Journal of Nonlinear Analysis and Optimization Vol. 15, Issue. 1, No.7 : 2024 ISSN : **1906-9685**



AN ARTIFICAL INTELLIGENCE IN AI TECHNOLOGIES USING FUTURE ASPECTS

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ABSTRACT

Through only a dream an Artificial Intelligence(AI) has become a reality, being now part of our routines and penetrating every aspect of our lives, including education. It is still a field in its infancy, but as time progresses, we will witness how AI evolves and explore its unexploited potential. Against this back ground, this chapter examines current and future views of AI in various contexts, such as natural language processing (NLP), machine learning, and deep learning. For this purpose, social network analysis (SNA) is used as a guide for the interpretation of the key concepts in AI research from an educational perspective. The research identified three broad themes: Adaptive learning personalization and learning styles, Expert systems and intelligent tutoring systems and AI as a future component of educational processes.

KEYWORDS: Artificial Intelligence (AI), Machine Learning, Deep learning, Natural language processing.

INTRODUCTION

From a futuristic point of view, AI has emerged as a key feature in what appears to be a science fictional future, one in which users interact and learn with hard and soft technologies. In seeking to gain insight into technology's importance, it is apparent that many AI-based applications have become part of our routines. As underlined by Housman (2018), AI is capable of two things: Automating repetitive tasks by predicting outcomes on data that has been labeled by human beings and Enhancing human decision-making by feeding problems to algorithms developed by humans". In other words, AI learns the given commands by performing the tasks repeatedly and manages to somehow generate a decision pathway for humans by offering alternatives.

GENERAL OVERVIEW OF ARTIFICIAL INTELLIGENCE (AI)

Definition of AI

Artificial Intelligence (AI), a term coined by. emeritus Stanford Professor John McCarthy in 1955, was defined by him as "**the science and engineering of making intelligent machines**". Much research has humans program machines to behave in a clever way, like playing chess, but, today, we emphasize machines that can learn, at least somewhat like human beings do. Artificial intelligence (AI) is **the ability of a computer or a robot controlled by a computer to do tasks that are usually done by humans because they require human intelligence and discernment**. There have been mind-blowing developments in the evolution of AI and the remarkable role it has played in human lives. Recently, there have been some concrete examples of AI being capable of learning how to think like a human. These examples have even demonstrated that AI-based applications, in some cases, can even function as better as humans.

IMPORTANT TECHNOLOGIES THAT SUPPORT THE VISIONS OF AI

Artificial Intelligence is basically the mechanism to incorporate human intelligence into machines through a set of rules(algorithm). AI is a combination of two words: "Artificial" meaning something made by humans or non-natural things and "Intelligence" meaning the ability to understand or think accordingly. Another definition could be that "AI is basically the study of training your machine(computers) to mimic a human brain and it's thinking capabilities". AI focuses on 3 major aspects(skills): learning, reasoning and self-**correction** to obtain maximum efficiency



Machine Learning

Machine Learning is basically the study/process which provides the system(computer) to learn automatically on its own through experiences it had and improve accordingly without being explicitly programmed. ML is an application or subset of AI. ML focuses on the development of programs so that it can access data to use it for themselves. The entire process makes observations on data to identify the possible patterns being formed and make better future decisions as per the examples provided to them . The major aim of ML is to allow the systems to learn by themselves through the experience without any kind of human intervention or assistance.

Deep Learning:

Deep Learning is basically a sub-part of the broader family of Machine Learning which makes use of Neural Networks(similar to the neurons working in our brain) to mimic human brain-like behavior. DL algorithms focus on information processing patterns mechanism to possibly identify the patterns just like our human brain does and classifies the information accordingly. DL works on larger sets of data when compared to ML and prediction mechanism is self-administered by machines.

Natural Language processing(NLP)

Natural Language Processing provides solution in a variety of different fields associated with the social and cultural context of language learning. It is an effective approach for teachers, students, authors and educators for providing assistance for writing, analysis, and assessment procedures. Natural Language Processing, or NLP, is a branch of Artificial Intelligence (AI) whose focus is on facilitating the interaction between humans and machines by using natural human language as the interactive medium.

Systems based on NLP can understand the structure and meaning of human language by analyzing its various aspects such as syntax, semantics, and morphology. Using a combination of computer science and linguistics, natural language processing systems transform the knowledge they gain through the study of language into rules-based machine learning algorithms capable of solving specific problems and performing particular tasks.

NLP systems can perform large-scale analysis of unstructured data sets, encompassing text-based information drawn from online content, news reports, documents, social media commentary, and consumer interactions with brands and their customer support services. The tools used in natural language processing can enable machines to sift through this information and learn from it with minimal human interaction. In addition, systems can be custom-tailored to the needs of any industry or application.

