ISSUE 6

CIRCARDIAN

The official magazine of the department of Artificial Intelligence and Machine Learning

JULY

The official magazine of the department of Artificial Intelligence and Machine Learning

The magazine committee extends its deepest appreciation to **Dr Rajesh I S**, faculty coordinator, for the successful completion of the magazine

About the Founders

Shri B. M Sreenivasaiah

Founder, BMS Institutions

The history of BMS institutions rewinds back to the year 1946 with the establishment of the first private engineering college in the country, BMS College of Engineering (BMSCE), by late Sri B.M Sreenivasaiah. He was a philanthropist and a great visionary who realized the necessity of technical education even before the country got independence. He was honored by the Maharaja of Mysore with the title "Dharma Prakasha Raja Karya Prasaktha" for his extraordinary service in the field of education.

The legacy he once began is being upheld with the same zeal by his inheritors and they continue to cherish his vision and ideals. After the sad demise of Sri B.M Sreenivasaiah, his renowned son, Sri B.S Narayan, a vibrant and ingenious personality, molded BMS College of Engineering into one of the finest engineering colleges.

Shri B. S. Narayan

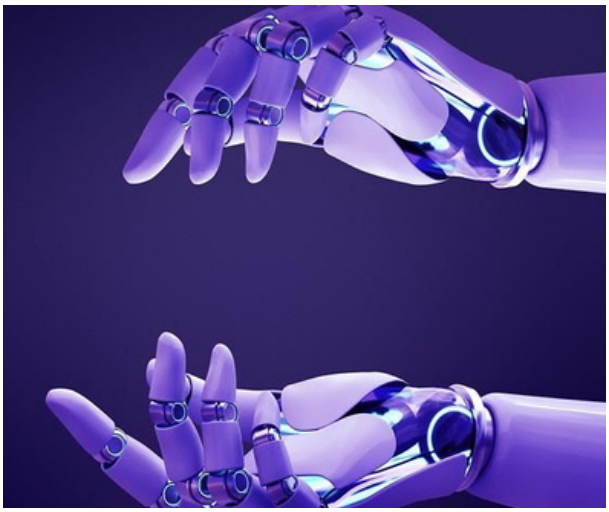
Founder & Donor Trustee

Apart from BMS College of Engineering, he had also established other institutions that promoted higher education which includes BMS College of Law, BMS College of Women, and BMS Evening College of Engineering. He was extremely supportive in the initiation of several collaborative programs such as training foreign students under the International Co-operative Division, cross-cultural programs with Melton Foundation U.S.A, etc.

BMS Institute of Technology (BMSIT), established in the year 2002 is one of the six institutions under BMS Educational Trust, is managed by a council of trustees appointed by Dr. B.S. Ragini Narayan, the successor of Late Sri B.S Narayan and the donor trustee and Member Secretary of BMS Educational Trust and it is one of the best engineering college in Bangalore. BMS School of Architecture is the latest addition to the BMS group of institutions

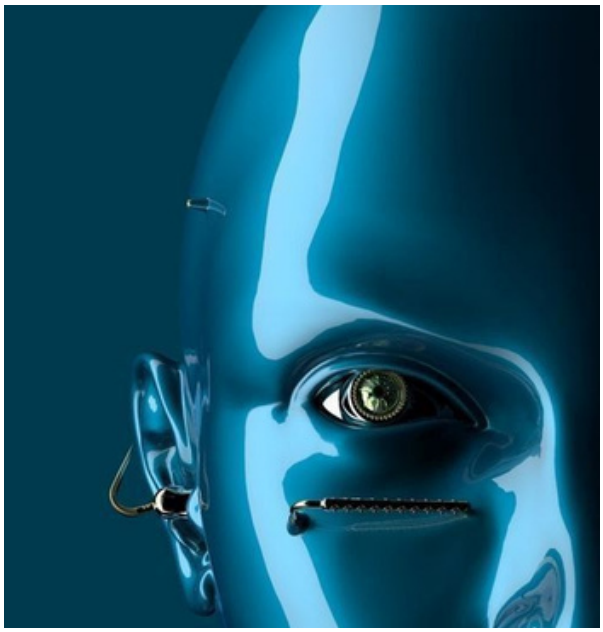
TABLE OF CONTENTS

SECTION 1



SECTION 3

SECTION 2



VISION

To develop professionals equipped to build sustainable and intelligent solutions that effectively interact with the natural intelligence towards creating a digitally empowered environment for future generations, safeguarding social ethics

MISSION

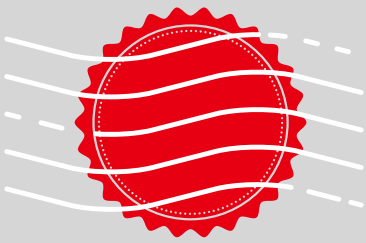
To enable students with the spirit and power of interdisciplinary acumen by integrating a world of knowledge into a world of intelligent systems and subsystems. boost academic outcomes through place-based education and collaborations with establishment reserach labs and industries. Encourage entrepreneurship efforts among students and develop them into great leaders.

HoD's Message

It gives me immense pleasure to present another issue of "Circadian" from department of Artificial Intelligence and Machine Learning. This is a half yearly newsletter where all the departmental activities which includes both students and teachers are brought under one folder. The Department of Artificial Intelligence and Machine Learning is showing consistent improvement in its academics, research and placement performance. The department has been imparting quality education through Outcome based education to the students with the intension of making them intellectually, ethically and academically strong to meet the challenges in the field of Artificial Intelligence and Machine Learning. This Magazine show cases the talents of the students and the achievements of the faculties in the department. I congratulate the editorial team for their effort and hard work for covering the information.

Wishing best of luck to all of them.....

Dr Anupama H S
Associate Professor and HoD
Department of Artificial Intelligence and Machine Learning



Committee Introduction

Nidhi Umashankar

Student Coordinator

Rahul Unnikrishnan

Editor in Chief

Sirisha Satish

Design team

Vaibhav M K

Writer

Committee Introduction

Anusha Bhagwath

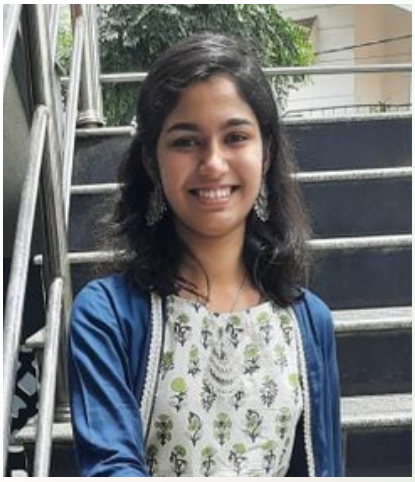
Writer

Arnav Sundar

Writer

Abhay Sharma

Writer

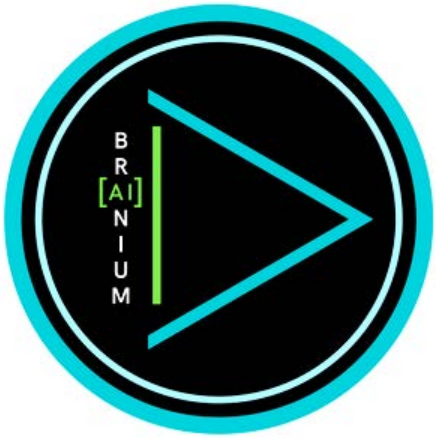


Vishishta Shenoy

Writer

Akash

Writer



BRAINIUM

The technical forum of the department of Artificial intellingence and machine learning has evolved over the last one year. The main aim of this forum is to help students develop skills and knowledge, which can be applied into their projects and future careers. The forum hosts a plethora of events such as workshops, webinars, clutural and technical fests, and expert talks, helping the students connect with the best of the industry.

