CIRCADIAN AIML

JULY | ISSUE 10

THE OFFICIAL MAGAZINE OF THE
AIML DEPARTMENT

THE OFFICIAL MAGAZINE OF THE DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

THE MAGAZINE COMMITTEE EXTENDS ITS DEEPEST APPRECIATION TO **DR. RAJESH I S**, FOR THE SUCCESSFUL COMPLETION OF THE MAGAZINE

THE FOUNDERS

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

Shri B. S. Narayan
Founder & Donor Trustee

Shri B. M Sreenivasaiah
Founder. BMS Institutuions

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 andideals. 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 finestengineering colleges.

CIRCADIAN
ISSUE 10

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.

A Message From HOD

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

It gives me immense pleasure to present another issue of "Circadian" from the 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. This Magazine showcases 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.....

A Message From Associate Head

Dr Pradeep K R

Associate Head and
Associate Professor of
Artificial Intelligence and
Machine Learning

Dear Students,

Greetings to the aspiring innovators and trailblazers of the AI & ML department! As you explore the vast frontiers of Artificial Intelligence and Machine Learning, remember that you're shaping a transformative future. Embrace curiosity, foster creativity, and nurture the collaborative spirit that drives progress.

Your dedication anchassion are the keys to unlocking unimaginable possibilities. With cutting—edge advancements in Generative Al, Explainable Al (XAI), Natural Language Processing (NLP), and Reinforcement Learning, the potential for innovation has never been greater. These technologies are revolutionizing industries "creating new avenues for breakthroughs.

Stay ahead of the curve by embracing lifelong learning and experimentation. The world eagerly awaits the groundbreaking innovations you'll bring to light.

Committee Introduction

Meet Our Team

Dr Rajesh IS
Faculty Coordinator

Abhay Sharma
Student Coordinator

Vishishta Shenoy
Editor-in-Chief

Editing Team

Neha Myageri

Diya Ghorpade

Sunisha

Rohit M

Ananya Gupta

Design Team

Abhay Sharma

Kushal Raj

Sunisha

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.

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.

WHEN YOUR DATA TRAINS AI WITHOUT CONSENT

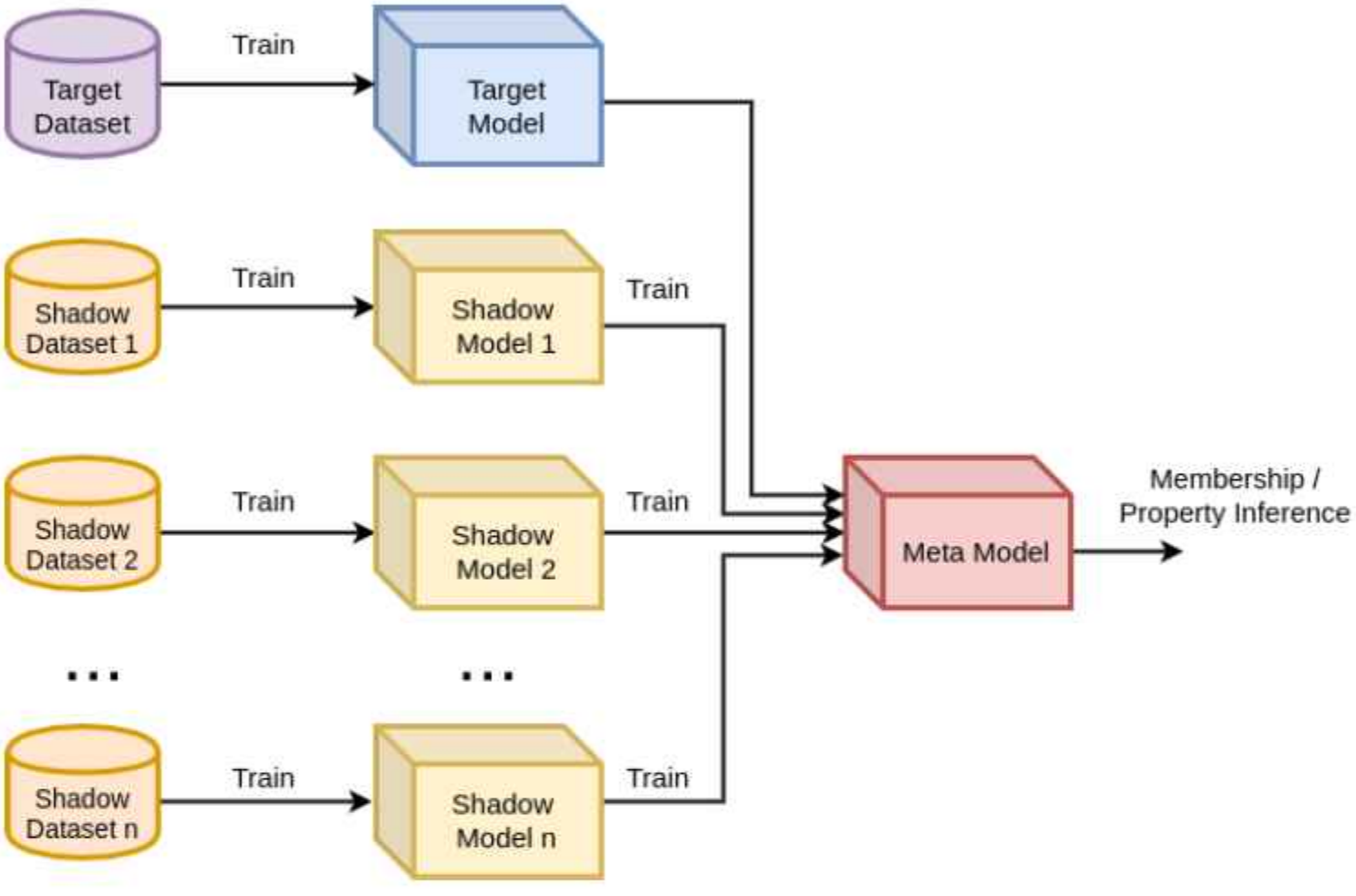
Shadow Models

"You are the dataset." This isn't just a catchy phrase; it's a stark reality for anyone online today. Every tweet, every piece of art, every review, and even that old blog post from 2012 might be shaping the intelligence of today's most powerful AI models. This is the world of shadow models – AI systems quietly trained on publicly available content, often without the original creator's knowledge or permission. As Large Language Models (LLMs) and generative AI grow incredibly sophisticated, the question of where they get their 'smarts' is becoming impossible to ignore.

The legal battles are already heating up. In 2023, the New York Times sued OpenAI and Microsoft, alleging their content was used without consent to train ChatGPT. Comedian Sarah Silverman and other authors have filed similar lawsuits. Meanwhile, artists on platforms like DeviantArt and Reddit started noticing their unique styles and ideas appearing in AI-generated art, sometimes eerily mimicking their own work. These models don't "steal" your files in the traditional sense. They don't download your entire blog or copy your high-resolution images. Instead, they absorb patterns. Think of it this way: an AI doesn't memorize a specific sentence, but it learns your tone, sentence structure, phrasing, or visual style. It then processes these patterns and remixes them into something "new." But if it looks and sounds just like your creation, is it truly original, or just a clever imitation?

