DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ECHELON M AGAZINE

TECHNO TRACK

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SRI VENKATESHWARA COLLEGE OF ENGINEERING

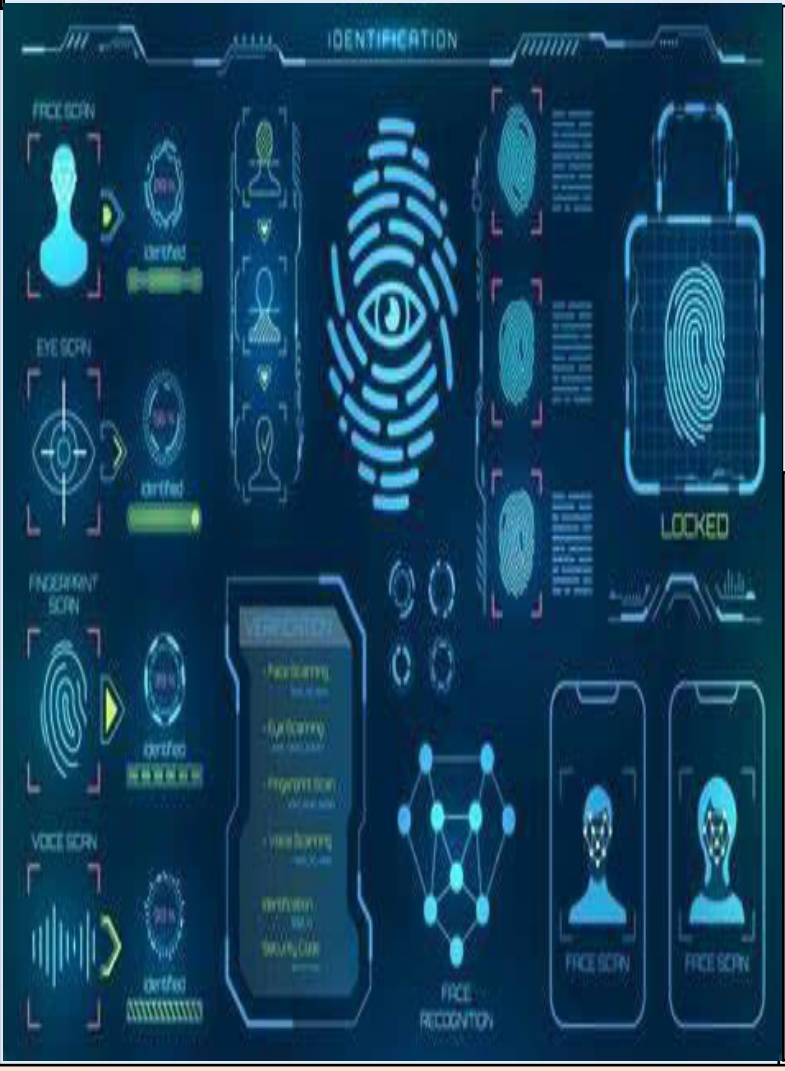
VOLUME-16 ISSUE-2 JUNE - DECEMBER 2022

INSIDE THIS ISSUE

BIO METRICS

In recent years, more companies have adopted the use of biometric data, such as facial recognition software and applications, in their internal business operations and to analyze customer behaviors for marketing purposes. This trend has been met with substantial legal action due to the private right of action and availability of liquidated damages under some state laws. The leading domestic biometric state law, the Illinois Biometric Information Privacy Act (BIPA), triggered a surge of class action lawsuits on the collection, safeguardingor retention of biometric data, including employment-related class actions. A recent Illinois state court decision, however, may change the landscape for biometric lawsuits in 2018.

In Rosenbach v. Six Flags Entertainment Corp., the court held that the plaintiffs must claim actual harm, rather than simply a technical violation, to be considered an "aggrieved person" under BIPA, signaling that courts may be looking to reign in the number of BIPA-related classactions. As the Rosenbach decision is the first of its kind, plaintiffs will likely continue to test what constitutes an "aggrieved person" under BIPA.



Key Takeaways

Companies are vying for control of biometrics and AI, the hot new technological frontiers. But like many new technologies, they come with a double- before collecting and using and boost their approached with caution and include.