AAAI

It brings us immense exuberance to share that Brainium is now a member of the AAAI **(ASSOCIATION FOR THE ADVANCEMENT OF ARTIFICIAL INTELLIGENCE)** organization, a rightful place for the students of our institution to be exposed to the plethora of opportunities that lie ahead.

Founded in 1979, the Association for the Advancement of Artificial Intelligence (AAAI) is a nonprofit scientific society devoted to advancing the scientific understanding of the mechanisms underlying thought and intelligent behavior and their embodiment in machines. AAAI aims to promote research in, and responsible use of, artificial intelligence. AAAI also aims to increase public understanding of artificial intelligence, improve the teaching and training of AI practitioners, and provide guidance for research planners and funders concerning the importance and potential of current AI developments and future directions.

Members throughout the world benefit from AAAI's efforts in research. Major AAAI activities include organizing and sponsoring conferences, symposia and workshops; publishing a quarterly magazine for all members; publishing a series of books, proceedings, and technical reports; compiling a host of online resources and publications; and awarding grants and scholarships. AAAI is committed to fostering student interest and development in the field of artificial intelligence. Student members are eligible for conference grants and fellowships, and receive publishing opportunities through AAAI conferences, workshops, and symposia.

Special networking and mentoring events are offered at the annual AAAI conference, as well as other AAAI meetings. AAAI promotes student career advancement through its annual job fair program and through recognition of exceptional work with special student research awards

UNLEASHING THE POWER OF GENERATIVE AI:

TRANSFORMING CREATIVITY AND INNOVATION

In the rapidly evolving landscape of artificial intelligence, one technology has fascinating researchers, artists, and enthusiasts alike: Generative AI. With its ability to produce original and imaginative content, generative AI opens up new horizons for creativity and innovation. From generating stunning artwork to composing music, writing stories, and even designing virtual worlds, the possibilities seem boundless.

So what exactly is Generative AI? In a nutshell, generative AI is a branch of artificial intelligence that can create various types of content such as text, images, audio, and synthetic data. This ability to create something new and valuable has opened up a realm of possibilities across multiple domains.

It's also surprising that this technology is not entirely new. Chatbots first used generative AI in the 1960s. But this technology didn't emerge until 2014 with the development of generative adversarial networks, or GANs. The most well-known generative AI bots include Bard and ChatGPT. Bard is a generative AI chatbot developed by Google. It is trained on a massive dataset of text and code that can generate text, translate languages, write different kinds of creative content, and answer your questions in an informative way. Bard is still under development, but it has the potential to be used in a wide variety of applications.

Types of Generative AI

There are many different types of generative AI, each with its strengths. Among the most popular varieties of generative AI are:

- Generative adversarial networks (GANs): GANs are a type of generative AI that places two neural networks against each other to create realistic images or text.
- Variational autoencoders (VAEs): VAEs are a type of generative AI that learns to represent data in a latent space and then decodes that latent space to generate new data.
- Boltzmann machines: Boltzmann machines are a type of generative AI that uses a probabilistic approach to generate data

How Do Generative AI Models Work?

Unlike traditional AI systems that rely on pre-programmed rules, generative AI makes use of deep learning algorithms and neural networks to extract patterns from massive amounts of data and produce new results. Generative

AI models can learn to identify patterns and relationships in data from a variety of sources, such as the internet, blogs, books, and image libraries. This is done using unsupervised or semi-supervised learning methods. Unsupervised learning methods train models on data that has not been labeled, while semi-supervised learning methods train models on a combination of labeled and unlabeled data.

This training allows a generative AI model to replicate those patterns when generating new content, making it seem like the content could have been created by a human rather than a machine.

Generative AI models can replicate human content so closely because they are designed with neural networks that think the way human brains work. Neural networks are a type of machine learning algorithm that is inspired by the human brain. These networks are made up of layers of nodes, which are connected by links and the strength of the connections between nodes is determined by the data that the model is trained on. So when a new piece of data is presented to the model, the model uses the strength of the connections between nodes to generate an output.

The more data that a generative AI model is trained on, the stronger the connections between nodes become. This allows the model to generate more accurate and realistic output.

Real Power of Generative AI

The real power of generative AI is its ability to create new and original content that is indistinguishable from human-created content. This means that generative AI can be used to create a wide range of products and services like AI-generated art, music, text, codes, images, and many more.

Generative AI has the potential to revolutionize many other industries such as Creating new product designs, Personalizing marketing campaigns, Improving customer service, Detecting fraud, and Generating synthetic data. Overall, generative AI has the potential to revolutionize many industries and improve the lives of people all over the world. As technology continues to develop, we can expect to see even more amazing benefits emerge.

Challenges Faced by Generative AI

In this rapidly developing field, some challenges need to be addressed before it can be widely adopted. Some of the challenges include:

- Data bias: Generative AI models are trained on large datasets of human-created content. If these datasets are biased, the models will learn to generate biased output
- Fake content: Generative AI models can be used to create fake content, such as fake news articles, fake images, and fake videos. This content can be used to mislead people and spread misinformation.
- Intellectual property: Generative AI models can be used to create content that infringes on intellectual property rights.
- Safety and security: Generative AI models can be used to create harmful content, such as content that is violent, hateful, or discriminatory. This content can be used to harm people and communities.
- Regulation: There is currently no clear regulatory framework for generative AI. This could make it difficult to hold developers and users of generative AI models accountable for the harm that their models cause.
- Job Losses: If generative AI can automate tasks that are currently done by humans, it could lead to job losses in some industries.

Despite the challenges, the potential benefits of generative AI are immense. By using generative AI, businesses can be more creative and innovative, individuals can be more productive and efficient, and society as a whole can be more informed and connected. As technology continues to develop, we can expect to see even more amazing applications of generative AI emerge in the future.

Abhay Sharma
2nd semester , AI&ML
1BY22AI004

Meta’s Voicebox is a generative AI model that can generalize speech-generation tasks it was not specifically trained to accomplish with state-of-the-art performance.it incorporates advanced capabilities such as voice recognition, speech synthesis, context understanding, and conversational abilities. These AI systems can be integrated into various devices or platforms, including smartphones, smart speakers, or virtual assistants, to facilitate voice-based interactions and enhance user experiences.

It is 20 times faster than existing models while consisting of a multitude of voices. It is capable of diverse text to speech, style transfer, in context text to speech, noise removal, content correction

meta's voicebox.

Voicebox generates outputs in an array of styles, and it can both start from scratch and modify a sample that has been given, just like generative systems that generate graphics and text. But Voicebox creates high-quality audio samples rather than a picture or a passage of text. The model is capable of noise reduction, content editing, style conversion, and distinct sample production in addition to speech synthesis across six languages.

Before Voicebox, generative AI for speech required to be trained specifically for each task using carefully crafted training data. Voicebox employs a novel technique to learn solely from untranslated audio. Voicebox can alter any portion of a sample, not simply the conclusion of an audio clip it is given, in contrast to autoregressive models for audio production.

The foundation of Voicebox is a technique termed Flow Matching, which was previously demonstrated to outperform diffusion models. Voicebox performs better on zero-shot text-to-speech than the most advanced English model VALL-E in terms of both intelligibility (5.9 percent vs. 1.9 percent word error rates) and audio similarity (0.580 vs. 0.681), whilst being up to 20 times faster. Voicebox surpasses YourTTS for cross-lingual style transfer, lowering the average word error rate from 10.9 percent to 5.2 percent and increasing audio similarity from 0.335 to 0.481.

