ARTIFICIAL INTELLIGENCE AND APPLICATIONS

Janhvi Jha
Department of CSE (AI & ML), JAIN (deemed to be University), Bangalore, Karnataka, India
jahnvi.jak@gmail.com

Ajeet Kumar Vishwakarma
Assistant Professor, Dev Bhoomi Uttarakhand University, Dehradun, drajeetkumarvishwakarma@gmail.com

Chaithra N
Department of CSE (AI & ML), JAIN (deemed to be University), Bangalore, Karnataka, India
chaithra3nats@gmail.com

Allagari Nithin
Department of CSE (AI & ML), JAIN (deemed to be University), Bangalore, Karnataka, India
21btrcl007@jainuniversity.ac.in,

Anu Sayal
Department of Mathematics, Taylor's University, Malaysia
anu.sayal.07@gmail.com,

Ashulekha Gupta
Department of Management Studies, Graphic Era (deemed to be University), Dehradun, Uttarakhand India
ashulekha26@gmail.com,

Rajiv Kumar
CSE Department, UIT, Uttaranchal University, Dehradun, Uttarakhand India
rajiv.gill1@gmail.com

2023 1st International Conference on Intelligent Computing and Research Trends (ICRT) | 979-8-3503-3677-1/23/$31.00 ©2023 IEEE | DOI: 10.1109/ICRT57042.2023.10146698

Abstract

Artificial intelligence (AI) has been employed since the 1950s in a number of industries, including manufacturing, logistics, finance, and healthcare. AI is being utilised more and more to automate operations that formerly required human intervention as a result of recent developments in machine learning (ML). AI can be used to automate decision-making procedures and increase the precision of predictions and recommendations. AI can, for instance, be used to determine which people are most likely to contract specific diseases, to suggest the best treatments for those diseases, and to automate the process of approving or rejecting insurance claims, in short healthcare. AI can also be used to identify product flaws and then automatically fix them, enhancing the effectiveness of manufacturing operations. AI can be applied to logistics to improve delivery routes and forecast demand for certain products. AI has a wide range of possible uses, and the opportunities are limitless. AI will probably grow more pervasive in our lives as machine learning continues to progress, altering the way we work, play, and live. In this paper, we will elaborate on the application of artificial intelligence in daily life, such as education, e-shopping, navigation, etc. AI has open vast number of opportunities and increased human efficiency. This has been studied through an intensive literature review concerning matters and applications of AI.

Keywords: Artificial Intelligence, Education, Healthcare

1. Introduction:

Artificial intelligence (AI) is a discipline of computer science that focuses on the study of autonomous algorithms or computer programs with the capacity to think, learn, and act independently. The goal of AI research is to develop computers that exhibit intelligent behaviour.

McCarthy, Minsky, and Rochester defined the idea of artificial intelligence (AI) in the 1950s, which can be considered the beginning of AI history [1]. Since then, AI has been extensively utilised in a variety of industries, including manufacturing, banking, and healthcare. The primary purpose of AI technology is to process and analyse vast volumes of data to identify patterns and trends. Rule-based systems and learning-based systems are the two basic categories of AI. While learning-based systems learn from data, rule-based systems utilise a set of rules to make judgments. When the decision-making process is clearly defined and there isn't a lot of data to process, rule-based systems perform better.

Among the most trending and important applications of AI is healthcare, one of the main uses being, where AI can spot cancer and other anomalies in cells that even the best-trained radiologist cannot [2]. Moreover, instances of development in fields of education using smart learning, industrial sector being exposed to 3D printing, automation of households, and much more has been made possible solely through the progress of AI. Businesses are already utilising artificial intelligence for innovative products and core business operations in the automotive, financial services, utilities, and many other industries [3]. Further, we will discuss the existing applications of AI and their scopes.

2. AI in Education

Some of the many ways in which AI has impacted the classroom include enhanced performance, more targeted instruction, expanded access to education worldwide, enhanced content intelligence, and more streamlined management of the classroom [4].

2.1 Robotic Tutors:

When we discuss AI, we envision powerful supercomputers capable of adaptive reasoning through data and sensors, leading to more natural and fluid interactions between robots and humans. In education, AI embedded into robots and supercomputers has crossed the boundaries of learning and understanding of concepts for both teacher and student alike. Timms proposed the use of co-bots, or robots that collaborate with teachers or other students to teach youngsters regular skills like spelling and pronunciation while also adapting to the students' capacities [4,5].

2.2 Adaptive Learning:

AI encourages adaptive learning, which employs data mining, intelligent teaching methods, comprehension insights, and genuine research. Adaptive learning is an educational strategy that seeks to blend assessment, lecture, performance, and training in order to enhance student learning [6].