Critics call this digital exploitation—a modern gold rush where tech giants mine creative content for free. They argue that it's financially beneficial for these companies to scrape the web for data rather than paying for licenses.

On the other hand, supporters argue that public data is fair game. They believe AI needs vast amounts of information to evolve and reach its full potential. From this perspective, restricting access to public data could stifle innovation and hinder the development of beneficial AI technologies. However, amidst these differing views, one fact stands out: the creators—you, me, and millions of others—are rarely asked for their direct permission. This lack of explicit consent lies at the heart of the ethical dilemma.



Shadow Training Architecture

Addressing shadow models is challenging because technology moves much faster than legal and regulatory bodies. Tools like "Have I Been Trained?" allow artists to check if their images were part of large datasets. Experimental tags like "Do Not Train" are also emerging, signalling a creator's wish for their content to be excluded from AI training. Yet, their effectiveness and enforcement remain uncertain. Lawmakers are just beginning to grasp the complex implications of AI's data demands. By the time regulations are drafted and enacted, the technology may have already advanced significantly, potentially limiting their impact. This creates a persistent gap where innovation often outpaces oversight. In a world where every post could feed a machine, consent becomes the new frontier. This isn't just about legal agreements; it's about digital dignity—the right to know where your data goes, and to say no.

Until then, you're not just online. You're in the dataset.

Vishishta Shenoy
1BY22AI123

THE RISE OF 1-BIT LLMS

Every smart assistant, concierge robot, natural language model and a self-driving car leverages a powerful backbone- the data centres. Data Centres are huge facilities that house computers and all the necessary infrastructure to store, use, process and manage large amounts of data for cloud services and organizations. Known as the digital brain of the world these centres are equipped with powerful servers and GPUs working around the clock to fuel Artificial Intelligence tasks. They serve as the nerve centre crunching data and enabling AI to interpret, adapt and learn from it.

However, as AI models grow exponentially both in terms of capability and size, their demand for computational power increases as well, thus making the dependency on data centres highly unreliable and unsustainable. Recently, there has been a radical breakthrough in Language Model Architecture: the advent of 1-bit LLMS.

1 BIT LANDSCAPE

WHAT ARE 1-BIT LLMS?

1-bit LLMs are ultra-efficient, highly powerful language models that possess the capability to shrink computation to minimal infrastructure, hence allowing AI tasks to run on smaller devices like smartphones and tablets, completely offline at just 5 watts of power. They work by quantization of weights and activations to a single bit, especially binary values like +1 and -1. While traditional models use 16 and 32-bit floating point numbers, 1-bit quantization significantly helps in model optimization and reduces energy consumption making it feasible to deploy server-bound LLMs on mobile and edge devices.

With aggressive quantization, model pruning, layer fusion, and hardware acceleration, research now shows that it is possible to run a 70B parameter model using 5 watts of power on custom chips and advanced mobile System-on-Chips (a single chip that includes CPU, GPU, AI Engine, Modem and Memory/Storage Controller). Pioneering work from institutions like MIT (BitNet), Alibaba DAMO, and Tsinghua University has proven that large binary LLMs can match or even rival the performance of full-precision models on tasks like summarization, Q&A, and translation. Companies like Meta, Google and Qualcomm are exploring on device LLM inference, integrating these advances into next-gen smartphones.

1-bit LLMs are built on Binary Neural Network (BNNs) where these models quantize both weight and activations to +1 and -1, replacing heavy matrix multiplications with lightweight XNOR and popcount operations to save memory and computational power. Language architectures like BitNet and BinaryBERT rely on transformers and keep some parts of the model in higher precision. Since it is hard to train these models directly, researchers used techniques like Straight-Through-Estimator (STE) to let the model learn non-differentiable binary weights. Different quantization methods were used to balance speed and accuracy of the models.

To optimize these 1-bit models, model pruning, i.e., removing unused weights, knowledge distillation and lightweight fine-tuning methods like LoRA are used. For embeddings, hash-based embeddings are being explored. These models also run really well on special hardware like FPGAs, AI chips in smartphones (like Apple Neural Engine), and other low-power accelerators.

SMART TRICKS THAT MAKE 1-BIT AI MODELS SURPRISINGLY POWERFUL

Even though 1-bit models are extremely compressed, they use clever techniques to stay accurate.

1.) **Quantization-Aware Training (QAT):** In QAT, the model is trained while simulating 1-bit precision thus making it learn and adapt to limited precision and preserving accuracy even after compression.

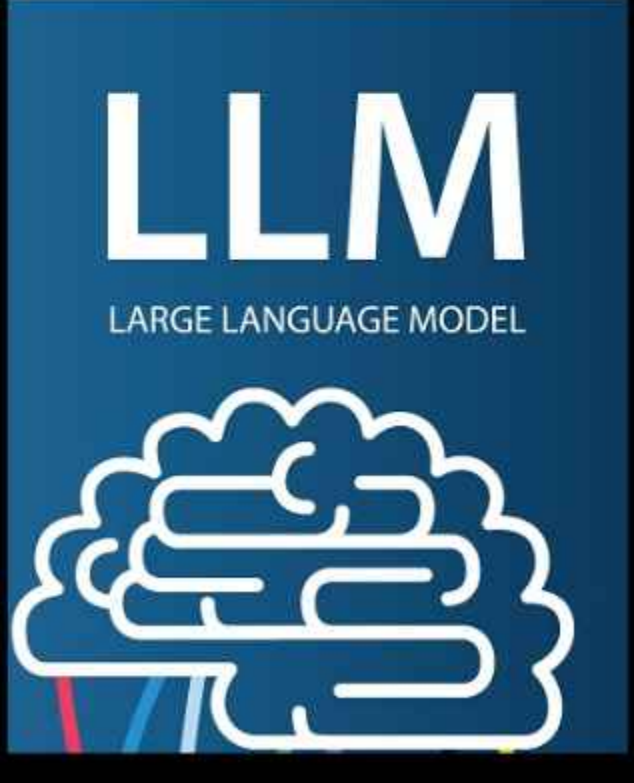
2.) **Low-Rank Adapters (LoRa) with Quantized Matrices:** LoRa adds side networks to the large model, allowing updates without changing all parameters, which when combined with quantization, helps models stay flexible and learnable while still being compact.

3.) **Knowledge Distillation:** A large, accurate model is used to guide the training of the smaller 1-bit model.

4.) **Custom Binary Layers and Activation Functions:** In 1-bit models, custom activation functions and binary operations are used and optimized for speed and hardware efficiency. This allows massive parallelization and fits large models into smaller memory.