Nidhi Umashankar
4th semester, AI&ML
1BY21AI036

The AI&ML department of BMSIT&M bid a warm adieu to the batch of 2025!

Their remarkable journey, marked by dedication and passion, has left an indelible mark on the department. Their departure is met with bittersweet emotions and a sense of pride for their accomplishments.

FAREWELL 2023

Throughout their journey, the batch of 2025 exhibited unwavering dedication, passion, and an insatiable thirst for knowledge in the fields of Artificial Intelligence and Machine Learning. Their commitment to academic excellence and their remarkable drive for innovation have undoubtedly made a lasting impact on the department and the entire institution.

As this batch now embarks on their individual journeys, we cannot help but feel a profound sense of pride for their accomplishments and the heights they have achieved during their time at BMSIT&M. We are confident that their talents, skills, and the knowledge they have acquired will serve as a solid foundation for their future endeavors in the ever-evolving realm of AI and ML

Although bidding farewell brings a sense of sadness, we believe it is merely a temporary parting. The AI&ML department at BMSIT&M will forever remain a nurturing home, where these bright minds can always return for guidance, mentorship, and support. Their contributions to the department will continue to inspire and motivate future batches, leaving a lasting legacy.

As we say goodbye to the batch of 2025, we extend our heartfelt wishes for their future success and fulfillment.

PROM IT IS!

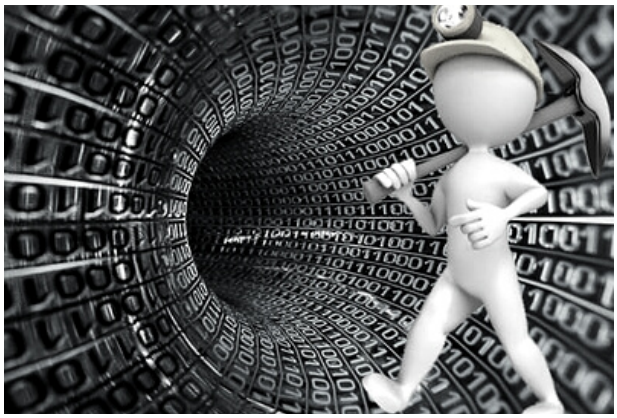
ANANYA'S MESSAGE

Stepping into the enchanting world of reminiscence, I find myself utterly awash with an overwhelming sense of gratitude and nostalgia, as I reflect upon the unforgettable prom-themed farewell orchestrated by the exceptional minds of BMSIT's AIML department. Graduating as an AI engineer from this esteemed institution has been an exhilarating journey, culminating in a spectacular evening meticulously crafted with unwavering affection by our devoted juniors. Every detail of the soirée bespoke an unrivaled level of thoughtfulness and ardor, leaving us feeling remarkably cherished and cherished indeed. From the elegantly curated decorations to the infectious rhythm of music that beckoned us to dance with unbridled joy, our hearts swelled with pride in witnessing the boundless talent and creativity of our juniors. They serenaded us with soul-stirring melodies, engaging us in laughter through playful games, and fostering an atmosphere of camaraderie that epitomized the very essence of unity within our department. Amidst this dazzling affair, our prom attire adorned us with an air of elegance, mirroring the radiant spirit of celebration that enveloped the entire event. And as the delectable aroma of pizza and the delectable spread of lunch filled the air, we couldn't help but feel pampered beyond measure, touched by the profound affection emanating from the hearts of our juniors. Truly, our department boasts the finest and most exceptional set of juniors, whose love and dedication have etched an indelible memory in the annals of our academic journey.

In this enchanting tale of gratitude and nostalgia, I am humbled to bear witness not only to the magnificence of our junior's efforts but also to the unwavering support bestowed upon us by our department teachers and esteemed Head of Department (HOD) throughout our four-year journey. As AI engineers graduating from the hallowed halls of BMSIT's AIML department, we are blessed to have been nurtured and mentored these exceptional educators, who have been our guiding beacons for the past four years, were instrumental in shaping our academic prowess and igniting our passion for AI and machine learning.

As we bid adieu to this cherished chapter, we carry with us a treasure trove of cherished moments, forever grateful for the extraordinary send-off gifted to us by our best set of teachers and juniors

Ananya S Malagi
Batch of 2023



“You can have data without information, but you cannot have information without data.” — Daniel Keys Moran

Digging in the Earth for valuable gold is called mining. Similarly , searching large data sets for valuable information is called data mining.

Data mining is in analytical process that identifies meaningful trends and relationships in raw data. The need for data mining arises from the fact that modern organisations generate and collect vast amounts of data but this data is often too complex and unstructured to be analysed by humans alone.
Data mining uses machine learning algorithms, artificial intelligence and statistics on uncover hidden patterns trends and relationships.

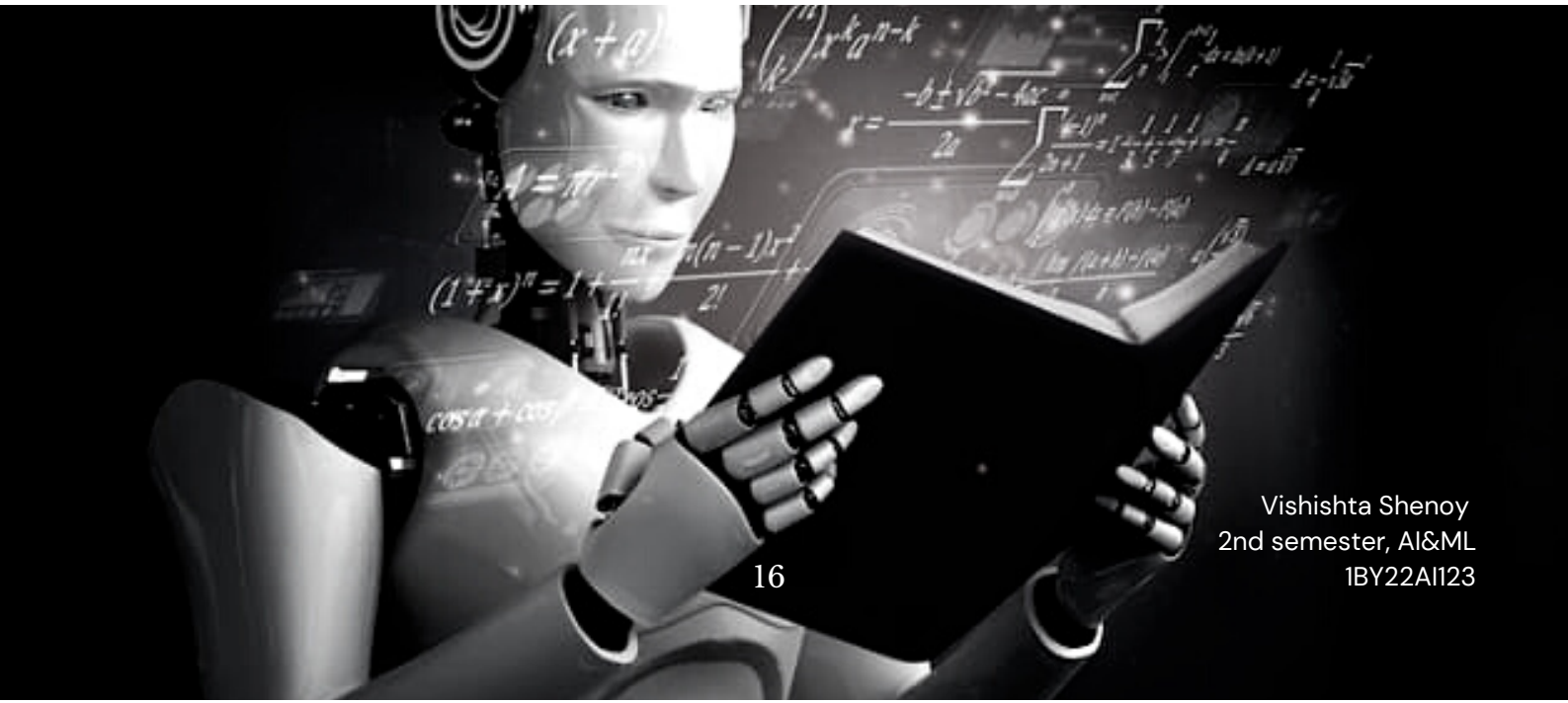
DATA MINING

It is used by companies to increase overall efficiency by:

- future planning
- improved marketing strategy
- mitigate risk and fraud detection
- make informed decisions
- manage supply chain

Software tools available for data mining include IBM SPSS modeller, rapidminer, KNIME and WEKA. These provide a range of data mining functions to the user including classification, clustering, association, cleaning,filtering, transforming.