N.Yogi
21BF1A05C5

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ROBOTIC PROCESS AUTOMATION

Robotic Process Automation refers to the functioning of corporate process due to the mimicking human tasks. In this particularsphere, it is important to bear in mind that A.I is not meant to replace humans, But to support and complement their skills and talent. Companies like pega system, Automation Anywhere, Blue prism, Uipath and work fusion focus on this process

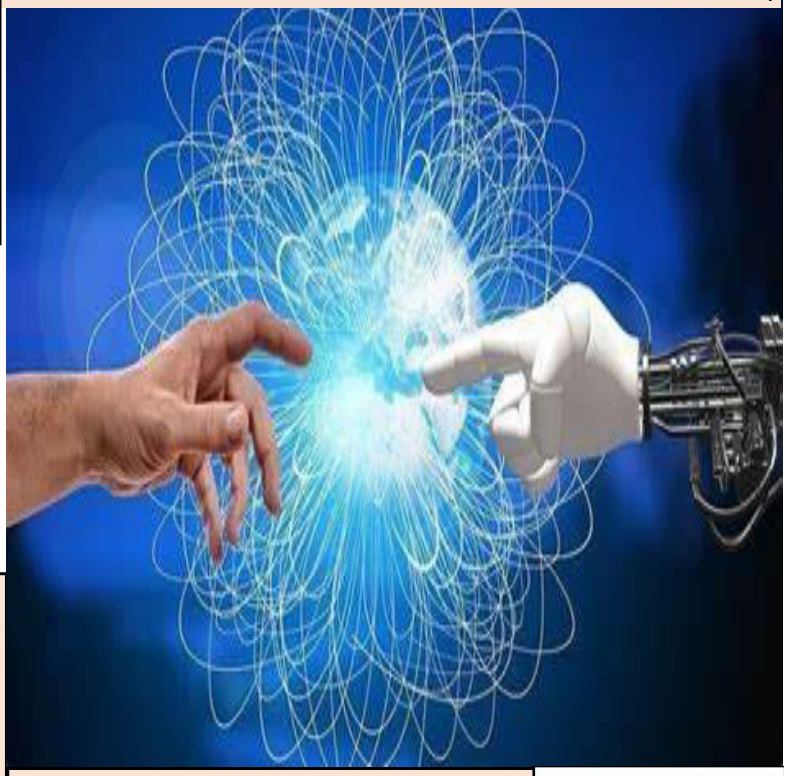
Leading RPA vendors are incorporating cognitive technologies such as natural language processing and machine learning into their offerings.

Large RPA providers are partnering with vendors of cognitive technologies; for example, blue prism and IBM Watson have partnered to bringcognitive capabilities to clients Analysts firm forests suggests that best practice for installing RPA is to design the system to potentially link with cognitive platforms

RPA and artificial intelligence

Robotic process automation is often mistaken for artificial intelligence (AI), but the two are distinctly different. AI combines cognitive automation, machine learning (ML), natural language processing (NLP), reasoning, hypothesis generation and analysis.

The critical difference is that RPA is process- driven, whereas AI is data-driven. RPA bots can only follow the processes defined by an end user, while AI bots use machine learning to recognize patterns in data, in particular unstructured data, and learn over time. Put differently, AI is intended to simulate human intelligence, while RPA is solely for replicatinghuman-directed tasks. While the use of artificial intelligence and RPA tools minimize the need for human intervention, the way in which they automate processes is different.



