

## Future of Artificial Intelligence

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### Abstract

*Artificial intelligence is the science and engineering of making smart machines, aiming to provide machines with the ability to think achieve and overcome human intelligence. In his study, we begin with an introduction to the general field of artificial intelligence, then move on to the birth, history and rise of artificial intelligence. We then explore the main trends on the ground, as well as the advancement, evolution and its applications for various aspects of our lives. The study covers core and ongoing research related to artificial intelligence, including enhancement learning, robotics, and computer vision. At the same time, we highlight the unique benefits of future technologies, focusing on opportunities, limits and ethical questions. In conclusion, we outline several current areas of research in this area and make recommendations for further research.*

**Keywords:** Artificial Intelligence, Machine Learning, Deep Learning, neuroscience, generative adversarial networks, symbolic AI robotics, Reinforcement Learning, self-driving cars

### INTRODUCTION

Artificial intelligence (AI) is the science and engineering which deals with the computational understanding of intelligent behavior and therefore the creation of intelligent machines [1]. AI encompasses various tools, techniques and algorithms, as mentioned in Figure 1. These technologies are growing exponentially which have considerable impacts in areas such as health care, space, robotics and the military. With the increasing quantity of data, ubiquitous connectivity, high-performance computing and various algorithms available to us, Artificial intelligence will add yet another level of efficiency and sophistication to future technologies. One of the main objectives of Artificial Intelligence is to produce fully autonomous intelligent agents that interact with their environments, discover optimal behaviors, and improve over time through near trial and error just like the humans. It has been a long-standing challenge, ranging from robots, which can detect and respond to the world around them, to purely software-based capable of interacting with natural language and multi-media. Today's artificial intelligence technologies are used in driving, aviation, medicine, on-line advertising, image recognition, and personal assistance.

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Received Date: May 12, 2021

Accepted Date: August 11, 2021

Published Date: September 25, 2021

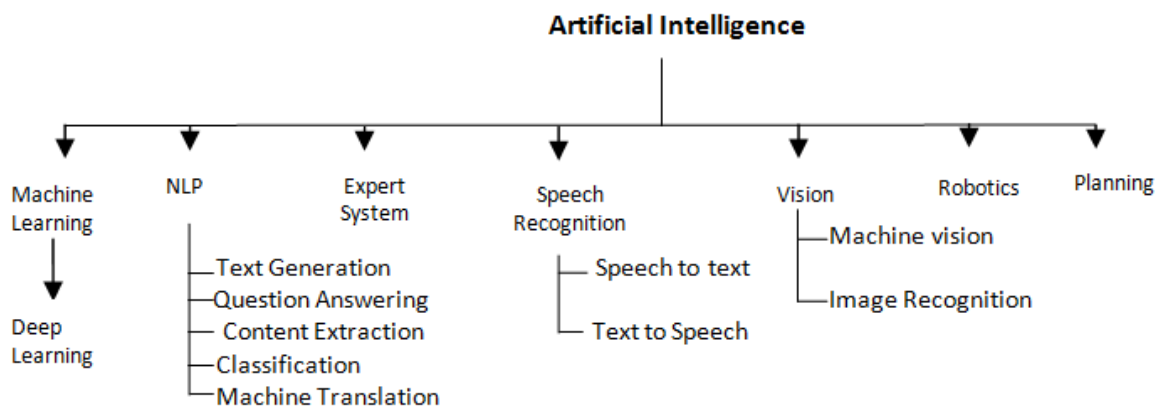
**Citation:** Navin Prakash, Mohd Sharique Khan. Future of Artificial Intelligence. Journal of Artificial Intelligence Research & Advances. 2021; 8(2): 31–33p.

The recent success of artificial intelligence has captured the imagination of the science community and the public. An example of this is autonomous cars providing the ability to make intelligent decisions on maneuvers in variable, real-traffic road conditions [2]; a further example is the AlphaGo and AlphaZero [3], developed by Google DeepMind, to play the board game Go, that beat expert player. It is both the excitement and fear about AI when it will surpass human intelligence.

### THE BIRTH AND EVOLUTION OF AI

Firstly, Turing raised the question "CAN MACHINE THINK?" [1]. Turing developed the Turing test in 1950 that exhibited intelligent

behavior. The test has some requirements to build a truly intelligent machine as knowledge representation, natural language, machine learning, automated reasoning, vision, and robotics for the Turing test. The term AI was firstly introduced by John McCarthy and which was related to the field of "symbolic AI", which was popular until the end of the 1980s. In the 1990s, concept of "intelligent agent" emerged that perceives its environment and undertakes actions [4]. To overcome of the boundaries of symbolic AI, neural networks, fuzzy systems, evolutionary computation, and further computational models started in advance popularity, termed as "computational intelligence", as an emerging subfield of AI. Two most important methodologies are the top-down and bottom-up methods. The top-down approach mimics the human brain's behavior, while the bottom-up theory which is the best way to achieve AI by building electronic replicas is similar to the human brain's complex network of neurons.



