs much of the trading on Wall Street.

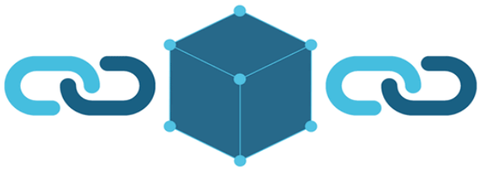
AI in Law. The discovery process, sifting through of documents, in law is often overwhelming for humans. Automating this process is a more efficient use of time. Startups are also building question-and-answer computer assistants that can sift programmed-to-answer questions by examining the taxonomy and ontology associated with a database.

AI in Manufacturing. This is an area that has been at the forefront of incorporating robots into the

Blockchain Technology

A blockchain, originally block chain, is a growing list of records, called blocks, which are linked using cryptography. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data. By design, a blockchain is resistant to modification of the data.

The Blockchain is an encrypted, distributed database that records data, or in other words it is a digital ledger of any transactions, contracts - that needs to be independently recorded. One of the key features of Blockchain is that this digital ledger is accessible across several hundreds and thousands of computers and is not bound to be kept in a single place. With all the fraud resistant features, the block chain technology holds the potential to revolutionize various business sectors and make processes smarter, secure, transparent, and more efficient compared to the traditional business processes.



Benefits of Blockchain Technology

- Increased effectiveness due to the real-time transactions
- Direct Transactions eliminate the overheads and intermediary costs
- Reduced risks related to cybercrimes, frauds and tampering
- More transparent processes with a proper record creation and tracking
- Highly secure due to cryptographic and

Applications of Blockchain Technology in Various Industries

Blockchain technology can be utilized in multiple industries including Financial Services, Healthcare, Government, Travel and Hospitality, Retail and CPG.

Financial Services: In the financial services sector, Blockchain technology has already been implemented in many innovative ways. Blockchain technology simplifies and streamlines the entire process associated with asset management and payments by providing an automated trade lifecycle where all participants would have access to the exact same data about a transaction. This removes the need for brokers or intermediaries and ensures transparency and effective management of transactional data.

Healthcare: Blockchain can play a key role in the healthcare sector by increasing the privacy, security and interoperability of the healthcare data. It holds the potential to address many interoperability challenges in the sector and enable secure sharing of healthcare data among the various entities and people involved in the process. It eliminates the interference of a third-party and also avoids the overhead costs. With Blockchains, the healthcare records can be stored in distributed data bases by encrypting it and implementing digital signatures to ensure privacy and authenticity.

Government: Blockchain technology holds the power to transform Government's operations and services. It can play a key role in improving the data transactional challenges in the Government sector, which works in siloes currently. The proper linking and sharing of data with Blockchain enable better management of data between multiple departments. It improves the transparency and provides a better way to monitor and audit the transactions. Travel and Hospitality: The application of Blockchain can radically change the **Travel and Hospitality Industry**: It can be applied in money transactions, storing important documents like passports/other identification cards, reservations and managing travel insurance, loyalty and rewards.

Mrs. Sukshma R D,
Assistant Professor

Delta Robots: A Delta robot consists of three arms connected to universal joints at the base. The key design feature is the use of parallelograms in the arms, which maintains the
orientation of the end effectors. The Delta robot has popular usage in picking and packaging in factories pathfinder Mission landed on Mars. Its robotic rover Sojourner, rolled down a ramp and onto Martian soil in early July. It continued to broadcast data from the Martian surface until September. So journer performed semi-autonomous operations on the surface of Mars as part of the Mars Pathfinder mission; equipped with an obstacle avoidance program. Sojourner was capable of planning and navigating routes to study the surface of the planet. Sojourner's ability
to navigate with little data about its environment and nearby surroundings allowed the robot to react to unplanned events and objects. After so journer's mission NASA sent twin robots Spirit and Opportunity to the Red Planet on 10, June and 23, July 2003. Spirit and Opportunity landed on Mars on 4, January and 25, January 2004.

Spirit and Opportunity are solar powered robots with six wheels included their own motors. Both of the Mars Rovers is 1,5 m high, 2,3 m wide and 1,6 m long and weighing 180 kg. Spirit and Opportunity have many science instruments in order to perform their missions on Mars. They have a robot arm, that contains a Mossbauer spectrometer to investigate the mineralogy of the rocks and soils on Mars, an Alpha particle X-ray spectrometer for analysis of elements found in rocks and soils, a rock abrasion tool used to expose the fresh material for examination, a microscopic imager and magnets to collect magnetic particles.