RPA AND HYPERAUTOMATION

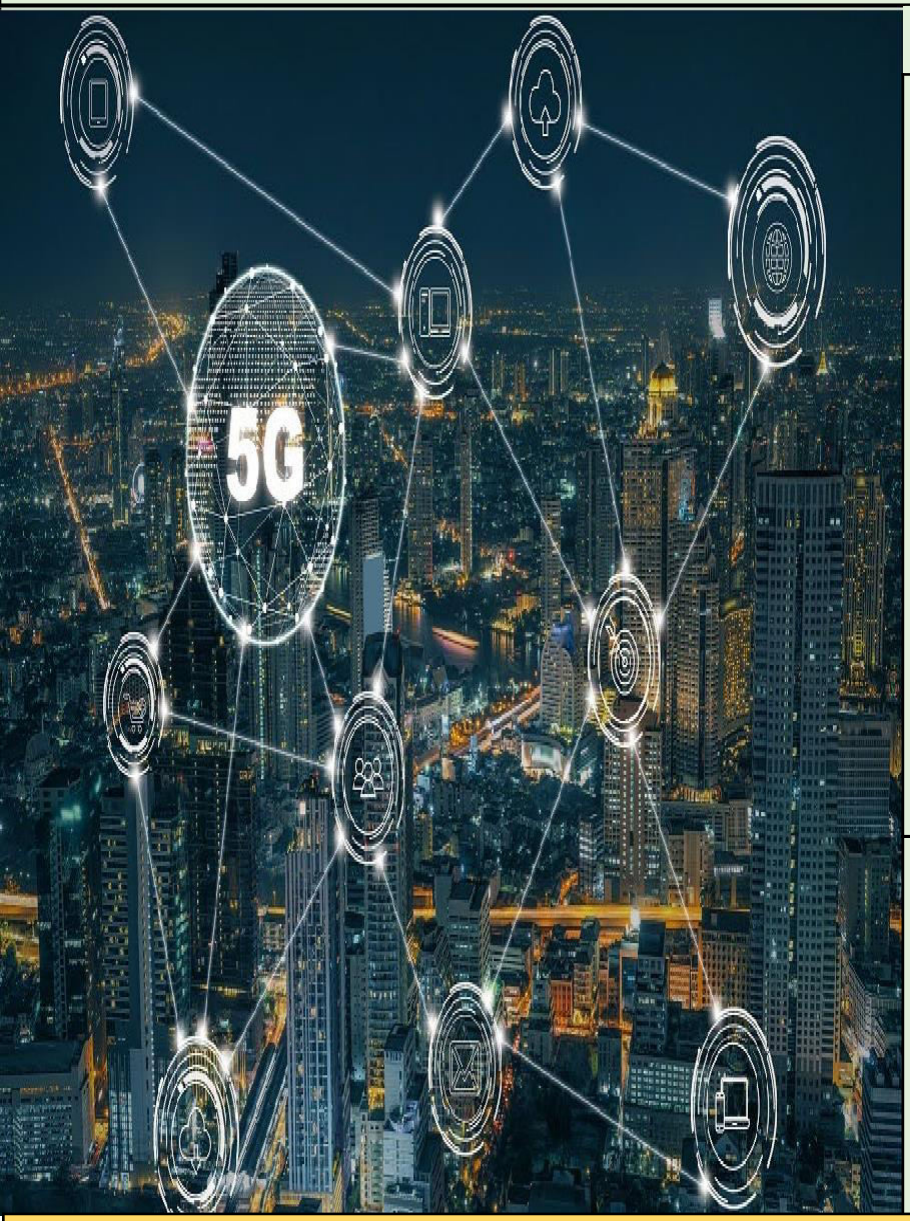
Hyper automation is the concept of automating everything organization that can be automated. Organizations.

21BF1A0574
CSE-B

5G NETWORKS

5G networks are cellular networks, in which the service area is divided into small geographical areas called cells. All 5Gwireless devices in a cell communicate by radio waves with a cellular base station via fixed antennas, over frequency channels assigned by the base station. The base stations, termed nodes, are connected to switching centers in the telephone network and routers for Internet access by high-bandwidth optical fiber or wireless backhaul connections. As in other cellular networks, a mobile device moving from one cell to another is automatically handed off seamlessly. 5Gis expected to support up to a million devices per square kilometer.

The industry consortium setting standards for 5G, the 3rd Generation Partnership Project (3GPP), defines "5G" as any system using 5G NR (5G New Radio) software - a definition that came into general purpose.
5G is the 5th generation mobile network. It is a new global wireless standard after 1G, 2G, 3G, and 4G networks. 5G enables a new kind of network that is designed to connect virtually everyone and everything together includingmachines, objects, and devices. 5G wireless technology is meant to deliver higher multi-Gbps peak data speeds, ultra low latency, more reliability, massive network capacity, increased availability, and a more uniform user experience to more users. Higher performance and improved efficiency empower new user experiences and connects new industries.



