Artificial Intelligence: Cutting Edge Technology in Everyday Life Experience

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Abstract - The rapid growth of Artificial Intelligence (AI) has a significant impact on our daily lives. AI has created a co-dependency with automated systems that directly or indirectly engage with us. Computers and smart devices exhibiting human-like intelligence have become indispensable to our everyday routines. AI-powered applications have brought about innovative changes in our daily lives.

This paper explores the transformative changes brought about by AI techniques in daily life. It closely examines the AI-driven improvements in applications and devices that are integral to daily life. AI platforms are constructed using algorithms that analyze extensive datasets in two different analytical models: predictive analysis and generative analysis. Predictive algorithms analyze existing data to forecast future events, catalyzing the precise management of complex operations with a higher degree of uncertainty. On the other hand, generative AI produces output of various formats by the intelligent analysis of patterns in the existing data. Predictive AI applications drive revolutionary changes in industrial, social, and economic sectors. Healthcare, security, weather forecasting, and home automation are some typical areas where predictive AI techniques have extensive applications. On the other hand, generative AI focuses on content generation based on the input provided by the user and has a wide range of applications in education, healthcare, personal assistance and entertainment sectors.

Keywords - Artificial Intelligence, Large Language Model, virtual assistant, education, healthcare, social media, emotion detection, home automation, cyber security, law enforcement, weather forecasting

1. INTRODUCTION

AI is an emerging technology that equips the machine to simulate the human nature of thoughts and behavior. In the initial stage, the AI programs were capable of deriving conclusions from a set of conversions. Through several innovative advancements, AI emerged as a technology that creates an amazing impact on the everyday life of human beings.

Approaches and Techniques: Based on the approaches taken in the implementation, AI programs can be classified as predictive or generative. Predictive AI consists of a set of algorithms that analyze the existing data and predict the nature of future events. Predictive AI has several business and industrial applications that empower an organization with intelligent decisions derived from existing data. These applications are capable of handling complex operations with a high degree of uncertainty with more precision. On the other hand, generative AI produces new content by studying the existing pattern and rendering output in the form of text, image, audio, video, program and application files. A unique output is

produced by the intelligent examination of the patterns outlined in the existing data. In addition to professional applications, generative AI provides open access in the form of chatbots and application programs which in turn acquire extreme popularity and reachability through the web and social media platforms. Some of the major tools and techniques used to develop AI applications are discussed below:

Machine Learning: Machine Learning is an AI technique that works on algorithms that solve problems from experience rather than the explicit program code. The system learns to make decisions and predictions by the experience in a trained dataset.

Deep learning: Deep learning is an extensive application of machine learning that eliminates external intervention by acquiring a level of human intelligence. Innovative applications such as virtual assistants and large language models are implemented using deep learning methods.

Natural Language Processing(NLP): Natural Language Processing algorithms enhance AI applications with the capability to understand human language. With the help of machine learning algorithms, computers can interpret input given in human language.

Computer Vision: Computer vision is an AI technique that enables a program to interpret images and video given as input. AI algorithms extract meaningful information from visuals and interpret them.

2. REVIEW OF LITERATURE

Due to its widespread applicability, artificial intelligence is a discipline enriched by many research activities. Some of the prominent articles reviewed are listed here.

The studies of (Ayeni, O. O., Al Hamad, N. M., Chisom, O. N., Osawaru, B., & Adewusi, O. E, 2024.) discuss the role of AI in the adaptive learning environment. Discussions in the study(Onesi-Ozigagun, O., Ololade, Y. J., Eyo-Udo, N. L., & Ogundipe, D. O, 2024) have been utilized for analyzing AI as a teaching and assessment aid.

The role of AI in patient care, diagnostic accuracy, medical imaging and surgical precision are discussed in (Aftab, M., Nadeem, A., Zhang, C., Dong, Z., Jiang, Y., & Liu, K, 2024). The studies of (Gamel, S. A., & Talaat, F. M., 2024) propose a smart sleeping enhancement system based on AI-powered IoT devices.

Application of AI methodologies in the context of cognitive disorders have been explored in (Javed, A. R., Saadia, A., Mughal, H., Gadekallu, T. R., Rizwan, M., Maddikunta, 2023)

The role of chatbots and virtual assistants in enhancing user experience is discussed in the reviews of (BHaiyan, M. S., 2024; Vijaykumar.M, Sri Varsini.R, Mappillai Meeran. S., 2024)

The article (Minaee, S., Mikolov, T., Nikzad, N., Chenaghlu, M., Socher, R., Amatriain, X., & Gao, J., 2024) performs a detailed study on the capabilities of Large Language Models.

The role of artificial intelligence in enhancing social media interaction has been discussed in (Manoharan, A., 2024; Shahzad, M. F., Xu, S., Lim, W. M., Yang, X., & Khan, Q. R., 2024)

The article (Pereira, R., Mendes, C., Ribeiro, J., Ribeiro, R., Miragaia., 2024) systematically reviews emotion detection with AI methods.

