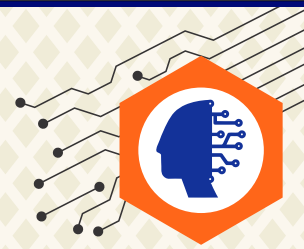


AIML QUEST

NEWSLETTER

DEPARTMENT OF
ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING



VOLUME 2

ISSUE 1

DECEMBER 2022



VISION, MISSION AND OBJECTIVES OF THE INSTITUTE

VISION

- To be one of the premier Institutes of Engineering and Management Education in the country

MISSION

- To provide Engineering and Management education that meets the needs of human resources in the country
- To develop leadership qualities, team spirit and concern for environment in students

OBJECTIVES

- To achieve educational goals as stated in the vision through the mission statements which depicts the distinctive characteristics of the Institution
- To make teaching-learning process an enjoyable pursuit for the students and teachers

VISION, MISSION AND OBJECTIVES OF THE DEPARTMENT

VISION

- To be renowned department for education in Artificial Intelligence and Machine Learning in Karnataka state moulding students into professional engineers

MISSION

- Impart rigorous training to generate knowledge through the state-of-the-art concepts and technologies in Artificial Intelligence and Machine Learning
- Mould students to be technically competent through innovation and leadership
- Inculcate values of professional ethics, social concerns, environment protection and life-long learning
- Establish centres of excellence in leading areas of computing and artificial intelligence

OBJECTIVES

AFTER 2/3 YEAR OF GRADUATION, THE STUDENTS WILL HAVE THE ABILITY TO:

- Apply appropriate theory, practices and tools to provide solution for multi disciplinary challenges
- Function effectively in the workplace for professional growth
- Adapt, contribute and innovate new technologies in the key domains of Artificial Intelligence and Machine Learning during higher studies/ product development

DEDICATED TO.....



Alan Turing was a British mathematician and computer scientist who made significant contributions to the fields of Mathematics, Cryptography, and Artificial Intelligence. He is widely considered to be the father of Artificial Intelligence and a genius of Mathematics. During World War II, Turing worked for the British government as a codebreaker, where he developed an electro-mechanical device popularly known as Bombe machine, which was used to decrypt German messages. His work in cryptography is said to have significantly shortened the war. Turing is also known for his contributions to the development of early computers. In 1936, he published a paper on the concept of a universal Turing machine, which laid the groundwork for modern computers. Turing is perhaps best known for his work on the Turing Test, which he proposed in 1950, as a way to evaluate a machine's ability to exhibit intelligent behavior equivalent to that of a human. The test involves a human evaluator engaging in a conversation with a machine and trying to determine whether they are communicating with a human or a machine.

INSIDE AIML QUEST

- Editor's Desk
- Department Overview
- Technical Articles
- Department Activities
- Faculty Achievements
- Students Achievements



Vidyayamruthamashnuthu

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Editor's Desk.....

Dear readers, we welcome you to the QUEST of AIML

We, the Department of Artificial Intelligence and Machine Learning, are elevated to introduce you all to the AIML QUEST. AI is getting smarter every day, imagine how smarter you will become! Considering the influence of AI in all fields, we are glad to let you all know about the insights it has on humans. This QUEST brings forth the AI Technique which organizes and uses knowledge efficiently. It also highlights the immense enthusiasm of our students and faculty members in contributing to this magazine and their achievements.

“Some people call this artificial intelligence, but the reality is this technology will enhance us. So instead of artificial intelligence, I think we'll augment our intelligence.”—Ginni Rometty.

The Editorial Board would like to thank all contributors. We would like to express our deepest gratitude to our Management for their keen interest, guidance and active support. We look forward to receiving constructive suggestions from readers to improve the Newsletter content.

Happy Reading...!!

Department Overview

The Department of Artificial Intelligence & Machine Learning (AIML) is approved by AICTE, and affiliated to VTU from the academic year 2020-21. We have started our exciting journey in the year 2020 where the department offers an undergraduate B.E. program with an intake of 120 students.

The Department boasts of well qualified teaching faculty with rich research, teaching and industrial experience and is committed to impart rigorous training to students to generate knowledge through the state-of-the-art concepts and technologies in AIML, and transform the Department as a leader in imparting AIML education and research.

