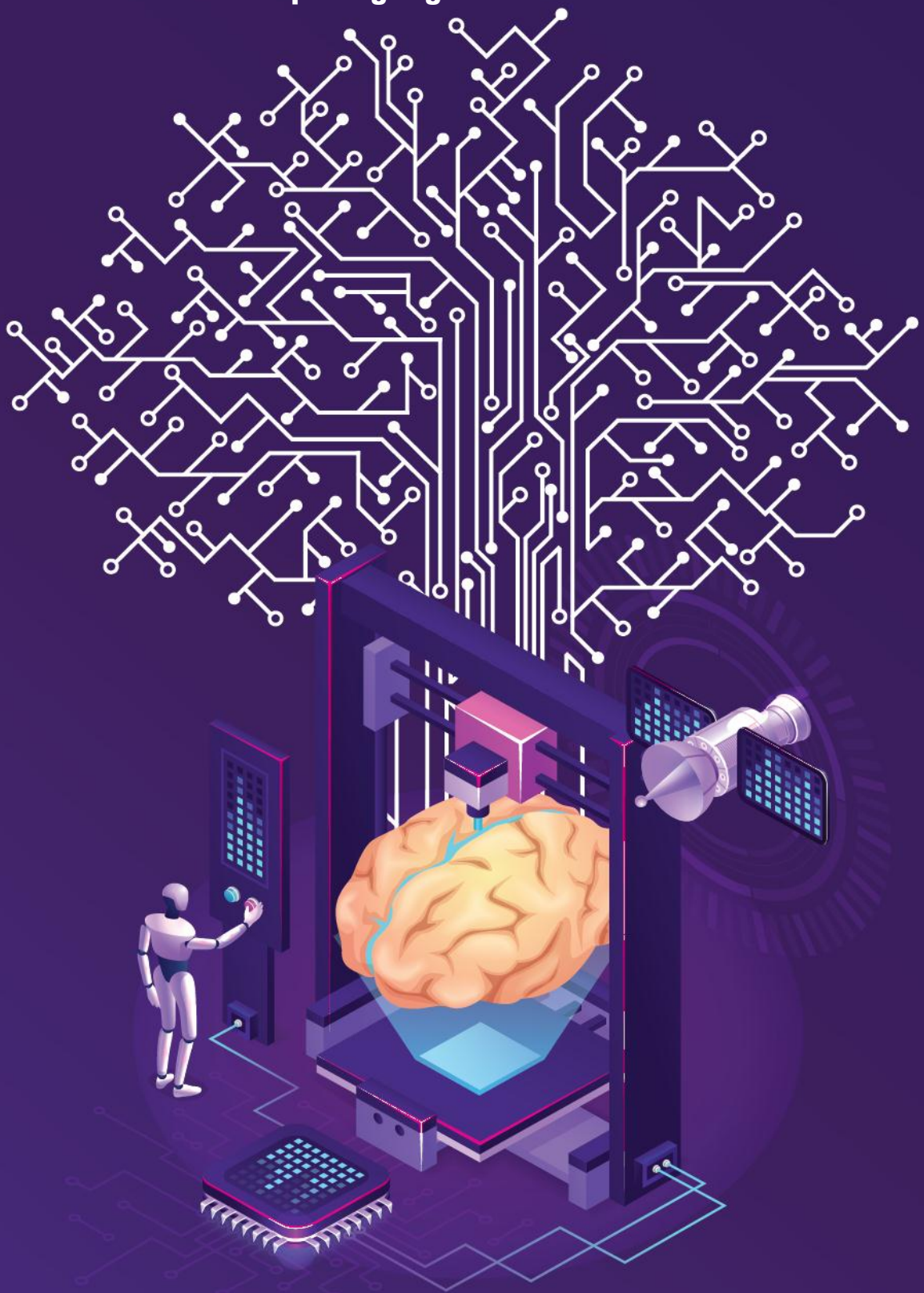
अन्वेषण

Exploring Digital World

JULY 2022



Technical Magazine

MAHARAJA AGRASEN INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

VISION

To be center of excellence in education, research and technology transfer in the field of computer engineering and promote entrepreneurship and ethical values.

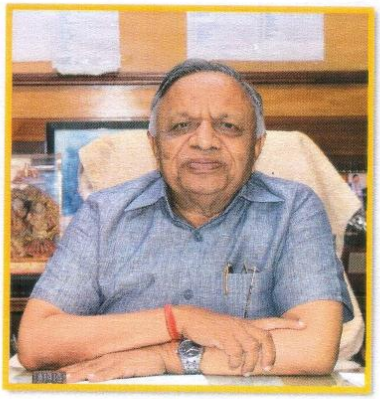
MISSION

To foster an open, multidisciplinary and highly collaborative research environment for producing world-class engineers capable of providing innovative solutions to real-life problems and fulfil societal needs.

TECHNICAL MAGAZINE COMMITTEE

MAHARAJA AGRASEN TECHNICAL EDUCATION SOCIETY

MATES
उद्यमेन हि सिध्यन्ति कार्याणि न मनोरथैः



Dr. Nand Kishore Garg
Chief Patron

MESSAGE

I am extremely happy to know that the Department of Computer Science and Engineering, MAIT is releasing the 5th Volume of Technical Magazine in the month of July 2022.

The magazine, I understand is designed to provide a broad range of information focusing on the application of existing technologies, research, practical explanations, and developments in the latest trends and techniques.

I thank Prof. (Dr.) Namita Gupta, HOD (CSE), and the department for their sincere efforts in the release of this magazine.

I congratulate the Editorial team on getting the magazine printed.

I wish them all success in life.

03.05.2022

Dr. Nand Kishore Garg

Founder Chairman, MATES & Chancellor, MAU

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MESSAGE FROM CHAIRMAN'S DESK

MAHARAJA AGRASEN TECHNICAL EDUCATION SOCIETY

MATES
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Shree Vineet Kumar Lohia
Chief Patron

MESSAGE

I am gratified to know that the Department of Computer Science and Engineering, MAIT has taken the initiative to publish the Technical Magazine in the month of July 2022.

This is productive as well as a great platform for students, researchers, faculty members, and industry experts to disseminate achievements in research and developments in computer science and technology.

I acknowledge the efforts of Prof. (Dr.) Namita Gupta, HOD (CSE), the faculty members, and the students of the CSE department for their efforts in publishing the Technical Magazine.

I also applaud the coordination and efforts of the Editorial team to bring up the issue.

I wish them all a great success.

Sh. Vineet Kumar Lohia

Chairman, MATES

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MESSAGE FROM VICE CHAIRMAN'S DESK

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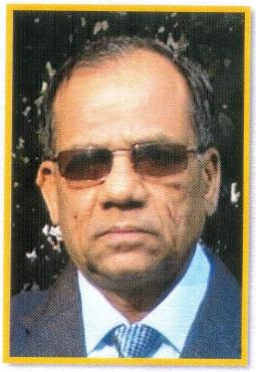

Prof. M L Goyal
Patron

MESSAGE

I am very happy that the Department of Computer Science and Engineering, MAIT is releasing its Technical Magazine to commemorate technical publications and articles of faculties, Industry experts, alumni, and students for the academic year 2021-2022.

This Technical Magazine is a forum that could aptly be used for recording the technical articles and research papers published by the students and faculty members. I am sure that this magazine will be informative and resourceful. I owe my hearty appreciation to Prof. (Dr.) Namita Gupta, Head of the Department, CSE, and her team for their sincere efforts to make the release of this magazine a reality. I wish them "The Very Best" in all their future endeavors.

Prof. (Dr.) M.L. Goyal

Vice Chairman (Academics), MATES

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MESSAGE FROM DIRECTOR'S DESK

MAHARAJA AGRASEN INSTITUTE OF TECHNOLOGY

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(AFFILIATED TO GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY, DELHI)

Prof. (Dr.) Neelam Sharma
Patron

MESSAGE

Good Wishes to all,

It gives me immense pleasure to know that a Technical Magazine - 2022 is being published by the Department of Computer Science and Engineering, MAIT. It is a platform to combine the efforts of Faculty, students, and the editorial team to publish their technical work going on in the department.

Industrial and productive technical material forming the contents of the magazine will definitely be a developing tool for the readers.

I applaud the HoD, Editorial team, and Coordinators of the team who are publishing this issue. I wish them success for future publications.

Prof. (Dr.) Neelam Sharma
Director, MAIT

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MESSAGE FROM DEAN'S DESK

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Prof. (Dr.) S. S. Deswal
Patron

MESSAGE

It gives me immense pleasure to announce that the CSE department will be publishing a technical magazine that showcases the innovative research, projects, and achievements of our faculties and talented students. This magazine is an excellent opportunity for faculties, staff and students to showcase their technical skills & knowledge and encourage all students to contribute their work.

The CSE department is known for producing some of the most innovative and creative minds in the industry, and this magazine will serve as a platform to showcase the brilliant ideas and projects of our students. It will not only help to enhance the reputation of the department but will also provide an opportunity for our students to gain recognition for their hard work and dedication.

I extend my grateful wishes to Prof. (Dr.) Namita Gupta, the Editorial team, and the coordinators for putting their best efforts into the publication of this magazine.

Prof. (Dr.) S.S. Deswal
Dean, MAIT

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MESSAGE FROM HEAD OF THE DEPARTMENT

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Prof. (Dr.) Namita Gupta
HoD, CSE

MESSAGE

On behalf of the Computer Science and Engineering Department, Maharaja Agrasen Institute of Technology, I am pleased to announce the launching of the Fifth Volume of the Technical Magazine of the Computer Science and Engineering Department and to make it available to everyone.

This Technical Magazine aims to disseminate achievements in research and developments while featuring new break-through in the field of Computer Science Engineering and Technology.

The entire Editorial team did their best to provide a platform for distinguished faculties, researchers, industry experts and students to share the latest accomplishments with fellow researchers, faculties, Industry experts, and students whereby disseminating the knowledge gained from their technical endeavors.

As Editor-in-Chief, I am open to exploring the opportunities for making this Technical Magazine an exciting and definitive forum for attracting and publishing high-impact research contributions that are innovative and transformative, and for making this technical magazine serve as a forum for disseminating timely and exciting ongoing research that can stimulate innovation.

In the end, I would like to thank editorial board members, faculties, Industry experts, and students and hope that our collective efforts stimulate further progress in this domain of activity with strong determination at both national and international levels.

Prof. (Dr.) Namita Gupta
Editor-in-Chief
Technical Magazine
Department of Computer Science and Engineering

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FACULTY CORNER

Software Requirements Prioritization: Towards Handling Requirements Vagueness, Dependency and Collaboration

Dr. Ankita Gupta, Assistant Professor
Department of Computer Science & Engineering

There are normally a larger number of requirements than one can actualize in given stakeholder‘s time and resource requirements. In order to produce high quality software the primary concern of development team is to select and rank most favorable requirements from the pool of requirements with the aim to maximize stakeholder’s stratification and within budget and resource constraints. This decision-making turns out to be significantly more intricate and tedious when number of requirements is more. Research has established that most software projects have more candidate prerequisites that can be acknowledged within available budget, time constraints, intrinsic contradiction between the requirements, stakeholder expectations and technical constraints. In this situation, one of the key challenge for software engineers is to determine the ‘‘right” selection (i.e. to prioritize between various options) of requirements fulfilling stakeholder’s scope and objective. This process of identification of important and core requirements from relevant stakeholder’s perception is in fact, a complex multi-criteria decision-making process. The major factors which can influence this decision of requirement prioritization may include inter-relationships among requirements, inability to deal with complex situations, unaccepted or biased final ranking. For effective requirement prioritization it is imperative to consolidate distinctive aspects by both stakeholders and developers to better assist in decision-making process. An aspect is a property or trait of a task and its necessities that can be utilized to prioritize requirements. Often aspects act together, communicate and change in a single perspective could bring about an effect on different aspects. Years of literature recommend that a large portion of the prioritization approaches experiences one or the other issues listed below: unfit to acknowledge imperative of dependency, are time consuming, are sensitive – a solitary mistake may influence entire prioritization order, can’t resolve logical inconsistency, unfit to deal with complex situations, questionable final ordering and biased ranking. One of the most difficult aspects of requirements engineering is picking the best requirement to execute first. Software development requires requirements prioritisation, an iterative process that involves critical and complex decision-making to develop a high-quality system within defined constraints of dependencies, communication, and collaboration with stakeholders, resource availability, time, cost, and effort constraint, risk, business importance, etc. Any requirements prioritisation process depends on how well stakeholders and developers handle different conditions and influential factors. Requirements prioritisation is crucial regardless of organisation size. Incorrect prioritisation may cause project failure. To overcome the challenges of existing approaches, there is a need of requirement prioritization approaches which considers constraints of requirements vagueness, dependency and collaboration among stakeholders, their key interests, preferences to achieve overall end-user satisfaction using meta-heuristics, intuitionistic fuzzy logic and multi-criteria preference acquisition.