2.3 Evaluation:

Utilizing AI technology such as image processing, numerical modeling, and computer vision simplifies the assessment process in the classroom. Evaluation of pupils is an integral part of teaching. Traditional teaching approaches often provide instructors with little time for assessment tasks, such as problem writing, grading, and assessing student achievement. With the aid of AI, instructors are able to pick from a greater variety of effective and scientifically valid evaluation methodologies [6].

3. AI in E-Commerce

E-commerce has seen an influx of AI technology in the past decade. Some of those are mentioned as follows.

3.1 Product Recommendation:

E-commerce stands to gain the most from the growing use of AI to enhance service quality and reliability. Artificial intelligence helps online businesses keep up with the ever-changing needs and preferences of their target demographic. Therefore, customer comfort raises contentment and keeps supply and demand in harmony [7]. When it comes to doing some activities in e-commerce, such as forecasting demand and supply chain processes, human intelligence may frequently be constrained. To combat the growing obstacles in e-commerce, AI mimics and expands human intellect [8]. Through AI, e-commerce achieves customer satisfaction at a whole new level of success.

3.2 Personalized Shopping Experience

Businesses in the e-commerce industry may use the data they gather and analyze to personalize their services to the specific demands of each customer in real time. Professional uses of artificial intelligence in e-commerce provide an individualized consumer experience that extends well beyond the act of completing a transaction [9].

3.3 Fraud Detection

E-commerce and banking institutions are implementing cutting-edge technologies that use predictive analytics, AI, and deep learning approaches in order to better serve their customers. [10]. Through the collection of data sets and machine learning, AI prevents the unsanctioned transactions and fraudulent attempts of access to information and finances.

4. AI in Navigation

The user's hard activities can be completed automatically using the GPS Navigational System (GNS). This simulation requires a flawless recollection of all the tours you've ever done, the time it took you to travel each leg of the journey, the dates and times, and the ability to turn back time in order to demonstrate how a person with such powers may utilize prior experience to identify the optimal route. The individual begins with no prior information, as if they had recently come to the place. The system becomes better at choosing the best routes and properly estimating the travel time from the starting point to the destination as more and more data is gathered from daily driving experience.[11]

The largest advantage of AI is its capacity to increase productivity and finish difficult jobs that are difficult for people to handle. In terms of navigation, this entails assessing current conditions with the best route recommendation that aids the driver in avoiding traffic and other road hazards. The majority of contemporary automobile navigation systems may use data and the Internet of Things to alert for travel delays and modify the route as necessary. However, very few are sophisticated enough to predict how the traffic situation will evolve throughout the course of any given trip [12].

With the rapid advancement of Artificial Intelligence (AI) technology and neural networks, an exceptional opportunity has developed for allowing completely automated learning of the "noise parameters" and appropriate personalizations that are advantageous for "IMU-based self-sufficient navigation applications [13].

RoadTagger is a system that uses machine learning to analyse satellite photos to identify additional information about roads, such as their lane count, with a high degree of accuracy. Drivers may receive a head-up regarding merging or diverging lanes as a result. The researchers who developed RoadTagger

believe that it might be tweaked to make informed decisions on bike paths and parking spots. Particularly useful in locations with little current mapping data, this would allow for new information to be added to maps quickly and economically [14].

5. AI in Healthcare

The medical field is undergoing a revolution. The causes of this revolution include the rising overall expense of healthcare and the growing shortage of healthcare professionals. In order to reduce costs and address these growing challenges, the healthcare sector is looking to incorporate new information technology-based processes and solutions. With the use of AI technology in healthcare, pharmaceuticals have been able to expedite the drug development process. On the other side, it streamlines the process of finding targets. By evaluating off-target compounds, healthcare artificial intelligence also facilitates medication repurposing. Thus, the process of drug development in the healthcare and AI industries is sped up and requires less manual labour thanks to AI [15].

Real-time health monitoring is made possible by AI technologies using wearable technology or healthcare apps on smartphones, empowering people to take charge of their own health. Individual health data gathered and processed by AI may be used for monitoring, precise intervention, and drug regimen selection. It may also be sent to physicians for a more in-depth evaluation. The moral dilemma posed by AI's lack of disclosure and the general lack of confidence in the performance of black-box AI systems in healthcare have heightened the need for interpretable AI models. [16].