FUTURE SCOPE OF 1-BIT LLMS

The invention of 1-bit LLMs shows a paradigm shift in the way we interact with AI tools. They serve as the cornerstone of power-efficient and decentralized intelligence. This will drive a shift from cloud-based AI to fully offline, private, and real-time AI assistants in consumer electronics. 1-bit LLMs can be used to make AI tools accessible in remote regions and extreme environments such as space missions, underwater robotics and military grade equipment. The modularity and lightweight nature of 1-bit models will support the development of micro-agents — small, purpose-built AI models that handle specific tasks. 1-bit LLMs are a transformative step toward scalable, privacy-preserving, and eco-friendly AI. As hardware and training methods improve, their role in the AI ecosystem will continue to expand, bringing cutting-edge intelligence closer to everyone, everywhere.



Diya Ghorpade
1BY23AI045

Students Workshop Conducted

The Department of Artificial Intelligence and Machine Learning has conducted a workshop on **"Entrepreneurship and Innovation"** from 09:30 AM to 12:30 PM on 9th April 2025, in association with the Department of Computer Science and Business Systems, under the Institution's Innovation Council (IIC) initiative. The session was exclusively organized for 4th semester students and was held at the Dr A P J Abdul Kalam Innovation Laboratory.

Ms. Ashwini Raju, Founder of **Raj Avanta**, delivered an insightful session on entrepreneurship, covering idea validation, product development, and funding with real-life examples. The workshop encouraged innovative thinking and explored how technologies like AI support business growth. Students actively engaged in discussions, gaining practical insights into the startup ecosystem and bridging the gap between academics and real-world entrepreneurship.

Department Of AI & ML Organized Student Development Program on **"Full-Stack Development using Python, Django & PostgreSQL: A DBMS Approach"** for 4th semester students in collaboration with the department of CSBS from 6.3.2025 to 8.3.2025.

Students Achievements

M Krishna Prasad, Kushal Raj GS, Kritik Gianța, Navanith V, 4th Sem. students Won 3rd place with a cash prize of Rs. 14,000/- at National Level Social Hackathon at CMR Institute of Technology held on 16.5.2025 Project: BIOBLOOM.

Mr. Akash J P 6th Sem. A Section selected as IEEE AESS Student and Young Professionals (SYP) Travel Grant of $800 for the upcoming AESS SYP event in Nairobi, Kenya taking place from Aug. 13 to 15, 2025.

All the answers can be found at last.

BRAIN BUSTERS

TEST YOURSELF

CODE SCRAMBLE

Unscramble these AI/tech terms!

SCRAMBLE	CLUE
RTONES	Multi-dimensional array in ML
EMDOL	What you "train" on data
OTROB	Physical automaton that carries out tasks
NREFEICNE	When a model makes a prediction
KOREWTN	Many Connected Computers

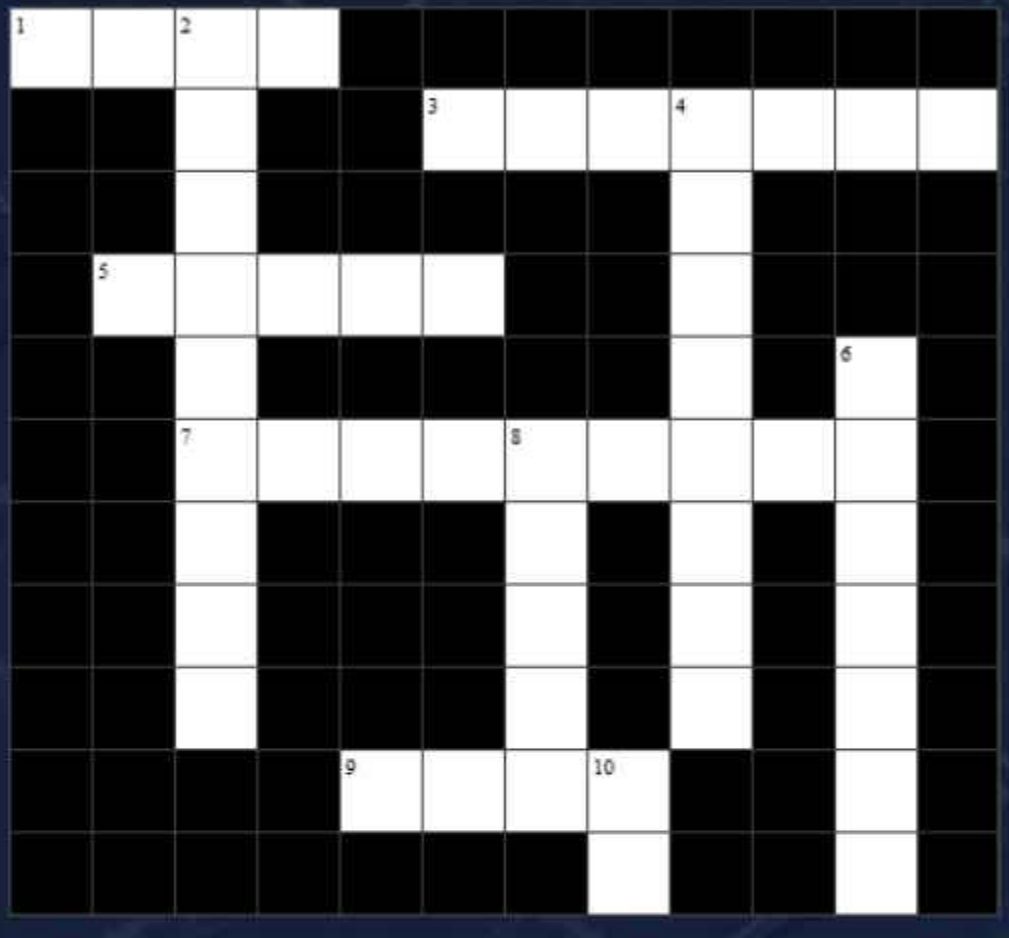
RIDDLE ME TECH!

Think Like a Bot

01 I have keys but no locks,
I have space but no rooms,
You can enter but you can't go outside.
What am I?

02 I store your facts and figures bright,
Accessible anytime, day or night.
What am I, that shines with digital light?

CRACK THE CROSSWORD!



Click on the Button or Scan the QR to Solve this Fun Interesting Crossword

Sideways

1. Unfair preference in data or predictions

3. Text-based AI you can "chat" with

5. What you "train" on data to make predictions

7. When a trained model makes a prediction

9. Raw facts and figures used to train models

Down

2. Step-by-step recipe a program follows

4. Process of teaching a model by feeding it examples

6. Group of connected neurons (or computers)

8. Physical machine that can carry out tasks

10. Abbreviation for machines "thinking" like humans

All the answers can be found at last.

DEPARTMENTAL PROFESSIONAL AND TECHNICAL ACTIVITIES

International Conference Organized

The AR VR HUB of CSE & AIML had organized the orientation sessionon 20th May 2025 at 11.00 AM for The Changemakers World Cup, powered by **1M1B (1 Million for 1 Billion)** – a global initiative aligned with the UN to empower young leaders and innovators. This prestigious platform identifies India's Top 500 student changemakers, offering life-changing opportunities including:

- National recognition as a Top Changemaker.
- Leadership and innovation on campus.
- Chance for the Top 50 to present at the 1M1B Activate Impact Summit at the United Nations HQ, New York.

