



**BMSIT INSTITUTE
OF TECHNOLOGY AND MANAGEMENT**

CIRCADIAN

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



ISSUE 5

FOUNDERS



Shri B. M Sreenivasaiah
Founder, BMS Institutions



Shri B. S. Narayan
Founder & Donor trustee

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 realised the necessity of technical education even before the country got independence. He was honoured 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, moulded BMS College of Engineering into one of the finest engineering colleges. 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 International Co-operative Division, cross cultural program 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, being 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.

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VISION AND MISSION

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 outcome through place-based education and collaborations with established research labs and industries.
- Encourage entrepreneurship efforts among students and develop them into great leaders

HOD'S MESSAGE



Ever since the department of Artificial Intelligence and Machine Learning started its journey, the department has been simultaneously and successfully performing the multiple roles of creating new knowledge, acquiring new capabilities and producing an intelligent human resource pool contributing in various domains of the society. The Department has always been on a high growth path and has experienced and dedicated faculty with strong commitment to engineering education who work with zeal and enthusiasm to provide a vibrant and optimum learning environment. In keeping with the department's vision, the holistic development of the students is focused upon that instills a habit of continued learning and a sense of responsibility in them to contribute towards the betterment of the society.

I am confident that the students of the department would justify the credibility of the department by showing a high level of professional competence able to face challenges of life with our holistic approach in teaching and learning encouraging students to indulge in extracurricular activities to shape them as leaders of tomorrow in their respective field. All these efforts are followed ambitiously to develop the overall personality of the students to equip themselves with a modern and sensitive outlook to face the challenges of the competitive world.

I wish Best of Luck to all of them...

Dr. Bharathi Malakreddy A
Professor and HOD
Department of
Artificial Intelligenc and Machine Learning

COMMITTEE INTRODUCTION



Nidhi

4th Semester, AI&ML

It was a very nice experience working on circadian. I got to learn a lot during the process.



Payal K R

2nd Semester, AI&ML

Circadian has nurtured my creativity across multiple fields. Having the opportunity to put together this issue has been a great learning experience. Hope this issue is well received.



Sirisha

2nd Semester, AI&ML

It was a fun experience, working on this magazine with my classmates. Grateful to have had this opportunity.



Nidhi Umashankar

2nd Semester, AI&ML

Being provided with an opportunity to write is like a four-leaf clover, hard to find and lucky to have! I do hope you thoroughly enjoy what the team has curated for you.

COMMITTEE INTRODUCTION



Vaibhav M K
2nd Semester, AI&ML

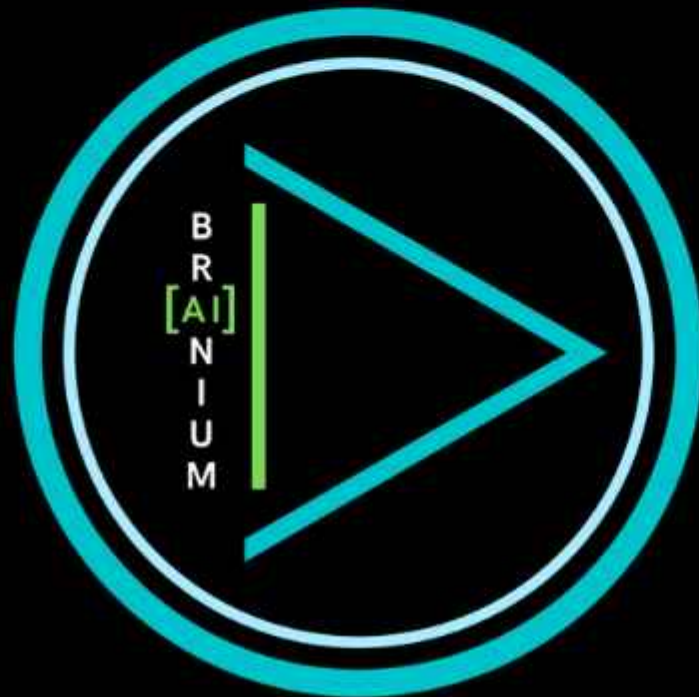
It is an honor working with such inspiring people as part of this platform which has proven integral in establishing higher intellect and understanding in much broader scopes in our cherished peers and mentors



Aakash
2nd Semester, AI&ML

Having a great time working for Circadian magazine and I hope that the people reading this magazine would be updated about the events and achievements of the department.

INTRODUCTION TO BRANIUM



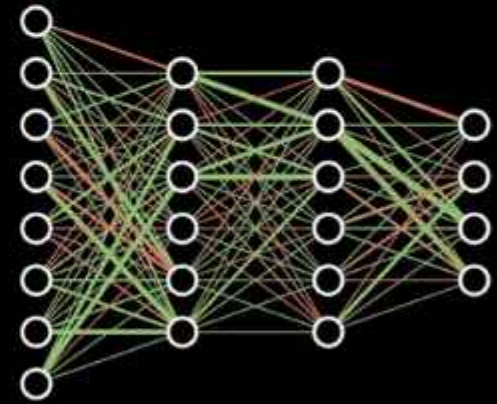
BRAINIUM - The technical forum of the department of Artificial intelligence and machine learning has evolved over the last one year. The main aim of this forum is to help students develop skills and knowledge, which can be applied into their projects and future careers. The forum hosts a plethora of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

ANATOMY OF NEURAL NETWORKS

INTRODUCTION

What Are Neural Networks?