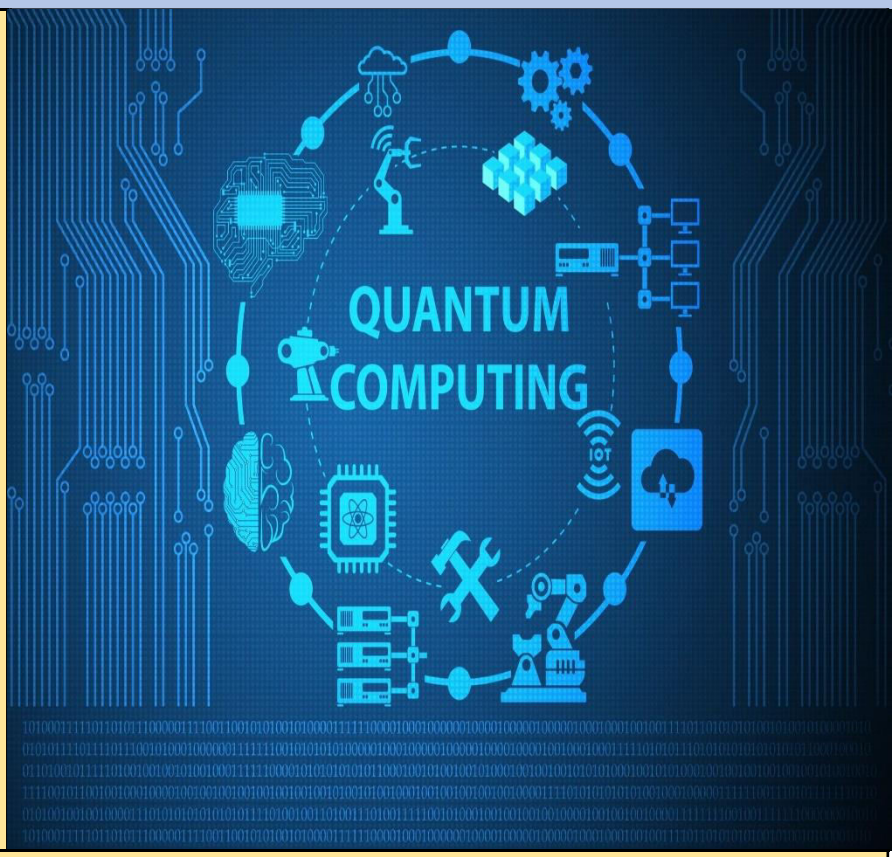
In healthcare, 5G technology and Wi-Fi 6 connectivity will enable patients to be monitored via connected devices that constantly deliver data on key health indicators, such as heart rate and blood pressure. In the auto industry, 5G combined with ML-driven algorithms will provide information on traffic, accidents, and more; vehicles will be able to share information with other vehicles and entities on roadways, such as traffic lights. These are just two industry applications of 5G technology

LAKSHMIKAR
21BF1A0597
CSE-B

QUANTUM COMPUTING

Quantum computing is a rapidly-emerging technology that harnesses the laws of quantum mechanics to solve problems too complex for classical computers.

Today, IBM Quantum makes real quantum hardware -- a tool scientists only began to imagine three decades ago -- available to hundreds of thousands of developers. Our engineers deliver ever-more-powerful superconducting quantum processors at regular intervals, alongside crucial advances in software and quantum-classical orchestration. This work drives toward the quantum computing speed and capacity necessary to change the world



A classical processor uses bits to perform its operations. A quantum computer uses qubits (CUE-bits) to run multidimensional quantum algorithms Your desktop computer likely uses a fan to get cold enough to work. Our quantum processors need to be very cold – about a hundredth of a degree above absolute zero.