Amphitheatre

Seminar Hall

B.M.S. Institute of Technology and Management in collaboration with the National Research University of Electronic Technology (MIET), Russia, and with technical co-sponsorship from the IEEE Bangalore Section, successfully hosted the International Conference on **"Computing for Sustainability andIntelligent Future"** (Comp-SIF 2025) on March 21, 2025.

FDP Conducted

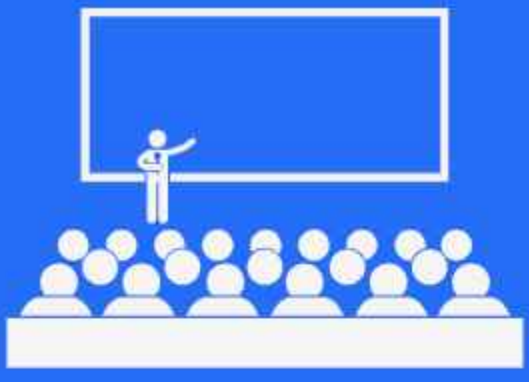
Departments of Artificial Intelligence & Machine Learning (AI & ML) and Computer Science & Business Systems (CSBS) has conducted an FDP on **"Quantum Machine Learning: Bridging AI and Quantum Computing"** from 03.02.2025 to 07.02.2025, Sponsored by IEEE Circuits and Systems Society Bangalore Chapter.

Expert Talks

Department of CSE/AIML/ISE/CSBS organized an expert talk titled **"Case Studies and Real time examples MCP Operating System and OS 2200."** The seminar aimed to provide students and faculty with an in-depth understanding of two significant operating systems developed by Unisys: The Master Control Program (MCP) and OS 2200. This was organized in Collaboration with Unisys and the resource persons were Siyamala, Narayanan, Ravi Kumar and Shamanth. The event was organized on 21.03.2025 from 11.00 AM to 1.00 PM and 1.30 to 3.00 PM, at Seminar Hall, 5th Floor, BSN Block.

Alumni Interaction

The Department of **AI & ML** in association with **IEEE** Computational Intelligence Society (CIS) Student Branch Chapter (SBC) of BMSIT & M successfully conducted The GATE Prep Bootcamp: CS & AI Edition on 16.05.2025, with enthusiastic participation from students across the CSE, ISE, and AIML departments. The session aimed to provide strategic guidance and motivation for students aspiring to crack the GATE examination in Computer Science. The event officially commenced at 10:00 AM, with a brief introduction by **Mr. Umashankar**, Student Chair - IEEE CIS SBC, who welcomed the participants and outlined the purpose of the bootcamp. This was followed by encouraging words from Prof. Sanjay M Belgaonkar, the Faculty Advisor of IEEE CIS SBC, who emphasized the importance of such academic initiatives. Further setting the tone for the session, Dr. Anupama H S, HoD, Dept. of AI & ML addressed the attendees and stressed the significance of early preparation and guidance for competitive exams.



The bootcamp featured **Ms. Anjali Chauhan, AIR 13** in GATE CS 2023 and current M.Tech scholar at the Department of CSA, IISc Bangalore, as the keynote speaker. She shared her GATE preparation journey, resource strategies, time management tips, and addressed common doubts from students. Her insights were both practical and inspiring, drawing attention to the importance of early preparation, consistency, and conceptual clarity

HACKATHONS

The Department of Artificial Intelligence and Machine Learning conducted a 12-hour internal hackathon titled **NeuroNova-25** on 27 March 2025, under the banner of **Tech-Transform** and the Institution's Innovation Council (IIC) initiative. Held from 8:00 AM to 8:00 PM in the department's laboratories, the event saw active participation from 200 students across 55 teams, focused on developing impactful solutions using AI and AR/VR technologies.

Two real-world problem statements were given: AI-powered deforestation monitoring using satellite imagery and AR/VR-based smart farming for disease detection and productivity enhancement. After the initial round, 22 teams advanced to the final phase, presenting prototypes featuring satellite image segmentation, biodiversity risk mapping, AR-assisted agricultural planning, and interactive data dashboards.

Winners

Seminar Hall

Mr. Dion D'Sa, Director of Business Development in XR and GenAI, delivered an insightful address, motivating students with industry-aligned perspectives. The event concluded with the felicitation of six winning teams, recognized for their innovation and execution, and awarded cash prizes.

NeuroNova-25 provided an engaging platform for experiential learning, promoting technological innovation and social impact among aspiring engineers.

SORA

WHEN AI STARTS TURNING SCRIPTS INTO SCENES

Every once in a while, a piece of technology arrives that quietly resets expectations. Sora is one of those. It doesn't shout for attention, but the moment you see what it does, you start to rethink what's possible.

Sora is a new AI model from OpenAI that generates high-quality, realistic video content from plain text prompts. You write a sentence, and Sora translates it into moving images complete with perspective, lighting, characters, motion and detail. Not animation. Not editing. A fully original clip built from scratch.

WHAT IS SORA?

Sora is a text-to-video model. Technically, it uses a diffusion process, where it starts with random noise and gradually builds a video that matches the input prompt. Conceptually, though, it's something much more intuitive: a way to describe a visual idea and see it come to life without cameras, sets, or editing software.

The system has been trained on a wide range of video and image data, which means it doesn't just understand how things look—it also understands how they behave over time.

A dog running, a curtain blowing in the wind, a camera panning across a crowd—Sora captures those dynamics with a surprising amount of realism.

It can produce up to a minute of continuous footage, with consistent objects, smooth transitions and even basic physics. There's a sense of coherence across the timeline that earlier models lacked. The result isn't just a video—it's a convincing sequence.

WHY IT MATTERS

The implications of Sora go well beyond technical achievement. For creatives, marketers, educators, and startups, it opens up an entirely new way of producing content. What used to take days of planning, design, and editing can now be prototyped in minutes.

A filmmaker can storyboard ideas instantly. A brand can test campaign visuals before committing to a shoot. An educator can explain complex ideas with generated visual examples. The entry barrier to storytelling just got dramatically lower.

WHAT SETS SORA APART

The visuals are surprisingly close to real video footage, often indistinguishable at a glance. Objects and people stay consistent throughout the clip. There are no jarring transitions or disappearing limbs. Small changes in the input text lead to meaningful changes in output. The model seems to understand not just words, but context and nuance.

That said, it's not perfect. Like most generative systems, it occasionally fumbles with hands, facial expressions, and complex interactions. It also can't yet generate dialogue or meaningful narratives. But given how far it's come already, those limitations feel more like temporary bugs than permanent boundaries.

CONCERNS IN THE FRAME

With great power comes great responsibility—a line we've all heard before, but one that feels especially relevant now.

Sora's ability to generate near-realistic video content opens up exciting creative possibilities, but also raises serious concerns. In the wrong hands, it could become a tool for misinformation, deepfakes, or manipulation on a scale we've never seen before. In an age where video evidence carries enormous weight, the idea that realistic-looking footage can be generated from scratch is as unsettling as it is impressive.

There's also the question of originality. As AI models begin pulling visual styles, patterns, and cultural references from massive training datasets, where do we draw the line between inspiration and imitation? And in terms of ownership—who exactly owns what's generated?