Load Balancing in Cloud

Ms. Sudha Narang, Associate Professor
Department of Computer Science & Engineering

Load balancing is the method of distributing network traffic equally across a pool of resources that support an application. Modern applications must process millions of users simultaneously and return the correct text, videos, images, and other data to each user in a fast and reliable manner. To handle such high volumes of traffic, most applications have many resource servers with duplicate data between them. A load balancer is a device that sits between the user and the server group and acts as an invisible facilitator, ensuring that all resource servers are used equally. It directs and controls internet traffic between the application servers and their visitors or clients. As a result, it improves an application's availability, scalability, security, and performance. Server failure or maintenance can increase application downtime, making your application unavailable to visitors. Load balancers increase the fault tolerance of your systems by automatically detecting server problems and redirecting client traffic to available servers. Load balancers also come with built-in security features to add another layer of security to your internet applications. They are a useful tool to deal with distributed denial of service attacks, in which attackers flood an application server with millions of concurrent requests that cause server failure. They improve application performance by decreasing response time and reducing network latency. Different Load balancing Algorithms exists which direct the requests to different datacentres which allocates the tasks to the virtual machines in such a way that the processing capability of the machines is not wasted. User requests to the application first go to the load balancer. The load balancer then routes each request to a single server in the server farm best suited to handle the request. It is like the work done by a manager in a restaurant. Consider a restaurant with five waiters. If customers were allowed to choose their waiters, one or two waiters could be overloaded with work while the others are idle. To avoid this scenario, the restaurant manager assigns customers to the specific waiters who are best suited to serve them. In general, there can be hardware and software based load balancers. A hardware-based load balancer is a hardware appliance that can securely process and redirect gigabytes of traffic to hundreds of different servers. You can store it in your data centres and use virtualization to create multiple digital or virtual load balancers that you can centrally manage. Software-based load balancers are applications that perform all load balancing functions. You can install them on any server or access them as a fully managed third-party service. Hardware load balancers require an initial investment, configuration, and ongoing maintenance. You might also not use them to full capacity, especially if you purchase one only to handle peak-time traffic spikes. If traffic volume increases suddenly beyond its current capacity, this will affect users until you can purchase and set up another load balancer. In contrast, software-based load balancers are much more flexible. They can scale up or down easily and are more compatible with modern cloud computing environments.

Generative AI like ChatGPT

Mr. Moolchand Sharma, Assistant Professor
Department of Computer Science & Engineering

The audience of people who are obsessively online has gone crazy about ChatGPT, a chatbot developed by OpenAI. It has been applied to the writing of sonnets, essays, and even computer code, generally with a comment along the lines of "Wow, this is fantastic." It is the most recent and well-known instance of generative AI, the same kind of model that enables web platforms like Midjourney and DALL-E 2 to create graphics from prompts. Both proponents and opponents of broad language models like ChatGPT and others are already hailing these advancements as forces that will profoundly alter how we live and work, from how students complete their homework to who writes computer code.

But the truth is more convoluted. Although generative AI models excel at a narrow range of tasks, they are not universally applicable technologies. For instance, ChatGPT can compose beautiful sonnets on tectonic plates but finds it difficult to write a modern definition of plate tectonics. Given that GPT-3, the huge language model it was trained on, finished collecting data in 2021, and that it has a tendency to be biassed, it also struggles to produce accurate code or comprehend the context of current events. Furthermore, despite the fact that many startups claim to be working on "generative AI," experts and venture capitalists claim that in some cases this is simply marketing as tiny businesses jump on the newest buzzword bandwagon. Writing form emails, penning an article on philosophy, or producing record covers are examples of more generic jobs where generative AI might excel. How compelling it may be might sometimes work against it. In a recent study, it was shown that phoney scientific publications with AI-written abstracts managed to dupe real experts who couldn't tell the difference.

What is generative AI?

AI is not a monolithic field. It encompasses many types of models and architectures whose common ground is imitating human intelligence. Historically, most models have focused on tasks such as pattern recognition to help make analyzing large amounts of data more efficient. For example, you could have an algorithm that monitors thousands of cameras and senses when a human is approaching one — cutting back on labor and saving money. (Congratulations, you've now made Ring doorbells possible!) It's also the reason AI can recognize an identify images of, say, a cat.
Generative AI flips that on its head by shifting from analyzing existing data for information to using that data to learn how to write new text or create new images."The difference now with more generative AI, it's not so much about the interpretation and processing of information as the production of new content," said Micah Musser, a research analyst at Georgetown University's Center for Security and Emerging Technology. "And so that opens up the ways in which this technology can affect the jobs or the activities of people who weren't previously affected — including software engineers, writers and artists."

STUDENT CORNER

A Guide to Non-Fungible Tokens: Understanding the Future of Digital Ownership

Rishika Sharma (20514802719)
Student, Department of Computer Science & Engineering

The use of Non-Fungible Tokens to own and trade digital assets has seen rapid growth in recent years. NFTs are built on blockchain technology and provide a secure, decentralized ledger of ownership and authenticity for each NFT. This makes NFTs impossible to change and easy to check, making sure that each token is a unique and valuable asset. Whether it is art, music, video, or gaming, NFTs allow creators and owners to establish ownership and provenance for their digital assets and sell, trade, or collect them in a new and exciting way. In this article, we will explore the concept of NFTs, how they work, and their potential impact on the digital world.

What are Non-Fungible Tokens (NFTs)?

A Non-Fungible Token, or NFT, is a unique digital asset that represents ownership of a specific item or piece of content, such as a piece of artwork, music, or video. Unlike traditional fungible assets, such as cryptocurrencies, each NFT is one-of-a-kind and cannot be replaced or exchanged on a one-to-one basis. An example of an NFT is a digital painting created by an artist. This painting can be sold to a collector as a unique and one-of-a-kind piece of art, just like a physical painting. The collector can then display and trade the digital painting just like they would with a physical painting. The NFT is then put on the blockchain, which makes a permanent, unchangeable record of all transactions and changes of ownership for that particular NFT.

How do NFTs work?

The idea of NFTs is made possible by blockchain technology, which keeps a safe and clear record of who owns each token and when it was made. This makes sure that each NFT is really different and can't be copied or replaced. Here's how it works:

1. Creation of the NFT: Creating a unique digital asset, such as a piece of artwork, music, or video.

2. Tokenization: "Tokenizing" the asset by converting it into a unique digital token on the blockchain. This token represents ownership of the specific asset and is stored in a digital wallet.
3. Issuance: The NFT is then issued on the blockchain, which creates a permanent and tamper-proof ledger of all transactions and transfers of ownership for the specific NFT.
4. Transactions: The NFT can then be bought, sold, and traded on various online marketplaces. When a transaction occurs, the ownership of the NFT is transferred from one digital wallet to another, and the transaction is recorded on the blockchain.
5. Verification: The ownership and authenticity of the NFT can be easily verified by anyone with access to the blockchain, providing transparency and trust in the ownership and provenance of the NFT.

Some characteristics of NFTs

1. Uniqueness: NFTs represent ownership of a specific item that is unique and cannot be exchanged on a one-to-one basis like traditional fungible assets.
2. Digital Ownership: NFTs provide a secure and verifiable way to establish digital ownership of a specific asset.
3. Blockchain-based: NFTs are built on blockchain technology, granting a secure and decentralized list of all trades and transfers of possession for each NFT.
4. Tamper-proof: The blockchain provides a tamper-proof record of ownership and authenticity for each NFT, ensuring that it cannot be duplicated or altered.
5. Verifiable: The blockchain gives a clear and verifiable account of control and legitimacy for every NFT, making it straightforward to check the possession and origin of a particular asset.
6. Monetization: NFTs allow originators and proprietors to gain income from their digital works and assets by offering, trading, and amassing extraordinary digital items.
7. Scarcity: NFTs introduce a novel kind of scarceness for digital items, creating esteem for exclusive digital assets and permitting new prospects for makers and accumulators.

Impact of NFTs on the digital world

The rise of NFTs is revolutionizing the way we think about digital ownership and value. One of the key impacts of NFTs is the monetization of digital assets. NFTs provide a new way for artists, musicians, gamers, and other creatives to establish ownership and roots for their digital works, allowing them to monetize their creations in a way that was previously not possible. This has the potential to transform the art world, music industry, gaming industry, and more, as creators and owners are able to monetize their digital assets in new and exciting ways.

The impact of NFTs on the digital world is far-reaching and profound. They are providing a new level of trust and decentralization in the ownership and authenticity of digital assets, empowering artists and creatives, and creating new revenue streams and investment opportunities. As the technology continues to evolve and mature, the possibilities for NFTs are endless, and we can expect to see continued growth and adoption in the years to come.

NFTs represent a new era in the digital world, and their impact on the world is only just beginning. As technology continues to grow and change, it will be interesting to see how NFTs will affect the wider world and how they will shape the future of digital ownership and value.

Unlocking the Power of AI: Exploring the Exciting Future of Generative AI

Syeda Reeha Quasar (14114802719)
Student, Department of Computer Science & Engineering

The field of artificial intelligence (AI) has advanced significantly in recent years. While AI was initially used for simple tasks like playing chess and solving puzzles, it has now evolved to encompass more complex tasks such as machine learning, deep learning, and even generative AI. In this blog, we will explore the exciting future of generative AI and how it can be used to unlock the power of AI. Generative AI is a type of AI that uses algorithms and models to generate new data or insights from existing data sets. It is a powerful tool that allows us to uncover hidden patterns and trends in data, which can then be used to make more informed decisions. Generative AI can also be used to create AI-generated content such as articles, summaries, and even entire books. Generative AI is closely related to machine learning (ML) and deep learning (DL). ML and DL are the two main approaches to AI, with ML focusing on developing algorithms that can learn from data and DL focusing on developing algorithms that can learn from data without the need for human intervention. Generative AI is a combination of both ML and DL, as it relies on both methods to generate new data or insights.

How AI Writers Work

AI writers are software programs that use generative AI to create human-like content. These programs use natural language processing (NLP) and natural language understanding (NLU) to understand the context of the content they are writing. They also use AI-based models and algorithms to generate new content based on the input they receive. AI writers can be used to generate content for websites, blogs, and even books. They are able to generate content that is both accurate and engaging, making them a valuable tool for content creators.

Benefits of AI Writers

There are many benefits to using AI writers. For starters, AI writers are able to generate content faster than human writers, allowing content creators to quickly create high-quality content. AI writers are also able to generate content that is tailored to the target audience, as they are able to understand the context of the content and tailor it accordingly. Finally, AI writers are able to generate content that is free from errors, as they are able to detect and correct mistakes before the content is published.

Popular AI Writers and Generative AI Tools

There are many popular AI writers and generative AI tools available today. Some of the most popular AI writers include ChatGPT, OpenAI, and GPT-3. ChatGPT is a conversational AI writer that is able to generate engaging conversations based on input from the user. OpenAI is an AI platform that can generate human-like content, while GPT-3 is a deep learning-based AI writer that

is able to generate content that is more accurate and detailed than other AI writers. There are also many generative AI tools available, such as Natural Language Generation (NLG) and Cognitive Services. NLG is a tool that uses AI and ML to generate human-like content, while Cognitive Services is a suite of AI-powered tools that can be used to generate content, detect anomalies, and more.

OpenAI and GPT-3

OpenAI is an AI platform created by Elon Musk and other industry leaders. OpenAI has developed a number of AI-powered applications, including the OpenAI GPT-3. GPT-3 is an AI-powered text generator that is capable of generating human-like text. GPT-3 has been used to generate text for a variety of applications, including news articles and technical articles. The ground-breaking AI-powered text generator GPT-3 can comprehend the context of the text it is generating and even produce text that is specifically suited to the target audience. In addition, GPT-3 can produce text that is more accurate than text produced by other AI systems.

Chatbots and AI-Powered Chatbot Platforms

Chatbots are AI-powered programs that are able to engage in conversations with users. AI-powered chatbot platforms such as ChatGPT, IBM Watson, and Microsoft Bot Framework are used to create and manage chatbots. These platforms are used to create chatbots that are able to understand the context of conversations and generate human-like responses. Chatbots are becoming increasingly popular, as they are able to provide customers with personalized and engaging experiences.

Innovations in Generative AI

Generative AI has come a long way in the past few years, thanks to advancements in AI, ML, and DL. Generative AI is now being used for a variety of applications, such as content generation, anomaly detection, image recognition, and more. Generative AI is also being used to create AI-powered models that are able to generate insights from data. Innovations in generative AI are also being used to create more powerful and accurate AI-powered chatbots. AI-powered chatbots are now able to understand the context of conversations and generate human-like responses. These chatbots are becoming increasingly popular, as they are able to provide customers with personalized and engaging experiences.

How to Use AI Writers and Generative AI Tools

AI writers and generative AI tools can be used to generate content for websites, blogs, books, and more. To use them, you first need to select the type of content you want to generate (such as a blog post or article) and then provide the AI writer or generative AI tool with the necessary input. The AI writer or generative AI tool will then generate content based on the input it receives. Once the content is generated, it is important to review it to make sure it is accurate and engaging. If the content is not up to your standards, you can make adjustments and refine it before publishing.

Big Data and the Future of AI

Big data has become increasingly important in the field of AI. Big data provides AI with more data to work with, which allows AI to be more accurate and efficient. Big data is also being used to create AI-powered models that can generate insights from data. The future of AI is bright and there are a number of exciting innovations in the field. AI is being used for a variety of applications, from content generation to anomaly detection to image recognition and more. AI is also being used to create AI-powered chatbots that are able to understand the context of conversations and generate human-like responses.

Conclusion

Generative AI is a powerful tool that is being used to unlock the power of AI. Generative AI is being used to generate content, detect anomalies, and create AI-powered models that are able to generate insights from data. AI writers and generative AI tools are becoming increasingly popular, as they are able to generate content that is both accurate and engaging. Big data is playing an important role in the future of AI, as it provides AI with more data to work with. Overall, the future of AI is bright and there are a number of exciting innovations in the field.