Superconductors

At those ultra-low temperatures certain materials in our processors exhibit another important quantum mechanical effect: electrons move through them without resistance. This makes them "superconductors." When electrons pass through superconductors they match up, forming "Cooper pairs." These pairs can carry a charge across barriers, or insulators, through a process known as quantum tunneling. Two superconductors placed on either side of an insulator form a Josephson junction Control

Our quantum computers use Josephson junctions as superconducting qubits. By firing microwave photons at these qubits, we can control their behavior and get them to hold, change, and read out individual units of quantum information. Quantum computing uses the qubit as the basic unit of information rather than the conventional bit. The main characteristic of this alternative system is that it permits the coherent superposition of ones and zeros, the digits of the binary system around which all computing revolves. Bits, on the other hand, can only have one value at a time — either one or zero.

Lukesh Chandra
21BF1A0581

COMPUTING GENOMICS

Computational Genomics

Computational genomics is a major focus of the department. Computational genomics involves the application of techniques from the fields of computer science and statistics to problems in genomics. A single data set in genomics can routinely provide more than a million measurements, often necessitating the need for innovative computational methods to extract the desired knowledge from such data. Over the past two decades, advances in genomics have significantly contributed to our understanding of disease. In 2005, there were only a handful of genes implicated in diseases. Today, there are more than 150,000 genes implicated in human disease..

computational genomics refers to the use of computational and statistical analysis to decipher biology from genome sequences and related data, including both DNA and RNA sequence as well as other "post-genomic" data (i.e., experimental data obtained.

Computer software has played a central role in the development of genomics during the past 50 years. However, it is less clear whether computer *science* has mattered for genomics, or whether genomics has led to new computer science. I'll examine, via a series of examples, questions about Bio: Lior Pachter was born in Ramat Gan, Israel, and grew up in Pretoria, South Africa where he attended Pretoria Boys High School. After receiving a B.S. in Mathematics from Caltech in 1994, He left for MIT where he was awarded a

His research interests span the mathematical and biological sciences, and he has authored over 100 research articles in the areas of algorithms, combinatorics, comparative genomics, algebraic statistics, molecular biology and evolution. Bioinformatic tools have been developed to predict, and determine the abundance and expression of, this kind of gene cluster in microbiome samples, from metagenomic data.

MOKSHITH
21BF1A0585

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

3D PRINTINING

In computer systems, 3D technology (three-dimensional) explains a photograph which gives visual information. The environment is called augmented reality whenever 3-D images are made dynamic so that the participants felt engaged with the setting. In order to view and communicate with 3-D images you generally need to have a specific plug-in reader for your internet browser. The evolved substantially are delivered in the third phase of 3D modelling to particles with really intricate detail. Famous 3-D affect development products involve Softimage 3D, Language (VRML) enables the developer to use textual regular expressions to define images as well as the guidelines for their presentation and communication. One of the key advantages of 3D printing is the ability to produce very complex shapes or geometries that would be otherwise infeasible to construct by hand, including hollow parts or parts with internal truss structures to reduce weight. Fused deposition modeling (FDM), which uses a continuous filament of a thermoplastic material, is the most common 3D printing process in use as of 2020. The general concept of and procedure to be used in 3D-printing was first described by Murray Leinster in his 1945 short story Things Pass By "But this constructor is both efficient and flexible. I feed magnetron plastics — the stuff they make houses and ships of nowadays — into this moving arm. It makes drawings in the air following drawings it scans with photo-cells.

The advantages of 3D-technology. Each architectural design started with a model design. This is a basicresource that allows architects, stakeholders, and the general public to imagine the dream of can propose any and to see them easily in a fresh 3D-printed design. This keeps costs down as opposed to preparing untilnear completion of the buildingbefore findingit requires someadjustments.

3D TECHNOLOGY

SAI GANESH REDDY
21BF1A0584

INFORMATION SECURITY AND DATA PROTECTION

Information technology allows us to generate, store, and process huge quantities of data. Search engines, satellites, sensor networks, scientists, security agencies, marketers, and database managers are processing terabytes of data per day. A good part of these data is about persons – about their characteristics, their thoughts, their movements, behavior, communications, and preferences – or they can be used to produce such data.

All countries and cultures in the present and past have constrained access to certain types of personal data in some way or the other (see Moore 1984). There are etiquettes, customs, artefacts, technologies, or laws, and combinations thereof, which prevent or proscribe against the use or dissemination of personal information.