Neural Networks are a subset of Machine Learning and are at the heart of Deep Learning Algorithms. Their name and structure are inspired by the human brain, mimicking the way that biological neurons signal to one another. Neural Networks reflect the behavior of the human brain, allowing computer programs to recognize patterns and solve common problems in the fields of AI, Machine Learning, and Deep Learning.

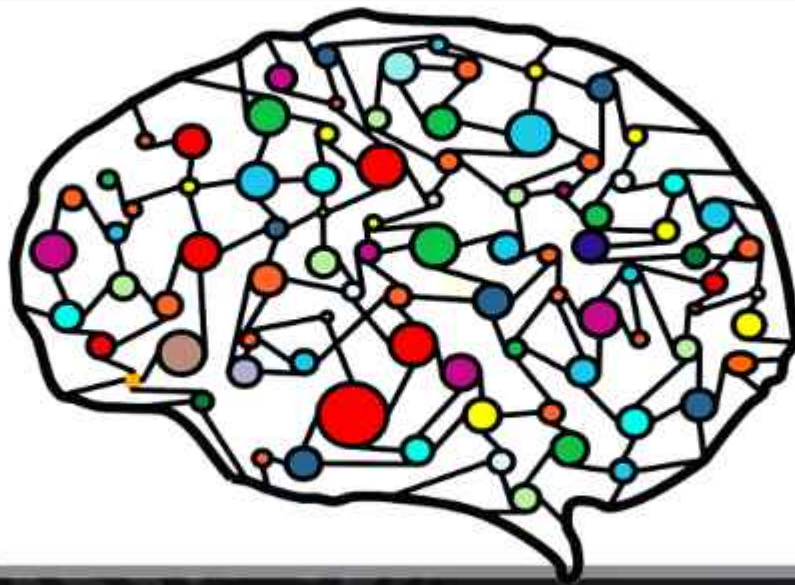


STRUCTURE OF A BASIC NEURAL NETWORK

Neural Networks are inspired by the brain. Consider an example of a handwritten numerical digits analysis algorithm, which can be thought of as the “Hello World” of Deep Learning algorithms. This is the most vanilla form of a neural network algorithm and is considered a prerequisite to understanding any of the more complex or modern algorithms available. Here, we will input an image of a handwritten numeric digit of size 28x28 pixels and the algorithm will give us one number as an output which it thinks is the most likely match for the given image. Neurons can be thought of as Nodes that hold a numerical value ranging from 0.00 to 1.00. But it is more accurate to think of them as a function which takes in the input of all the activations, weights and biases from the previous layer and gives us an output in the form of its activation value. For our example: each Neuron corresponds to each of the pixels in the image giving us a total of where the numeric value of the neuron represents the grayscale value of each of the pixels, ranging from 0.00 for black pixels upto 1.00 for white pixels. This number inside the neuron is called its “Activation”.

VAIBHAV MK
1BY21AI058

ANATOMY OF NEURAL NETWORKS



LAYERS

Input:

The First layer, which is the Input layer, consists of the neurons corresponding to each of the 28x28 pixels to make a chain 784 neurons long with the value of the neurons representing the grayscale value of each pixel. This input layer is the only layer whose values are directly under our control via the data we feed in.

Output:

Our Last layer, which is the Output layer, consists of ten neurons corresponding to the ten possible output digits ranging from 0 to 9. The activation of these neurons, which is a number from 0.00 to 1.00 represents the probability that the algorithm assigns that the given digit corresponds to the input image. If multiple neurons in this layer are activated, the output is taken as the neuron with the highest activation.

Hidden Layers:

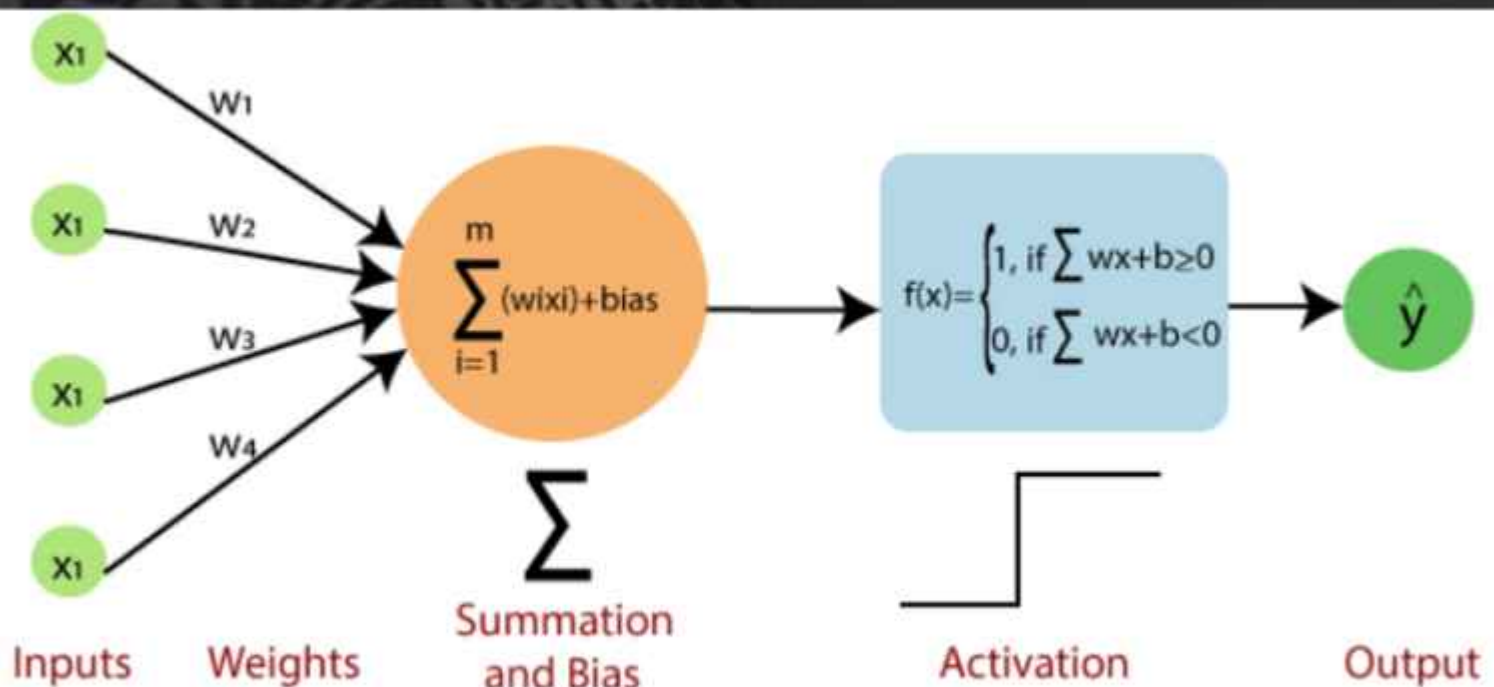
There are some hidden layers besides the input and output layers of the neural network. The amount of hidden layers and the number of neurons per layer can be decided based on the algorithm and the method you want to motivate or train it. But each layer and each neuron in the layer increases the complexity of the computations and decreases the training speed exponentially so it is important to find a balance.