The companies that have adopted data mining include Amazon, Walmart, Netflix, Google, Facebook and Uber.
Amazon uses data mining for enhancing it's product recommendations. Walmart for managing the supply chain and Netflix uses it for personalising the movie recommendation.



Vishishta Shenoy
2nd semester, AI&ML
1BY22AI123

Large Language Model is a type of artificial intelligence model that is designed to generate humans like language.

It is based on an unsupervised machine learning algorithm that can learn from patterns in the data to make predictions and generate new content. LLM are trained on vast amount of text data such as books, articles and web pages to learn patterns of human language and generate text similar to what a human might write.

LARGE LANGUAGE MODELS (LLMs)

Vishishta Shenoy
2nd semester, AI&ML
1BY22AI123

They are used for a variety of language task including language translation when a human translator is not available , text completion and question answering. They are used in chatbots and virtual assistant that can communicate with humans

LLM are useful in situations where large amount of unstructured data needs to be analysed. For example social media has vast amount of data, LLMs analyse this data to extract trends and sentiments.

All it is, is a powerful tool for natural language tasks and wide range of applications from social media to language translation. As the amount of text generated increases LLMs will be of even more importance

CHAT GPT is a chat box that uses GPT series of LLMs to generate responses to other input user

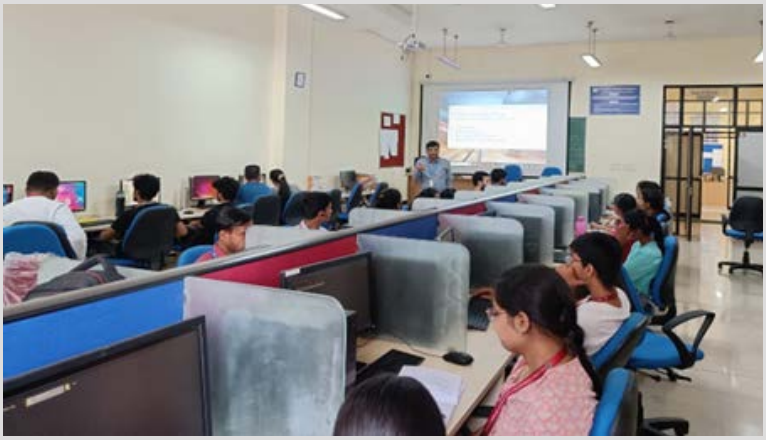
OPEN COURSE

5 DAYS - 5 PROJECTS ON DATA SCIENCE

Data Science continues to grow in popularity as a promising career path for this era. Data Science encompasses a wide range of scientific methods, procedures, techniques, and information retrieval systems to detect meaningful patterns in organized and unstructured data. Demand for Data Scientists is increasing in the market. According to recent reports, demand will skyrocket in the future years, increasing by many times. This Open Course provided data science project ideas for students new to Python or data science in general and all of the tools required succeeding as a data science developer.

The Department of Artificial Intelligence and Machine Learning hosted an intensive five-day event titled "5 Days – 5 Projects on Data Science" for 60 students from AI&ML, CSE, ISE, ECE, and ETE branches. The course covered a wide range of topics, including data analysis, visualization, machine learning, and artificial intelligence. Students had the opportunity to work on real-world projects using various software and hardware tools. The event's assessment methods included tests and mini-projects to gauge students' understanding and practical skills.

Under the guidance of Dr. Vishwa Kiran S and other professors, the participants received expert mentorship and guidance throughout the event. The course not only provided valuable project ideas but also addressed curriculum gaps related to Program Outcomes (POs) and Program Specific Outcomes (PSOs). It aimed to equip students with essential skills and knowledge to meet the increasing demand for Data Scientists in the job market. "5 Days – 5 Projects on Data Science" proved to be an enriching experience, empowering students to excel as data science developers and professionals in today's rapidly evolving technological landscape.



OPEN COURSE

MLOps

MLOps stands for Machine Learning Operations. MLOps is a core function of Machine Learning engineering, focused on streamlining the process of taking machine learning models to production and then maintaining and monitoring them. MLOps is a collaborative function, often comprising data scientists, DevOps engineers, and IT.

The Department of Artificial Intelligence and Machine Learning organized a transformative event titled "MLOps: Machine Learning Operations" targeting students from AIML, CSE, and ISE branches. The course focused on equipping participants with the skills to streamline the process of deploying machine learning models in production and efficiently maintaining and monitoring them. MLOps, a collaborative function involving data scientists, DevOps engineers, and IT professionals, ensures a seamless integration of machine learning and operations.

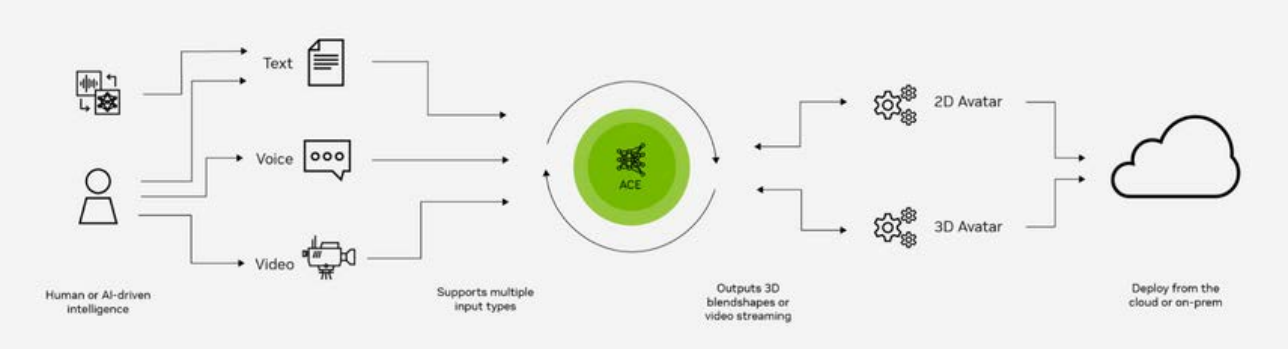
The event witnessed active participation from 60 students who delved into the world of MLOps, learning about its profound benefits. One key advantage is efficiency, as MLOps enables faster model development, higher-quality ML models, and quicker deployment in production. Additionally, MLOps facilitates vast scalability, empowering organizations to manage and monitor thousands of models seamlessly, promoting continuous integration, delivery, and deployment.

Under the guidance of Dr. CHANDRASHEKHAR B N, Dr. ARCHANA BHAT, and Mr. Md. Sinan Khan, the participants gained valuable insights into the world of MLOps. Additionally, the event benefited from the expertise of external resource person, Dr. SRINIVAS PADANABHUNI, Co-founder of INTELLECT and TESTAING.COM, who provided real-world industry insights.