The Department practices an Outcome-Based Education (OBE) right from the inception, has an adequate infrastructure with state-of-the-art laboratories and other supporting facilities to provide enhanced learning environment. The Department attracts the best of engineering aspirants from all over the country.

Industry 4.0 demands smart systems integrated with intelligence to have better human-machine interface. To cope with emerging industrial demands, it is expected to bring translational skills among the students of the Artificial Intelligence and Machine Learning undergraduate programme to meet the industry's expectations.

Technical Articles

AI AND BLOCKCHAIN: POWERING THE NEXT WAVE OF INNOVATION

The combination of Artificial intelligence (AI) and Blockchain technology has generated considerable buzz in recent years. This convergence offers immense potential for disrupting various industries through increased efficiency, transparency, and security. This article explores some interesting applications that have resulted by integrating these two novel technologies.

What is a Blockchain?

Blockchain is a decentralized and distributed ledger technology that enables secure, transparent, and immutable transactions. It is essentially a chain of blocks that contains data and cryptographic hash functions that link each block to the previous one, forming a tamper-proof chain. The data stored in the blockchain is not owned by any centralized authority and is accessible to all participants in the network

What are Smart Contracts?

Smart Contracts are autonomous computer programs that can be used to enforce business logic on a blockchain without the need for an intermediary. They form the foundational layer for Decentralized Applications (Dapps).

Here are some interesting applications that showcase the potential of integrating AI with Blockchain

Decentralized AI: The deployment of artificial neural networks on a decentralized blockchain network has many advantages and game-changing applications. One such example is Akash Network which is a decentralized cloud-computing platform. Dubbed as the “Airbnb for Computing”, Akash allows users to rent servers and GPUs with cheaper costs when compared to AWS and Microsoft Azure. Akash Network has its own cryptocurrency token for payments that ensures the permissionless deployment of applications and services. Users can deploy a Docker instance with just a few clicks and the application has pre-loaded templates for Tensorflow, Jupyter and various other popular machine learning environments. Akash Network enables users to access computing resources without having to rely on centralized providers at a lower cost than traditional cloud computing providers. The platform provides high-performance computing resources while ensuring data security and privacy.

Zero-knowledge Machine Learning: One of the biggest concerns with regard to developing ML models is data privacy. The typical approach to developing ML models involves aggregating data from various sources and training the model using this data to identify patterns and make predictions. However, the privacy of this data can be compromised if it is exposed to third-party entities. Blockchain provides an innovative solution to this problem through the use of Zero-Knowledge Proofs (ZKPs). ZKPs allows an entity to prove that they have knowledge of something without actually revealing the knowledge itself. The implementation of ZKPs in blockchain networks involve complex cryptographic methods and arithmetic circuits that enables a prover to demonstrate knowledge regarding some data without revealing the data. By applying this concept to a ML model on a blockchain network, a data owner can encrypt and store data on a blockchain and by using ZKPs will be able to prove the accuracy of a model without exposing the underlying dataset which also allows the data owner to securely share information. This level of privacy and accuracy is essential for financial and healthcare applications

The convergence of AI and Blockchain represents a powerful force for innovation, with the potential to transform many industries. The use cases discussed above only represent a small subset amongst a myriad of applications that will arise from the integration of Blockchain and AI as these two technologies evolve and grow.

Riddhi Ravindra (1BG20AI068), Dept. of AIML

EMPOWER ,EMERGE AND EVOLVE

Humanity has made it through millions of years of adversities and hardships. Constant observation, learning and evolution have all led humanity to be the most thriving species. Working together in tribes and empowering each other is what led them to conquer the planet. From the earliest civilizations who are known for building the base upon which humanity has built itself to the Romans who showed the world the capabilities of humans. But as the world modernized and with rapid improvements in infrastructure and lifestyle the qualities that were seen in humans throughout history have been declining. There are examples all over human history that without these qualities no matter how powerful the civilisation it will meet its end.

What exactly are these qualities?

Empowering humans are social creatures they always look for ways to connect and maintain relationships with other humans. However, studies conducted over the last 10 years have shown a decrease in human-to-human connection. Humans as social animals fail to connect to any community leading to a loss in the development of society.

Humans are known to rise by lifting and helping the community and for that humans must start by empowering themselves. Incrementally one can help another and soon there will be less negativity and judgement and more belief, support and more communities.