VAIBHAV MK
1BY21AI058

ANATOMY OF NEURAL NETWORKS

HOW ARE THEY CONNECTED

Activations in one layer determine the activations in the next layer. Each neuron in a layer of the neural network is connected to every neuron in the next layer via a connection called a "Weight". These weights are real numbers and could be unique for every individual connection. A positive weight indicates a direct correlation with the corresponding neuron and a negative weight indicates an inverse correlation. The way a neuron's activation in the next layer is calculated is by the sum of the products of all the neuron activations in the previous layer with their corresponding weights. This is called the weighted sum. For the neuron to only activate when this weighted sum is above some threshold, we add a bias to this weighted sum function. This bias can be positive or negative and can be unique for every neuron to neuron connection.



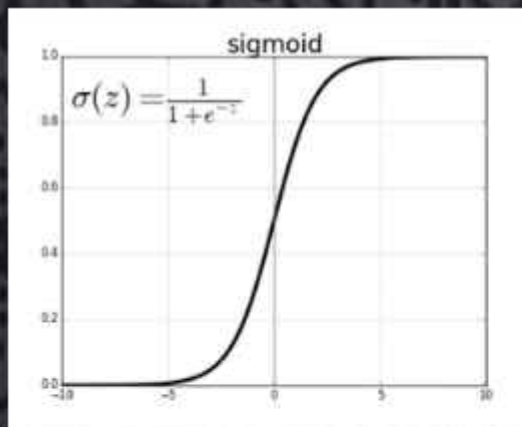
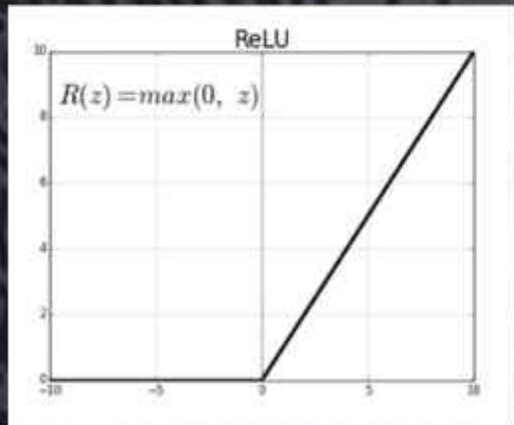
ANATOMY OF NEURAL NETWORKS

SIGMOIND AND RELU

When the value of a neuron is calculated from the previous layer via the weighted sum, the value could be any real number. But for the activations of the neurons we need a x representation in the range of 0.00 to 1.00. For this we use a function that fits the real number line into the range between zero and one.

A common function that does this is called the "Sigmoid" function also known as a "Logistic Curve". Basically, larger negative inputs approach zero, larger positive inputs approach one, and it steadily increases at inputs around zero. So the activation of the next neuron is a measure of how positive the relevant weighted sum is.

But while the use of sigmoid is motivated by condensing the real value into the range between one and zero, it is a very old school method and is rarely implemented in more modern algorithms. Instead, "ReLU" is more commonly used as it is found to be easier to train and gives more accurate results. ReLU stands for Rectified Linear Unit. It is motivated by our biology where neurons would either be active or inactive, so until a certain threshold the neurons would just be zero, and past the threshold the value would just be the identity function. Sigmoid was found to train much slower at a certain point and ReLU works better for these complex Deep Learning algorithms.