Typical NLP applications include email filtering, voice assistants, translation system, speech recognition, the automation of customer support and the analysis and correction of written or spoken text. In addition natural language processing is the driving force behind everyday use cases like chatbots, internet search engines, product recommendation portals, and the digital voice assistants that power smart homes, smart vehicles and smartphones.

Intelligent Personal Assistants (IPAs)

An intelligent personal assistant (IPA) is software that has been designed to assist people with basic

JNAO Vol. 15, Issue. 1, No.7: 2024

tasks, usually providing information using natural language. Most IPAs use online resources to answer a user's questions about the weather, sport scores, to provide driving directions and to answer similar information- based queries. Some IPAs may provide business services, such as calendar and meeting reminders while many offer essential services, like health monitoring and alerts via special applications. Typically, an IPA will answer queries and perform actions via voice commands using a natural language user interface.

Assistants are available as Smartphone (or other mobile device) applications and may also feature Internet of Things (IoT) integration. Many companies and device manufacturers develop IPAs that are unique, have a bit of a personality and actually become part of the brand (or device) experience. Examples of well-known intelligent personal assistants include the following: Apple's Siri, Google Now, Microsoft's Cortana.

THE IMPACT OF AI ON THE EDUCATION INDUSTRY

Artificial Intelligence is revolutionizing this sector in the following ways:

Task automation

In addition to managing classrooms, teachers also traditionally handle organizational and administrative tasks. They include filing paperwork, overseeing lecture resources, and creating periodic progress reports. AI has the potential to make their work easier by automating these additional functions.

Statistics show educators spend more than 50% of their professional time performing non-teaching activities. This technology can grade tests, plan lessons, and generally make educators' tasks better. In addition to increasing their productivity, it also gives them enough time for one-to-one discussions with their students.

Smart content creation

AI and machine learning tools enable the creation of accurate and targeted educational content. They also use advanced data analytics to create solutions suitable to each student's capabilities. AI tools can make these decisions based on the learner's interaction with other apps. This content incorporates virtual solutions such as digital textbooks, lectures, and webinars.

Robots can enhance the learning experience by building interfaces that cater to students in different grades. They make the content understandable by splitting it into intelligible portions, highlighting lessons, and summarizing crucial points. This convenience allows students to achieve their academic goals faster.

Personalized education

According to research, personalized learning improves your skills at whatever starting level you pick. Students have different characters and approaches. The traditional one-size-fits-all approach to teaching isn't always fair to all learners.

AI can complement teachers' efforts by personalizing the process depending on the student's comprehension level. In addition to making content easier to understand, technology offers recommendations based on their interests and learning difficulties.

Carnegie Learning is an example of such a platform. It acts as a teacher's assistant that personalizes experience after evaluating your strengths and weaknesses. Apart from providing actionable feedback to learners, they generate periodic reports to help teachers understand their students better.

Virtual learning solutions

AI is an essential aspect of cloud-based digital content platforms that enable students to access learning resources anytime and from anywhere. It's an innovative solution if you can't physically attend. For instance, foreign learners can still benefit from American STEM classes via digital interaction.

What's more, it's easy to translate AI-powered content into several different languages to optimize it for all learners. These benefits facilitate an interactive community that includes non-English speakers of various grades and ages.

Around-the-clock assistance

In the past, you had to be in class to receive assistance from teachers. If students didn't understand concepts, they had to look for their lecturers for one-on-one follow-ups. Today, several AI-powered chatbots specifically serve the education sector. They provide 24/7 aid to students on various

subjects.

Facial recognition

Some academic institutions are piloting AI-powered facial scans to replace traditional student IDs. This solution improves security, research, and administrative functions. For instance, these scans make it more convenient for students to order food in the canteen and take books from the library.

Most schools also use them to identify troublesome students and prevent crimes. American institutions are bound to benefit from this technology, given the rising number of school gunfire incidents. AI-powered surveillance and machine learning solutions help keep your school safe.

Secure virtual exams

The popularity of remote learning solutions means educational institutions have to invest in secure exam portals as well. Teachers can design pre-set question banks that AI tools can use to create queries and exercises. They can also grade tests once they're complete.

The most apparent benefit of these tests is that they're more secure than regular exams. They have advanced configurations that you can use to assign tests to designated students. The system prevents cheating by limiting availability and allocating questions randomly. In addition to eliminating the risk of human error, they provide educators extra time to focus on their core teaching activities.

APPLICATION OF AI

When we think of Artificial Intelligence in Education, we find different schools of thought, where one group supports and the other is strongly against its implementation.