Latest Trends in Computer Technologies: Blockchain

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The rapid advancement in computer technology has drastically changed the way we live, work, and communicate. From smartphones to artificial intelligence, computer technology has revolutionized every aspect of our lives and continues to shape the future. With its endless possibilities and potential, computer technology is a constantly evolving field that brings new innovations and ideas every day. This article will explore the latest advancements in blockchain technology and its impact on our daily lives. Blockchain technology has been rapidly evolving since its creation, with new advancements and trends emerging on a regular basis. The following are some of the latest trends in the world of blockchain technology:

1. Decentralized Finance (DeFi): Decentralized finance refers to financial systems that operate on blockchain technology and allow for peer-to-peer transactions without intermediaries. DeFi has been growing rapidly in recent years, with new platforms and applications emerging that offer a wide range of services such as lending, borrowing, and trading of digital assets.
2. NFTs: Non-fungible tokens (NFTs) are unique, one-of-a-kind digital assets that are stored on a blockchain. NFTs have become popular in the art world, where they are used to verify the ownership and authenticity of digital artworks. In addition, NFTs are being used in other industries such as gaming, music, and real estate, to represent unique assets.
3. Hybrid Blockchains: Hybrid blockchains are a combination of public and private blockchains that offer the best of both worlds. Public blockchains like Bitcoin and Ethereum are transparent, secure, and decentralized, but they can be slow and expensive. Private blockchains, on the other hand, offer faster and cheaper transactions, but they are typically centralized and lack the transparency and security of public blockchains. Hybrid blockchains provide a way to balance these trade-offs by leveraging the strengths of both public and private blockchains. In a hybrid blockchain, certain parts of the network are kept private, while others are made public. For example, a company might use a private blockchain to store sensitive data, while using a public blockchain to verify and track transactions. This allows the company to maintain control over its sensitive data while still benefiting from the security and transparency of a public blockchain. Hybrid blockchains are growing in popularity due to the increasing demand for enterprise-grade blockchain solutions that can handle large amounts of data and transactions. They are particularly well-suited for use cases in finance, supply chain management, and other industries where the need for security and scalability is high.
4. Interoperability: Interoperability refers to the ability of different blockchain systems to communicate and exchange data with each other. As more blockchain networks are being created, the need for interoperability is becoming increasingly important. This is because a lack of interoperability can limit the potential for blockchain-based applications and limit

their scalability. Interoperability can be achieved through various means, including the use of APIs, sidechains, and cross-chain bridges. By allowing different blockchains to communicate with each other, interoperability opens new possibilities for creating decentralized applications and services that can reach a wider audience. For example, imagine a decentralized platform that allows users to make payments using different cryptocurrencies. To do this, the platform would need to be able to communicate with different blockchains to verify transactions and exchange data. This is only possible if the platform is interoperable with the different blockchains it interacts with.

5. Security Token Offerings (STOs): Security token offerings (STOs) are a new form of fundraising that involves issuing security tokens that represent ownership in an underlying asset, such as real estate or stocks. STOs offer a number of benefits compared to traditional investment instruments, including increased security, transparency, and liquidity. In an STO, a company issues security tokens that are stored on a blockchain. These tokens represent ownership in the underlying asset and can be bought and sold just like stocks. Because they are stored on a blockchain, security tokens offer increased transparency and security compared to traditional investment instruments. This is because all transactions are recorded on the blockchain, making it easy to track and verify ownership. STOs also offer increased liquidity compared to traditional investments, as security tokens can be bought and sold on various exchanges and trading platforms. This makes it easier for investors to buy and sell their investments, increasing the overall liquidity of the market.

In conclusion, blockchain technology is rapidly evolving and these trends represent just a few of the many exciting developments in this field. As the technology continues to mature, it is likely that new trends will emerge, leading to even more innovative and impactful applications of Blockchain.

Latest Trends in Computer Technologies: Bioinformatics

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The use of computer technologies has revolutionized virtually every aspect of modern life, from communication and commerce to entertainment and education. In recent years, advancements in hardware and software have dramatically increased the power and versatility of computer systems, enabling the processing of vast amounts of data and the development of new applications and services. The field of computer technology is constantly evolving, with new innovations emerging at a rapid pace. From artificial intelligence and machine learning to cloud computing and the Internet of Things, computer technologies are transforming the way we live, work, and interact with one another. This article will explore one such computer technology, namely Bioinformatics and its impact on our daily lives.

Bioinformatics is the field of science that deals with the analysis and interpretation of biological data, particularly DNA and protein sequences, using computational methods and software. It helps to advance our understanding of biological systems and processes, such as gene function and evolution. In layman’s term Bioinformatics combines the fields of biology, computer science, and information technology to analyse and understand the complex systems of living organisms. It is used to analyse genomic data to identify genetic variations that contribute to the development of diseases, leading to the development of personalized medical treatments based on a patient's unique

genetic profile. This has led to ground breaking innovations in cancer treatment using precision therapy. Precision cancer therapy is a type of medical treatment that is designed to target the specific genetic changes that drive the growth and spread of cancer. Unlike traditional cancer treatments, which often cause significant harm to healthy cells and tissues, precision cancer therapy focuses on the specific genetic mutations that are unique to each individual's cancer. Bioinformatics is used to identify such genetic changes and intern help to design an appropriate treatment mechanism. Bioinformatics is has also proved useful to predict the potential efficacy and safety of new drugs, study evolution of microbial organisms, creating genetically modified crop for better yield, studying various microbial ecosystems such as the human gut microbiome among many more application. During the Covid-19 pandemic, Bioinformatics played a crucial role in treating and controlling the spread of disease. Bioinformatics was used in the following ways.

1. Virus Genomics: Bioinformatics was used to analyse the genome of SARS-CoV-2, the virus responsible for COVID-19, leading to a better understanding of its origin, evolution, and spread.
2. Diagnosis: Bioinformatics was used to develop new diagnostic tests and analyse test results, helping to rapidly and accurately diagnose COVID-19 cases.
3. Therapeutic Development: Bioinformatics was used to identify potential drug targets , predict the efficacy of existing drugs against COVID-19, and evaluate the safety and effectiveness of vaccines.
4. Epidemic Surveillance: Bioinformatics was used to analyse large amounts of data from various sources, such as health records and social media, to track the spread of COVID19 and monitor its impact on public health. These examples show the critical role that bioinformatics has played in the response to the COVID-19 pandemic and highlight the importance of investing in this field for future public health emergencies.

In conclusion, bioinformatics is a rapidly evolving field that is playing a crucial role in understanding biological systems and advancing healthcare. With the continued development of new technologies and techniques, it is likely that bioinformatics will continue to play an increasingly important role in the field of biology in the years to come

Personal and Lifestyle

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Introduction:

The way we live our lives has a profound impact on our health, happiness, and overall well-being. Our personal and lifestyle choices can shape our future and determine the quality of our lives. Whether it's the foods we eat, the way we manage our stress, or the people we surround ourselves with, every decision we make has consequences. In this article, we will explore the impact of personal and lifestyle habits and decisions on our lives and offer some practical tips for improving our overall health and happiness.

The Impact of Diet on Our Health:

One of the most significant lifestyle factors affecting our health is the food we eat. Our diet has a direct impact on our physical and mental well-being. Eating a balanced diet rich in whole foods, such as fruits and vegetables, whole grains, and lean proteins, can help prevent chronic diseases and promote overall health. On the other hand, consuming a diet high in processed and junk foods can lead to weight gain, high blood pressure, and an increased risk of heart disease and type 2 diabetes.

The Importance of Exercise:

In addition to a healthy diet, regular exercise is essential for maintaining good health. Physical activity helps to improve our physical and mental well-being by reducing the risk of chronic diseases, improving our sleep, and reducing stress and anxiety. Exercise can also improve our overall quality of life by increasing our energy levels, promoting a positive outlook, and boosting our self-esteem. Aim to include at least 30 minutes of moderate-intensity physical activity in your daily routine, such as brisk walking, cycling, or swimming.

The Benefits of Sleep:

Getting enough quality sleep is essential for our overall health and well-being. Sleep is crucial for restoring and rejuvenating our minds and bodies, and a lack of sleep can lead to a range of health problems, including fatigue, irritability, and an increased risk of chronic diseases. To ensure you get the sleep you need, aim to establish a consistent sleep routine, avoid screens and caffeine before bedtime, and create a comfortable sleep environment.

The Power of Positive Thinking:

Our thoughts and beliefs play a crucial role in shaping our lives. Negative thoughts and self-talk can lead to feelings of anxiety, depression, and low self-esteem, while positive thinking can help us to build resilience, boost our self-esteem, and improve our overall quality of life. To cultivate a more positive outlook, try to focus on the present moment, practice gratitude, and surround yourself with positive and supportive people.

The Benefits of Social Connection:

Social connections are essential for our overall well-being, and having a strong network of friends and family can help to reduce stress, improve our mood, and increase our overall happiness. Spending time with loved ones, engaging in meaningful conversations, and participating in social activities can help to strengthen our bonds and promote a sense of community.

Conclusion:

Our personal and lifestyle habits and decisions have a profound impact on our lives, and it’s never too late to make changes for the better. By making small, positive changes in our diets, exercise routines, sleep habits, and social connections, we can improve our health, happiness, and overall quality of life. So, take the time to reflect on your personal and lifestyle habits and make the changes you need to live a healthier, happier life.

Mental Health & Well Being

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Introduction:

Mental health and well-being are crucial aspects of a person's overall health and quality of life. Mental health refers to an individual's emotional, psychological, and social well-being, while well-being encompasses physical health, financial stability, and overall satisfaction with life. Despite the growing awareness of mental health, a significant proportion of the world's population still struggles with various mental health issues.

The Importance of Mental Health and Well-Being:

1. **Improved physical health:** Good mental health is linked to improved physical health, and vice versa. Individuals with good mental health are more likely to take care of their physical health, engage in healthy behaviors, and have a more positive outlook on life.

2. **Better relationships:** Good mental health and well-being can improve relationships with family, friends, and romantic partners. Individuals with good mental health are more likely to communicate effectively, solve problems, and experience fewer conflicts in their relationships.

3. **Increased productivity**: Good mental health and well-being are critical to overall productivity and success in life. Individuals with good mental health are better able to concentrate, make decisions, and have the energy and motivation to pursue their goals.
4. **Increased happiness:** Good mental health and well-being are associated with increased happiness, life satisfaction, and overall well-being.

Factors Affecting Mental Health and Well-Being:

1. **Genetics:** Mental health and well-being can be influenced by genetic factors, including a person's family history of mental health issues.

2. **Life events:** Traumatic life events, such as the loss of a loved one, a divorce, or a major financial loss, can significantly impact mental health and well-being.
3. **Stress:** Chronic stress can significantly affect mental health and well-being. Stress can cause physical symptoms, such as headaches and fatigue, as well as emotional symptoms, such as anxiety and depression.
4. **Substance abuse:** Substance abuse, including alcohol and drug use, can significantly impact mental health and well-being. Substance abuse can lead to a wide range of physical and emotional health problems.
5. **Social support:** A lack of social support can negatively impact mental health and well-being. Individuals with strong social support systems are more likely to experience better mental health and well-being.

Strategies for Improving Mental Health and Well-Being:

1. **Exercise:** Regular exercise is one of the best ways to improve mental health and well-being. Exercise releases endorphins, which are natural mood boosters, and can help reduce stress and anxiety.
2. **Healthy diet:** Eating a balanced, nutritious diet can improve mental health and well-being. A diet that is rich in fruits, vegetables, and whole grains can help reduce symptoms of depression and anxiety.
3. **Sleep:** Getting adequate sleep is critical to good mental health and well-being. Lack of sleep can cause physical and emotional symptoms, including fatigue, irritability, and mood swings.
4. **Mindfulness:** Mindfulness practices, such as meditation and yoga, can help reduce stress, anxiety, and depression. Mindfulness can also improve focus, concentration, and overall well-being.
5. **Social support:** Building strong social support networks is critical to good mental health and well-being. Spending time with friends and family, volunteering, and participating in community activities can all help improve mental health and well-being.
6. **Professional help:** If necessary, seeking professional help, such as therapy or medication, can be an effective way to improve mental health and well-being.

Conclusion:

Mental health and well-being are essential components of overall health and quality of life. They are influenced by a range of factors, including genetics, life events, stress, substance abuse, and social support. However, there are many strategies that individuals can employ to improve their mental health and well-being, including exercise, a healthy diet, sleep, mindfulness, social support, and professional help. Improving mental health and well-being can have numerous positive benefits, including improved physical health, better relationships, increased productivity, and increased happiness. It is crucial for individuals to prioritize their mental health and well-being to achieve optimal health and overall well-being.

Next.js: The Current Hot Topic in Web Development!

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Next.js 13 brings a slew of new features, including the new Turbopack bundler, support for React Server Components, and more. Let's get started with Next.js 13.

Next.js is more like React, but with benefits, in that it delivers all the features of React with ease-of-use conventions and a well-defined client-server stack. Next.js 13 is the newest version, released by Vercel at the Next.js conference in October 2022. It brings a slew of new features, including a bundler called Turbopack and support for several React-incubated optimisations like React Server Components and streaming rendering.

Next.js from my own point of view, has been a great tool in making react applications so powerful that for small-scale single page applications (SPAs), you do not even require to create a backend server. You can simply create APIs in Next and use them to your own advantage. This is important because the most hustling part in creating a fully functional web-application is integrating the back-end with the front-end, and for small-scale applications, where you do not need a lot of APIs, its pretty much futile to go over the task of doing so. Next offers a way-out to this problem.

The new Turbopack bundler:

Turbopack is a new general-purpose JavaScript bundler and a major feature in Next.js 13. It is intended as a Webpack replacement, and although it’s released as alpha, you can use Turbopack now as the dev-mode bundler from Next.js 13 forward. Turbopack is a new entrant into the bundler competition, where several contenders have vied to overcome Webpack’s dominance. This is going to stir up a lot of application functionalities that are into existence and will make the job for front-end developers a lot easier.

The new/app directory:

Now let’s look at our directory layout, where you will notice the new / app directory. This is a new feature of Next.js 13. Basically, everything in the / app directory participates in the next generation of React and Next.js features. The /app directory lives next to the familiar /pages directory and supports more advanced routing and layout capabilities. Routes that match in both / pages and /app will go to /app, so you can gradually supersede existing routes.