**Figure 1.** Subfields of AI.

## AI APPLICATIONS AND FUTURE TECHNOLOGY

AI is everywhere and is not only limited to computer science but has evolved to include other areas like health, security, music, education, art and business application. Many AI applications are deeply embedded in every industry. AI is currently being engaged in broad range of tasks like medical diagnosis, e-commerce, robotics, and remote sensing. It has been used in advancement of several fields and industries, like finance, education, transportation, and healthcare. AI scientists have developed many tools to solve the very difficult problems in computer science and other fields.

AI finds applications like facial recognition, speech recognition, object recognition [5], images classification [6] and surpassing human intelligence in The Game of Go, Chess, StarCraft II and Dota 2. AI is used in clinical decision-making systems for medical diagnosis, interpretation of medical images, and escort robots. It can even produce computer-generated music for stress and pain relief. Furthermore, like Google Magenta [7], developed by the Google Brain team, is capable of making persuasive art and music. One more active field of AI research is the use of AI to create other AI. Extension of Generative Adversarial Networks [8]: This includes Google's AutoML project that evolves new neural network topologies which is better performance of all previously published ImageNet performances. This is also extended to the current research of Technical University of Munich and Stanford University developed Face2Face [9], a program which animates the face of a target person, transposing the facial expressions of an exterior source. Since then, another method deep neural network has been developed "DeepFake" [10]. Recently, other research directions in quantum machine learning, self-driving cars, Bayesian deep learning, hierarchical reinforcement learning, affective computing & Human-Centered AI, neuroscience, and conversational agents.

## OPPORTUNITIES, LIMITATIONS AND ETHICS OF AI

With the advancement of AI, now major concerns have been started about impact of AI on society, not only in legal and ethical areas. It also includes the thought that super AI may supersede the

cognitive capabilities of humans. This scenario is known as "AI SINGULARITY" [11], termed as the ability of machines to build better machines by them. Current AI researchers are focused on developing systems that are excellent at tasks and mimic all various cognitive abilities related to human intelligence such as emotional knowledge and self-awareness. On the other hand, AI technology is still very limited to specific applications. As there is lack of common sense, emotional intelligence, the power to judge information away from its acquired knowledge, AI can only detect basic human emotional states such as anger, pain, joy, sadness, and stress. The computer science mainly believes in motivating AI forward, not only from a technological standpoint but also from a social, ethical and legal perspective.

## CONCLUSION AND CONCERNS

AI is about to transform the future of our society and our life. Along with the unique enthusiasm of AI, there are also worries about the impact of AI technology on our society. Such fears should not obstruct the development of AI but encourage the development of an organized agenda on which future AI will grow.

## REFERENCES

1. Turing Alan M. *Computing Machinery and Intelligence*. Parsing the Turing Test. Springer; 2009.
2. Zhuo Xu, Chen Tang, *et al.* Zero-shot Deep Reinforcement Learning Driving Policy Transfer for Autonomous Vehicles based on Robust Control. 2018 21st International Conference on Intelligent Transportation Systems (ITSC). IEEE; 2018.
3. David Silver, Julian Schrittwieser, *et al.* Mastering the game of go without human knowledge. *Nature*. 2017; 550: 354–359.
4. Michael Wooldridge, Jennings Nicholas R. *Intelligent agents: Theory and practice*. *Knowl Eng Rev*. 1995; 10(2): 115–152.
5. Kulhanek J, *et al.* Vision-based Navigation Using Deep Reinforcement Learning. 2019 European Conference on Mobile Robots (ECMR). 2019.
6. Ryosuke Furuta, Naoto Inoue, *et al.* PixelRL: Fully Convolutional Network with Reinforcement Learning for Image Processing. *IEEE Trans Multimedia*. 2020; 22(7): 1704–1719.
7. Magenta. An open source research project exploring the role of machine learning as a tool in the creative process. [Online]. Available from <https://magenta.tensorflow.org/>.
8. Goodfellow IJ, *et al.* Generative Adversarial Networks. *Adv Neural Inf Process Syst*. 2014; 3(11): 1–9.
9. Justus Thies, Michael Zollhöfer, *et al.* Face2Face: Real-Time Face Capture and Reenactment of RGB Videos. 2016 IEEE Conference on Computer Vision and Pattern Recognition (CVPR). 2016 Jun 27–30; Las Vegas, NV, USA, New York: IEEE; 2016.
10. Brian Dolhansky, Russ Howes, *et al.* (2019). The Deepfake Detection Challenge (DFDC) Preview Dataset [Online]. Available from <https://arxiv.org/pdf/1910.08854.pdf>.
11. Spinrad N. Mr. Singularity. *Nature*. 2017; 543(7646): 582–582.