The twin Mars Rovers have a panoramic camera used for examinations of the texture, color, mineralogy, and structure of the local terrain, a miniature thermal emission spectrometer for identification promising rocks and soils which is useful to determine the formation processes of them. There is also a navigation camera on both Mars rovers in order to take view with a higher field but lower resolution for driving and navigation. Phoenix Mars Rover was sent to the Red Planet on 4, August 2007 and landed on 25, May 2008. The mission of the Phoenix was to investigate the existence of water and life supporting conditions on Mars. Military Applications: In today's modern army robotics is an important factor which is researched and developed day by day. Already remarkable success has been achieved with unmanned aerial vehicles like the Predator drone, which are capable of taking surveillance photographs, and even accurately launching missiles at ground targets, without a pilot.
There are many advantages in robotic technology in warfare however, as outlined by Major Kenneth Rose of the US Army's Training and Doctrine Command.

Shreyas N,
IV Sem BCA

workflow. Industrial robots used to perform single tasks and were separated from human workers, but as the technology advanced that changed.

Concerns and criticisms

While AI tools present a range of new functionality for businesses, artificial intelligence also raises some ethical questions. Deep learning algorithms, which underpin many of the most advanced AI tools, only know what's in the data used during training. Most available data sets for training likely contain traces of human bias. This in turn can make the AI tools biased in their function. This has been seen in the Microsoft chatbot Tay, which learned a misogynistic and anti-Semitic vocabulary from Twitter users, and the Google Photo image classification tool that classified a group of African Americans as gorillas.
The application of AI in the realm of self-driving cars also raises ethical concerns. When an autonomous vehicle is involved in an accident, liability is unclear. Autonomous vehicles may also be put in a position where an accident is unavoidable, forcing it to make ethical decisions about how to minimize damage.
Another major concern is the potential for abuse of AI tools. Hackers are starting to use sophisticated machine learning tools to gain access to sensitive systems, complicating the issue of security beyond its current state.
Deep learning-based video and audio generation tools also present bad actors with the tools necessary to create so-called deep fakes, convincingly fabricated videos of public figures saying or doing things that never took place.

Regulation of AI technology

Despite these potential risks, there are few regulations governing the use AI tools, and where laws do exist, the typically pertain to AI only indirectly. For example, federal Fair Lending regulations require financial institutions to explain credit decisions to potential customers, which limit the extent to which lenders can use deep learning algorithms, which by their nature are typically opaque. Europe's GDPR puts strict limits on how enterprises can use consumer data, which impedes the training and functionality of many consumer-facing AI applications.

In 2016, the National Science and Technology Council issued a report examining the potential role governmental regulation might play in AI development, but it did not recommend specific legislation be considered. Since that time the issue has received little attention from lawmakers.

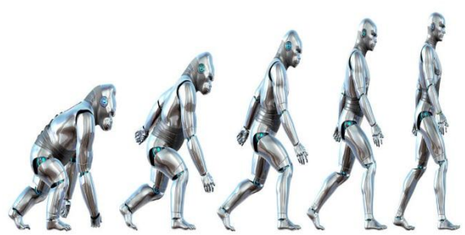
The History of AI

John McCarthy, an American computer scientist, coined the term "artificial intelligence" in 1956 at the Dartmouth Conference where the discipline was born. Today, it is an umbrella term that encompasses everything from robotic process automation to actual robotics. It has gained prominence recently due, in part, to big data, or the increase in speed, size and variety of data businesses now collect. AI can perform tasks such as identifying patterns in data more efficiently than humans, enabling businesses to gain more insight from their data.

Hemanth Kumar B,
IV Sem BCA

Robotics

Robotics is a branch of engineering and science that includes mechanical engineering, electronic engineering, information engineering, computer science, and others. Robotics deals with the design, construction, operation, and use of robots, as well as computer systems for their control, sensory feedback, and information processing.



These technologies are used to develop machines that can substitute for humans and replicate human actions. Robots can be used in many situations and for lots of purposes, but today many are used in dangerous environments (including bomb detection and deactivation), manufacturing processes, or where humans cannot survive (e.g. in space). Robots can take on any form but some are made to resemble humans in appearance. This is said to help in the acceptance of a robot in certain explicative behaviors usually performed by people. Such robots attempt to replicate walking, lifting, speech, cognition, and basically anything a human can do. Many of today's robots are inspired by nature, contributing to the field of bio-inspired robotics.

History

In 1948, Norbert Wiener formulated the principles of cybernetics, the basis of practical robotics.