The basic routing in /app is similar to /pages in that the nested folders describe the URL path, so /app/foo/bar/page.js becomes localhost:3000/foo/bar in our dev setup.

That’s quite a lot of action in Next.js 13—and there is more that I did not cover. Other new features include updates to the next/image component and a new font-loading system. Overall, Next.js 13 continues the tradition of delivering an all-in-one, React-with-benefits framework that makes it easier to take advantage of a variety of features. All-in-all, the new release of Next.js 13 has created a whole range of new things that you can enable within your single-page or multi-page react applications, be it sending API calls to a back-end server without having to deal with the issue of the page being reloaded or getting your application to have a better SEO. Next.js is going to be at the top of your choice list!

RESEARCH PUBLICATIONS

Exploration Study of Ensembled Object Detection Models and Hyperparameter Optimization

Jayesh Gupta[*], *Arushi Sondhi*[*], *Jahnavi Seth*[*], *Tariq Hussain Sheikh*[†], *Moolchand Sharma*[*] & *Farzil Kidwai*[‡]

Abstract: Object identification models are becoming more accurate as processing capabilities improve. It is our goal to improve the accuracy of object recognition through the use of several ensembles of distinct state-of-the-art object detection models. The use of single architectures and models to handle object detection challenges has been demonstrated in prior studies; however, each model was later shown to have its own bias and variation. "Ensemble Learning" is currently being studied in recent research after the success of fundamental ensembled models like XGBoost. Ensemble learning in object detection is proposed to be expanded through this research by grouping different permutations of existing models to reduce individual bias and variance while improving metrics, accuracy, and gathering metrics that will aid in hyper parameter optimization for future research on object detection ensembles. It took us a while to find a top-performing ensemble for PASCAL VOC problems.

A Comprehensive Framework for the IoT-Based Smart Home Automation Using Blynk

Faraz Doja[*], *Reenu Batra*[*], *Sandeep Tayal*[*], *Prashant Vats*[*] & *Siddhartha Sankar Biswas*[*]

Abstract: *The* phrase "IoT" mentions to any technology that makes it possible for a device to connect to the Internet. Data collecting is essential for such systems. The information is subsequently utilized for Internet-based control, monitoring, and transfer of data to other devices. Smart home technology is the future of domestic technology, aiming to offer and distribute a variety of services both inside and outside the home via networked devices in which all of the many applications and intelligence behind them are merged and interconnected. Given the constant availability of a broadband Internet connection, these smart gadgets have the potential to communicate information with one other. As a result, technology for the smart home is now a part of the Internet of Things (IoT). In this research paper, we have offered a framework for remote administration and monitoring IoT-enabled appliances and systems in this paper. Home automation provides homeowners with allowing them to have peace of mind to keep an eye on and defend their homes from afar.

Comparative Study of Enhanced Round Robin Algorithms with Drrha and Other Metaheuristic Algorithms

Ritika Verma[*], *Sarthak Mittal*[*], *Siddharth Pawar*[*], *Moolchand Sharma*[*] & *Deepak Gupta*[*]

Abstract: CPU scheduling has a substantial influence on system resource usage and overall performance. Scheduling Algorithms are a technique for reducing CPU resource deprivation while

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simultaneously maintaining fairness among the numerous programs that utilize the resources. Round Robin is a preemptive scheduling method that significantly improves response time by restricting each operation to a certain length of time known as the Time Quantum. Various efforts have been made to calculate a time quantum value to optimize these Round Robin algorithm parameters. However, this gain in response time comes at the expense of turnaround and waiting time. In this paper, we compare the conventional Round Robin CPU scheduling algorithm to updated Round Robin algorithms such as DRRHA, as well as our suggested approaches termed MDRRHA and NDRRHA, which seek to reduce process waiting time. The Quantum value for MDRRHA and NDRRHA is derived dynamically using the arithmetic mean and the normal distribution of execution time values of tasks, respectively. The recommended solutions decrease average turnaround time and average waiting time values by up to 13%. In this research, we compare different job scheduling approaches by simulating them in a variety of test situations.

Multimodal Sentiment Analysis using Speech Signals with Machine Learning Techniques

V Sunil Kumar[*], *Piyush Kumar Pareek*[*], *Victor Hugo Costa de Albuquerque*[*], *Ashish Khanna*[*], *Deepak Gupta*[*]; *Deepak Renukadevi S*[*]

Abstract: The study of people's perspectives, evaluations, attitudes, and feelings in regard to objects and the qualities of those entities is referred to as sentiment analysis. This research is conducted via the use of computers. One of the most basic jobs in sentiment analysis is to identify the sentiment polarity of the documents, words, or attributes that are being studied. This may be done in a number of ways. The affective states of individuals are evaluated and taken into account in order to establish the perspective that is conveyed. Users will typically express their opinions on a product or service in the form of a blog post, a shopping site, or a review site the vast majority of the time. These sorts of opinion-related objects are overwhelming and are developing at a quick rate, which makes it a difficult process for the manufacturer to categorize them. typing in all of this information manually. People are also looking forward to hearing people's perspectives on the new linear entities that have been discovered on the level of aspects. As a consequence of this, it is of the utmost importance to develop an automated sentiment analyzer that is able to detect the sentiment polarity of the documents or aspects at both the bipolarity level and the multipolarity level automatically. As a result of the rise of social networking sites, individuals now have the capacity to freely express their thoughts and opinions via social media. This not only provided as a rich source of feedback and analysis of emotions, but it was also a driving force for the creation of automated emotional analysis. Because of this, the supervised classification method has been shown to be successful; hence, it is used widely in a variety of multi sentiment analysis applications as a consequence of this. A hybrid deep learning network, namely a three-dimensional CNN-BLSTM, has been created in order to analyze the sensations that are elicited by opinion videos. This evaluation will take place. YouTube and the Multimodal Opinion Utterances Dataset (MOUD) are the two key datasets that are used the most when it comes to gathering the temporal and geographical information that is contained within video frames. Both of these datasets are available online. In order to identify the candidate's face inside the frames, the Viola-Jones Algorithm is implemented. This algorithm is comprised of four essential steps, such as Haar feature selection, integral image conversion, cascade, and Adaboost training classifiers. The Viola-Jones Algorithm is used in order to accomplish this task. The recommended technique shows greater performance when compared to the standard methods to sentiment analysis on two separate datasets. The last stage of the research study entails doing an analysis of multimodal attitudes. This is necessary since the range of modalities and forms of social data is continually growing. The primary objective of this study is to design an efficient strategy for

choosing characteristics in order to improve the overall performance of MSA, which serves as the motivation for the research. This will make it possible to pick the right characteristics, which will eventually result in greater performance. In order to get the values of features from the input data, the dataset from YouTube is used as the input, and hybrid feature extraction algorithms are utilized in order to do this. The Relief feature selection method is put to use in order to choose the most useful characteristics, and after that, the random forest classifier is given access to those characteristics together with the values that are the most useful for them.

Improved Domain Generation Algorithm to Detect Cyber-Attack With Deep Learning Techniques

Chethana C[*], Piyush Kumar Pareek[*], Victor Hugo Costa de Albuquerque[*], Ashish Khanna[*], Deepak Gupta[*]

Abstract: Deep learning is a subfield of machine learning (ML) that focuses on the development of artificial intelligence. It is also often referred to by its acronym, DL (AI). This technique lays an emphasis on the use of big capacity, scalable models that are able to construct distributed representations depending on the input data set. This proposed illustrates the generalizability of these methods and the usage of them in a broad range of cyber security investigations that are peculiar to their environment. The neural network models have been continuously refined and extended during the whole of this research in order to achieve greater adaptability. The following is a list of the important contributions that this proposed makes, in order from most significant to least significant: Work is currently being done to create a comprehensive database for the identification of domain names that have been generated by a domain generation algorithm (DGA), as well as a one-of-a-kind architecture that will increase the overall effectiveness of DGA domain name detection. Both of these will help increase overall efficiency. The creation of a hybrid intrusion detection warning system that is founded on a deep neural network (DNN) and that has the capability to monitor network and host-level activities inside an Ethernet local area network (LAN) (LAN). The examination of information gathered from social media platforms, electronic mail (email), and uniform resource locators in order to design a unified, DL-based framework for the detection of spam and phishing (URL). The creation of a technique based on DL for the study of secure shell (SSH) traffic, the categorization of application network traffic, the classification of malicious traffic, and the detection of harmful traffic is being worked on. The name of the new framework that has been suggested, which is called ScaleMalNet, reflects how hybrid and scalable it is. In the first stage, the executables file is classified as malware or genuine by using static and dynamic analysis. In the second stage, the malicious executables _le are grouped into corresponding malware families. This is a two-step process. For the aim of conducting investigations into Android ransomware and malware, an analogous hybrid DL framework is now in the process of being developed. This framework is better in its capacity to detect dangerous software and ransomware on Android when compared to the typical ML-based techniques that are presently in use. These approaches are already in widespread usage. The development of a framework for DNS-based botnet detection and DL-based network intrusion detection is now being worked on in the context of the Internet of things (IoT) and smart cities

Deep Learning Technique based Intrusion Detection in Cyber-Security Networks

C Chethana[*]*, Pareek, Piyush Kumar*[*]*, Costa de Albuquerque Victor Hugo*[*]*, Khanna, Ashish*[*]*, Gupta Deepak*[*]

Abstract : As a result of the inherent weaknesses of the wireless medium, ad hoc networks are susceptible to a broad variety of threats and assaults. As a direct consequence of this, intrusion detection, as well as security, privacy, and authentication in ad-hoc networks, have developed into a primary focus of current study. This body of research aims to identify the dangers posed by a variety of assaults that are often seen in wireless ad-hoc networks and provide strategies to counteract those dangers. The Black hole assault, Wormhole attack, Selective Forwarding attack, Sybil attack, and Denial-of-Service attack are the specific topics covered in this thesis. In this paper, we describe a trust-based safe routing protocol with the goal of mitigating the interference of black hole nodes in the course of routing in mobile ad-hoc networks. The overall performance of the network is negatively impacted when there are black hole nodes in the route that routing takes. As a result, we have developed a routing protocol that reduces the likelihood that packets would be lost as a result of black hole nodes. This routing system has been subjected to experimental testing in order to guarantee that the most secure path will be selected for the delivery of packets between a source and a destination. The invasion of wormholes into a wireless network results in the segmentation of the network as well as a disorder in the routing. As a result, we provide an effective approach for locating wormholes by using ordinal multi-dimensional scaling and round trip duration in wireless ad hoc networks with either sparse or dense topologies. Wormholes that are linked by both short route and long path wormhole linkages may be found using the approach that was given. In order to guarantee that this ad hoc network does not include any wormholes that go unnoticed, this method is subjected to experimental testing. In order to fight against selective forwarding attacks in wireless ad-hoc networks, we have developed three different techniques. The first method is an incentive-based algorithm that makes use of a reward-punishment system to drive cooperation among three nodes for the purpose of vi forwarding messages in crowded ad-hoc networks. A unique adversarial model has been developed by our team, and inside it, three distinct types of nodes and the activities they participate in are specified. We have shown that the suggested strategy that is based on incentives prohibits nodes from adopting an individualistic behaviour, which ensures collaboration in the process of packet forwarding. To guarantee that intermediate nodes in resource-constrained ad-hoc networks accurately convey packets, the second approach proposes a game theoretic model that uses non-cooperative game theory. This model is based on the idea that game theory may be used. This game reaches a condition of desired equilibrium, which assures that cooperation in multi-hop communication is physically possible, and it is this state that is discovered. In the third algorithm, we present a detection approach that locates malicious nodes in multihop hierarchical ad-hoc networks by employing binary search and control packets. We have shown that the cluster head is capable of accurately identifying the malicious node by analysing the sequences of packets that are dropped along the path leading from a source node to the cluster head. A lightweight symmetric encryption technique that uses Binary Playfair is presented here as a means of safeguarding the transport of data. We demonstrate via experimentation that the suggested encryption method is efficient with regard to the amount of energy used, the amount of time required for encryption, and the memory overhead. This lightweight encryption technique is used in clustered wireless ad-hoc networks to reduce the likelihood of a sybil attack occurring in such networks.

Pest Detection in Plants Using Convolutional Neural Network

Savita Sharma, Rishabh Sharma*, Rishav Kumar**

Abstract: Agriculture or farming is an imperative occupation since the historical backdrop of humanity is kept up. Artificial Intelligence is leading to a revolution in the agricultural practices. This revolution has safeguarded the crops from being affected by distinct factors like climate changes, porosity of the soil, availability of water, etc. The other factors that affect agriculture includes the increase in population, changes in the economy, issues related to food security, etc. Artificial Intelligence finds a lot of applications in the agricultural sector also which includes crop monitoring, soil management, pest detection, weed management and a lot more. Significant problems for sustainable farming include detection of illness and healthy monitoring of plants. Therefore, plant disease must automatically be detected with higher precision by means of image processing technology at an early stage. It consists of image capturing, preprocessing images, image segmentation, extraction of features and disease classification. The digital image processing method is one of those strong techniques used far earlier than human eyes could see to identify the tough symptoms. Considering different climatic situations in various regions of the world that impact local weather conditions. These climate changes affect crop yield directly. There is a great demand for such a platform in the world of today which would enable the farmer market his farm products. We have proposed in this study a system where farmers can sell their products directly to customers without the intervention of distributors and traders. The predictive analytics system is necessary for the farmer to get the maximum yield which benefit the farmer. This may be done if the environment, market conditions and knowledge of the timely planning of farms are known properly.