DEEP FAKE AI

Artificial intelligence can create such realistic human faces that individuals can't distinguish them from real faces – and that they actually trust the fake faces more. Fictional, computer-generated human faces are so convincing they'll fool even trained observers. they can be easily downloaded online and used for internet scams and faux social media profiles. "We should be troubled because these synthetic faces are incredibly effective for nefarious purposes, for things like revenge porn or fraud, as an example," says Sophie Nightingale at Lancaster University within the UK. AI programs called generative adversarial networks, or GANs, can learn to make fake images that are less and fewer distinguishable from real images, by pitting two neural networks against one another. Generative Adversarial Networks, or GANs for brief, are an approach to generative modelling using deep learning methods, like convolutional neural networks. Generative modelling is an unsupervised learning task in machine learning that involves automatically discovering and learning the regularities or patterns in input file in such a manner that the model is accustomed to generate or output new examples that plausibly could be drawn from the initial dataset. GANs are a creative way of coaching a generative model by framing the matter as a supervised learning problem with two sub-models: the generator model that we train to come up with new examples, and therefore the discriminator model that tries to classify examples as either real (from the domain) or fake (generated). the 2 models are trained together in a very game, adversarial, until the discriminator model is fooled about half the time, meaning the generator model is generating plausible examples.

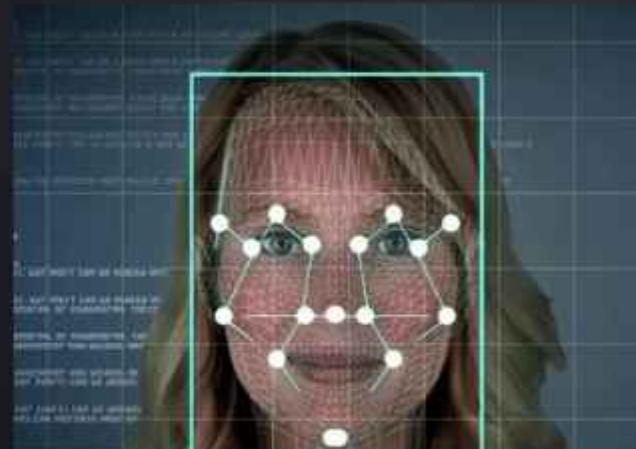


HITESH CHANDRA
1BY21AI022

DEEP FAKE AI

GANs are an exciting and rapidly changing field, delivering on the promise of generative models in their ability to come up with realistic examples across a variety of problem domains, most notably in image-to-image translation tasks like translating photos of summer to winter or day to night time, and in generating photorealistic photos of objects, scenes, and other people that even humans cannot tell are fake.

Nightingale and her colleague Hany Farid at the University of California, Berkeley, asked 315 participants, recruited on a crowdsourcing website, to mention whether or not they could distinguish a range of 400 fake photos from 400 photographs of real people. Each set consisted of 100 people from each of 4 ethnic groups: white, Black, East Asian and South Asian.



HITESH CHANDRA
1BY21AI022

DEEP FAKE AI

This group had an accuracy rate of 48.2 per cent – slightly worse than chance. A second group of 219 participants got training to recognise computer-generated faces. This group had an accuracy rate of 59 per cent, but this difference is negligible, says Nightingale. White faces were the toughest for people to differentiate between real and pretend, perhaps because the synthesis software was trained on disproportionately more white faces. The researchers also asked a separate group of 223 participants to rate a variety of the identical faces on their level of trustworthiness, on a scale of 1 to 7.

They rated the fake faces as 8 per cent more trustworthy, on average, than the real faces – a tiny low yet significant difference, in step with Nightingale. which may be because synthetic faces look more like “average” human faces, and other people are more likely to trust typical-looking faces, she says. Looking at the extremes, the four faces rated most untrustworthy were real, whereas the three most trustworthy faces were fake. We need stricter ethical guidelines and more legal frameworks in situ because, inevitably, there are visious people out there who want to use them to try and do harm. To reduce these risks, developers could add watermarks to their images to flag them as fake.



FACULTY ACHIEVEMENTS

Dr. Bharathi Malakreddy A

HoD , Department of Artificial Intelligence and
Machine Learning

- Mentor to 03 Collaborative Projects NITK Suratkal (Progress).
- 10.00 Lakhs Got Funds/Grants to work on Design and Research of Healthcare Applications using Artificial Intelligence from Vision Group of Science and Technology (VGST), Government of Karnataka
- 10.83 Lakhs Got Funds/Grants for research work on "A Product of Risk Estimation in Neurocognitive Disorders, Enabled with radio genomics and Digitized Neurocognitive Test
- Batteries (Development of Imaging Analysis Pipeline for oncological Medical images) from Visvesvaraya Technological University (VTU), Belgaum
- Member of Committee BoS – Reva University, Bengaluru
- Member of Committee BoS - New Horizon College of Engineering, Bengaluru
- Member of Committee BoS- PDA CEG, Gulbarga
- Member of Committee BoS- BEC, Bagalkot
- Member of Committee BoE- MSRIT, Bengaluru
- Published "SparseMAX: Accelerating Quantum Neural Networks on GPU Clusters using Sparse-Matrix Kernels" at SAMOS:21 st International Conference on Embedded Computer Systems: Architectures, Modeling, and Simulation at Greece April 2022.
- Published "Blockchain-based Access Control Model with Privacy Preservation in a Fog Computing Environment" at International Conference IEEE CONNECT 30 Aug 2022.
- Published Optimization of sub- space clustering in a high dimension data using Laplacian graph and Machine Learning "International Journal of Bioinformatics Research and Applications" Inderscience March 2022
- Published a Queuing Theory based Delay Efficient Packet scheduler for Machine Type Communication International Journal of Vehicle Information and Communication Systems, Inderscience 28 April 2022.