Walls, curtains, doors, veils, sealed envelopes, sunglasses, clothes, locked cabinets, privacy as health care, social or homeland security, search engines, marketing, or policing. More specifically the issues can be concerned with camera surveillance, themonitoring of Internet communications, the retention of Internet traffic data, the disclosure of health system, the linking and matching of databases in social security to detect fraud, and sifting and trawling through financial databases in order to find suspect transactions.

Information security protects sensitive information from unauthorized activities, including inspection, modification, recording, and any disruption or destruction.

The goal is to ensure the safety and privacy of critical data such as customer account details, financial data or intellectual property. Information security differs from cybersecurity in both scope and purpose. The two terms are often used interchangeably, but more accurately, cybersecurity is a subcategory ofinformation security.

Information security is a broad field that covers many areas such as physical security, endpoint security, data encryption, and network security. It is also closely related to information assurance, which protects information from threats such as natural disasters and server failures.

As the amount of data being created and stored has increased at an unprecedented rate, making data protection increasingly important. In addition, business operations increasingly depend amount of data loss can have major consequences. Technology and the internet pose privacy issues, for instance, when you doing online shopping, you may concern what they store your personal information and credit card details for any other purpose or is it secure to give the information.

CHARAN TEJA
21BF1A0573
CSE-B

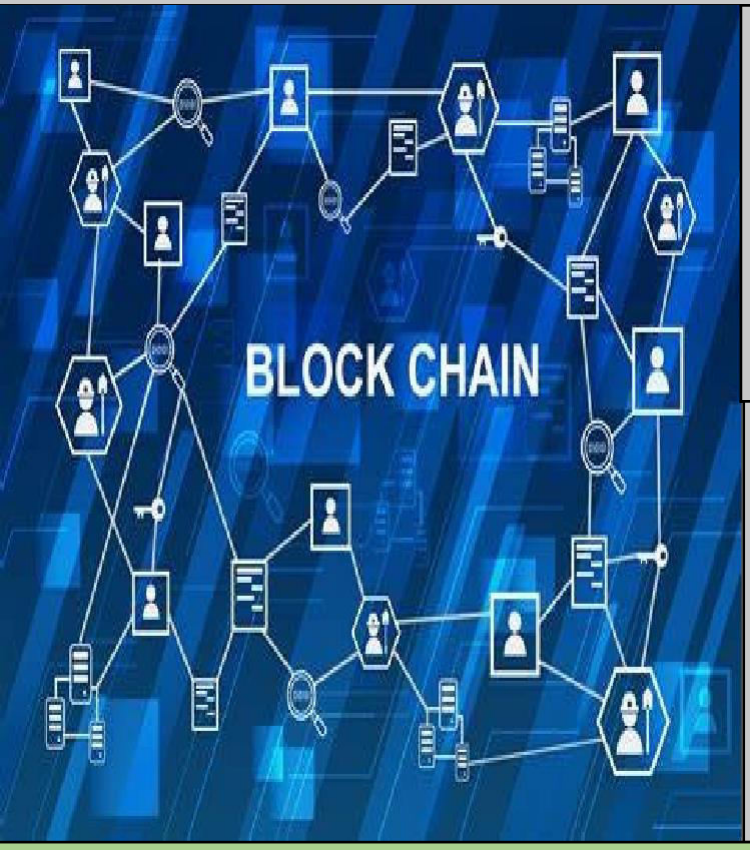
BLOCK CHAIN

Blockchain technology is a structure that stores transactional records, also known as the block, of the public in several databases, known as the "chain," in a network connected through peer-to-peer nodes. Typically, this storage is referred toas a 'digital ledger.' Every transaction in this ledger is authorized by the digital signature of the owner, which authenticates the transaction and safeguards it from tampering. Hence, the information the digital ledger contains is highly secure Most people assume Blockchain and Bitcoin can be used interchangeably, but in reality, that's not the case.

Blockchain is the technology capable of supporting various applications related to multiple industries like finance, supply chain, manufacturing, etc., but Bitcoin is a currency that relies on Blockchain technology to be secure. Blockchain is an emerging technology with many advantages in an increasingly digital world:Highly Secure It uses a digital signature feature to conduct fraud-free transactions making it impossible to corrupt or change the data of an individual by the other users without a specific digital Decentralized System Conventionally, you need the approval of regulatory authorities like a government or bank for transactions; however, with Blockchain, transactions are done with the mutual consensus of users resulting in smoother, safer, and faster transactions.