As a cinephile, it's personally a little unnerving to watch AI move into territory that was once purely human. Film has always been a medium where craft, instinct, and emotion come together. Seeing an algorithm now capable of recreating that—at least visually—makes you wonder how much of what we love about cinema is replicable, and how much is irreplaceable.

These aren't just technical questions. They're creative and cultural ones too. And as this technology continues to evolve, we'll need to be just as thoughtful about its use as we are amazed by its potential.

WHERE THIS LEAVES US?

Sora isn't the end of human creativity—it's a new tool for shaping it. It lowers the barrier to visual storytelling, but it doesn't remove the need for imagination, clarity, or taste. In fact, in a world where anyone can generate a video, what will matter most is not the ability to create, but the ability to create something meaningful.

For students like us, that's both a challenge and an opportunity. Learning how these systems work, how to prompt them effectively, how to use them ethically—these are fast becoming essential skills.

We're not just studying machine learning anymore. We're studying how machines can learn to express, to visualize, and maybe one day, to direct. That future isn't theoretical anymore. It's rendering now.

Rohit M
1BY23AI129

Therefore, I rest my case here, Your Honour.

Artificial Intelligence taking the jobs of lawyers? The last segment of people whose jobs were expected to be taken. Will AI be able to understand the complexities of an entire state's law system? Will AI actually be able to investigate as a prosecutor? Will AI have the ability to find the echo of humanity in the deepest of crevices?
Questions raised.

Artificial Intelligence, the Tony Stark of the tech world today. Every newspaper, every article, and every media house has at least one mention of the words "artificial intelligence." The Stark man is omicroned into almost every industry, including obviously software, medicine, writing, and cinema. Every app uses AI chat friends like Disha (IRCTC), Alexa (Amazon), and of course Google's own AI assistant, Gemini. But never had we ever thought AI's next big project would be a state's judiciary system.

AI is now revolutionizing evidence investigation. It is being used to help lawyers in collecting evidence and much more.

Here are some cases:

Case Crunch

A UK-based AI website specializes in legal decision predictions. They aim to solve law by finding out whether there is a right answer to a question of law within an objective dimension. If such a dimension exists, they strive to make it transparent and accessible. If it doesn't, they want to work with the public to create one because there can be no justice without objective legal knowledge.

Netherlands & Estonia: AI in Judicial Automation

Estonia is widely recognized for its advanced digital infrastructure, having pioneered initiatives such as e-residency and online voting. Building on this foundation, the Estonian government is now integrating artificial intelligence (AI) into public administration to enhance decision-making speed and efficiency.

Cool, right?

But AI can mess up, and big time!

If AI is biased, it might unfairly reject someone's benefits or accuse the wrong person, especially individuals from minority or vulnerable groups.

Countries which messed up:

• Netherlands: Thousands of families were wrongly punished by a tax AI, some even lost their children

• UK: Their AI for catching welfare fraud targeted old people, disabled people, and foreigners more than others

Other than that, AI has been used to manipulate or even hallucinate cases like the DoNotPay case.

DoNotPay, created by 19-year-old Stanford student Joshua Browder, is the world's first robot lawyer. It helps users appeal parking tickets through a simple chat interface by asking basic questions and guiding them through the process. Since launching in London and New York, it has handled 250,000 cases and won 160,000 with a 64% success rate, saving users over $4 million.

Chaos arose when the FTC claimed DoNotPay misled users by advertising itself as a "robot lawyer" without proof that it could match human attorneys and without employing any lawyers. Under a proposed settlement, DoNotPay will pay $193,000 and must inform 2021–2023 subscribers about its service limits. The case, part of the FTC's "Operation AI Comply," underscores that AI companies face the same rules against deceptive practices as everyone else.

To conclude, AI in the judicial system can help lawyers, but understanding a country's constitution and amendments isn't feasible for AI, not yet. It's still a long way to go. But if we do get there, we might just build one of the finest advocates of all time.

Neha Myageri 1BY23AI093

INDUSTRIAL VISITS

The Department of AIML organized an industrial visit for 4th semester students to Centum Electronics Ltd, Bengaluru on 23rd May 2025. The visit aimed to give students practical exposure to electronics and their role in AI & ML systems.

A total of 80 students took part in the visit, accompanied by Dr. Rajesh I S and Prof. Umesh T, who facilitated the tour and coordinated student-industry interactions.

An industrial visit was conducted by the Department of AI & ML for 4th semester students to Centum Electronics Ltd, Bengaluru on 22nd May 2025. The visit focused on understanding industrial practices and the application of electronics in emerging technologies.

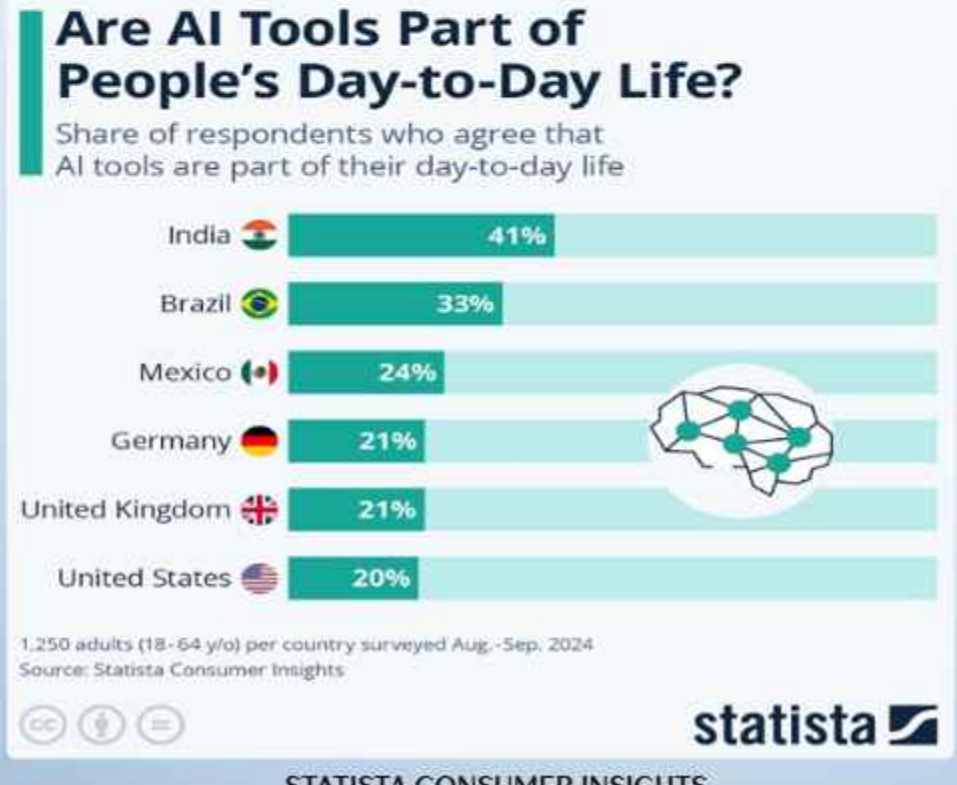
100 students participated in the visit, guided by Prof. Megha, Prof. Shruthi S, and Dr. Archana, who ensured a smooth and enriching experience.