It is universally accepted that education is a sector, where human-to-human interaction is a must. Parallely, the integration of AI cannot be overlooked considering the advantages it could provide.

Let us explore the opportunities AI applications can provide in the field of education here.

The use of Artificial Intelligence (AI) is advancing in every sector at a faster pace including education. It is disrupting the traditional teaching methodology through its learning algorithms. The algorithms indeed are helping the teachers to uplift the students in a more personalised and responsive manner.

The Applications of Artificial Intelligence in Education is offering opportunities for student engagement against the typical four-walled classroom. Though AI cannot replace our teachers, AI applications are used in one or the form today in education. Let us have a broad outlook of these applications.

9 Applications of Artificial Intelligence in Education:



Adaptive Learning:

It is one of the promising application for the benefit of students. AI in schools help the students for adaptive learning by tracking their academic progress, modify the course or its learning pace, informing the teacher about the difficulty in comprehension, and, more.

Automated Grader:

Though automatic grading has a long way to go, several standardized tests are using automatic grading systems.

At an initial phase, the teachers submit graded essays as a sample to distinguish good and a bad essay. The software accumulates the knowledge as it grades more essays and provides specific feedback instantly.

However, the Robo-graders replace a part of the grading system, and human grader is always there for further assessment.

Chatbot:

Students' evaluation is necessary as it gives a valuable information and also needs an elevation from the existing setup. The AI-driven chatbots seem to be promising in increasing the feedback quality. The chatbot collects the students' opinion through a dialog interface as if it is a real interviewer and look reasons too for varied opinions. The system is unbiased.

Chat Campus:

As the name itself indicates, you can chat with AI to know the campus. You can understand the life on the campus like searching a lecture hall, application procedure for the next semester, get assignments, know the cafeteria, parking lot, library, campus events, interviews, and more.

Data Accumulation:

Using previous search queries, Artificial intelligence in education can suggest related content for the students. For instance, if you are looking into preposition part of English grammar, it may suggest further readings on complete parts of speech as a whole, or other parts of speech like Noun, Adverb, and, etc.

Personalized Learning:

It is evident that the pace and needs for learning differ from one learner to another. Accordingly, the learning instructions and approach should vary and optimized for individual benefits.

Artificial intelligence in education can adapt quickly to the individual needs and deliver personalized learning methodologies and activities driven by the learners' interest. And, it incorporates complex tasks readily and accelerates the learning task too.

Proctoring:

E-learning, the future of learning needs supporting technologies. AI-powered systems ensure the authenticity of the student to take the exam and prevent from cheating.

It can be used for attending competitive exams, school/college admission test, promotions, and, more. **Smart Content:**

Smart content creation is already introduced into the primary and secondary school, college, and corporate environment. With the help of AI, the textbooks could be split into small chunks of digestible guides, which is easy to read and understand.

The study guide includes flashcards, MCQs, fill in the blanks, pointers, true/false, chapter summary, and, so forth. For instance: Cram 101, Netexlearning, and, etc.

Virtual Facilitator:

Though virtual humans are not welcomed in the place of a human instructor, virtual instructors could be used in the educational and therapeutic environment. It can think, act, and react to the students' queries and act as an assistant for the teacher.

It could be used successfully in remote training programs.

FUTURE OF ARTIFICIAL INTELLIGENCE IN EDUCATION:

No doubt, education in one sector where a human-to-human interaction is a rule, and it is unbreakable in the future too. Though the integration of AI is taking its pace into this sector, it may not develop the human attributes of understanding and responsiveness.

Still, the strength of AI can be explored to a greater extent in regards to closing the gaps of learnings.

The analytics of students' massive data, smart content providers, tailored learning methodologies, and more could be explored for the benefit of students and teachers alike for a continued and successful learning.

RISK AND CHALLENGES OF AI IN EDUCATION

Though it will accelerate progress towards SDG 4 i.e., ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all, but it has several risks and challenges in implementing AI in the education sector.

Both students and teachers have difficulties while trying to teach their students how to use technology. The main issue is that instructors are frequently not given the proper training to use the new technology in their classes.

In more and more professions, including education, AI is replacing the role of humans and it may

take away the human role in education. It involves more than just teaching; it also involves grading papers, composing essays, and advising students on their next course of study.

It can lead to the consequence that a robot may not be as good a teacher as a human can be and may reduce the element of behavioral learning.

CONCLUSION

The main role of AI in education is the automation of both academic and administrative tasks, personalized learning, smart content, and all-time accessibility. Over the course of time, AI has resolved the issue of accessibility in several fields like health, environment, etc. India's potential for AI growth has made it unavoidable for the country to integrate technology into education in order to take advantage of it and better educate India's young people for the future.

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