Crime Pattern Prediction and Analysis Using Machine Learning

Jatin Chopra,Kartik Sharma*, Kartik Sharma*, Farzil Kidwai**

Abstract: Crime is one of the greatest and overwhelming issues in our general public and its anticipation is a significant undertaking. Day by day there are immense quantities of violations submitted regularly. This requires monitoring every one of the violations and keeping an information base for a similar one which might be utilized for future reference. The current issues confronted are keeping an appropriate dataset of wrongdoing and breaking down this information to help in anticipating and settling violations in the future. The target of this task is to investigate a dataset that comprises various wrongdoings and anticipate the sort of wrongdoing that might occur in the future relying on different conditions. In this venture, we will utilize the method of AI and information science for the wrongdoing forecast of the Chicago wrongdoing informational index. The wrongdoing information is separated from the authority entryway of Chicago police. It comprises wrongdoing data like area depiction, sort of wrongdoing, date, time, scope, longitude. Prior to preparing the model information preprocessing will be finished after this component choice and scaling will be done as such that exactness will be high. The K-closest neighbor (KNN) arrangement and different calculations will be tried for wrongdoing forecasts and one with better precision will be utilized for preparing. Perception of the dataset will be done as far as the graphical portrayal of many cases for instance when the crime rates are high or at which month the crimes are high. The sole motivation behind this task is to give a joke thought of how AI can be utilized by the law authorization offices to distinguish, foresee and address violations at a much quicker rate and accordingly lessen the crime percentage. It isn't confined to Chicago, in this way can be utilized in different states or nations relying on the accessibility of the dataset

Cryptocurrency Price Detection Using Machine Learning

Himanshu Goyal, Ishaan Garg*, Aakash Garg*, Anubha Khanna**

Abstract: Cryptocurrency represent valuable and intangible objects which are used electronically in different applications and networks such as virtual worlds and peer to peer networks. The use of virtual currency has become widespread in many different systems in recent years. Based on the fact that many users follow the conventional method of investing in any stock or cryptocurrency, we aim to provide the investor with the knowledge to buy a digital currency based on its past trends using machine learning algorithms.

A Multi-Label Approach to Toxic Comment Classification Using Machine Learning

Sudha Narang, Satvik*, Om Parashar*, Mohammad Salik**

Abstract: Due to the recent events of mass spreading of COVID-19, every physical operation has been hard stuck with its effect and has caused a sudden exponential increase in the usage of internet services. With everything going online and people using it for their respective activities, there has been a widespread of cyber bullies causing negative online behaviours, including comments that are rude, disrespectful or otherwise likely to make someone leave a discussion. The paper addresses the problem of classifying toxic comments into subcategories to help the online moderation. This paper has employed Multi-Label Classification using Problem Transformation methods.

Video Conferencing WebApp

Sanjay Majhi, Ratul Hans*, Naman Ahuja*, Sudha Narang**

Abstract: During the last few years, video conferencing has become very popular and very reliable as a tool to bridge the gap where travel is not an option. And the COVID-19 epidemic has also led to lockdown orders that have led to dramatic changes in the way people work. The number of people working in the home (WFH) had increased significantly during the pandemic. The need for distance learning has also increased and has become a compulsory education system in the midst of this current situation. The Companies are also adopting an innovative recruitment process at such time. So to address this issue, our project aims to build a conference app that helps to provide communication between people through audio conferencing, video conferencing, screen sharing and messaging in real time. In this, we have created group video chat with the help of WebRTC technology and socket programming. Also we have added real-time chat feature and screen share feature. We had created the web app using Jquery for front end and node.js express.js for signaling server and real time database of Firebase for storing chats and user information. WebRTC helped us to create peer to peer connection and with the help of sockets we have done transfer of sdp packets and ice candidates. We have discussed extensively about them in our paper.

Custom Hand Gesture Recognition

Anuj Jain, Chandan Ranga* and Hitesh Garg**

Abstract: Sign Language is mainly used by deaf (hard hearing) and dumb people to exchange information between their own community and with other people. It is a language where people use their hand gestures to communicate as they can't speak or hear. Sign Language Recognition (SLR) deals with recognizing the hand gestures acquisition and continues till text or speech is generated for corresponding hand gestures. Here hand gestures for sign language can be classified as static and dynamic. However, static hand gesture recognition is simpler than dynamic hand gesture recognition, but both recognition is important to the human community. We can use Deep Learning Computer Vision to recognize the hand gestures by building Deep Neural Network architectures (Convolution Neural Network Architectures) where the model will learn to recognize the hand gestures images over an epoch. Once the model Successfully recognizes the gesture the corresponding English text is generated and then text can be converted to speech. This model will be more efficient and hence communicate for the deaf (hard hearing) and dump people will be easier. In this paper, we will discuss how Sign Language Recognition is done using Deep Learning.

Image Captioning using Deep Learning

Ankit Kumar, Abhishek Ranjan*, Neetu Garg**

Abstract **-** The topic of autonomously producing descriptive words for photographs has piqued interest in natural language processing and computer vision research in recent years. The process of creating a written description of an image is known as image captioning. The captions are generated using both Natural Language Processing and Computer Vision. The authors propose a hybrid system that uses a multi-layer Convolutional Neural Network (CNN) to produce image-descriptive vocabulary and a Long Short Term Memory (LSTM) to accurately form meaningful sentences utilizing the generated keywords in this study. A Convolutional Neural Network (ConvNet/CNN) is a Deep Learning algorithm that uses convolutional neural networks. There are many open source datasets available for this problem, like Flickr8k (containing 8k images), Flickr30k (containing 30k images), MS COCO (containing 180k images), etc.

Artificial Intelligence Based Automated Exam Proctoring System

Vishesh Khanna, Sahil Brodiya* and Deepesh Chaudhary**

Abstract **-** There have been giant leaps in the field of education in the past 1–2 years. Schools and colleges are adapting online to provide more resources to their students. Online proctoring services (part of assessment) are also on the rise, and AI-based automated exam proctoring systems (AEPS) have taken the market by storm.. Major issues with AEPS include security and privacy concerns, ethical concerns and to ensure that the level of online examinations is at par with offline examinations in all aspects; be it integrity of marks scored, ensuring candidates do not get involved in wrongdoings etc. The exam proctoring system built uses Face recognition to verify a candidate while conducting an exam on an online exam platform. Images of candidates will be stored in the database. After the candidate logs in, the automated proctor keeps a check on candidate and prevent candidate from using any unfair means while giving the examination.

Sustainability in Supply Chain with Blockchain: Understanding the Adoption Barriers and Scalability Solution

Rajat Kumar, Harish Dagar**

Abstract: The drastic increase in globalization across the globe has made traditional supply chains more complex and their management a daunting task for organizations. Blockchain Technology, which can be described as a distributed, decentralized, digital ledger that is immutable and consists of blocks to record transactions, is set to transform the Supply chain and logistics industry. Previous studies have suggested that blockchain can play a pivotal role in sustainable supply chain management. Despite regular advancements, the supply chain industry is yet to adopt and trust blockchain technology for its regular use. In this research paper, we have discussed major adoption barriers among institutions. In addition, this study illustrates a possible solution to some of the barriers especially for the sustainability and scalability of blockchain-based supply chains.

Anti-Counterfeit Product System Using Blockchain Technology

Ishaan Singhal, Himanshu Singh Bisht*, Yogesh Sharma**

Abstract: Fake Products is a serious issue, as in today's world we can't really distinguish between real and fake product. And some people make these fake products just to make some profit without thinking about its impact on user and also affects company's name, profit and sales. Blockchain technology can be used to detect whether the product is real or fake and assure user about the authenticity of the product. Blockchain is a trending technology and lot of applications are using this technology. Blockchain technology is the technology where information is stored in the form of blocks in many databases which is connected with the chains and it doesn't require any third-party users for permission. Benefits of blockchain is that it is immutable and secure. It is decentralized and distributed. We can use Quick Response [1] (QR) code or an encrypted unique code which is a very efficient technique to detect fake product. When the QR code is scanned or the unique code in entered, it will redirect us to the blockchain containing the information of the product and provides us the details of the manufacturer and information of owner to make decision easy for buyer if they are looking to buy the product.

Parkinson's Disease Prediction Using Xgboost, Random Forest And Catboost

Umang Tiwari, Himani Sheoran*, Udit Jain*, Zameer Fatima**

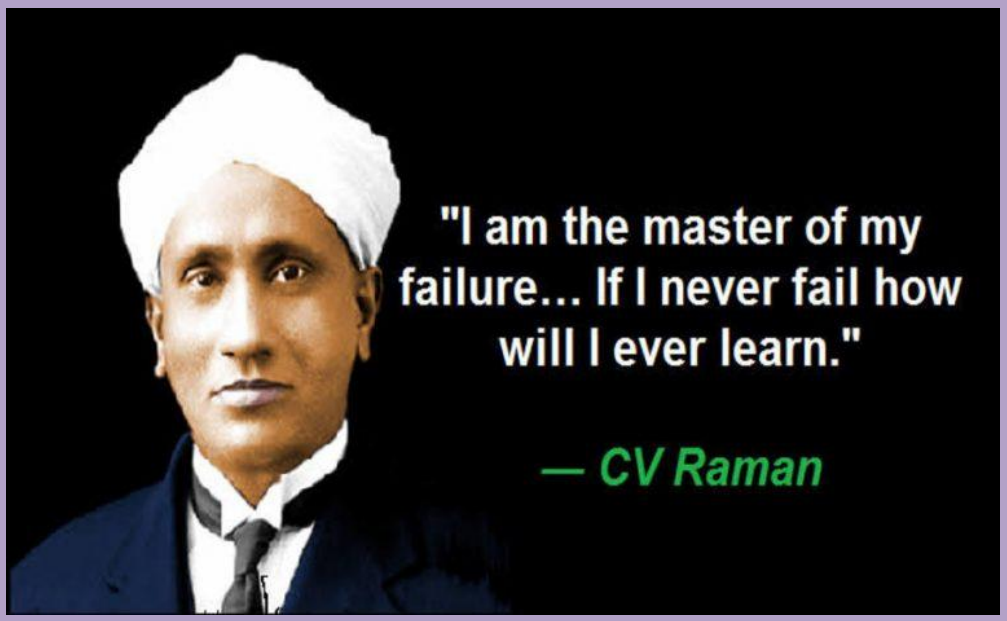
Abstract: We are predicting Parkinson's disease with the assistance of voice Dataset efee which allows to treat the human beings in early stages. Parkinson's disease is a neurological sickness that ends in shaking and issue in strolling, balance, and coordination. In worst instances, sufferers have super problem on foot or status even they're not capable to live by themselves and require a wheelchair to move around an assistance is wished in all each day activities. Besides motor signs and symptoms, the character may additionally see, pay attention, or revel in things that are not real (hallucinations), or agree with matters that aren't genuine (delusions). Parkinson's disease patients normally have a low-quantity voice with a monotone high-quality.The speech sample of Parkinson's affected person is often produced in quick bursts with beside the silences between words and long pauses earlier than initiating speech. The voice dataset have the functions like MDVP:Fo(Hz)-

average vocal fundamental frequency, MDVP:Fhi(Hz)- most vocal essential frequency, jitter, Simmerand so forth. First, we balanced the data using SMOTE (synthetic Minority Oversampling approach) and then train and test one-of-a-kind model like Random Forest, Cat boost, XGboost and tuned the hyperparameter with the assist of GridSearchCV. On assessment we located that Cat boost showing the higher accuracy – 96.6% and high Matthews Correlation Coefficient (MCC) – 91.43% among these kinds of fashions.

A Novel Hybrid Clustering Based Transmission Protocol for Wireless Body Area Networks

Neelam Sharma[*], *Harshita Chadha*[*], *Karan Singh*[*], *B. M. Singh*[*], *Nitish Pathak*[*]

Abstract: Wireless sensor networks are a collection of intelligent sensor devices that are connected to one another and have the capability to exchange information packets amongst themselves. In recent years, this field of research has become increasingly popular due to the host of useful applications it can potentially serve. A deep analysis of the concepts associated with this domain reveals that the two main problems that are to be tackled here are throughput enhancement and network security improvement. The present article takes on one of these two issues namely the throughput enhancement. For the purpose of improving network productivity, a hybrid clustering based packet propagation protocol has been proposed. The protocol makes use of not only clustering mechanisms of machine learning but also utilizes the traditional forwarding function approach to arrive at an optimum model. The result of the simulation is a novel transmission protocol which significantly enhances network productivity and increases throughput value.



INTERNSHIP CORNER

Making E-Commerce Experience Seamless

PayU Innovation Track Application

Pavitra Walia (42414802718), CSE, MAIT

In the emerging global economy, eCommerce has increasingly become a vital component of business strategy and a solid catalyst for economic development. The continued expansion of eCommerce could lead to downward pressure on inflation through increased competition, cost savings, and changes in sellers' pricing behaviour. From startups to small and medium-sized businesses right through to huge brands, there are a large number of companies that can benefit from their own online store, where they can sell their own products/services.

At the same time, the speedy influx of new technology in the retail experience has driven consumers of all ages to expect a convenient and connected experience that seamlessly aligns with their everyday lives.

The main Objective/Aim of the internship was to develop a cross-platform web application from scratch for the company. I gained a lot of experience in the field of web application development. During my summer internship, I was given the opportunity to develop a web application from scratch. During the 24 weeks of internship, I, with a team of 2 interns, successfully developed the web application for the company PayU Payments Private Limited.

During the course of the internship, my team followed the agile methodology. I learned about how we can collaborate with fellow team members, divide the work and complete the assigned tasks as per the milestones set This Internship gave me a glimpse of new and emerging components that are evolving in the field of web development and new career opportunities that are arising in the field of web development. I got to know how to work on projects at the industrial level. I learned to work under tight deadlines. I also learned how to write clean code along with good documentation.