By the end of the event, the participants were equipped with the necessary knowledge and tools, including opensource platforms like OpenMP, MPI, and CUDA, to implement MLOps effectively in their future projects. The course utilized discussions, lectures, and e-learning methods, with assessment conducted through quizzes to evaluate students' understanding of the subject matter.

NVIDIA Omniverse ACE

Suite of real-time AI solutions for end-to-end development and deployment of interactive avatars and digital human applications based on Universal Scene Description(OpenUSD) and NVIDIA RTX™ technology.



The Key Benefits of ACE

Simple to Build

Enjoy realistic, advanced avatar development without the need for specialized expertise, equipment, or manually intensive workflows. With cloud-native AI microservices and AI workflows like Tokkio, Omniverse ACE enables you to build realistic avatars quickly.

Realistic Results

Bring your avatars to life using rich software tools and APIs, including Omniverse Audio 2Face for simplified 3D character animation, NVIDIA Live Portrait for 2D image animation, Conversational AI solutions like NVIDIA Riva for natural speech- and translation-AI-based interaction, and NVIDIA NeMo for Generative AI..

Flexible Deployment

Build, configure, and deploy your avatar application across any engine in any public or private cloud. Whether you have real-time or offline requirements, Omniverse ACE enables you to develop and deploy your avatar to suit your needs.

ACE Components

Animation AI

Bring avatars to life with realistic 2D and 3D character animation based on video or audio input.

Speech AI

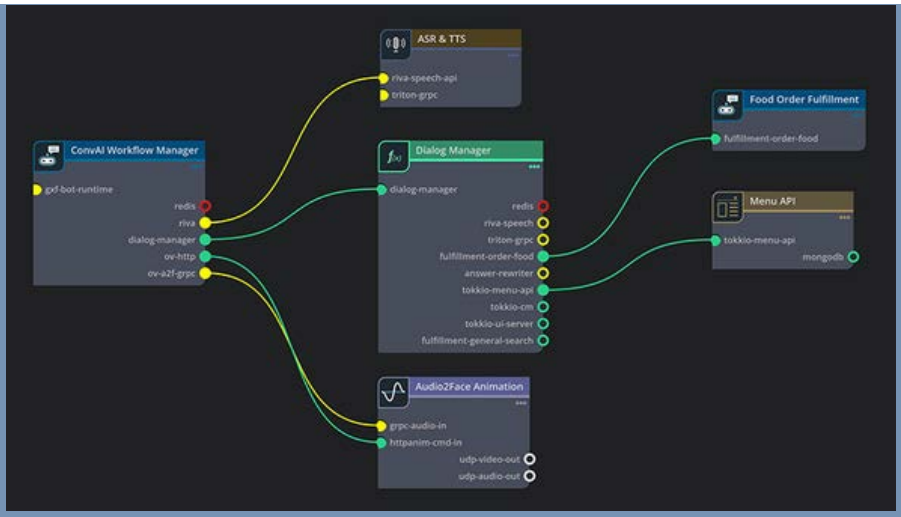
Create deeper user engagement with avatars that can hear, understand, and speak in real-time leveraging NVIDIA Riva microservices and APIs.

NeMo Service

Develop fully autonomous, intelligent avatars using pre trained generative AI language models.

Unified Compute Framework

Omniverse ACE is built on NVIDIA's Unified Compute Framework (UCF), a low-code framework for developing cloud-native, real-time, and multimodal AI applications. This enables developers to seamlessly integrate NVIDIA's avatar technologies into their applications without the need for low-level domain and platform knowledge.



Vaibhav M K
4th semester, AI&ML
1BY21AI058

Faculty Achievements

Dr Vishwa Kiran S

- Dr Vishwa Kiran S, Associate Professor, Department of AI & ML, has delivered an EDP for Volvo Group India Pvt Ltd, on Traditional C ++ with STL" from 18.7.2022 to 22.7.2022
- Dr Vishwa Kiran S, Associate Professor, Department of AI & ML, has delivered an EDP for Mindtree Pvt Ltd, on C and Embedded Linux during the Month of September.
- Dr Vishwa Kiran S, Associate Professor, Department of AI & ML, was resource person for Volvo India Pvt Ltd from 17.10.2022 to 21.10.2022 on Embedded C.

Dr Anupama H S

- Dr Anupama H S, Associate Professor, Department of AI & ML. has delivered an EDP for Mindtree Pvt Ltd, on Embedded Systems from 12.9.2022 to 16.9.2022
- Dr Anupama H S, Associate Professor, Department of AI & ML, was reviewer for International Conference on Artificial Intelligence and Machine Learning in Applied Biotechnology (AIMLBIO), organised by RVCE in collaboration with Bangalore BIO Innovation center
- ·Dr Anupama H S and Dr Pradeep K R, Department of AI & ML, has presented a paper on "Detection of chronic lung disorder using deep learning" in the 4th IEEE International conference held on 23rd and 24th Dec 2022.

Dr Pradeep K R

- Dr Pradeep K R, Assistant Professor, Department of AI & ML, was actively participated as a reviewer for IEEE MYSURUCON 2022 in October 2022.

Faculty Achievements

Dr Bharathi Malakreddy A

- Dr Bharathi Malakreddy A, Professor and HoD, Department of AI & ML, has chaired the session for the conference in Oct 2022.
- Dr Bharathi Malakreddy A, Professor and Head, Department of AI & ML, sessioned the Chair at International Conference on Multidisciplinary Research for the track on AI & ML , SBR University, Gulbarga on 23.11.2022.
- Dr Bharathi Malakreddy A, Professor and HoD, Department of AI & ML, session the Chair to the "International Conference on Circuits, Control, Communication and Computing (I4C-2022)" which has been scheduled on 22.12.2022 and 23.12.2022 at MSRIT, Bengaluru
- Dr Bharathi Malakreddy A, Professor and HoD, Department of AI & ML, has delivered a talk on Data Science and Demonstration of Mathematical Application Modelling, FDP on Mathematical Foundation in Data Science" on 18.10.2022, BMSIT&M
- Dr Bharathi Malakreddy A, Professor and Head, Department of AI & ML, has delivered a talk on " Mathematical Modelling in Data Science " at the International Conference on Multidisciplinary Research , SBR University, Gulbarga on 22.11.2022.
- Dr Bharathi Malakreddy A, Professor and HoD, Department of AI & ML, invited as Guest for Innovation day by Nokia Solutions & Networks India Pvt. Ltd., Manyata Tech Park for the "5G Advanced and Beyond" on 1.12.2022.
- ·Dr Bharathi Malakreddy A, Professor and Head, Department of AI & ML, was a BoS member for SBR University, Gulbarga on 4.11.2022.
- Dr Bharathi Malakreddy A, Professor and HoD, Department of AI & ML, was BoE member for REVA University on 21.4.2023.
- Dr Bharathi Malakreddy A, Professor and Head, presented and published paper on, " A Comparative Study for Early Diagnosis of Alzheimer's Disease using Machine Learning Techniques "in 6th INTERNATIONAL CONFERENCE ON INNOVATIVE COMPUTING & COMMUNICATION (ICICI-2023), from 17.2.2023 to 19.2.2023 in New Delhi.
- Dr Bharathi Malakreddy A, Professor and HoD, Department of AI & ML, Published a Paper on "Blockchain-based Access Control Model with Privacy Preservation in a Fog Computing Environment" : 2022 IEEE International Conference on Electronics ,Computing and Communications Technologies on 30.8.2022 .