FACULTY ACHIEVEMENTS

Dr. Bharathi Malakreddy A

HoD , Department of Artificial Intelligence and
Machine Learning

- Resource Person for a Session on “Recent Trends of Artificial Intelligence in 6G Communications “ AICTE ISTE sponsored Induction Program, January 2022, AIT, Belgaum
- Keynote Speaker for Session on “Fundamentals and Applications of AI” – An Interdisciplinary Perspective, March 2022
- Resource Person for a Session on “ AI Driven Intelligent Networks – 6G “, - AICTE sponsored FDP, ATME, Mysuru ,April 2022
- Resource Person for a Session on – “AI and Its Applications” , IEEE Student Chapter KSEC , Bengaluru

FACULTY ACHIEVEMENTS

Dr. Rajesh I S

Assistant Professor, Department of Artificial Intelligence and machine Learning

- Reviewed papers for Journal of Mobile Information Systems Hindawi Publisher
- Published a review paper "A Study on Automatic Extraction of Retinal Blood Vessels in Fundus Images" in Journal of Image Processing and Artificial Intelligence (e-ISSN: 2581-3803) on July 2022.
- Reviewed papers for International Journal of Clinical Practice Hindawi Publisher
- Recognised as IEEE Young Professionals Membership-2022.

Dr. Anupama H S

Associate Professor, Department of Artificial Intelligence and machine Learning

- Dr Anupama H S, Associate Professor, Department of AI & ML, was a resource person for ATAL FDP," Bare Metal Programming on RTOS Programming", on 14.12.2021.
- Published a paper on "Smart Attendance using RFID: A Pandemic solution" in High Technology Letters, ISSN NO: 1006-6748, Volume 28, Issue 1, 2022, Page no 595-597.
- Dr Anupama H S, Associate Professor, Department of AI & ML, paper on " A Survey on Artificial Intelligence Techniques in Cyber Security", High Technology Letters, ISSN NO: 1006-6748, Volume 28, Issue 1, 2022, Page no 671-675.

FACULTY ACHIEVEMENTS

Dr. Vishwa Kiran S

Associate Professor, Department of Artificial Intelligence and machine Learning

- Resource person for ATAL FDP," Bare Metal Programming on RTOS Programming", on 15.12.2021.
- Delivered a talk on " Database design and PL SQL", at NITTR, Bengaluru on 5.1.2022 and 6.1.2022.
- Resource person for L & T pvt ltd, on the topic Core Java from 11.5.2022 to 13.5.2022.
- Resource person for Aprameyah, Nagra Vision from 18/04/2022 to 26/04/2022.
- Resource person for Aprameyah, L&T from 11-5-2022 to 13/5/2022.
- Resource person for Aprameyah, L&T from 20/6/2022 to 22/06/2022.
- Resource person for Pytriot Solution, Volvo from 18/7/2022 to 22/07/2022.
- Resource person for Aprameyah, Mindtree from 26/7/2022 to 15/9/2022.

FACULTY ACHIEVEMENTS

Dr Pradeep K R

Assistant Professor, Department of Artificial Intelligence and machine Learning

- Published paper titled "Improved Machine Learning Method for Intracranial Tumor Detection with Accelerated Particle Swarm Optimization", Hindawi-Journal of Healthcare Engineering, 03 Mar 2022, vol. 2022, Special Issue. (Web of Science indexed).
- Reviewer for Second Edition of IEEE Mysore Subsection, International Conference: - IEEE MysuruCon-2022.
- Invited as speaker for 3 Days Workshop on "Artificial Intelligence and Machine Learning in Current Trends using Python", from 28/06/2022 to 30/06/2022, hosted by IEEE student chapter, Dept. of ECE, KSSEM, Bengaluru-109.
- Delivered a lecture on "Machine Learning Algorithms: Supervised and Unsupervised Learning Machine Learning Datasets" in two days workshop on Applied Artificial Intelligence and Machine Learning hosted by Dept of AI & ML, BMSIT&M, Bengaluru-64 on 4th March 2022
- Completed "Crash Course on Python" in Coursera dated 20/03/2022.
- Attended 2 days FDP on "Big Data – Hadoop" Organized by Imarticus Learning - Data Science Club from 26/08/2022 to 27/08/2022 – Online.
- Attended One Week AICTE – VTU Joint Training Programme for Teachers on "An Overview of Teaching Techniques in Innovation & Design Thinking" on 6th to 10th December 2021 Organized by VTU Human Resource Development Centre (VTU - HRDC), Centre for PG Studies, Muddenahalli, Chikkaballapur (Dist.) - 562101.
- Attended 5-Day Online FDP on "Bare Metal Programming and Real Time Operating System Programming" from 13/12/2021 to 17/12/2021, (ATAL) Academy, BMSIT, Bangalore 64.

HOW IS AI TRANSFORMING THE WORLD



Every aspect of life is changing, thanks to AI technology. It is a versatile tool that helps individuals to reconsider how we combine information, evaluate data, and use the insights obtained to enhance decision-making.

AI is regarded to typically refer to "machines that respond to stimulus consistent with traditional responses from humans, given the human ability for deliberation, judgement, and intention," despite the fact that there is no universally accepted definition.

Algorithms for artificial intelligence are created to make judgments, frequently using data that is current. They differ from passive machines, which can only make mechanical or preset decisions. They combine data from numerous sources, instantaneously assess the information using sensors, digital data, or remote inputs, and then take action based on the conclusions they draw from the data. They are capable of making decisions with a high level of sophistication thanks to significant advancements in storage systems, computing speeds, and analytical approaches.