The Data Science Course 2021: Complete Data Science Bootcamp

Jatin Malhotra (41914802718), CSE, MAIT

After reviewing the set of our test results and outcomes versus the initial problem statement and the underlying hypotheses we can conclude that there is a clear distribution of incomes for data scientists and software engineers across the world. Survey respondents from the low-income ('Developing) countries have considerably lower average incomes than the survey respondents from the high-income ('Developed') countries. Although this is an expected phenomenon, it could provide a serious impact on social dynamics within the future state of the world. As the technology advances and there are more jobs created in the data science and software engineering domain, the gap is likely to widen, as the developed world enjoys the low-cost labour of the professionals from developing countries and promotes high-end, higher paid labour domestically. Furthermore, the increase in demand for the low-cost labour is likely to be offset by the increase in supply driven by technological gowth in the developing world, keeping the average income levels constant. Consequently, upon studying the hypothetical income gap between male and female data scientists and software engineers, we have discovered that such gap exists and is quite significant, with female professionals earning considerably less than their male counterparts across the globe. The relative bias is more pronounced in the developed world, where males earn ~22% higher salaries on average than their female counterparts.

Although the income gender gap is quite significant in the developing world, the bias is less pronounced with males earning ~12% higher salaries than females. Once again, the income disparity between male and female data scientists and software engineers may increase over time, with the exponential growth of technology and data applications, which we have enjoyed over the past few decades. The negative consequences of the growing income disparity between genders are three-fold. Firstly, there is likely to be an increase in social tension between the genders, especially in the domain of technology and data science. Secondly, females may become discouraged from entering the aforementioned domain by unrealistic expectations and lower perceived rewards, resulting in a potential overall loss of expertise and diversity of insight. Lastly, male-dominated industry may carry over gender bias into the machine learning systems of the future, as they will be trained on the datasets engineered by predominantly male data scientists and software engineers. The gender bias in the machine learning systems may start off on a subtle note but expand exponentially with time, making it hard to identify, yet creating a serious inequality in the social outcomes in the longer-term.

The outcomes of our compact study may warrant futher 'in-depth' research. If our concerns are confirmed by the subsequent studies, we may seek to present the findings to the corporate, governmental and academic decision-making organizations for further discussion around possible strategies to alleviate some of the concerns raised and offset potential negative impact of the gender income bias on the global society of the future. On a final note, you have gained some basic, yet practical knowledge of data manipulation and analysis, as well as a pragmatic data-driven workflow in a simulated organizational context.

PyTorch Forum Tag Recommender using NLP

Deepika Rana (03214802718), CSE, MAIT

Level 1 Projects

Solve concrete problems and work on all aspects of a project. Expand on concepts, techniques, and technology used. Communicate difficult concepts and analyses in realistic settings.Applicants must have completed intermediate coursework or have practical experience in their desired pathway. DiscourseHub is a open-source forum-based platform with over 150 communities. Our team selected the Pytorch Forums Community as the foundation of our project. Reasoning: The community forum provides a space for users interested in machine learning

Problem Statement

- Currently there exist a huge disproportion between the existing categories within the Pytorch Forums Community.
- Majority of the post are currently uncategorized.
- Users cannot find similar and relevant post when visiting a post in the uncategorized section

Project Description

Develop a classifier system that takes the title and content of a post and classify it into the top 15 categories and also recommend the suitable category for a post if it is previously “Uncategorized”

Fake Cartoon Face Generation

Divyam Sinha (03614802718), CSE, MAIT

Face age progression, goals to alter the individual's face from a given face image to predict the future appearance of that image. In today's world that demands more security and a touchless unique identification system, face aging attains tremendous attention. The existing face age progression approaches have the key problem of unnatural modifications of facial attributes due to insufficient prior knowledge of input images and nearly visual artifacts in the generated output. Research has been continuing in face aging to handle the challenge to generate aged faces accurately Learning After training:

The following are the content of the project:-

1) Linear Regression, Multivariate regression, logistic regression from scratch and a project on air quality prediction, diabetes prediction, a brief introduction to AUC, ROC curve , confusion matrix.
2) Naive bayer's theorem - project on movie review prediction (Tokenization, bag of words, stemming, vectorization)
3) Clustering using K-means from scratch - project on Dormant color extraction and learned implementation of DBSCAN.
4)SVM from scratch and building a classifier using SVM - project(Image classification)
5) Decision tree from scratch : project (Kaggle titanic survivor).
6)ANN from scratch (Basic) - Project(mnist fashion dataset prediction)
7)CNN implementation - project(Pokemon classifier , coughing sound analysis using melspectrogram) and also improved accuracy using fine tuning.
8) RNN,LSTM implementation - projects(Movie rating prediction)
9)GAN's and DCGANS from scratch - project (Fake cartoon face generation

Website Reliability & Management

Gauransh Kumar (00396407220), CSE, MAIT

Website Reliability & Management was the main objective of this internship. Website Reliability is a combined task of Development and Deployment. During the Internship major tasks include managing various websites for higher availability and upgradations to the site as required with least Downtime of the Site. I have got an exposure to various technology Stacks like HTML5, CSS, React JS, Node JS, Ruby and Postgres SQL. The websites are all hosted on the AWS cloud Server and hence I got learn about various cloud Technologies like, Creating/Configuring Cloud Environments and Securing them. The Deployment was entirely based on Direct Cloud Deployment hence I got learn a lot about SSH and VS Code's Remote Desktop. The complete upgradation in system was done with the help of Git & GitHub. Deploying the Realtime Websites with huge traffic was a great leaning for me as it allowed how to keep system Up-&-Running for the maximum time. The above stated were my reason to put the "WEBSITE RELIABILITY & MANAGEMENT" as my Report Title. This report takes us through all the details of WEBSITE RELIABILITY & MANAGEMENT knowledge and experience gathered during this internship period.

Product Design and Web Development

Satyam Mishra (01096407220), CSE, MAIT

Product Design and then Development on Web was the objective of this internship. The basic idea of the project was to develop an ecommerce website where we could list our products and users

could buy that online simple function of an ecommerce website. In the development part as per the internship I used the basic HTML, CSS, JavaScript. The UI/UX part was also done by me using FIGMA where I collected all the user requirements and then Designed the website with respect to user and keeping in mind the brands perspective also. This report takes us through the learning of this internship in detailed manner.

Various Time-Series Model to Predict Covid-19 Case

Pranav Bansal (03896402719), CSE, MAIT

Time series analysis is a specific way of analysing a sequence of data points collected over an interval of time. In time series analysis, analysts record data points at consistent intervals over a set period of time rather than just recording the data points intermittently or randomly. However, this type of analysis is not merely the act of collecting data over time. What sets time series data apart from other data is that the analysis can show how variables change over time. In other words, time is a crucial variable because it shows how the data adjusts over the course of the data points as well as the final results. It provides an additional source of information and a set order of dependencies between the data. Time series analysis typically requires a large number of data points to ensure consistency and reliability. An extensive data set ensures you have a representative sample size and that analysis can cut through noisy data. It also ensures that any trends or patterns discovered are not outliers and can account for seasonal variance. Additionally, time series data can be used for forecasting—predicting future data based on historical data. Time series analysis helps organizations understand the underlying causes of trends or systemic patterns over time. Using data visualizations, business users can see seasonal trends and dig deeper into why these trends occur. With modern analytics platforms, these visualizations can go far beyond line graphs. When organizations analyze data over consistent intervals, they can also use time series forecasting to predict the likelihood of future events. Time series forecasting is part of predictive analytics. It can show likely changes in the data, like seasonality or cyclic behavior, which provides a better understanding of data variables and helps forecast better. For example, Des Moines Public Schools analyzed five years of student achievement data to identify at-risk students and track progress over time. Today's technology allows us to collect massive amounts of data every day and it's easier than ever to gather enough consistent data for comprehensive analysis.

This work is basically concerned with making people aware of rising COVID-19 cases in India. The need of this machine learning model is that to predict the trend of covid 19 cases and to take necessary precaution before its too late. Machine learning model is trained on supervised data. All the data is labelled and the algorithm learn to predict the output from the input data. Trained and tested different model on first covid wave that occur between June 2020 to February 2020 and finding the which model is most reliable for making most accurate prediction. Then using most accurate model to predict the accurate date of attaining peak of second covid – 19 wave.
This project has 2 parts:
1. Manipulating dataset to make it compatible with different machine learning models
2. Training the model on previous covid 19 daily cases and predicting the future trend

Social Distancing System

Prabal Malik (03996402719), CSE, MAIT

Social distancing is one of the most effective measures to reduce the spread of the virus, which is transmitted by air droplets. The droplets produced by coughing, sneezing or forced speaking have a certain transmission distance. By keeping this distance, we can reduce the spread of the virus. This

work can be used to analyze social distancing in a public area and carry out necessary actions to better deal with the pandemic. Automating the task will lead to effective actions taken in a short time hence equipping us better to deal with the situation.

Future of Social Distancing System

1. Social distancing indicator needs manual calibration for image detection right now. In cases where more people are in a 3D space, it is difficult to indicate and mark the images. Potential solutions can be working on a overhead image (essentially a 2D image of human heads) which detects human heads and calculates distances between the detected windows easily by finding the vector distance between coordinates on image.
2. A more innovative approach towards social distancing indicator would be to include AR (Augmented Reality) libraries from opencv and use them. Due to time restrictions, we couldn't do it but it is can be done with opencv.
3. Counting people in a given frame can be made more dynamic by capturing video. The current issue with video was it's size and we didn't have free memory on our microprocessor. If a SD card of size 128 GB or above is in beagle bone, it would provide more utility in recording the video. (After some time the video can be deleted).
4. We are doing face detection not recognition right now. It would be good to include some face data and carry out recognition as well (can be used for real time attendance as indicated in above section).
5. Microprocessor is doing all the processing work right now which can be pretty intensive for it's processor and may take some time. To reduce this latency, we can shift the processing work from microprocessor to a cloud computer. Microprocessor can just be used as an instructional device for sending/receiving data.

Web Development Internship

Achint Narang (00614802718), CSE, MAIT

As web developers, we are constantly trying to resolve inconsistencies between the rendering of websites by different browsers and browser versions. This requires time- consuming double / multiple coding or coding for a single browser which makes it more difficult if not for the representatives of the same people who use these browser manufacturers, web developers, content providers and other organizations. Writing websites to standards shortens website development time and makes site maintenance easier. Debugging and troubleshooting becomes easier because the code follows a standard. You no longer have to worry about coding and maintaining multiple versions of code that are supposed to run the same presentation. The universal adoption of web standards is becoming increasingly important. The mission of the Web Standards Project is to make the web a better place for developers and end users by encouraging browsers and website builders to follow the standards in their applications. These efforts are greatly supported when web developers use standards in their applications. These efforts are greatly supported if web developers take standards for granted and insist that their code builders and renderers comply with standards. The above reasons should prompt web developers to use standards, as well as ammunition that we can use to encourage our head office and other developers to use those standards. For any business, a website matters more than anything, when it comes to reaching out to customers online. A website is the representation of the business online. These days, every business realizes the need for having a website and are putting in efforts to design and develop the best site for taking their products or services online. This is where we can see a great deal of scope for web development and design.

Machine Learning Model for the Detection of Neurodegenerative Diseases

Satyajit Sen (00214807219), CSE, MAIT

Neurodegeneration is the progressive loss of structure or function of neurons, which may ultimately involve cell death. Many neurodegenerative diseases—such as amyotrophic lateral sclerosis, multiple sclerosis, Parkinson's disease, Alzheimer's disease, Huntington's disease, andprion diseases—occur as a result of neurodegenerative processes. Neurodegeneration can be found in the brain at many different levels of neuronal circuitry, ranging from molecular to systemic. Because there is no known way to reverse the progressive degeneration of neurons, these diseases are considered to be incurable. Biomedical research has revealed many similarities between these diseases at the sub-cellular level, including atypical protein assemblies (like proteopathy) and induced cell death. These similarities suggest that therapeutic advances against one neurodegenerative disease might ameliorate other diseases as well. This project is a machine learning model to help in diagnosing neurodegenerative diseases where based on the dataset that the model has been trained on, it can identify actual neurodegenerative signals from noise in new datasets. In India alone, around 10 lakh people die every year due to neurodegenerative diseases. While the dataset used in training the model is a relatively comprehensive one, it is possible to train the model on a bigger dataset still and also test a bigger dataset. In this way, this project can be scaled up as per the requirement.

Image Captioning Bot

Deeksha Madan (02814802718), CSE, MAIT

Image Captioning is the process of generating textual description of an image. It uses both Natural Language Processing and Computer Vision to generate the captions. Image captioning bot is a popular research area of machine learning and data science that deals with image understanding and a language description for that image. Generating well-formed sentences requires both syntactic and semantic understanding of the language. Being able to describe the content of an image using accurately formed sentences is a very challenging task, but it could also have a great impact, by helping visually impaired people better understand the content of images.

Amazon Clone

Bharat Goma (02414802718), CSE, MAIT

Businesses, in any field, have a lot of competition. They are always on the lookout for a proven way to increase their business revenue. Restaurants, retail shops, stores - whatever a business may want to sell, if the business doesnt have an e-commerce website, they are leaving money on the table! The world has moved online a fact that businesses have to accept and put up a website to address. Amazon is a prime example of a website with all the key elements making up a good e-commerce site. The e-commerce website of Amazon was initially put together with simple HTML, CSS and JavaScript. But as time progressed and different frameworks came into the limelight, the website got a makeover. We built a functional clone of Amazon e-commerce website, relying on React and Firebase.