Faculty Achievements

Dr Rajesh I S

- Dr Rajesh I S, Assistant Professor, Department of AI&ML, participated in five-day online National-Level Workshop on “Deep Learning and its Applications” from 6th to 10th March 2023 organized by the Department of Computer Science & Engineering, Kalpataru Institute of Technology, Tiptur.
- Dr Rajesh I S, Assistant Professor, Department of AI&ML delivered a talk entitled ‘Introduction to medical Image Processing’ on 10th March 2023 in a Five-day online National-Level Workshop on “Deep Learning and its Applications” from 6th to 10th March 2023 organized by the Department of Computer Science & Engineering, Kalpataru Institute of Technology.

Dr Archana Bhat

- Dr Archana Bhat, Assistant professor, Department of AI&ML, has completed her final Viva voce on title “A Framework for IPV6 based energy efficient Routing in IoT in low power Lossy Networks and Multimodal sensors” on 17.5.2023 in NIT Suratkal

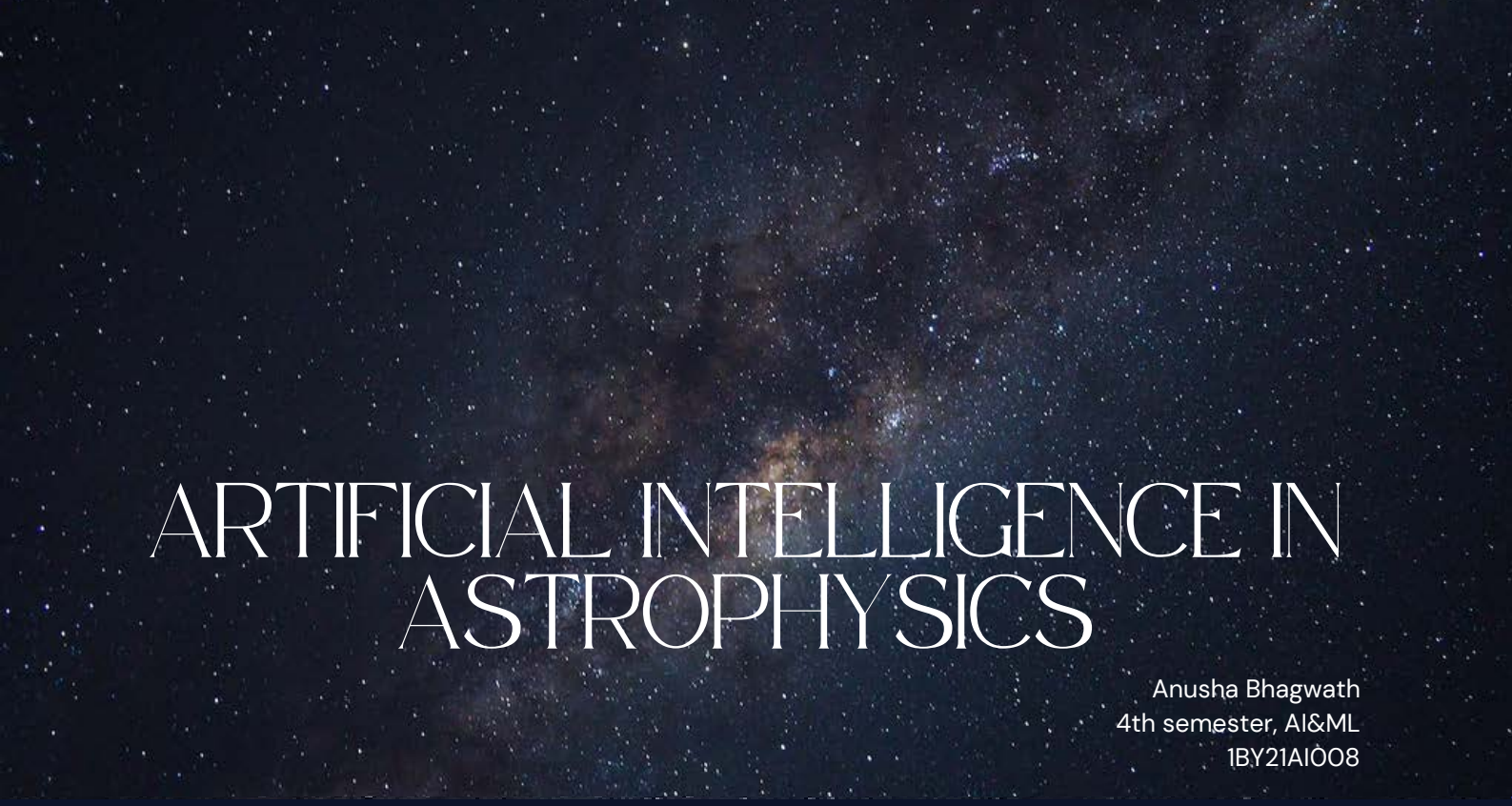
Student Achievements

Srishti Hackathon 2022, Winner Prize of Rs 25,000 and Citation of special appreciation was awarded on 26.07.2022 at BMSCE for AI based Medical Transcription. Which held on 16th -18th June-2022 Participants from AIML Dept.:

a) SADANAND VENKATARAMAN
b) SAI DARSHAN
c) MADHUMITHA V

Partial Delivery conducted

- Department of AI & ML has conducted partial delivery on Automata Theory and Computation. Prof Manjunath C has delivered the partial delivery on the concepts of Regular expressions and DFA and NDFA. This helped students to explore and solve more problems on ATC.
- Department of AI & ML has conducted partial delivery on Python programming for Artificial Intelligence on 29.12.2022 for 5th semester students to get the industry exposure on AI concepts.



ARTIFICIAL INTELLIGENCE IN ASTROPHYSICS

Anusha Bhagwath
4th semester, AI&ML
1BY21AI008

Astrophysics is a branch of space science that applies the laws of physics and chemistry to seek and understand the universe and our place in it. The field explores topics such as birth, life and death of stars, planets, galaxies, nebulae and other objects in the universe. Astrophysics creates physical theories of small to medium-size objects and structures in the universe.

UNDERSTANDING THE IMPORTANCE OF AI IN ASTROPHYSICS

Artificial intelligence (AI) in astrophysics refers to the application of machine learning and other AI techniques to analyse and interpret astronomical data, which frequently deals with huge data sets created by contemporary telescopes and satellites.

It is deployed to identify patterns and anomalies in vast amounts of data that would be difficult, if not impossible, for humans to analyse effectively in a reasonable time frame. AI can help detect new celestial bodies, forecast cosmic events, and even contribute to our understanding of dark matter.

POTENTIAL CHALLENGES IN IMPLEMENTATION OF AI IN ASTROPHYSICS

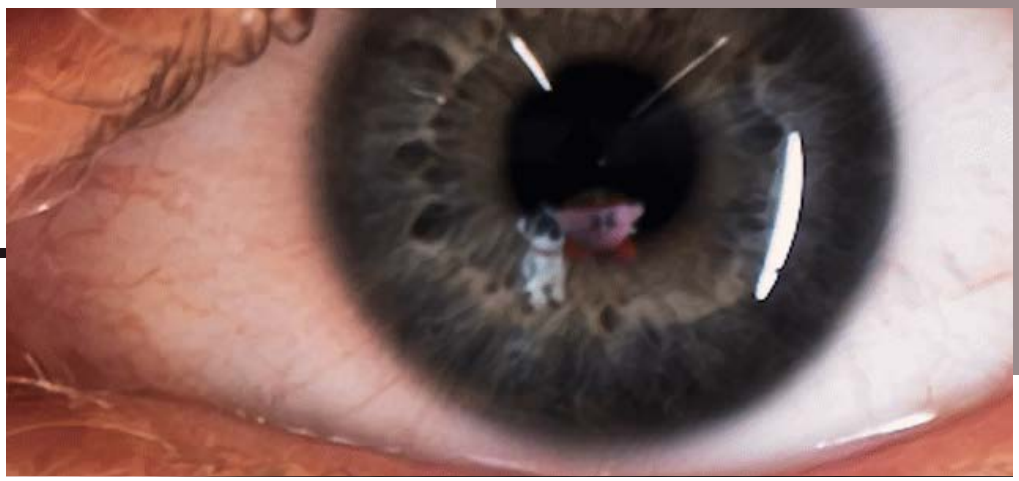
Despite its clear benefits, applying AI in astrophysics isn't without challenges. These include the need for vast, labelled datasets to train algorithms, the complexity of interpreting AI's findings, and ensuring the robustness of AI models in the face of noisy or incomplete data.