A detailed review of the role of AI in entertainment has been conducted by (Nader, K., Toprac, P., Scott, S., & Baker, S., 2024)

The integration of AI techniques in home automation has been discussed in (Chakraborty, S., & Aithal,P.S., 2024; Rani, K. P., Sreedevi, P., Veeranjaneyulu, P., Kanth, M. R., Allam, S., & Mohanty, J. R., 2024)

AI-powered security methods to encounter the challenges of cyberattacks have been explored in the studies of (Rao, S. D. P., 2024; Binhammad, M., Alqaydi, S., Othman, A., & Abuljadayel, L. H., 2024)

The studies of (Kaufmann, M., 2024; Prayatno, C., Tohari, M., & Susilowati, T., 2024) gave an insight into the role of AI in law enforcement.

Studies on climate change prediction and weather forecasting with the help of AI algorithms are highlighted in (Dilshodjon, M. D., 2024; L Abd Al-Nabi, D., & Sh Ahmed S., 2024)

The article(Kalota, F., 2024, Primer on Generative Artificial Intelligence) has been considered to explore the tools and techniques used in the implementation of AI systems.

3. METHODOLOGY

The main application areas of AI are categorized into the most common and relevant operations in everyday life. A thorough review of research papers, articles, study results, websites, and technical documents was performed. Discussions with people involved in different applications were conducted. Based on the outcome of these processes, a comprehensive analysis was performed to gain insight into the day-to-day operations deeply influenced by Artificial Influence.

4. APPLICATIONS OF AI

Today, Artificial Intelligence (AI) has emerged as a cutting-edge technology that gives a cognitive face to digital platforms and smart devices that are indispensable to our everyday lives. AI algorithms developed using tools such as machine learning, deep learning, natural language processing and computer vision induce human-like intelligence in smart devices and digital platforms that come across our daily routine. Some of the major application areas of AI that enhance the comfort and convenience of users are explored below.

4.1 Education

The extensive application of Artificial Intelligence has led to a paradigm shift in the teaching and learning process. AI techniques provide better learning opportunities for students through a learner-centered approach. AI methods promote an adaptive learning environment, providing a personalized learning experience that adheres to the ability and preferences of the learner. Most of the systems are featured with provisions for self-evaluation and assessment. AI provides a collaborative learning platform that facilitates knowledge sharing without geographical barriers. AI-powered content generators have a deep impact on the learning process. AI tools have the potential to enhance teaching activities such as content preparation, topic presentation, and assessment of the learner. Generative platforms can be adopted for content creation and resource procuration. AI-powered teaching aids such as dictation tools, writing assistants, lesson planners, question makers, and presentation generators can be used for the preparation and presentation of topics. Artificial intelligence plays a key role in formative and summative assessment of the learner. AI-driven dashboards are powerful tools in the teaching process. AI assessment tools drive the education system to the regime of automated evaluation process. Thus, AI applications give shape to an Intelligent Tutoring System that opens the path to a new era in education.

4.2 Healthcare

The healthcare system plays a prominent role in our day-to-day life. AI-based applications reshape the diagnosis, treatment, and monitoring of the patient. AI applications have significantly enhanced medical diagnosis. There are occasions, in which a lot of medical records need to be analyzed instantly for spontaneous diagnosis in the case of patients in critical situations. Features of AI can give instant suggestions and recommendations to a doctor. Medical imaging is another key area in which AI algorithms have a vital role. Image analysis and feature extraction methods facilitate the precise examination of medical images. Deeping learning techniques have been used to diagnose tumors and cancer cells, cardiac

abnormalities, internal fractures and injuries. One of the major advancements in the medical field is the AI-assisted surgery. It enables a surgeon to perform complex procedures in a flexible and precise manner. AI techniques have a profound impact on the health monitoring process. Wearable devices and smartphones can be integrated with AI power to attain perpetual tracking of personal health. AI techniques are revalorizing the sleep pattern analysis resulting in improved performance of the sleep medicine system. Starting from wearable rings to advanced neuro diagnostic systems that perform brain monitoring processes rely upon AI algorithms for data analysis and decision-making purposes.

4.3 Cognitive Training

AI-enhanced applications leverage cognitive training for the elderly and children. By observing personal behavior, AI can act as a memory enhancement tool and companion robot for emotionally impacted persons suffering cognitive decline resulting from age-related issues. Thus AI-assisted system ensures the well-being of persons deserving elderly care and disability support.

4.4 Personal Assistance

AI has become an integral part of websites and smart devices providing customized solutions for the user. With the outcome of AI tools, the applications can provide a personalized user experience. Chatbots and virtual assistants analyze user behavior and preferences to provide a friendly and customized response to user queries. Chatbot is a prominent AI-based interface commonly used in websites and mobile applications to create a simulative environment of personal conversation in user interaction. A virtual assistant is an AI interface that assists users in performing various tasks with cognitive responses coming closer to a human assistant. With the power of deep learning and natural language processing methods, virtual assistants can perform a wide range of tasks through voice interaction with the user. Amazon Alexa, Google Assistant, Apple Siri, etc. are some of the prominent virtual assistants.