WILL AI MAKE US "COGNITIVELY" DUMBER?

AI is becoming a big part of everyday life and work. It promises to make things more efficient, but it also makes people worry about how it will affect their minds. This makes them recall less and be less engaged with knowledge when computers do their normal thinking for them.

Rising Use Of AI

With the public release of ChatGPT in 2022, AI LLMs have gained massive popularity among working professionals and creative minds as well. We can see the inclusion of AI in nearly all of our daily life products that use electricity, be it as simple as our washing machines, to critical fields such as advanced healthcare. It's shocking that about 41% of Indians utilize AI tools every single day.



STATISTA CONSUMER INSIGHTS

SMART MACHINES, SLOWER MINDS?

According to a study conducted by researchers at the Massachusetts Institute of Technology, participants were divided into three groups: "LLM, Search Engine, and Brain-only (no tools)." The groups were studied across three sessions of essay-writing, while their cognitive load was tracked with electroencephalography (EEG).

"EEG revealed significant differences in brain connectivity: Brain-only participants exhibited the strongest, most distributed networks; Search Engine users showed moderate engagement; and LLM users displayed the weakest connectivity. Cognitive activity scaled down about external tool use."

So, how is AI making us Dumber?

Well, the answer is not very simple. When humans over-rely on AI to do mental tasks like writing, planning, or decision-making, it can lead to changes in the human mind and not just behavioural changes, but physical changes as well.
It has the following effects on the human unconscious mind:

- **Cognitive Offloading:** Cognition refers to the mental processes involved in acquiring knowledge and understanding through thought, experience, and the senses. As a result, Memory, critical thinking, and problem-solving skills are all declining because of our over-dependence on AI to recall, write, compute, and plan.
- **Loss of Skill Mastery:** AI provides immediate answers and automatically creates code, so why learn to memorize data or write code from scratch?
- **Reduced Attention Spans:** We are trained to absorb information in short periods by AI-powered content algorithms (YouTube and Reels), which makes it harder for humans to concentrate on complex activities.
- **Over-reliance impairs judgment** since it encourages independent critical thinking and questioning of AI's outputs.

Over time, this can lead to a decline in abilities such as memory retention and critical thinking. Despite its potential to simplify tasks, these effects suggest that AI may weaken the cognitive skills that give humans an edge in solving human problems.

BUT IT'S NOT ALL BAD

If we utilize AI correctly, it can actually make us smarter instead of stupid. AI can enhance learning, creativity, and sharpen human cognitive powers when considered more as a co-worker than a replacement. It is up to us to keep our curiosity, question the advantages of AI, and utilize it to enhance instead of fully replace our brainpower. **AI and humans working together is the future of intelligence, not just ARTIFICIAL INTELLIGENCE**

Abhay Sharma
1BY22AI004

Securing the Future

NIST's Quantum-Proof Encryption Algorithms

In a significant leap toward securing the digital world of tomorrow, the U.S. Department of Commerce's National Institute of Standards and Technology (NIST) has selected a set of advanced encryption algorithms designed to withstand the potential threats posed by quantum computers.

While quantum computing remains largely experimental today, its potential to break the mathematical foundations of current encryption methods has long been recognized by cryptographers. If left unaddressed, this could jeopardize the security of everything from online banking to email systems. In response, NIST initiated a global search for quantum-resistant encryption techniques back in 2016. Now, after six years of rigorous testing and international collaboration, the agency has unveiled the first four algorithms set to become part of its forthcoming post-quantum cryptographic standard.

WHY THIS DEVELOPMENT IS IMPORTANT

Encryption forms the backbone of digital security. It protects personal and financial data, verifies identities, and ensures the privacy of communication. Most public-key encryption systems today rely on problems that are currently too complex for classical computers to solve. However, a sufficiently powerful quantum computer could one day solve these problems with ease, rendering current encryption obsolete.

By proactively developing and standardizing quantum-resistant alternatives, NIST is ensuring that governments, businesses, and individuals can continue to trust digital systems well into the future. This is not just about theoretical threats—it's about preparing infrastructure and institutions for real-world resilience.

The Four Algorithms Selected by NIST

1. CRYSTALS-Kyber: This algorithm is intended for general encryption, such as securing website connections. Its main advantages are speed and compactness, using small encryption keys that make data exchange efficient and practical for modern networks.

2. CRYSTALS-Dilithium: Designed for digital signatures, Dilithium is NIST's recommended primary algorithm for identity verification in online communications and electronic document signing. It is known for its high efficiency and strong security foundation.

3. FALCON: Like Dilithium, FALCON is used for digital signatures but stands out for producing smaller signatures. This makes it especially useful for applications with tight storage or bandwidth constraints.

4. SPHINCS+: While slower and larger than the others, SPHINCS+ offers a unique advantage: it is based on a different mathematical approach (hash functions), making it a robust backup should vulnerabilities be discovered in the lattice-based algorithms.

Together, these four represent a balanced and diversified toolkit against future threats, forming the core of NIST's first post-quantum cryptographic standard. Another round of algorithms, primarily focused on alternative methods for general encryption, is still under review.

STEPS TO PREPARE FOR THE TRANSITION

Although the new standard is still under development and expected to be finalized in the next two years, NIST recommends that organizations begin preparing now. This includes:

- Identifying applications and systems currently relying on public-key cryptography.
- Notifying IT teams and software vendors about the impending change.
- Exploring the new algorithms and evaluating how they might be integrated into existing systems in the future.

At this stage, NIST advises against deploying the new algorithms in production systems, as some adjustments may still be made before they are finalized.

Future Scope: What Comes Next

As quantum computing evolves from theoretical to practical, its impact on cybersecurity will grow significantly. The algorithms selected by NIST represent a crucial first step, but they are just the beginning of a broader shift in cryptographic practice. In the coming years, we can expect to see:

- The integration of quantum-resistant algorithms into widely used internet protocols and software systems.
- Increased collaboration between government, academia, and private industry to support seamless migration.
- New research into hybrid cryptographic models that combine classical and quantum-resistant techniques during the transition phase.

Ultimately, the proactive standardization of these algorithms positions society to meet the challenges of a post-quantum era with confidence, preserving digital trust in the face of technological disruption.

The work of NIST and the global cryptographic community serves as a reminder that while technology constantly evolves, so too must our strategies for safeguarding it. Quantum computing may redefine the limits of possibility, but thanks to these new encryption tools, our data doesn't have to be left behind.

WHEN NPC'S BROKE THE SCRIPT

For decades, Non-Player Characters or NPCs have been tying game worlds together to provide an engaging experience. Be it relentless ghosts chasing players around in Pac-Man or the townsfolk that remember the players every little move in Red Dead Redemption. NPCs have continually made the gaming experience challenging. But the typical NPC often leaves something to be desired.
Imagine stepping into a game where non-player characters (NPCs) do not just follow scripted paths, but dynamically respond, learn, and interact with players. This is not a distant future scenario, it is happening right now.