ADVANTAGES OF USING AI IN ASTROPHYSICS

Adopting AI in astrophysics offers numerous advantages. It can drastically improve our ability to analyse astronomical data and uncover patterns that might elude human observers. AI not only enhances the speed of data analysis but also its accuracy, leading to more reliable findings and theories. Plus, AI's predictive capabilities can enable us to anticipate and track cosmic events with greater precision.

THE IMPACT OF AI ON DATA ANALYSIS IN ASTROPHYSICS

When we consider the large, complex datasets common in astrophysics, the influence of AI is even more profound. Telescopes and satellites capture a constant stream of data, and AI is instrumental in processing and analysing this data efficiently. For instance, AI can rapidly classify galaxies, detect exoplanets, and identify transient phenomena like supernovae, significantly accelerating the pace of discovery. Artificial Intelligence (AI) has become a critical tool for the aerospace industry.



RECONSTRUCTION OF A SCENE USING EYE REFLECTIONS

As the scope of AI increases, the confines of practicality are pushed. This is the case for the paper published by Hadi Alzayer, Kevin Zhang, Brandon Feng, Christopher Metzler and Jia-Bin Huang who have pushed the limits of image processing to recreate a scene in 3D by simply using the reflections of an eyeball. The reflective nature of the human eye is an underappreciated source of information about what the world around us looks like. By imaging the eyes of a moving person, they have collected multiple views of a scene outside the camera's direct line of sight through the reflections in the eyes. In this paper, a 3D scene was reconstructed beyond the camera's line of sight using portrait images containing eye reflections. This task was challenging due to:

1) The difficulty of accurately estimating eye poses
2) The entangled appearance of the eye iris and the scene reflections

The method used by the engineers jointly refined the cornea poses, the radiance field depicting the scene, and the observer's eye iris texture. They further proposed a simple regularization prior on the iris texture pattern to improve reconstruction quality. Through various experiments on synthetic and real-world captures featuring people with varied eye colors, they demonstrated the feasibility of their approach to recover 3D scenes using eye reflections Although far-fetched in the current day and limitations of technology that exists, possible applications can include forensics, both historical and in the field of detection of crime.

Rahul Unnikrishnan
4th semester, AI&ML
1BY21AI042

AI IN WARFARE

REVOLUTIONISING CONFLICT THROUGH ARTIFICIAL INTELLIGENCE

The upcoming development is Ai In Warfare,it enables the development of autonomous weapons systems, including drones and robotic vehicles, capable of independently engaging targets. AI algorithms analyse vast amounts of data, such as satellite imagery and intercepted communications, to enhance situational awareness and aid in target selection.

The use of AI weapons needs to be regulated as there is a chance that countries might use it for unfair practices. Today, U.S., Russian, Israeli, Chinese, Iranian, and Turkish drones are flying attacks in the Middle East, the African continent, Southeast Asia, and Europe. Fully autonomous drones that autonomously identify and attack their targets are a realistic possibility. Such systems are an example of lethal autonomous weapons systems ("LAWS"). There are international efforts to regulate them heavily or ban them altogether. However, because they can make or break a war, the major military powers in particular are reluctant to ban them. Autonomous weapons are considered the third revolution in warfare after the invention of the atomic bomb and gunpowder. They have the same ability to change the balance of power. Although it is not in doubt that AI is going to be part of the future of militaries around the world, the landscape is changing quickly and in potentially disruptive ways

Although it is not in doubt that AI is going to be part of the future of militaries around the world, the landscape is changing quickly and in potentially disruptive ways. AI is advancing, but given the current struggle to imbue computers with true knowledge and expert-based behaviours, as well as limitations in perception sensors, it will be many years before AI will be able to approximate human intelligence in high-uncertainty settings – as epitomized by the fog of war. Given the present inability of AI to reason in such high-stakes settings, it is understandable that many people want to ban autonomous weapons, but the complexity of the field means that prohibition must be carefully scoped. Fundamentally, for instance, does the term autonomous weapon describe the actual weapon – i.e. a missile on a drone – or the drone itself? Autonomous guidance systems for missiles on drones will likely be strikingly similar to those that deliver packages, so banning one could affect the other. And how will technologies be treated that emerge from the growing commercial market, which is expected to leapfrog some aspects of military capability and possibly change public perception?

The impact of the rapid expansion of the commercial market on autonomous systems development cannot be overstated, and an even bigger problem in the short term is how to fully understand the global implications of the discernible shift in the power base of AI expertise from the military to commercial enterprises.

AI can be used in a good way in defence by leveraging its capabilities for threat detection and analysis, supporting decision-making processes, enabling autonomous systems for surveillance and reconnaissance, strengthening cybersecurity measures, facilitating realistic training simulations, and optimizing logistics and supply chain management. However, it is crucial to prioritize ethical guidelines, human oversight, and adherence to international laws to ensure responsible use and prevent unintended consequences or misuse.

Akash
2nd semester, AI&ML
1BY22AI011

muse.ai

"The power of video, made simple for you"

Introduction

In recent years, the intersection of artificial intelligence (AI) and creativity has paved the way for innovative applications across various industries. One such groundbreaking development is Muse AI, a cutting-edge technology that is transforming the landscape of creative endeavors. Muse AI harnesses the power of AI to augment and inspire artists, writers, designers, and musicians, empowering them to unlock new realms of imagination and productivity.

What is Muse ai?

Muse AI is an advanced software system that leverages the power of AI algorithms to augment human creativity and provide new tools for artists and creators. It combines the strengths of deep learning, computer vision, and natural language processing to generate ideas, assist in the creative process, and enhance overall productivity.

Benefits

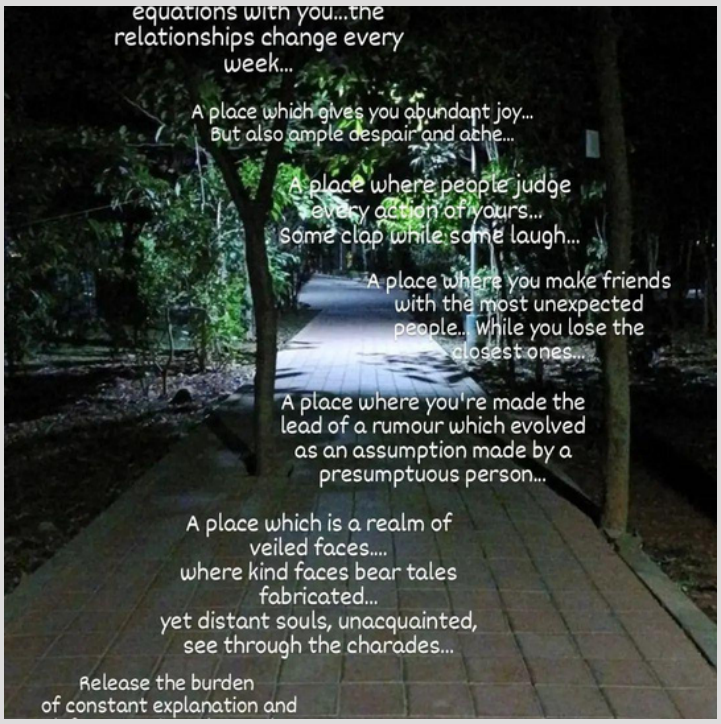
Muse AI accelerates the creative process by automating certain tasks and reducing manual labor. Artists can focus more on the conceptualization and refining stages, saving time and effort. By processing vast amounts of data, Muse AI uncovers patterns and trends that may elude human observation. It can offer fresh perspectives, unlocking new creative avenues and pushing the boundaries of artistic expression.