BEST PROJECTS 2021-2022

HARSHIT GARG 20614802718	KSHEM SHARMA 20214802718	ROHAN AGGARWAL 43714802718

Title: Implementing the Extractive Disaster Tweet Summarization Algorithms and Analysing Their Efficiency

Abstract: Microblogging sites, notably Twitter, have become important sources of real-time situational information during emergency events. Since hundreds to thousands of microblogs (tweets) are generally posted on Twitter during an emergency event, manually going through every tweet is not feasible. Hence, summarization of microblogs posted during emergency events has become an important problem in recent years. Several summarization algorithms have been proposed in the literature, both for general document summarization, as well as specifically for summarization of microblogs. However, to our knowledge, there has not been any systematic analysis on which algorithms are more suitable for summarization of microblogs posted during disasters. In this work, we evaluate and compare the performance of 8 extractive summarization algorithms in the application of summarizing microblogs posted during emergency events. Apart from comparing the performances of the algorithms, we also find significant differences among the summaries produced by different algorithms over the same input data.

DEEPIKA RANA 03214802718	HARSHITA CHADHA 35314802718	DEEKSHA MADAN 02814802718

Title: Detection of Schizophrenia using Machine Learning

Abstract: Schizophrenia is a serious mental illness that interferes with a person's ability to think clearly, manage emotions, make decisions and relate to others. It is a complex, long-term medical illness that severely affects the way a person thinks, acts, expresses emotions, perceives reality, or relates to others. An individual suffering from Schizophrenia might not be able to distinguish between reality and imagination and might feel frightened and withdrawn. This leads to problems in their relationships, hampers their performance at work or school, and in co-existing in society. Despite years of research, the mechanisms governing the onset, relapse, symptomatology, and treatment of schizophrenia remain elusive. The lack of appropriate analytic tools to deal with the heterogeneity and complexity of schizophrenia may be one of the reasons behind this situation. Machine learning has recently provided an accessible way of modelling and analysing complex, high-dimensional, nonlinear systems. The unprecedented accuracy of machine learning algorithms in classification and prediction tasks has revolutionized a wide range of scientific fields and is rapidly permeating schizophrenia research. The technology has the potential of becoming a valuable aid for clinicians in the prediction, diagnosis, and treatment of schizophrenia, especially in combination with principles from Bayesian statistics.

In the present project, we utilized available Electroencephalogram (EEG) data and applied various machine learning techniques: both supervised and unsupervised to detect the presence of schizophrenia. Initially, features such as Detrend Fluctuation Analysis (DFA), Hurst Exponent, Recurrence Quantification Analysis (RQA), Sample Entropy, Fractal Dimension (FD), etc were extracted from available EEG signals. The extracted features were then optimized and finally classified through certain classifiers such as support vector machine. In addition to such supervised

learning classification, we also studied the efficacy of deep learning-based solutions such as convolution neural networks and long short-term memory in schizophrenia detection. Based on the study of such existing techniques and their performance comparisons, we arrived at a novel deep learning-based solution for EEG-based schizophrenia detection that outperforms existing alternatives.

GOVIND DHINGRA 03914802718	GAGAN MITTAL 03814802718	HARSH VARDAN 04214802718

Title: Secured Document Storing Using Blockchain

Abstract: With the rapid advancement of technology and the growing number of information records, there is a significant risk of data leakage and record tampering, posing a serious threat to the privacy and accuracy of research records. When this information is stored on a centralized server, security and reliability issues may arise. As a result, a distributed system that is both efficient and secure is required.

Blockchain is the arising innovation which endeavors to tackle these issues by making carefully designed occasion of records in a distributed environment. So, we are proposing a secured decentralized document storing and sharing option in which we are using IPFS which enables us to store large files and put immutable, permanent links in transactions. Our solution uses Huffman compression for file size optimization and RSA encryption is used for data security purposes.

PRIYAM KUMAR SINGH 42196402718	RISHABH SHARMA 02696402718	HARSHIT SHARMA 41796402718

Title: Covid Detection Using X-Ray Scans

Abstract: COVID-19 is an infectious disease which started late December 2019 and has spread across the world. The World Health Organization (WHO) announced a COVID-19 as a pandemic on the 11th of March 2020. This epidemic continues to have a catastrophic impact on health and wellbeing worldwide. A critical step in the COVID-19 combat cycle is to develop an efficient classification system so that patients can begin to receive prompt medical care, treatment, and control transmission. During this short time, many researchers have attempted to develop various screening tools and classification systems. For example, reverse transcriptase-polymerase chain reaction (RT-PCR) is the critical screening tool to detect severe acute respiratory syndrome (SARS)-COV-2 [1] and as well as COVID-19. While the RT-PCR test is the standard screening tool to detect COVID-19, it also has limitations. The procedure of RT-PCR is very complicated and also time-consuming. Therefore, attempts have been made to diagnose COVID-19 through chest radiography imaging such as computed tomography (CT) or chest x-ray images. However, timely detection of COVID-19 with high classification accuracy and minimal data is still an open challenge. The quantity of annotated data for training and data quality are two key factors while building a detection system. Chest x-ray images obtained from publicly available dataset for experiments shown in Fig 1 are limited in numbers. Hence, due to the limited volume of COVID-19 data samples, transfer learning is considered a suitable approach for classification purposes. On this conquest, a CNN model is proposed to detect COVID-19 patients from chest X-ray images. This model is evaluated with a comparative analysis of multiple CNN models. The proposed model performs with an accuracy of 98.04%.

FACULTY PATENTS

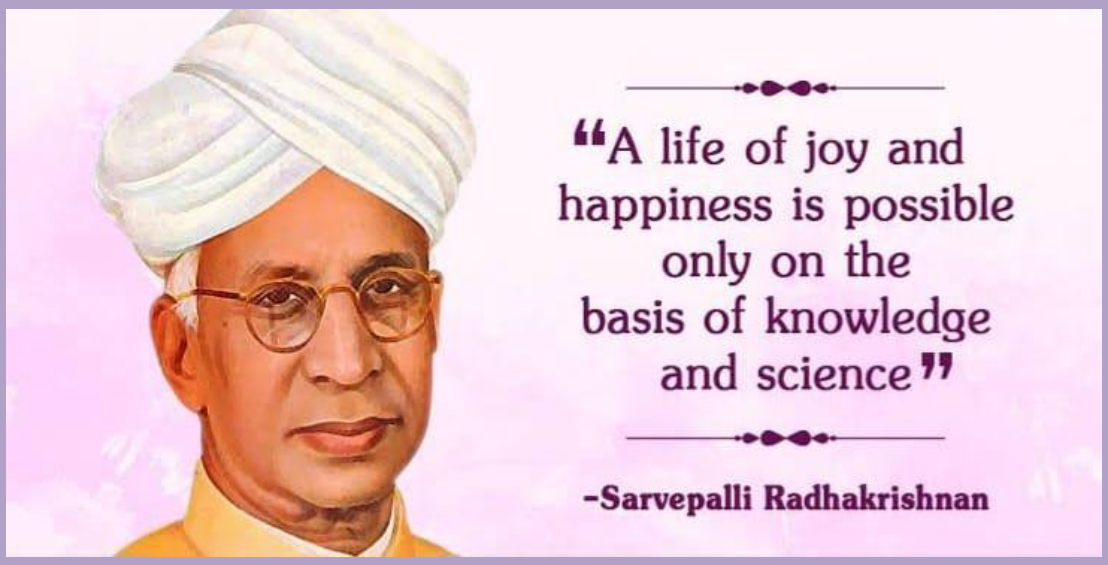
List of Patent Grant in 2021-22

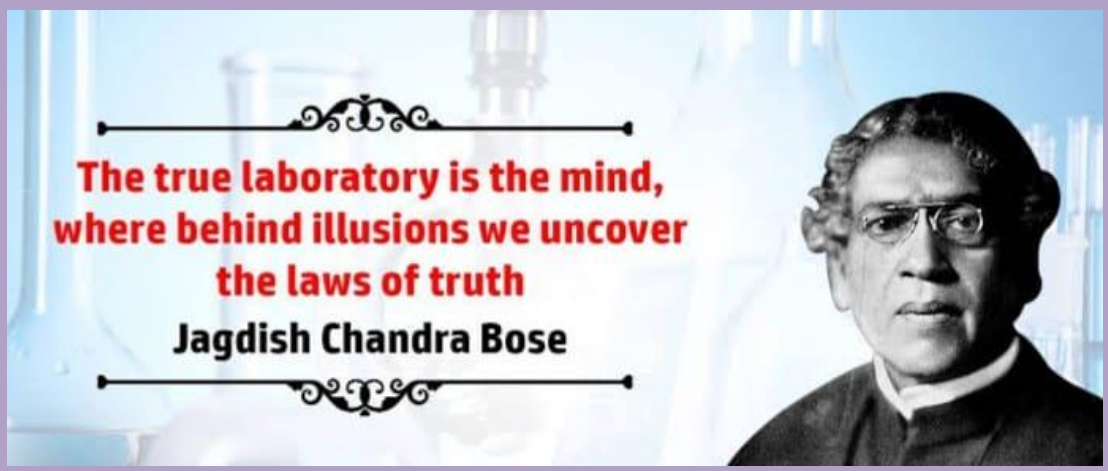
S.No.	Faculties/ Inventors Name	Patent Application Number	Title of Invention	Patent Filing Country	Grant Date
1	Ashish Sharma	202011020506	System And Method For Automated Detection Of Digital Modulation Technique	India	14/08/20
2	Savita Sharma	202011020506	System And Method For Automated Detection Of Digital Modulation Technique	India	14/08/20
3	Yogesh Sharma	202011020506	System And Method For Automated Detection Of Digital Modulation Technique	India	14/08/20

List of Patent Published 2021-22

S.No.	Faculties/ Inventors Name	Patent Application Number	Title of Invention	Patent Filing Country	Publication Date
1	Deepak Gupta	202111030375	Detection & Alert System for Animals Safety Across Railway Tracks	India	30/07/21
2	Deepak Gupta	202111045836	Machine Learning Model for Work-Life Balance	India	29/10/21
3	Ashish Khanna	202111045836	Machine Learning Model for Work-Life Balance	India	29/10/21
4	Ashish Khanna	202111030375	Detection & Alert System for Animals Safety Across Railway Tracks	India	30/07/21
5	Ashish Sharma	202241012283	Design System of Medical Ultrasound and CT image Classification using CNN	India	18/03/22
6	Yogesh Sharma	202241012283	Design System of Medical Ultrasound and CT image Classification using CNN	India	18/03/22
7	Dr Sandeep Tayal	202241012283	Design System of Medical Ultrasound and CT image Classification using CNN	India	18/03/22
8	Savita Sharma	202241012283	Design System of Medical Ultrasound and CT image Classification using CNN	India	18/03/22
9	Kajol Dahiya	202241014262	Design System of Medical Ultrasound image Classification using Deep Learning	India	25/03/22

10	Neelam Sharma	202111046067	IOT based Cost-Effective Drip Monitoring System with SMS Alert under COVID-19 Situation. (PATENT PUBLISHED dated 0	India	05/11/21
11	Neelam Sharma	202111053777	IoT-based health monitoring system over 4G network	India	17/12/21
12	Sudha Narang	B64C 39/02	Biomimetically designed intelligent drone for weed removal on agricultural crops using artificial intelligence and deep learning	Germany	20/01/22
13	Saurabhj Rastogi	202241019060	Design system of IoT Driven Eyeball and Gesture-Controlled Smart Wheelchair System for Disabled Person	India	08/04/22





CONSULTANCY PROJECTS

Title: Multiscale modeling of deformation behavior of carbon fiber reinforced high-end thermoplastics

Abstract: The present proposal aims at the development of fundamental approaches to mechanical-mathematical modeling to optimize the deformation behavior of structures made of composites based on high-end thermoplastic polymers reinforced with continuous carbon fibres.

The project deals with super constructive thermoplastic polymers for the creation of composite materials intended for power and transport equipment, the deformation behavior of such structures under conditions of a complexly stressed state and providing the possibility of optimizing the structure and technological parameters of the production of such composite materials. To meet the above objectives development of CNN based prediction model in conjunction with coarse model generators to predict material properties will be done.

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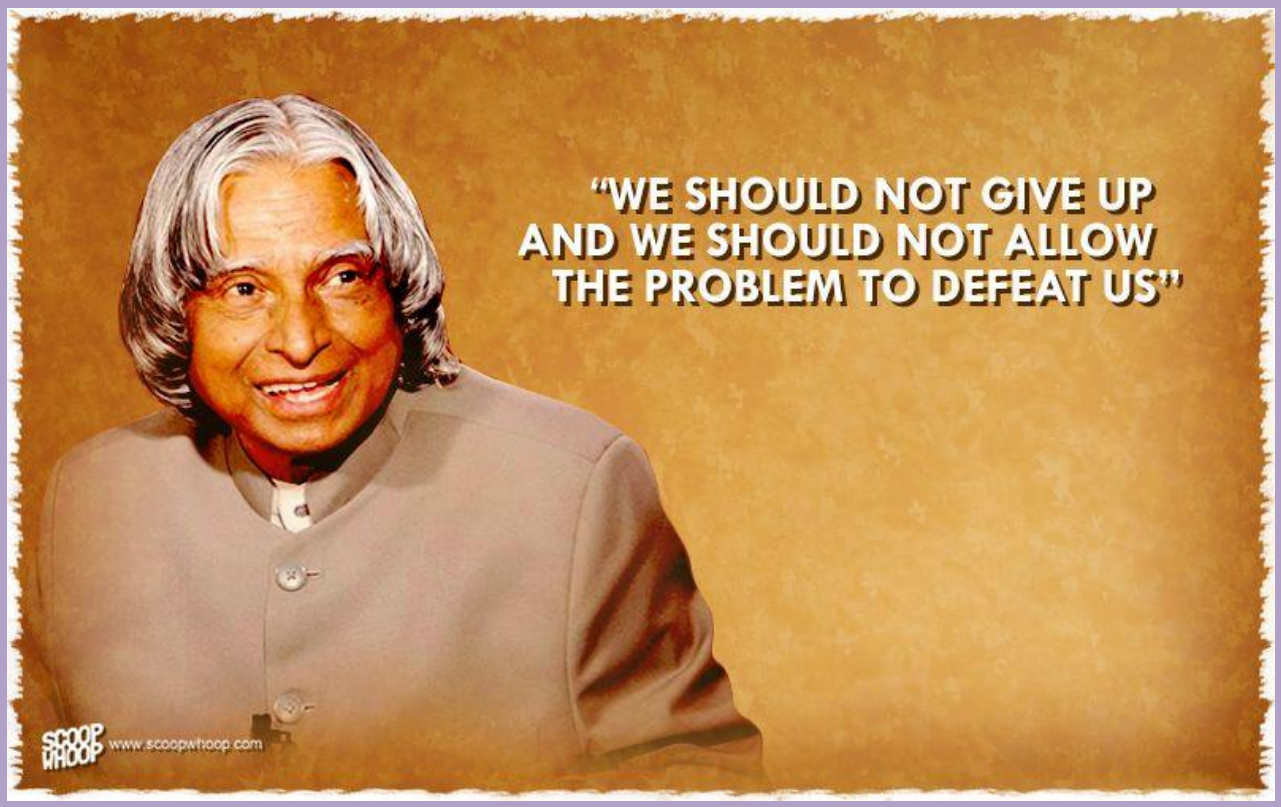
Programme or Scheme: India Russia Joint Research Call 2021

DST funded 1.43 Crore INR. Team members Dr. Ashish Khanna (Principal Investigator), Prof. (Dr.) Namita Gupta, Dr. Deepak Gupta, Dr. Suresh Chavan (IIIT Raichur, Karnataka).