HOW IS AI TRANSFORMING THE WORLD



AI decision-making systems have the capacity to learn and adapt. Semi-autonomous vehicles, for instance, have features that alert drivers and other vehicles about impending traffic jams, potholes, highway construction, or other potential roadblocks. Without human intervention, vehicles can benefit from the experience of other vehicles on the road, and the entire corpus of their acquired "experience" is instantly and completely transferable to other similarly constructed vehicles. Incorporating expertise from existing operations, their sophisticated algorithms, sensors, and cameras combine dashboards and visual displays to show information in real time so that human drivers can comprehend changing traffic and vehicle circumstances. Additionally, fully driverless vehicles can be entirely controlled by sophisticated technologies. One of the reasons for the growing role of AI is the tremendous opportunities for economic development that it presents.

Another way AI benefits financial systems is in fraud detection. In huge businesses, it can be challenging to spot fraudulent activity, but artificial intelligence (AI) can spot anomalies, outliers, or incidents that call for further inquiry. This assists managers in identifying issues early on in the cycle, before they escalate to risky levels.

NIDHI

1BY20AI032

HOW IS AI TRANSFORMING THE WORLD



Designers are using AI techniques to increase the computational sophistication of the healthcare industry. For instance, the German business Merantix uses deep learning to solve medical problems. It can be used to "identify lymph nodes in the human body in Computer Tomography (CT) pictures" in the field of medical imaging.

Through the use of data analytics and artificial intelligence, several industries are about to undergo a transformation. Significant deployments have already changed decision-making, business models, risk mitigation, and system performance in the financial, national security, healthcare, criminal justice, transportation, and smart city sectors. These changes are producing significant economic and social advantages.

However, how AI systems develop will have a significant impact on society as a whole. It matters how ethical dilemmas are resolved, legal constraints are overcome, and how much transparency is demanded of AI and data analytic solutions.

NIDHI

1BY20AI032

STUDENT ACHIEVEMENTS

Nidhi - 4th Sem AI & ML

- Won second place in National level quiz "Triviajet 3.0" 2022 conducted by IIT-Bombay.
- Volunteered as a Drone Pilot in "Bharath Drone Mahotasav" 2022 conducted by Drone Federation.



STUDENT ACHIEVEMENTS

Rushil Bali - 4th Sem AI & ML

- Hosted a Snapchat AR Lens Studio Workshop in association with Under 25, which was attended by over 50 people.
- Hosted a Jam Party in association with Alive India Studios on the occasion of World Music Day



Shashank R - 4th Sem AI & ML

- Got inducted into Melton Foundation as a New Fellow in April 2022.

THE TURING TEST

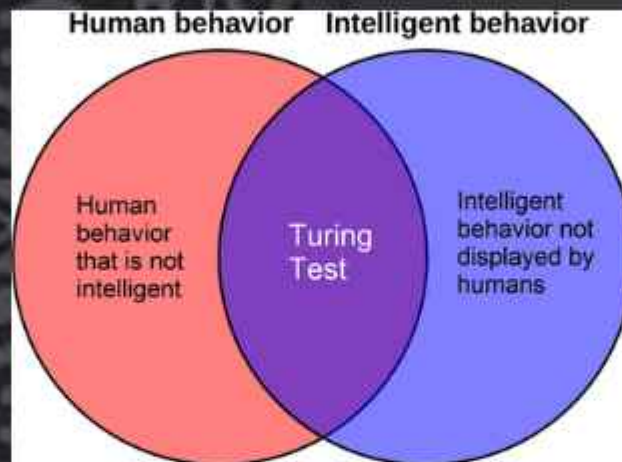
It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of incredulity, it was the season of Light-in short there is always something that demarcates it from its counterpart. This Charles Dickens quotation could be interpreted in a handful of ways instead of adhering to the run-off-the-mill literary interpretation. The Turing test, as many call it, the imitation game could be understood from this very perspective.

When we are asked a question, do we answer taking our biases into account? If yes, then how does a judge serve the community that he resides in? If not, how do we answer this question honestly in its entirety as we take away everything that makes us human?



NIDHI UMASHANKAR
1BY21AI036

THE TURING TEST



The Turing test merely highlights this dilemma; it pushes the boundaries of thought and implores mankind to find a solution to this enigma. The test is designed to evaluate a machine's ability to exhibit intelligent behaviour similar to that of a human being. For the said test, a human questioner is appointed. This remote human interrogator then poses a set of questions to humans as well as intelligent systems which are to be answered within a given time-frame. These human test-subjects and systems are distinguished based on the answers that are obtained from them. By means of using such specifically designed questions, a computer's success at "thinking" can be measured by its probability of being misidentified as the human subject.

The "Chinese Room" argument proposed by American philosopher John Searl in 1981 acted as the strong winds that set the sail-ships in motion for Turing. For the Chinese room test, a Chinese speaking interrogator is placed outside a room while a non-Chinese speaking subject is placed inside the very room with a manual at hand. Now, when the questions are thrown to him, he answers after looking into the manual. To the Chinese speaker, the room has passed the Turing test. However, no thinking is involved since the subject is simply following the manual.

Although mankind is making progress into the AI world at a relatively slow pace, slow progress is still considered progress. As this progress picks up pace, it throws open the doors to a technologically forward civilization where Turing's intelligent systems would take over to make life seem like rich butter sliding smoothly on fresh crisp toast.