4.5 Large Language Model(LLM)

LLMs are generative-pertained transformers that provide human-like responses to the user prompt and are capable of general-purpose applications suitable for any type of user. LLMs have chatbot interfaces with generative analytical capabilities implemented through deep learning algorithms. ChatGPT, Google Bard and Meta AI are examples of typical LLM platforms with wide acceptance.

4.6 Social Media

The core operations of the social media platforms are managed by AI methods. With the power of AI, social media platforms are capable of providing personalized user experience. Meta AI, one of the prominent features introduced in WhatsApp, provides a chat-based interface for accessing the LLM platform. Machine learning algorithms are used to automate tasks such as sentiment analysis, content generation, personalization and filtering according to the user's mind. Moreover, AI is used in operations such as the detection of fake accounts and scam chats and smart advertising methods in social media.

4.7 Emotion Recognition

AI provides automated emotion recognition capabilities for several computer systems and smart device applications. Computer vision and speech science enhanced with machine learning algorithms deployed in Recurrent Neural Networks provide an automated emission detection process. It provides a better human-machine interaction in the day-to-day activities. Major application areas of AI-based emotion detection include customer service, marketing, health care, and education. Thus, AI-powered emotion detection makes real-world applications more empathetic to the user.

4.8 Entertainment

AI enables personalized streaming applications for users on online platforms by suggesting films, music, and video clips based on individual user preferences. With AI assistance, gaming applications can be enhanced with cognitive behavior therapy, ensuring better user engagement. AI-assisted simulations in science and fixation prove fruitful results in mixing education and entertainment. With the help of AI, mobile apps and games can be used to catalyze the learning process, especially in the case of kids.

4.9 Home Automation

AI techniques promise amazing performance in home appliances and devices involved in the modern home environment. AI algorithms make IoT devices more customer-friendly. The AI system ensures the security and well-being of the occupants in the home. The lighting conditions and temperature can be adjusted according to the preferences of the occupants. The AI-based applications are capable of giving alters in situations such as calamities, accidents, and security breach conditions. AI-assisted home management and administration process relaxes a person from hurries and worries that can happen due to negligence and inattention in everyday life.

4.10 Cyber Security

Cyber Security is crucial for individuals and organizations due to heavy reliance on online platforms for day-to-day operations. Security methods like firewalls and antivirus programs have a limited role in vulnerable situations such as phishing and fake identity threats. AI algorithms that perform behavioral and predictive analysis are powerful tools in detecting counterfeit identities and untrusted transactions, which are common in cyber attacks. Machine learning algorithms are used for the pattern recognition process involved in the identification of vulnerable cases. Moreover, AI can make real-time responses to cyber intrusion minimizing the damage that can happen to the system.

4.11 Law Enforcement

AI leverages the process of automated law enforcement, by detecting suspicious activities, violations of law, and unfair practices in public places. AI provides a powerful method to overcome human limitations in law enforcement. The AI-powered camera surveillance system plays a vital role in monitoring traffic rule violations, littering of public places, and misuse of public property. Another role of AI is augmented intelligence which in turn assists the officials in the law enforcement process. Thus AI-based operations

enhance the capabilities of the law enforcement process resulting in an authentic, reliable, data-driven and automated system.

4.12 Weather Forecasting

Weather forecasting is a field integral to meteorology with a significant impact on our daily lives. Traditional numerical models that relied on deterministic algorithms and statistical methods have been largely replaced by predictive AI models, which offer more precise forecasts. Deep learning techniques, utilizing neural networks, have greatly improved prediction accuracy, particularly in analyzing complex atmospheric data. Algorithms empowered with predictive analysis eliminate the uncertainty in weather forecasting. These systems can provide precise real-time weather updates and alerts via SMS and notifications.

5. FUTURE SCOPE OF THE STUDY

AI techniques have border fields of application in the modern world. The utilization of AI techniques, whether directly or indirectly, significantly improves user comfort and convenience across a wide range of applications. This study focused only on the prominent sectors of everyday life deeply impacted by AI. Business sectors such as banking, finance, marketing, logistics and event management have wide applications of AI outputting cost-effective services in our day-to-day activities. Transportation, agriculture and disaster management are some other sectors that have in-depth application of AI techniques.

AI techniques also raise some challenges and negative impacts on the modern world. Deep fake and phishing attacks are typical examples of the dark side of AI techniques. Content generation based on generative AI platforms has multifaceted consequences in teaching-learning. All these limitations can be survived by careful implementation of AI methods.

6. CONCLUSION

AI applications are revolutionizing human life, and this study examines the current status of prominent applications. AI algorithms give a cognitive face to machine intelligence making applications more reachable to mankind. AI-controlled platforms are enhancing the public and private space of everyday life. The future advancements in AI algorithms will bring machines closer to human behavior. Large language models and generative platforms will occupy the space of natural intelligence. AI systems with the power of natural language processing will acquire the capability to think and act like human beings.

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