NPCs have gotten smarter

The term 'AI' has been used in games for decades. It is gradually transforming NPCs from simple clue givers to interactive characters like those in The Sims. The way AI is implemented in games has transformed over the years.

Deterministic NPC AI
These NPCs are strictly predictable, following fixed algorithms. Think of them like a chasing Pac-Man ghost or a boss with unchanging attack patterns; their limited, often repetitive dialogue reflects this rigid programming.

Nondeterministic NPC AI
Offering more unpredictable behaviour, these NPCs can learn and react to player actions. While they adapt combat styles (making bosses tougher), their conversations remain constrained by pre-written dialogue trees, limiting genuine interaction.

Generative NPC AI
Powered by neural networks, this AI can create entirely original content, text, images, even videos for NPCs. This breakthrough allows for NPCs with true autonomy, dynamic relationships, unique goals, and dramatically transformative gameplay experiences.

What is under the hood?

As mentioned before, at the core of AI-generated NPCs are sophisticated neural networks and machine learning models. These systems are trained on vast datasets of human interaction, dialogue patterns, and behavioural models.
By processing these complex inputs, AI can generate character responses that feel increasingly natural and unpredictable.

NVIDIA has been a leading player in making AI based NPCs, redefining gameplay with ACE Autonomous Game Characters. NVIDIA ACE characters function as autonomous squad members, following orders, collecting and sharing loot, and engaging enemies.
For instance, the Co-Playable Character" (CPC) PUBG Ally offers strategic suggestions by independently perceiving and understanding dynamic events occurring around them and take the necessary steps to complete an action or order, without additional prompting or assistance from the player.

In Naraka: Bladepoint, AI Teammates can join a player's party and actively fight alongside them in melee-focused battles, aiding where it is needed most. These AI companions can intelligently find specific items the player needs, swap gear to optimize loadouts, and even offer suggestions on which skills to unlock.

"Smart Zoi" NPCs in in ZOI act autonomously within the game's city, driven by their own life goals and reacting dynamically to their environment and events. They develop inner thoughts, reflect on their day, and adjust their schedules, creating unique and evolving personalities that contribute to a comprehensive community simulation.
The complex social situations so generated make the virtual world feel more alive and unpredictable.

What does this mean for gamers?

Gamers will interact with NPCs that have autonomy, independent goals, and their own decision-making processes. Consider an enemy who can get creative in how they plot your downfall. Or a merchant who can tell you about a secret all-powerful sword only if you mention weapons.

How a game unfolds – and how it can be replayed – is about to be transformed. Think of AI characters in video games that will only give you a clue if you ask the right question or earn their trust. Or a quest giver that will decide which quest to send you on based on your conversation and interests.

These NPCs develop player profiles, allowing gamers to influence the narrative in a deeper manner. Imagine playing a game where NPCs treat you differently because you bumped into them earlier. Or consider how your helpful interactions with an NPC could mean they come and help you later.

In a game with AI-powered NPCs, relationships with characters could evolve based on interactions over time. A slighted NPC might hold a grudge, while a frequently helped NPC might become an ally. It would be like having game mechanics where you are required to gain the trust of an NPC before they tell you a secret or you can get to the next level. Or a game where you could beat a boss by fighting him or making him your friend - your choice!

The future of gaming might be worlds that are truly dynamic and evolve entirely based on the players' actions. In these worlds – which are currently only dreamed of – entire ecosystems, societies, and environments could potentially organically grow, change, and react to the players' strategies and decisions.

The unpredictable nature of AI NPCs

Unlike traditional scripted characters, AI NPCs can generate responses that even their creators cannot anticipate. This creates a double-edged sword for game design. The unpredictability that we rely on to make immersive game world can create nonsensical interactions, or even expose critical system vulnerabilities.

AI-generated NPCs are based on Machine Learning models. They struggle with understanding the hidden nuances in natural language, making it challenging to generate genuine emotional responses. A 2023 report from the Gaming AI Research Centre highlighted that even state-of-the-art AI models can produce nonsensical or inappropriate responses up to 22% of the time when placed in complex interactive scenarios.

Creating truly adaptive AI NPCs is not just an algorithmic challenge—it is a massive computational undertaking. Each dynamic interaction requires significant processing power, impacting game performance and user experience.

Game developers must constantly balance between creating intelligent, responsive NPCs and maintaining smooth, lag-free gameplay. It is a delicate tightrope that requires sophisticated engineering and continuous refinement.

Let's talk ethics

One of the most pressing ethical concerns for AI, in general, is the potential for inherent bias. Machine learning models are trained on existing datasets, which can inadvertently reflect societal stereotypes and discriminatory patterns. Imagine an RPG where character interactions have undertones of gender stereotypes or racial slangs—not intentionally, but due to unexamined algorithmic training.

Research suggests that AI systems can inherit biases present in their training data. A 2022 study by the AI Fairness Institute found that approximately 68% of machine learning models showed some form of demographic bias in character generation and interaction patterns. This is not just a technical issue—it is an ethical challenge that demands careful intervention.

NPCs build player profiles to generate an immersive experience. They collect vast amounts of data, which raises the questions: Where does this data come from? How is it collected, processed, and protected? The line between game design and potential data exploitation becomes increasingly blurred.

Players might unknowingly contribute to a system that harvests and repurposes their digital interactions in ways they never consented to.

The ability of NPCs to have original thought processes, and ability to form complex relationships give rise to another interesting issue; Can an AI character truly consent? Do they have rights? How do we ensure ethical treatment of these increasingly complex entities?

Future Trends in AI for NPCs

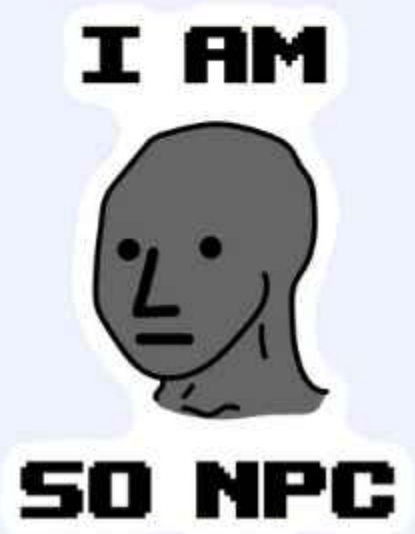
In the future, NPCs might become even more lifelike. With advancements in AI, NPCs might be able to hold conversations with players, remember past interactions, and change their behaviour based on long-term relationships. This would make games even more immersive and engaging.

New AI technologies like deep learning and neural networks could make NPCs even smarter. These technologies allow computers to learn and make decisions in ways that are like how the human brain works. This means that NPCs could become better at understanding and reacting to the player's actions.

AI in games is heavily influenced by other fields like psychology and robotics. For example, understanding human behaviour can help developers create more realistic NPCs. Robotics can also provide insights into how to create NPCs that can interact with the physical world. By combining knowledge from different fields, game developers can create NPCs that are more advanced and believable.