NIDHI UMASHANKAR
1BY21AI036

STUDENT SUBMISSION



Payal KR
1BY21AI040

STUDENT SUBMISSION



Meghana Raju
1BY20AI028

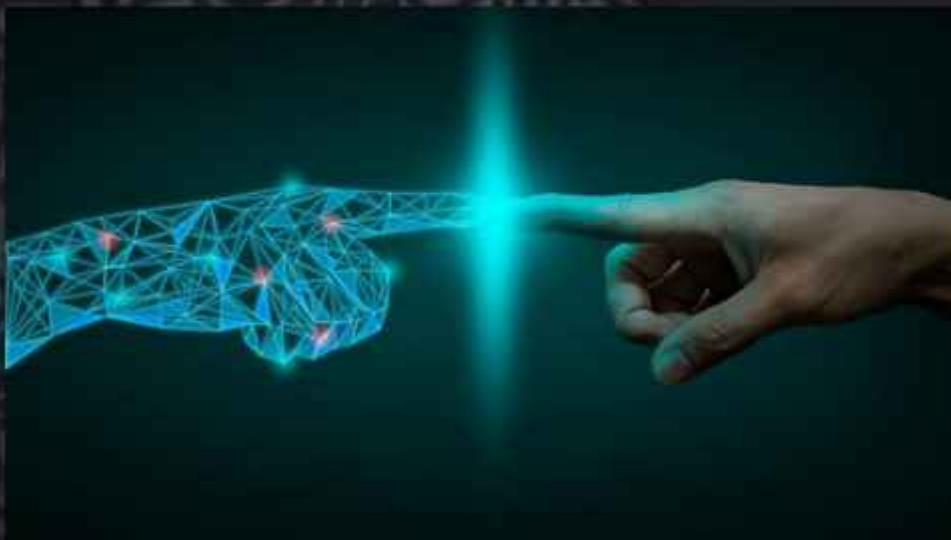
MISALIGNED AI

When we ask for the assistance of artificially intelligent computers, there is a risk that we won't be cautious enough in our wishes. These machines' animated lines of code will eventually lack nuance, forget to provide warnings, and end up providing AI systems incentives and goals that don't correspond to our actual tastes.

The most concerning illustration is one that has an impact on billions of people. YouTube uses AI-based content recommendation algorithms in an effort to lengthen viewers' sessions. Two years ago, users and computer scientists started to notice that YouTube's algorithm appeared to accomplish its objective by promoting increasingly radical and paranoid content.

The creators of YouTube undoubtedly didn't aim to radicalise people. Coders, however, are unable to anticipate every scenario. According to Hadfield-Menell, "the way we currently conduct AI places a lot of pressure on the designers to comprehend what the ramifications of the incentives they provide their systems are." "And one of the lessons we're learning is that engineers have made a lot of mistakes,"

One of the main issues is that humans frequently don't know what aims to give our AI systems since we are unsure of our own true desires.



MISALIGNED AI

To avoid these pitfalls and potentially solve the AI alignment problem, researchers have begun to develop an entirely new method of programming beneficial machines. According to new thinking, machines should attempt to meet human tastes rather than pursue their own objectives. Their main objective should be to understand our preferences better. Russell argues that the ambiguity surrounding our preferences and the necessity of turning to us for direction will keep AI systems secure.

He stated that, despite the need for further algorithms and game theory study, he has a strong feeling that programmers could successfully reduce detrimental preferences, and that the same strategy would even be useful "in the way we raise children, educate people, and so on." In other words, we might discover a way to teach ourselves by educating robots to be decent. I believe there is an opportunity, perhaps, to steer things in the right direction, he continued.



AI AND QUANTUM COMPUTING



What is Quantum Computing?

In the subject of quantum computing, computations are carried out using quantum phenomena as entanglement, polarisation, and interference. Quantum computers use "qubits," as opposed to classical computers, which use binary bits, 0 or 1. The two classical bits, denoted by the symbols $|0\rangle$ and $|1\rangle$, are combined linearly to form a qubit. According to the probability amplitudes corresponding to the classical bits, a qubit can be either $|1\rangle$ or $|0\rangle$. Superposition is the name for this line of combination. Quantum gates are operators that perform operations and transformations on qubits. A quantum algorithm applies successive quantum gates.

What is Quantum AI

The study of quantum computing focuses on developing computer-based technologies using the ideas of quantum theory. The nature and behaviour of energy and matter are described by the quantum theory at the quantum (atomic and subatomic) level. Quantum computing uses a mixture of bits to carry out certain computational operations.

AI AND QUANTUM COMPUTING

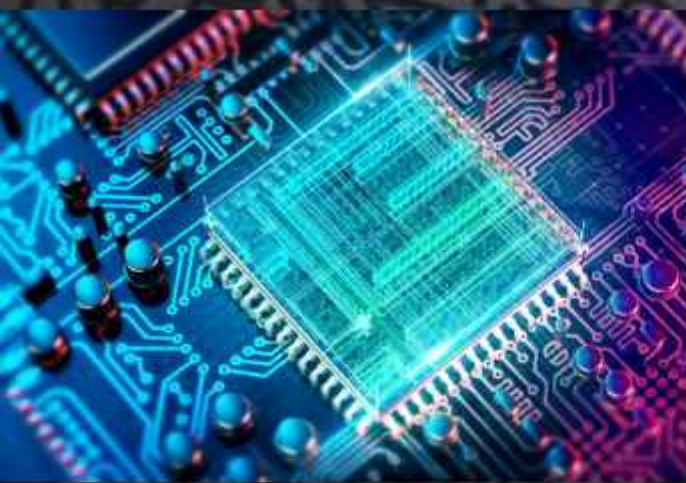
A major development in computing is represented by quantum computers.