Fully autonomous only appeared in the second half of the 20th century. The first digitally operated and programmable robot, the Unimate, was installed in 1961 to lift hot pieces of metal from a die casting machine and stack them. Commercial and industrial robots are widespread today and used to perform jobs more cheaply, more accurately and more reliably, than humans. They are also employed in some jobs which are too dirty, dangerous, or dull to be suitable for humans. Robots are widely used in manufacturing, assembly, packing and packaging, mining, transport, earth and space exploration, surgery, weaponry, laboratory research, safety, and the mass production of consumer and industrial goods.

Robotic aspects

There are many types of robots; they are used in many different environments and for many different uses, although being very diverse in application and form they all share three basic similarities when it comes to their construction.

1. Robots all have some kind of mechanical construction, a frame, form or shape designed to achieve a particular task. For example, a robot designed to travel across heavy dirt ormud, might use caterpillar tracks. The mechanical aspect is mostly the creator's solution to completing the assigned task and dealing with the physics of the environment around it. Form follows function.

2. Robots have electrical components which power and control the machinery. For example, the robot with caterpillar tracks would need some kind of power to move the tracker treads. That power comes in the form of electricity, which will have to travel through a wire and originate from a battery, a basic electrical circuit. Even petrol powered machines that get their power mainly from petrol still require an electric current to start the combustion process which is why most petrol powered machines like cars, have batteries. The electrical aspect of robots is used for movement, sensing (where electrical signals are used to measure things like heat, sound, position, and energy status) and operation.

3. All robots contain some level of computer programming code. A program is how a robot decides when or how to do something. In the caterpillar track example, a robot that needs to move across a muddy road may have the correct mechanical construction and receive the correct amount of power from its battery, but would not go anywhere without a program telling it to move. Programs are the core essence of a robot, it could have excellent mechanical and electrical construction, but if its program is poorly constructed its performance will be very poor.

A robot with remote control programming has a pre-existing set of commands that it will only perform if and when it receives a signal from a control source, typically a human being with a remote control.

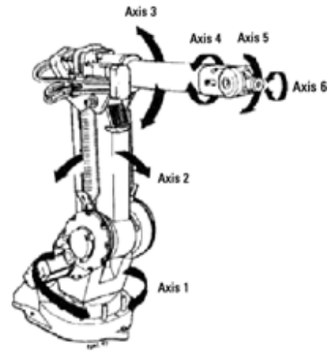
Applications:

Outer Space Applications: Robots are playing a very important role for outer space exploration. The robotic unmanned spacecraft is used as the key of exploring the stars, planets...etc. The most famous robots used in the outer space applications are the Mars rovers of NASA. In 1997 The Pathfinder Mission landed on Mars. Its robotic rover Sojourner, rolled down a ramp and onto Martian soil in early July. It continued to broadcast data from the Martian surface until September. So journer performed semi-autonomous operations on the surface of Mars as part of the Mars Pathfinder mission; equipped with an obstacle avoidance program. Sojourner was capable of planning and navigating routes to study under trees when it rains and they don't talk to their buddies...A human's attention to detail on guard duty drops dramatically in the first 30 minutes ... Machines know no fear.''

Intelligent Home Applications: We can monitor home security, environmental conditions and energy usage with intelligent robotic home systems. Door and windows can be opened automatically and appliances such as lighting and air conditioning can be pre-programmed to activate. This assists occupants irrespective of their state of mobility.

Industry: From the beginning of the industrial revolution robotics and automation becomes the most important part of manufacturing. Robotic arms which are able to perform multiple tasks such as welding, cutting, lifting, sorting and bending are used in fabrics. The most commonly used configurations of the industrial robots are:

Articulated Robots: An articulated robot is one which uses rotary joints to access its work space.



Articulated robots can range from simple two-jointed structures to systems with 10 or more interacting joints. The six-axis, articulated robot is the most versatile industrial robot which allows for a high level of freedom.

Cylindrical Coordinate Robots: These robots have three degrees of freedom and they moves linearly only along the Y and Z axes with a cylindrical work envelope. Scara Robots: It stands for Selective Compliant Assembly Robot Arm or Selective Compliant Articulated Robot Arm. SCARA robots usually have four axes as any X-Y-Z coordinate within their work envelope and a fourth axis of motion which is the wrist rotate (Theta-Z)

Spherical Coordinate Robots: The spherical arm, also known as polar coordinate robot arm, has one sliding motion and two rotational, around the vertical post and around a shoulder joint. Cartesian Coordinate Robots: Rectangular arms are sometimes called "Cartesian" because the arm´s axes can be described by using the X, Y, and Z coordinate system. It is claimed that the Cartesian design will produce the most accurate movement