Species lived and perished, but humans have always survived through all these changes. By evolving and adapting to the surroundings humans were able to get to where they are today. This took generations of natural genetic modification to have a significant impact. But the type of evolution needed today is “Evolving as a person”, working on becoming a better version every single day, figuring out what one needs to do individually to help themselves and their community, because if one is not evolving and trying to be better every day what are they even doing?

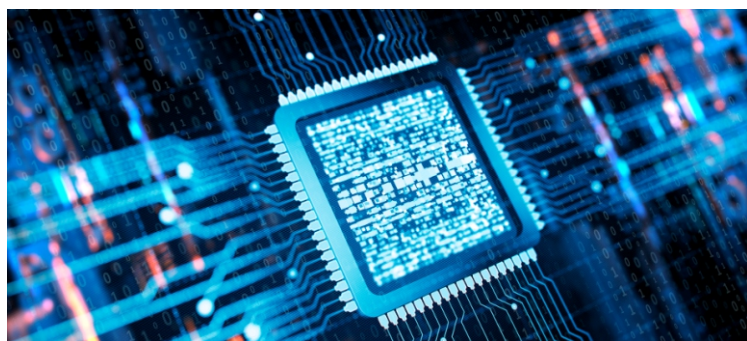
One needs to develop a progressive mindset and set their eyes on success for individual growth and communal growth. It doesn't have to be for humanity it can be at an organizational level. Every employee must have a growth mindset to reach their heights of success, employees lead to teams, teams lead to departments, departments lead to organisation and when humanity starts to grow at this rate it's only a matter of time before humans emerge once again and reach new heights that were never thought to be reachable before.

As J.K Rowling rightly said “We do not need magic to transform our world. We already carry all of the power that we need right inside ourselves”.

Every individual today has the power to change the world, be it by the smallest margin by working individually. Through these incremental improvements and by empowering one another the daunting task of evolving becomes so much easier. With that, emerging to be the best generation humanity has ever seen.

-Ganesh Ram (1BG20AI033), Dept. of AIML

AI HARDWARE: THE BRAINS BEHIND THE AI REVOLUTION



Artificial Intelligence (AI) has been making significant strides in recent years, and one crucial aspect of its development is the hardware that powers it. AI hardware refers to the specialized components and systems designed specifically for accelerating the processing of AI workloads, enabling faster and more efficient AI computations.

As AI continues to advance and find applications in various industries, including healthcare, finance, automotive, and more, the demand for robust and efficient AI hardware has grown exponentially.

The computational requirements of AI workloads are significantly different from those of traditional computing tasks. AI models require massive amounts of data to be processed in parallel, with complex calculations performed simultaneously. This has led to the development of specialized hardware optimized for AI workloads.

One of the key advancements in AI hardware is the emergence of application-specific integrated circuits (ASICs). ASICs are custom-designed chips that are purpose-built for a specific application, in this case, AI computations. They are optimized for AI workloads and can deliver superior performance and efficiency. They are designed to handle large amounts of data and perform the complex calculations required for AI tasks, making them ideal for accelerating AI computations.

Another significant development in AI hardware is the rise of field-programmable gate arrays (FPGAs). FPGAs are programmable chips that can be reconfigured to perform different tasks, including AI computations.

This flexibility allows FPGAs to be customized for specific AI models and tasks, making them a popular choice for AI hardware acceleration. FPGAs are more power-efficient as they can be programmed to perform only the necessary computations, reducing unnecessary overhead.

Other types of AI hardware, such as neural processing units (NPU), tensor processing units (TPUs), and quantum processors, are also gaining traction in the AI community. NPUs are specialized processors designed for accelerating neural network computations, while TPUs are custom-developed by Google for accelerating machine learning workloads. Quantum processors are designed to perform calculations based on the principles of quantum mechanics, which have the potential to revolutionize AI by enabling faster and more efficient computations.

AI hardware improves performance and increases efficiency and scalability. Thus, models that use this make quicker decisions, learn more efficiently and give low-latency responses. Several companies, use AI-optimized hardware to improve their operations and products, like Google (TPU), Amazon (AWS Inferentia), NVIDIA, Microsoft (FPGA) and IBM(PowerAI).