The Final Word

The rapid development of Generative AI and Machine Learning promise to create NPCs that transform game worlds into true virtual realities. This exciting prospect comes at the price of expensive computational processing and ethical dilemmas that make the grey area of AI a lot more blurry.



Ananya Gupta
1BY23AI018

Faculty Achievements

Dr Anupama HS

- Dr. Anupama H S, has undergone industry internship at Academy of Skill Development by Ardent Software services Kolkata, India on generative AI and Prompt Engineering from 01.08.2024 to 01.09.2024 (8 Weeks).
- Dr Anupama H S, Professor and Head, Department of AI&ML was a Chairperson at World Standards Day 2024 organized by Bureau of Indian Standards (BIS), Ministry of Consumer Affairs, Food and Public Distribution, Government of India on 14.10.2024 at Bengaluru.
- Dr. Anupama H S, Professor and Head, Department of AI&ML, reviewer for the 8th International Conference on Computational Systems and Information Technology for Sustainable Solutions, Organized by RV College of Engineering in association with Florida International University, Fachhochschule Dortmund, Germany. Technically Io-Sponsored by IEEE Bangalore Section, India held from 7.11.2024.

Dr Bharathi Malakreddy

- Dr. Bharathi Malakreddy A, Professor and Head of the R & C Cell, Department of AI&ML received the "Best Researcher" Award on Engineer's Day, from BMSIT&M on 20.09.2024.
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Dr Pradeep KR

- Dr. Pradeep K R, has undergone industry internship at Academy of Skill Development by Ardent Software services Kolkata, India on Generative AI and Prompt Engineering from 01.08.2024 to 01.09.2024 (8 Weeks).
- Mahesh, R., K. L. Abhishek, and G. M. Pradeep kumar. "Enhancing Retrieval-Augmented Generation via Dual-Granularity Document Indexing." In 2025 International Conference on Computing for Sustainability and Intelligent Future (COMP-SIF), pp. 1-5. IEEE, 2025.
- Dr Pradeep K R, Associate Professor and Associate Head, reviewer for the 8th International Conference on Computational Systems and Information Technology for Sustainable Solutions, Organized by RV College of Engineering in association with Florida International University, Fachhochschule Dortmund, Germany. Technically Co-Sponsored by IEEE Bangalore Section, India held from 7.11.2024.

Dr Rajesh IS

- Rajesh, I. S., Bharathi Malakreddy, Bharati M. Reshmi, Nidhi Umashankar, Manjunath Sargur Krishnamurthy, and S. Chandrappa. "Automated Retrieval of Retinal Blood Vessels in Color Fundus Images." In 2024 Fourth International Conference on Multimedia Processing, Communication & Information Technology (MPCIT), pp. 190-194. IEEE, 2024.
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Dr Manoj HM

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Dr Kantharaju V

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Dr Sanjay M Belgaonkar

- Prof. Sanjay M Belgaonkar, has undergone industry internship at Academy of Skill Development by Ardent Software services Kolkata, India on Generative AI and Prompt Engineering from 01.08.2024 to 01.09.2024 (8 Weeks).
- Prof. Sanjay M Belgaonkar, Asst. Professor, Dept. of AI & ML received the Certificate Appreciation from the company Hack2Skill Private Limited, Noida, UP in recognition of his contributions and support as an academic partner in conducting AI Builders Lab presented by Google for Developers.
- Prof. Sanjay M Belgaonkar, Asst. Professor, Dept. of AI & ML attended an IEEE CAS Seasonal School on Quantum Computing held at IISc, Bangalore on 9.11.2024 to 10.11.2024.

Mr Sachin A U

- Prof. Sachin A U, has undergone industry internship at Academy of Skill Development by Ardent Software services Kolkata, India on Generative AI and Prompt Engineering from 01.08.2024 to 01.09.2024 (8 Weeks).

Answer Sheet

Code Scramble

RTONES --- TENSOR

EMDOL --- MODEL

OTROB --- ROBOT

NREFEICNE --- INFERENCE

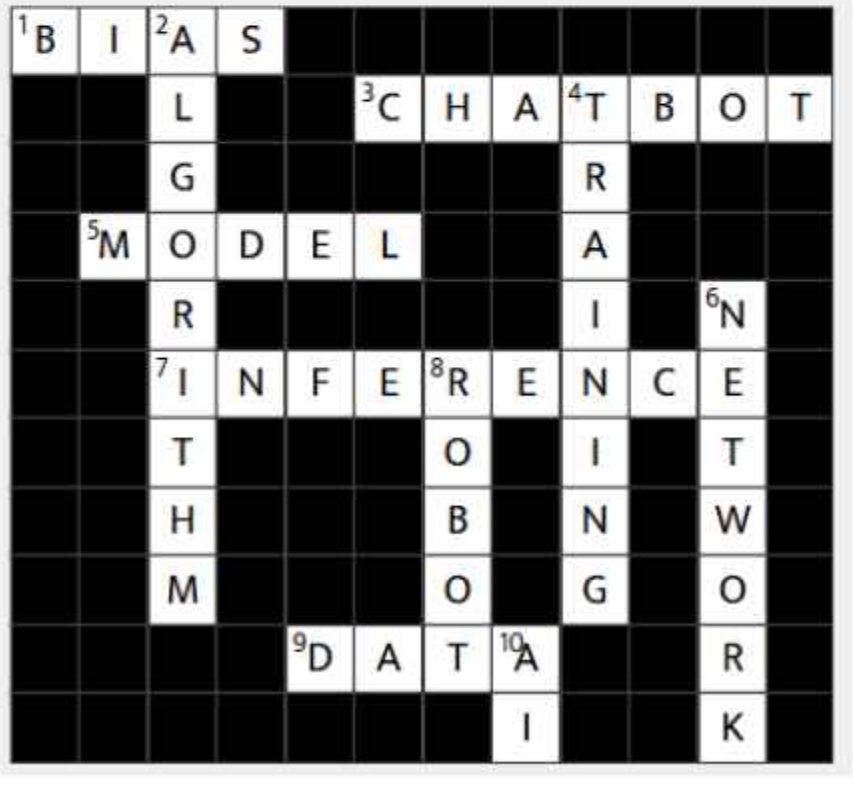
KOREWTN --- NETWORK

Riddles

01 - KEYBOARD

02 - CLOUD

CrossWord



Dear Readers,

As we close another edition of CIRCADIAN, we want to pause and express our heartfelt gratitude to you. Your curiosity and engagement have made every story, every insight, and every shared discovery meaningful.

This edition has been a journey of exploration - from emerging technologies to evolving education, from innovative solutions to inspiring possibilities. Through each page, we've aimed to spark conversations that matter and ideas that resonate. Your commitment to learning and growing with us has been both humbling and motivating. You've turned these pages into living conversations, these articles into launching pads for new thoughts and perspectives.

Thank you for being part of our CIRCADIAN community. For every minute you've spent with our words, for every idea you've contemplated, for every story you've carried forward- we are grateful. While this edition comes to a close, the conversations and connections it has sparked will continue to flourish.

Here's to many more editions of discovery together. With appreciation,

-Thank You-

Sincerely,
The CIRCADIAN Team