Based on current solutions and process concepts, scaling AI in healthcare will happen in a few stages throughout time. Initiatives to improve healthcare operations and promote adoption are likely to concentrate first on the time-consuming, monotonous, and mostly managerial tasks that doctors and nurses must perform. In this initial stage, there are imaging-based AI systems that are already in use in fields like radiology and ophthalmology. In addition, we anticipate a rise in the adoption of artificial intelligence solutions like as remote patient monitoring, AI-powered alarm systems, and virtual assistants as patients assume more responsibility for their care. In reality, this step may include increasing the use of NLP solutions in healthcare facilities and at home, as well as the application of AI across a broader variety of specialties, such as oncology and neurology, where progress has already been made. Providers and professional organizations will be required to actively contribute to the integration of AI into healthcare operations [17-28].

6. Conclusion

Although artificial intelligence (AI) is still in its early phases of development, it has already started to have an impact on a number of different areas, including manufacturing, logistics, healthcare, and finance. As AI technology develops, it is likely to impact many more industries, opening up possible new opportunities for both businesses and people. By assisting physicians with disease diagnosis and treatment options, AI is already being utilised to enhance healthcare outcomes. AI is being utilised in finance to identify and stop fraud as well as to offer individualised investment guidance. Robots with AI capabilities are being employed in manufacturing to increase productivity and improve quality control. Additionally, AI is being utilised in logistics to forecast customer demand and improve shipment routes. The potential uses of AI are practically endless. We can only speculate about the novel and creative ways that technology will be used to enhance our lives and businesses as it continues to advance.

References

[1] G. Press, "Artificial Intelligence (AI) defined," *Forbes*, 28-Aug-2017. [Online]. Available: https://www.forbes.com/sites/gilpress/2017/08/27/artificial-intelligence-ai-defined/. [Accessed: 14-Nov-2022].

[2] E. Adamopoulou and L. Moussiades, "Applications of AI and Projections of AI Impact," *SpringerLink*, 12-Jan-2020. [Online]. Available: https://link.springer.com/chapter/10.1007/978-3-030-35975-1_2. [Accessed: 13-Nov-2022].

[3] Online, "Ask the AI experts: What will take AI capabilities to the next level?," *McKinsey & Company*, 28-Apr-2022. [Online]. Available: https://www.mckinsey.com/capabilities/quantumblack/our-insights/ask-the-ai-experts-what-will-take-ai-capabilities-to-the-next-level. [Accessed: 13-Nov-2022].

[4] M. J. Timms, "Letting Artificial Intelligence in education out of the box: Educational Cobots and smart classrooms," *International Journal of Artificial Intelligence in Education*, vol. 26, no. 2, pp. 701–712, Jan. 2016.

[5] Y. Fang, P. Chen, G. Cai, F. C. M. Lau, S. C. Liew, and G. Han, ''Outage limit-approaching channel coding for future wireless communications: Root-protograph low-density parity-check codes,'' IEEE Veh. Technol. Mag., vol. 14, no. 2, pp. 85–93, Jun. 2019.

[6] J. Huang, S. Saleh, and Y. Liu, "A review on Artificial Intelligence in Education," *Academic Journal of Interdisciplinary Studies*, vol. 10, no. 3, p. 206, 2021.

[7] L. T. Khrais, "Role of artificial intelligence in shaping consumer demand in e-commerce," *Future Internet*, vol. 12, no. 12, p. 226, 2020.

[8] N. Soni, E. K. Sharma, N. Singh, and A. Kapoor, "Artificial Intelligence in business: From research and innovation to market deployment," *Procedia Computer Science*, vol. 167, pp. 2200–2210, 2020.

[9] "How ai is improving the shopping experience in online retail," *DMEXCO*, 24-Jun-2020. [Online]. Available: https://dmexco.com/stories/using-ai-to-create-a-personalized-shopping-experience-in-online-retail/. [Accessed: 13-Nov-2022].

[10] I. Hasan and S. Rizvi, "AI-driven fraud detection and mitigation in e-commerce transactions: Semantic

scholar," *undefined*, 01-Jan-2022. [Online]. Available: https://www.semanticscholar.org/paper/AI-Driven-Fraud-Detection-and-Mitigation-in-Hasan-Rizvi/607b9eaa290e04f919ad6d1f5b3773223f920979. [Accessed: 14-Nov-2022].

[11] J. L. Duffany, "Artificial Intelligence in GPS Navigation Systems," *2010 2nd International Conference on Software Technology and Engineering*, vol. 1, pp. V1–382, Oct.2010.

[12] Admin, "Artificial Intelligence: Taking driverless navigation up a gear," *TechNative*, 07-May-2020. [Online]. Available: https://technative.io/artificial-intelligence-taking-driverless-navigation-up-a-gear/. [Accessed: 13-Nov-2022].

[13] "Beyond GPS: Exploring positioning technology through Artificial Intelligence," *SK hynix Newsroom*, 11-Mar-2021. [Online]. Available: https://news.skhynix.com/beyond-gps-exploring-positioning-technology-through-artificial-intelligence/. [Accessed: 14-Nov-2022].