Automation Capability

It is programmable and can generate systematic actions, events, and payments automatically when the criteria of the trigger are meter. With blockchain, as a member of a members-only network, you can rest assured that you are receiving accurate and timely data, and that your confidential blockchain records will be shared only with network members to whom you have specifically granted access. With a distributed ledger that is shared among members of a network, time-wasting record reconciliations are eliminated. And to speed transactions, a set of rules — called a smart contract — can be stored on the blockchain and executed automatically.



It contains every single record of each transaction. Bitcoin is the most popular cryptocurrency an example of the blockchain. Blockchain Technology first came to light when a person or Group of individuals name 'Satoshi Nakamoto' published a white paper on "Bitcoin: A peer to peer electronic cash system" in 2008.

Hemanth kumar

21BF1A05A4.

VOICE TECHNOLOGY

The 2 Types of Voice Technology

Although there are many ways to classify voice recognition technology, for simplicity, we can divide it into two types of speech recognition systems: speaker- dependent and speaker-independent. For speaker-dependent systems, the user has to provide training datasets (clips of their voice) to a system for it totrain (get used to) before it can start recognizing the user's voice. With the other type of speech recognition systems, the user doesn't need to give it training datasets first. The downside of this system is that it can only recognize a limited amount of words (learned by the system while in production). Therefore, voice technology embedded in consumer-grade products is mostly in the form of speaker-dependent systems.

The ability of a machine or program to receive and interpret dictation or to understand and execute spoken commands is the basic function of voice technology. The advent of voice recognition technology and natural language processing (NLP) has made it possible for accepting voice as an input and respond using AI-driven, pre-scripted prompts. Simply put, voice technology allows consumers to communicate with the internet through voice.

Voice Technology Uses In Transcribing And Dictation

Another interesting use of voice technology is for transcribing and dictation cases. You can use its voice recognition capabilities in taking interview notes, transcribing meetings, podcasts, and other types of conversations.

21BF1A05C6
N.Bhanu Prakash Reddy.

ECHELON MAGAZINE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SRI VENKATESWARA COLLEGE OF ENGINEERING , TIRUPATI

ABOUT DEPARTMENT

Vision of the Department

To produce globally competent, dynamic and multi talented young leaders with skill & knowledge in Computer science and Engineering to cater the contemporary demands of the software industry, thereby making them industry ready while at the Institution and also to pursue higher education imbibing holistic approach.

Mission of the Department

M1: To impart high quality technical education in Computer Science and Engineering by providing well equipped infrastructure, core values.

M2: Advanced research and technical consultancy services with qualified and senior faculty.

M3: To prepare the learners professionally deft and intellectually adept possessing excellent skill, knowledge and behavior.

M4: To inculcate the leadership capabilities in learners to face the dynamic and challenging global of the Computer Science and Engineering field.

Programme Outcomes (POs)

PO1 : Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities rele-

ECHELON MAGAZINE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SRI VENKATESWARA COLLEGE OF ENGINEERING , TIRUPATI

ABOUT DEPARTMENT

Programme Outcomes (POs)

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

Programme Specific Outcomes (PSOs)

PSO1 : Problem Solving Skills: Ability to design and develop computing tools with moderate complexity in the areas pertaining to database, data analytics, networking, web and app design, IoT and information security with integration.

PSO2: Professional Skills: Ability to apply standard practices and methods in software project management and software development using suitable programming environments to deliver quality product to the industry

Programme Educational Objectives (PEOs)

PEO1: To impart foundations of applied science and engineering subjects in order to apply, analyze and solve problems in computational aspects.

PEO2: To inculcate ability in creativity and design of computer support systems and impart knowledge and skills to analyze, design, test and implement various software applications.

PEO3: To strengthen higher education, research, prepare for globally acclaimed competitions; imbibe in civic-leadership qualities and to trigger social, ethical, holistic and behavioral approach