ALUMNI CORNER

Decentralized Crowd-Funding Using Blockchain

Paras Chugh (43914802718), Himanshu Singh Bisht (42714802718) (Batch 2018-2022)

Crowdfunding is the use of tiny amounts of capital from a large number of individuals to finance a new business venture. Crowdfunding makes use of the easy accessibility of vast networks of people through social media and crowdfunding websites to bring investors and entrepreneurs together, with the potential to increase entrepreneurship by expanding the pool of investors beyond the traditional circle of owners, relatives, and venture capitalists. Our objective is to implement the crowdfunding model on blockchain technology, in order to rectify the problem of possible fraud or unverified usage of the funds collected. Our first step would be to verify the legitimacy of the project manager, we'll verify his revenue-generating model and plan for the project, his identification documents like Aadhar card, PAN Card, and post his campaign on our platform only if we find him to be genuine. According to our model, the collected funds will not be transferred to the founder of the project but will be collected by our company under his/her name, and whenever he/she would require to spend some amount on some expense, the founder would have to request approval of the investors, and particular payment would be provided only after more than 50% of votes from the investors who provided funds for the project verifies and accepts the legitimacy of the expenditure. Also, the payment would be made directly to the wallet of the vendor of the product or service, and not tothe project manager. Number of votes per person will be proportional to the amount of funds the person provided. Our project will also have an automatic return facility, which will keep records of all the investors who invested into a particular project and their investments would be returned if that project manager doesn't request funds for a certain time. Also, when a particular project finally starts generating revenue, the project manager could just send us the reward money, which our automatically reward distribution system could distribute to the investors of the project proportionally according to amount they invested. This proportionality will be based on the number of votes an investor has in a particular project. With time, we look forward to work on some more financial aspects related to the project in order to reduce possible frauds and cons in the space.

CHATGPT

Siddharth Seth (09914802718) (Batch 2018-2022)

ChatGPT is an artificial intelligence language model developed by OpenAI, which is based on the GPT-3.5 architecture. It is one of the most advanced and sophisticated language models available today, capable of processing and generating human-like responses to a wide range of queries and prompts.

Uses of ChatGPT:

1. Customer Service: ChatGPT can be used to provide customer service support through chatbots. It can respond to customer queries, provide information about products and services, and even guide customers through a purchase.
2. Personal Assistants: ChatGPT can be used as a personal assistant that can help users schedule meetings, set reminders, and even make recommendations based on the user's preferences.
3. Education: ChatGPT can be used as a teaching tool. It can help students with homework, answer their questions, and provide explanations for complex topics.
4. Healthcare: ChatGPT can be used in healthcare to provide patients with information about their medical conditions and treatments, and even offer mental health support.

Advantages of ChatGPT:

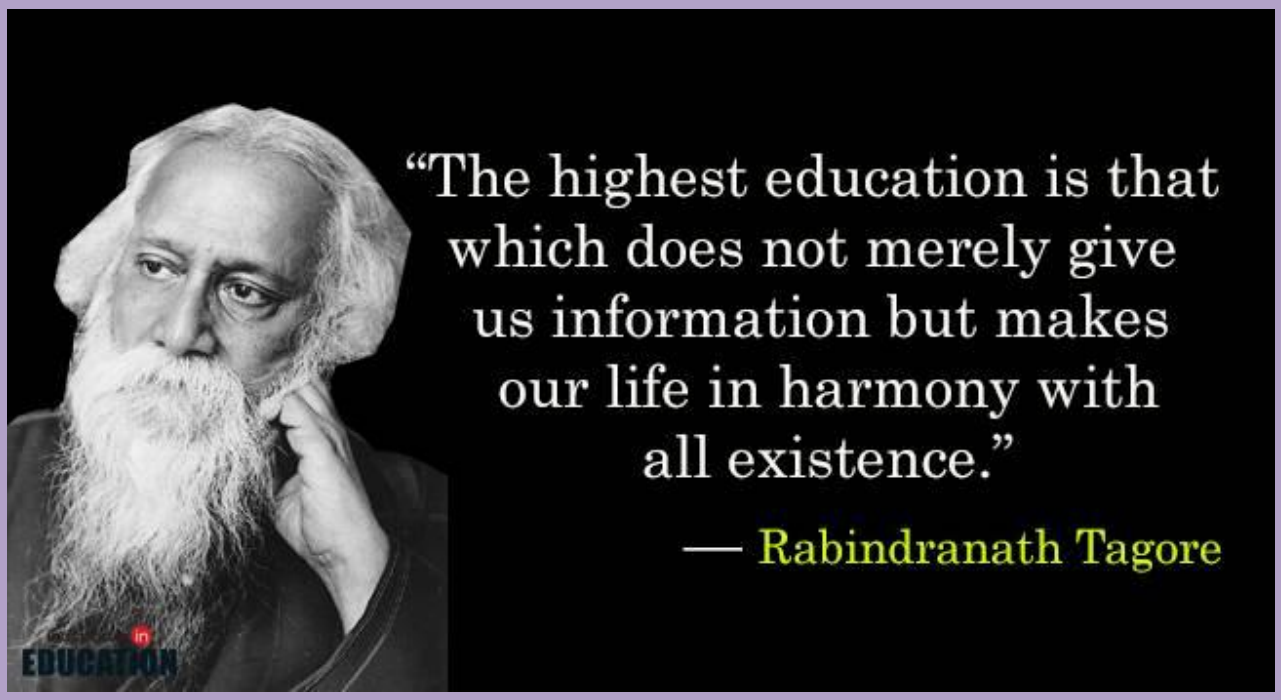
1. Speed: ChatGPT can respond to queries in real-time, which can save a lot of time and effort.

2. Accuracy: ChatGPT can provide accurate and reliable information that can help users make informed decisions.
3. Convenience: It can be accessed from anywhere, at any time, making it a convenient tool for users.
4. Scalability: ChatGPT can handle a large volume of queries and requests simultaneously, making it a scalable tool for businesses.

Disadvantages of ChatGPT:

1. Limited Knowledge: ChatGPT has limitations in terms of its knowledge base, and it may not be able to provide accurate or comprehensive answers to all queries.
2. Bias: ChatGPT can be biased towards certain demographics or groups, which can result in inaccurate or unfair responses.
3. Lack of Emotional Intelligence: ChatGPT may not be able to understand or respond to emotions, which can be a limitation in certain situations.
4. Dependence on Data: ChatGPT relies on data to generate responses, which means that the quality of responses may depend on the quality and quantity of data available.

In conclusion, ChatGPT is a powerful tool that can be used in various industries and fields. It has many advantages, such as speed, accuracy, and convenience, but also has limitations, such as limited knowledge, bias, and lack of emotional intelligence. Businesses and individuals must consider these advantages and disadvantages when deciding to use ChatGPT for their specific needs.



INDUSTRY EXPERT CORNER

Blockchain and Artificial Intelligence - The Hands of Future

Aman Osan, Junior Analyst @ Boston Consulting Group

Blockchain and Artificial Intelligence are both emerging technologies which have reached the pinnacle of visibility and acceptance. With a common aim to reduce operational inefficiency and add transparency, these two technologies are in great demand. PwC predicts that by 2030 AI will add up to $15.7 trillion to the world economy, and as a result, global GDP will rise by 14%. According to Gartner's prediction, business value added by blockchain technology will increase to $3.1 trillion by the same year.

In layman terms, a Blockchain is a system in which a record of transactions made in bitcoin or another cryptocurrency are maintained across several computers that are linked in a peer-to-peer network.

Artificial Intelligence (AI) has many definitions, however, the most commonly used is as follows - AI is the intelligence and capability exhibited by a computer to perceive, learn and solve problems with minimal probability of failure.

Now, let's take a look at how AI and Blockchain join forces to build solutions in the Healthcare and Supply Chain management domains:

AI and Blockchain in Healthcare

1. **IOTA eHealth -** is a solution-based initiative headed by the IOTA foundation that offers features such as REmote Patient Monitoring, Patient's Health Data Exchange and ensuring clinical research data integrity is supported.
2. **IBM Blockchain -** IBM Blockchain research groups are researching a solution to prevent counterfeit drugs by using a permissioned blockchain, along with a special mobile interface.

AI and Blockchain in Supply Chains

1. **IBM Sterling Supply Chain Suite -** powered by IBM Watson, it is a cloud-based digital business network which provides real-time intelligence and actionable recommendations. It also offers a platform for building tailored solutions in the supply chain using blockchain and AI.
2. **OpenText -** With the aim of making supply chains more connected, collaborative, intelligent and secure, OpenText is working on an autonomous and intelligent supply chain that can be used to apply AI, IoT and blockchain.

Putting the two technologies together has the potential to use data in ways never before thought possible. Data is the key ingredient for the development and enhancement of AI algorithms, and blockchain secures this data, allows us to audit all intermediary steps AI takes to draw conclusions from the data and allows individuals to monetize their produced data.

How To Become A Blockchain Expert?

Anjali Joshi Software Engineer @ Walmart

In usual conditions, it takes several years for the general public to know about technology to an extent where it becomes part of their everyday lives. The sudden and rapid rise of Blockchain technology and its huge impact on all sectors, from finance and education, has defied this presumption and established new growth bars. Blockchain technology is a decentralized and

distributed ledger that records transactions securely and transparently. It has gained significant attention recently due to its potential to disrupt traditional industries and improve existing processes. This rapid growth is not a coincidence or just sheer hype that will vanish over time. If we go by the trends and adoption rate of Blockchain, it's easy to deduce that this technology is here to stay.

The Blockchain industry is growing rapidly, and there are numerous career opportunities. These opportunities range from Blockchain developers to analysts, consultants, and project managers. The sector needs more passionate individuals skilled to handle the operations and creatively use the technology for innovative objectives. In this article, we will discuss the roadmap that you can follow to become a Blockchain expert.

Blockchain is a new concept even for experts in the IT field, Which makes the fundamentals even more important for an individual to deeply study and comprehend before they start getting expertise in a domain like development or auditing. The following topics, which we have discussed below, are essential to building a solid foundation:

Blocks, Nodes, and Consensus Mechanisms

Blockchain is a distributed ledger consisting of blocks containing transaction data. Nodes are computers that validate transactions and store a copy of the Blockchain. Consensus mechanisms are designed to ensure that the nodes involved in performing a transaction in a Blockchain network agree on the validity of transactions. There are different types of consensus mechanisms, such as Proof of Work (PoW), Proof of Stake (PoS), and Delegated Proof of Stake (DPoS). PoW is used by Bitcoin and involves solving complex mathematical equations or encrypted puzzles called hash to add a new block to the Blockchain. Then there is PoS, which requires validators to own some cryptocurrency to participate in the network's consensus process. DPoS follows a more distributed and transparent approach, where the other participants vote on and verify validators.

Public, Private, and Hybrid Blockchains

There are different types of Blockchains, such as public, private, and hybrid. Public Blockchains are open to everyone, and the nodes work on a monetary basis. Public chains are highly centralized but less secure and need a security mechanism to protect critical data. At the same time, private Blockchains are restricted to a specific group of users, where the participating nodes are pre-verified. The motivation behind this Blockchain is usually non-monetary and used by organizations to perform transactions or share information within a specific group of individuals who may be part of that organization.

Hybrid Blockchains are a combination of public and private Blockchains. This concept is popular due to the slow transaction speed on public chains, which are highly decentralized. Hybrid chains make it possible to perform transactions in private chains and switch to public verification when necessary.

Participating in Blockchain Forums and Online Communities

While one may think that the only communities related to the Blockchain may be private and not easily accessible, that is not the case. There are many online forums and communities dedicated to Blockchain technology. Platforms like Reddit, StackExchange, and GitHub provide knowledge on various Blockchain topics. These communities are not walled in any manner, and their members can help you gain new insights and perspectives on Blockchain-related issues.

Future possibilities in the Blockchain market

Current salary trends and other developments

With an estimated value of around $7.2 billion in 2022, Blockchain has emerged as one of the fastest-growing industries in the world. It is expected to reach a market valuation of approximately $60 billion by 2025. The current salary trends in the Blockchain market show that an average Blockchain expert can earn around $150,000 on average, and it's expected to grow along with the growing adaptability of Blockchain technology itself.