[14] G. N. M. I. T. News, "GPS system upgrade utilizes AI to make sure you're in the right lane," *New Atlas*, 28-Jan-2020. [Online]. Available: https://newatlas.com/technology/gps-system-ai-upgrade/. [Accessed: 14-Nov-2022].

[15] M. Y. Shaheen, "Applications of artificial intelligence (AI) in Healthcare: A Review," *Research Gate*, 2021. [Online]. Available: https://www.researchgate.net/profile/Mohammed-Yousef-Shaheen/publication/354841647_Applications_of_Artificial_Intelligence_AI_in_healthcare_A_review/links/614f3658154b3227a8acceb6/Applications-of-Artificial-Intelligence-AI-in-healthcare-A-review.pdf. [Accessed: 14-Nov-2022].

[16] U. Pawar, D. O'Shea, S. Rea, and R. O'Reilly, "Explainable AI in Healthcare," *2020 International Conference on Cyber Situational Awareness, Data Analytics and Assessment (CyberSA)*, pp. 1–2, Jun. 2020.

[17] M. Y. Shaheen, "Ai in healthcare: Medical and socio-economic benefits and challenges,"*Research Gate*, 2021. [Online]. Available: https://www.researchgate.net/profile/Mohammed-Yousef Shaheen/publication/354841418_AI_in_Healthcare_medical_and_socio-economic_benefits_and_challenges/links/614f346e154b3227a8accdeb/AI-in-Healthcare-medical-and-socio-economic-benefits-and-challenges.pdf. [Accessed: 14-Nov-2022].

[18] A. Gupta *et al*., "Artificial Intelligence And Smart Cities: A Bibliometric Analysis," *2022 International Conference on Machine Learning, Big Data, Cloud and Parallel Computing (COM-IT-CON)*, Faridabad, India, 2022, pp. 540-544, doi: 10.1109/COM-IT-CON54601.2022.9850656.

[19] A. Gupta and S. Singh (2023) "Barriers of digital transaction in rural areas: an interpretive structural modelling and MICMAC analysis" International Journal of Electronic Business, Vol 18, No. 1. DOI: 10.1504/IJEB.2023.10051508.

[20] Tyagi, S., Gupta, A., Bhatnagar, A., & Ansari, N. (2022). User's Involvement In The Information Flow Paradigm On Social Networking Sites During Covid-19: A Structural Equation Modelling Approach. Journal of Content, Community and Communication, 53-68.

[21] Gupta, A., & Kumar, H. (2022). Multi-dimensional perspectives on electric vehicles design: A mind map approach. Cleaner Engineering and Technology, 100483.

[22] R. Kumar, M. Memoria, A. Gupta and M. Awasthi, "Critical Analysis of Genetic Algorithm under Crossover and Mutation Rate," 2021 3rd International Conference on Advances in Computing, Communication Control and Networking (ICAC3N), 2021, pp. 976-980, doi: 10.1109/ICAC3N53548.2021.9725640.

[23] A. Gupta, R. Parmar, P. Suri, and R. Kumar, "Determining Accuracy Rate of Artificial Intelligence Models using Python and R-Studio," in *2021 3rd International Conference on Advances in Computing, Communication Control and Networking (ICAC3N)*, 2021, pp. 889–894.

[24] R. Kumar *et al.*, "Analyzing The Performance Of Crossover Operators (OX, OBX, PBX, MPX) To Solve Combinatorial Problems," in *2022 International Conference on Machine Learning, Big Data, Cloud and Parallel Computing (COM-IT-CON)*, 2022, vol. 1, pp. 817–821.

[25] A. Mohammed *et al.*, "Data security and protection: A mechanism for managing data theft and cybercrime in online platforms of educational institutions," in *2022 International Conference on Machine Learning, Big Data, Cloud and Parallel Computing (COM-IT-CON)*, 2022.

[26] N. Ansari *et al.*, "A critical insight into the impact of technology in transformation of tourist business into smart tourism," in *2022 International Conference on Machine Learning, Big Data, Cloud and Parallel Computing (COM-IT-CON)*, 2022.

[27] S. Tyagi *et al.*, "Role of IOT and blockchain in achieving a vision of metropolitan's digital transformation," in *2022 International Conference on Machine Learning, Big Data, Cloud and Parallel Computing (COM-IT-CON)*, 2022.

[28] S. Ahmad *et al.*, "The importance of quantifying financial returns on information system (IS) investment for organizations: An analysis," in *2022 International Conference on Machine Learning, Big Data, Cloud and Parallel Computing (COM-IT-CON)*, 2022.