Computing power, with significant performance advantages for particular use situations. The purpose of quantum computers is to execute significantly more accurately and effectively than traditional methods computers have given programmers a new tool for particular applications. This is all done much more effectively than with their conventional counterparts. Processing something on a quantum computer takes just seconds, whereas computing it on a classical computer takes years. Because they provide advantages over classical computers and can run machine learning algorithms more quickly, quantum computers are employed in quantum AI. very swiftly handle massive amounts of data.



NIDHI
1BY20AI032

AI AND QUANTUM COMPUTING



The fundamental concepts of Boolean algebra form the basis of classical computing. Data handling must be done exclusively in binary at all times, whether in terms of time or bits. As we get to smaller and faster circuits, we start to approach the physical limits of materials and the threshold for classical physics to apply. After then, the quantum universe takes over.

A quantum computer can use a number of fundamental particles, such as electrons or photons, with their charge or polarisation serving as a representation of 0 and/or 1. The foundation of quantum computing is found in the nature and behaviour of these particles. These particles are all referred to as quantum bits, or qubits.

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AI AND QUANTUM COMPUTING

Why do we need Quantum AI?

Only one of the four possible binary combinations—00, 01, 10, and 11—can be stored in a traditional register. A quantum register, on the other hand, can hold all four potential combinations simultaneously and would only collapse to provide one value once the quantum gate had been activated on the qubit. Therefore, capacity increases exponentially as qubits are added. Every day, we generate 2.5 exabytes of data. Massive volumes of data can be processed swiftly using quantum computers. Artificial intelligence may benefit from using quantum computing to process very large volumes of data in order to make better conclusions, such as in facial recognition.

Applications of Quantum AI?

- Quantum computers are built to handle massive volumes of data as well as finding patterns and identifying anomalies very rapidly. Developers are now better able to control the potential of quantum bits with each newly released iteration of quantum computer design and the new advancements achieved on the quantum error-correction code. Additionally, the same is optimised for resolving various business issues so that better decisions may be made.
- Calculations that take today's computers many years to perform can be completed by quantum computers in a matter of seconds. Developers can perform numerous calculations with multiple inputs at once using quantum computing.

AI IN ERP

In recent years, there has been a lot of emphasis on artificial intelligence in almost every business. But first, because the very idea of artificial intelligence might elicit dread and bewilderment, let us clarify a widespread misconception: AI is not necessarily malevolent.

While there is concern that AI may usher in an era of robot rulers, as represented in films such as *The Terminator* and *Avengers: Age of Ultron*, these examples offer an overly optimistic view of what AI is capable of. "AI achieving awareness – there has been absolutely no advance in research in that area," says Kilian Weinberger of Cornell University. I don't see that happening very soon."

So, just what is artificial intelligence? Simply said, AI-powered devices replicate human reasoning and intelligent behavior. These systems can do activities that would normally need human intellect.

There are numerous examples of AI technology in everyday life, including built-in smart assistants in your smartphone or other smart devices, such as Siri, Alexa, and Google Assistant, speech recognition software, security services, streaming services, and drone delivery services from companies such as Amazon, to name a few.

"Without a question, artificial intelligence (AI) will have a major influence on the footprint of enterprise resource planning (ERP) systems in the near future," CIO magazine stated in 2016 about how artificial intelligence is altering ERP solutions. AI will allow businesses to further improve their operational model, which consists of business processes, software applications, governance frameworks, and technical infrastructure."

AI IN ERP

Artificial intelligence in ERP is strong and continues to improve the efficacy of ERP solutions worldwide. Indeed, AI-based ERP is already present in a number of well-known platforms:

- Epicor debuted EVA, an AI-based voice command user interface aimed at increasing productivity, earlier this year.
- Microsoft provides consumers with cognitive services, bot service, and cognitive search through its Azure AI.
- In 2018, NetSuite released its first intelligent cloud suite, allowing professionals to obtain improved insights and efficiency through predictive, prescriptive, and automated results.
- SAP, among other AI-enabled processes and tools, provides a cloud-based predictive maintenance system based on machine learning algorithms, as well as a chatbot that employs machine learning technology.



AI IN ERP



Artificial intelligence in ERP has the key advantage of making it easier to automate business activities throughout an organization and track critical information about the company's resources. After all, making sound decisions is contingent on the effectiveness of your methods.

Looking at traditional business logic and expert systems like Oracle and SAP, it is evident that AI-enabled ERP was still in its infancy 20-30 years ago. Accounting, purchasing, and procurement are just a few of the components of a business that are now supported by AI in ERP systems.

The following are some of the advantages of AI in ERP:

- Forecasting
- Analytics
- Making purchasing choices
- Correct demand forecasting
- Human capital administration
- Selling goods to individuals who wish to buy them
- Maintaining high levels of customer service
- Data mining for significant patterns

MOHAMMED SINAN KHAN
and
MIRZA FARDEEN BAIG
6th Semester

MEMORY BOOTH



SIGNING OFF

We, the team of Circadian would like to thank the department of AI&ML, our highly regarded Principal of BMSIT&M and you, our dear readers, for making all our efforts to compile this magazine worthwhile. We hope to continue to publish many more editions of Circadian for all of you.

THANK YOU



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