Conclusion

Muse AI represents a paradigm shift in the creative landscape, empowering afrtists and creatives to explore new horizons and push the boundaries of their imagination. By merging the capabilities of AI and human creativity, Muse AI opens up new possibilities, enhances the creative process, and fosters collaboration between humans and machines. As this technology continues to evolve, it promises to reshape the way we approach and engage with creativity, unleashing a new era of innovation and expression.

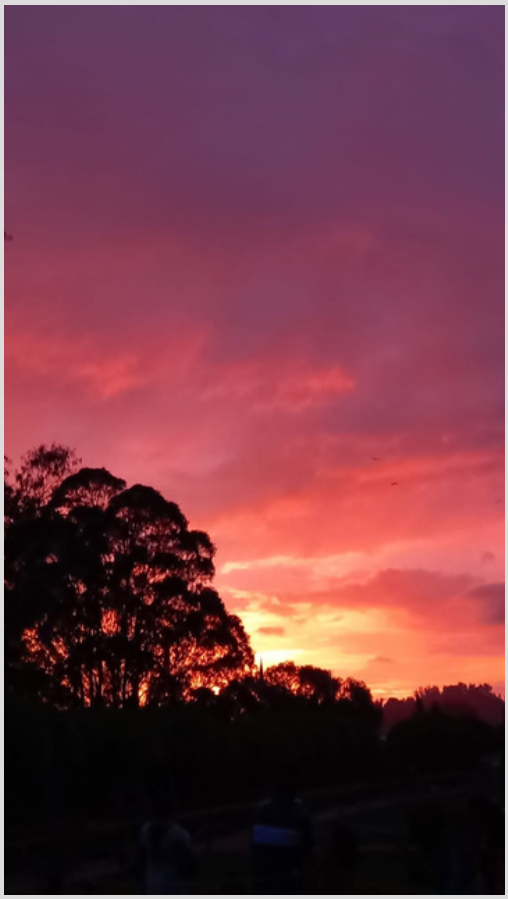
Arnav S
2nd Semester, AI&ML
1BY22AI016

Nishitha, 1BY22AI063



Vedashree B, 1BY22AI119

Aravind M, 1BY21AI009



Anusha Bhagwath, 1BY21AI008

STUDENT *Submissions*

UTSAHA VAIBHAVA

A SPECTACULAR BLEND OF CULTURE AND TECHNOLOGY

Utsaha Vaibhava, the grand cultural and technical fest organized by BMS Institute of Technology & Management (BMSIT&M) and BMSSA college, was a resounding success. The fest, held on the 23rd and 24th of June 2023, brought together students, faculty, and participants from various institutions, offering an array of exciting events and activities. One of the instrumental contributors to the fest's success was the AI & ML department's coordinators, who played a pivotal role in orchestrating an unforgettable experience.

Technical Events:
Utsaha Vaibhava provided a platform for tech enthusiasts to showcase their skills and compete in events such as Valorant, Stumble Guys, Typathon, BGMI (BattleGrounds Mobile India), CodeChef, Call of Duty Mobile, and the thrilling Tech Hunt. These events challenged participants to exhibit their expertise, problem-solving abilities, and teamwork in a highly competitive environment.

Main Events:
The fest showcased a diverse range of main events that captivated the audience. The "Roar" bike display mesmerized attendees with an exhibition of awe-inspiring motorcycles. The fashion show brought out the creativity and style of participants, while the live band performances added a melodious touch to the festivities. The DJ night, the grand finale event, concluded the fest on a high note, leaving everyone in high spirits.

Sports Events:
Utsaha Vaibhava celebrated the spirit of sportsmanship with thrilling competitions like Bowl Out, Tug of War, Gully Cricket, Badminton, and Table Tennis. Participants showcased their athletic prowess and enjoyed spirited matches, fostering a sense of camaraderie and healthy competition among participants.

Cultural Events:
The cultural events at Utsaha Vaibhava added color and vibrancy to the fest. "Sol-23" showcased mesmerizing dance performances that enthralled the audience. "Street Code" provided a platform for street artists to display their creativity, while "In Sync" celebrated the art of synchronization. The "Battle of Bands" and "Swing By" performances further enhanced the festive atmosphere, showcasing the talent and passion of the participants.

Literary Events:
Utsaha Vaibhava also provided a platform for intellectual engagement with literary events such as "Wise Muse," "Chatters and Whispers," "Wit Winner," and "Chita Kathe." These events encouraged participants to explore their literary prowess through creative writing, debates, and storytelling competitions.

The coordinators from the AI & ML department played a crucial role in the successful execution of Utsaha Vaibhava. They were responsible for overseeing the technical events, ensuring seamless operation of competitions, managing participant registrations, and coordinating with event sponsors and partners.

Their expertise in artificial intelligence and machine learning was leveraged to enhance event planning, data management, and automation of various processes, contributing to the fest's overall efficiency and success.

Utsaha Vaibhava, the cultural and technical fest organized by BMSIT&M and BMSSA college, left an indelible mark on all participants. The fest's diverse range of events catered to the interests of students from various disciplines, fostering talent, camaraderie, and healthy competition. The involvement of the AI & ML department coordinators played a pivotal role in ensuring a seamless experience. Utsaha Vaibhava 2023 will be remembered as a remarkable celebration of culture, technology, and the indomitable spirit of the BMSIT&M community

Hoop Chronicles

BMSIT vs NITTE

In an intense basketball showdown, BMS Institute of Technology (BMSIT) faced off against NITTE College in a thrilling tournament hosted by St. Claret College. Despite a valiant effort, BMSIT's basketball team narrowly lost their first game against NITTE College in a closely contested match. The final score stood at 40-37 in favor of NITTE, highlighting the competitiveness of the game.

The BMSIT team showcased exceptional skill and teamwork throughout the game. Among the standout players were Arnav, a talented first-year student from the AI&ML department, who scored an impressive 17 points in his outing and displayed remarkable agility and playmaking and contributed significantly to the team's efforts. Additionally, Rohan, a player who recently finished his final year in the AI&ML department, demonstrated his experience and leadership on the court, guiding the team with his strategic plays and precise shooting.

Although BMSIT couldn't secure a victory in this particular game, their performance demonstrated their resilience and determination. The close scoreline indicated the evenly matched competition and showcased the dedication and talent of both teams.
While the game against NITTE College may not have ended in their favor, BMSIT's basketball team can take pride in their strong showing. They exhibited the spirit of sportsmanship and represented their college admirably. With players like Arnav and Rohan leading the charge, BMSIT's basketball team has a promising future ahead and will undoubtedly continue to excel in future tournaments.

As we draw the final pages of this edition to a close, the team behind **CIRCADIAN** would like to extend our heartfelt gratitude to each and every one of our esteemed readers.

It has been an incredible privilege to curate and present the captivating stories, insightful articles, and stunning visuals that have filled the pages of this magazine.

We sincerely hope that our content has enriched your lives, broadened your perspectives, and ignited your passions. May the words and images within these pages continue to inspire and entertain you. Happy reading!