In conclusion, AI-optimized hardware represents a significant breakthrough in the field of computing. By integrating specialized AI accelerators into hardware, companies can achieve unprecedented levels of speed and efficiency when it comes to machine learning tasks. This technology has the potential to transform industries ranging from healthcare to finance, and it could pave the way for new, innovative applications that were previously thought impossible.

-Sussana john(1BG20AI092), Dept. of AIML

THE INTERSECTION OF AI AND IOT: A MATCH MADE IN TECH HEAVEN

The Internet of Things (IoT) is a rapidly growing field that connects physical devices to the internet, enabling them to collect and exchange data. Artificial Intelligence (AI) is another technology that is evolving and transforming many industries. When combined, AI and IoT create a powerful duo that can revolutionize the way we live and work.

One of the key benefits of combining AI and IoT is the ability to analyze large amounts of data in real-time. IoT devices generate vast data that can be difficult for humans to analyze and make sense of. AI algorithms can be used to analyze this data, identify patterns, and make predictions. AI can be used to predict equipment failures, optimize energy usage, and detect anomalies in a system.

Another application of AI in IoT is predictive maintenance. IoT devices can be used to monitor equipment and collect data on its performance. AI algorithms can then analyze this data and predict the time of maintenance. This can help to reduce down time and maintenance costs.

In addition, AI is being used to create smarter IoT devices. By integrating AI algorithms into IoT devices, they can become more intelligent and autonomous. For example, a smart home device could learn a homeowner's preferences and automatically adjust settings to optimize energy usage

Overall, the combination of AI and IoT has the potential to transform many industries and enable businesses to make better decisions, reduce costs, and improve efficiency. As these technologies continue to evolve, we can expect too many innovative applications in the years to come.

Pavithra H.C, Assistant Professor, Dept. of AIML

Guess the AI!!



What is the name of the method used in machine learning to train a model on a labeled dataset, where the output is already known?

Ans: supervised learning

Department Activities

A Technical talk on “On the way to Autonomous Mobility” was conducted for the 5th semester students under BNMIT – ISTE Student Chapter and IEEE on 20th October, 2022. Mr. Arun Shankar K, Head of Innovation, Continental Automotive was the Resource Person for the Technical talk. The speaker gave an insight through the core aspects of the Automated driving, primary challenge in getting self-driving vehicles in India, and Sensors used in self-driving vehicles



Dr. Sejal Santosh Nimbhorkar, former HOD, Dept. of AIML welcoming the resource person Mr. Arun Shankar H



Talk on “On the way to Autonomous Mobility” by Mr. Arun Shankar H

A two-day workshop on “Data Science and AI” was conducted for the 5th semester AIML students in association with the Placement Department and BNMIT – ISTE Student Chapter during December 7th and 8th, 2022. Mr. Suryanarayana Murthy, Master Trainer, Cognizant was the Resource person for the workshop.



Session by Mr. Suryanarayana Murthy, during the “Data Science and AI” workshop



Dr. S. Y Kulkarni, Additional Director with Mr. Suryanarayana Murthy, Master Trainer

A two-day workshop on “Application Development using Flutter” was conducted for the 3rd semester AIML students under the banner of Institution of Engineers (India) during December 10th and 17th, 2022. Mr. Manu K J, Software Development Engineer, Nuclei was the Resource person for the workshop.

Faculty Achievements

- ◆ **Dr. Sunitha R**, Associate Professor, Dept. of AIML has delivered an Expert talk on “Innovative cloud services for IoT” organized by Dept. of ISE, COE-Data Driven IoT, CMR Institute of technology, Bengaluru on 21st July 2022.
- ◆ **Dr. Sunitha R**, Associate Professor, Prof. Pavithra H C, Assistant Professor, Dept. of AIML was a Resource person for two day hands on workshop on “IoT & it's Application” organized by Dept. of AIML under COGNISQUARE Club on 12th July and 13th July 2022
- ◆ **Mr. Mahanthesha U** has worked as a Resource Person for the Internship Training Program (Online mode) on “Robotics and Embedded Systems” from 2nd November 2022 to 3rd December 2022 at Sai Tech Integrated Solutions, Mysuru.
- ◆ **Mr. Mahanthesha U** of Dept.of AIML has been awarded as “YOUNG RESEARCHER 2022” by InSc Institute of Scholars, ISO 9001:2015 certified and Registered under Ministry of MSME and Corporate affairs, Govt. of India for the work with the following details:

Publication Type: Journal

- ◆ Paper Title: Real-Time Human Facial Emotional Video Analytical system with Face and Voice Data Fusion Using Random Forest ML Algorithm
Journal Name: International Journal of Recent Scientific Research (IJRSR)
- ◆ Volume: 12, Issue No: 12
- ◆ Month of Publication: December
- ◆ Year: 2021
- ◆ Page No: 43792-43797
- ◆ ISSN: 0976-3031
- ◆ **Mr. Mahanthesha U** is appreciated for contribution as reviewer in 2022 third International Conference on Smart Technologies in Computing Electrical and Electronics (ICSTCEE), IEEE Conference Record# 56972 at REVA University, Bengaluru during 16th-17th December 2022.
- ◆ **Mr. Mahanthesha U** of Dept. of AIML has contributed as a session chair for IEEE MysuruCon 2022- 2nd Edition of the Flagship International Conference Series of IEEE Mysore Subsection in association with IEEE Bangalore Section hosted by JSS Science and Technology University, Mysuru partnered (Academic) with Nitte Meenakshi Institute of Technology, Bengaluru from 16th Oct- 17th Oct 2022.
- ◆ **Mr. Mahanthesha U**, Dr. H S Mohana, Prathibha G published a paper titled “Face and Fingerprint Based Smart Digital Voting Mechanism using the Data Fusion and ML Algorithm” ISSN NO: 0258-7982 in Journal of Electronics Information Technology Science and Management (JEITSM), VOLUME 12, ISSUE 12, December 2022
- ◆ **Dr. Anusha Preetham**, Mr. Vishnu Vardhan Battu published a paper titled “Soil Moisture Retrieval Using Sail Squirrel Search Optimization- based Deep Convolutional Neural Network With Sentinel-1 Images” in International Journal of Image and Graphics, August 2022.



That the first webcam was created at the University of Cambridge in 1991? It was used to monitor the status of a coffee pot in the Computer Science department and allowed users to remotely check whether there was any coffee left. The webcam was named "the Trojan Room coffee pot " and became an internet sensation, paving the way for the widespread use of webcams and video conferencing today.

Student Achievements

- Students of 4th semester CSE and AIML as team “Road Techies” were awarded as the winner of Smart India Hackathon, 2022 organized by Ministry of Education, Government of India held on 25th and 26th of August 2022. The Problem Statement for the team was “NC740 -Moving vehicle registration plate detection” for coal India Limited.



BNMIT Team “Road Techies” receiving award at the Nodal Center, Noida Institute of Engineering and Technology, Greater Noida. Photo showing the recipients standing from second left to right-Assistant Professor Pavithra H C, Brunda M S, Kotta Snigdhasree, Sharanna Das, Asmi, Riya Pandey, Jayashree Agarwal during the “Grand Finale”.

- Riddhi R Katarki of 5th semester AIML has actively participated and won at BLOCK CHEF- Blockchain for Good Ideathon organized by Kerala blockchain Academy as part of the 5th Edition of Kerala's Annual Blockchain Summit- BlockHash LIVE 2022 held on 16th December 2022.
- Naina Nimisha, Sahana R, Sampada Purushotham, Siddhant Priyadarshi, Subrat Pandey, Shreya M of 4th semester AIML under the guidance of Dr.Sejal Santosh Nimbhorkar participated in Grand finale event of Smart India Hackathon, 2022 organized by Ministry of Education, Government of India held on 25th and 26th of August 2022
- Kotta Snigdhasree of 4th semester AIML is appreciated for an outstanding performance in National Engineering Olympiad 6.0 with AIR 15 in Second Year Engineering conducted in July 2022.
- Kotta Snigdhasree of 4th semester AIML completed a 7-days Bootcamp on Server authentication using Express and NodeJS organized by DevTown.

Editorial Team

Faculty

- Prof. Pavithra H C**, Assistant Professor
Dept. of AIML
- Prof. Pankaja R**, Assistant Professor
Dept. of AIML
- Dr. Payal Mukherjee**, Assistant Professor
Dept. of Humanities

Students

- Greeshma L**, V Sem, A Section
- Jaysri A**, V Sem, A Section
- Prisha Vutti**, V Sem, B Section
- Rakshan R**, V Sem, B Section