ARTIFICIAL INTELLIGENCE AND ROBOTICS AND THEIR IMPACT ON WORKPLACE

NIKHIL SHRIVASTAVA
RESEARCH SCHOLAR, CMJ UNIVERSITY, MEGHALAYA
DR. VIRESHWAR MAJUMDAR
ASSISTANT PROF. GLOBAL COLLEGE, CHAURADEEH, KAUSAMBI

Abstract

The advent of modern information technology and machines powered by artificial intelligence (AI) has already influenced the world of work in the 21st century. Computers, algorithms, and software simplify everyday tasks, and it is impossible to imagine how much of our lives can be managed without them. However, it is also impossible to imagine how most process steps can be managed without human force. The information economy characterized by exponential growth largely transforms the production industry based on the economy.

Introduction

Artificial Intelligence (AI) is a commonly employed appellate mentioning the field of science for the purpose of providing machines with the ability to act like logic, planning, education and perception. In spite of "Machines" in this definition may refer to the latter. Be applied to "any form of living intelligence". Likewise, the meaning of intelligence, as found in primates and others for example extraordinary animals, it can be increased set an inter-set of capabilities including creativity, emotional knowledge, and self-awareness. However, current AI technologies are limited to very specific application. For example, AI lacks a boundary "common sense"; Ability to judge beyond information gained knowledge of it. A recent example of this is AI Robot Tay designed and developed

by Microsoft Chat on social networks. Had to cut it soon after its launch because it was not able to differentiate between positive and negative human interactions. AI is also limited in terms of emotional intelligence. AI can only detect basic human emotional states such as anger, happiness, sadness, fear, pain, stress and neutrality. Emotional intelligence is one of the next frontiers of higher levels of privatization.

True and complete AI does not exist yet. At this stage, A.I. mimicking human cognition at one point will enable this ability dreaming, thinking, feeling emotions and setting goals. Although such a true AI may exist even earlier. There is no evidence yet 2050, Still Computer Science Principles AI is advancing rapidly, and this is important assess its impact, not only from a technical standpoint, but also from a social, moral and legal point of view.

Looking for a customer on the development of AI

The development of AI has ended many cycles till date optimism (springs) and pessimism or negativity (winter):

1. Birth of AI (1952–1956): Before AI was coined, there were already advances in cybernetics and neural network, which started attracting the attention of both the scientific community and the public. Dartmouth conference (1956) was the result of this increase gave birth to the following golden years of interest and AI with high levels of optimism in the area.

2. First Spring (1956–1974): Computers of the time solve algebra and geometric problems, talk with English. Advances were "influential" and qualify as there was a general atmosphere of optimism in the area. The field researchers speculated that the

completely intelligent machine will be manufactured in the next 20 years.

3. First winter (1974–1980): winter started the public and media questioned the promises of AI. Researchers were caught in an exaggerated spiral claims and predictions but technology limitations were planted on time. Sudden end of financing by major agencies like DARPA, National Headed by the Research Council and the British Government AI's first winter.

4. Second Spring (1980–1987): Expert System Developed to solve the problems of a specific domain by using logical rules derived from experts. There was for this also the connection and revival of neural networks character or speech recognition. This period is known as AI's second spring.

5. Third Spring (2000-Present): Since 2000 internet and Web Success, Big Data Revolution started taking up newly emerged areas as Deep Learning. This new term is known as third spring of AI and for the time being, it looks like it's here live. Some have also begun to predict imminent the advent of singularity - resulting in an intelligence explosion a powerful super-intelligence that will eventually surpass human intelligence. Is it possible?

Financial impact of AI

It is well believed that AI enhances human’s efficiency as well as productivity and this is reflected rapid development of investment in many companies and organization. These include the healthcare sector, manufacturing, transportation, energy, banking, financial services, management consulting, government administration and marketing

advertising. Major tech firms are investing in applications for speech recognition, natural language processing and computer vision. A significant jump in performance machine learning algorithms that resulted in deep learning, took advantage of improved hardware and sensor technology to train artificial networks with large amounts of information received from 'big data'. IBM has developed a super computer platform Watson, which has the ability to extract text mining and complex analysis from large volumes of unstructured data. To showcase its capabilities in 2011, IBM Watson, defeat two top players on a popular quiz show 'Japanese'.

Participants are required to guess the questions with specific answers.

Subfields and Technologies That Arithmetic artistic integration

AI is a diverse field of research and the following subfields are necessary for its development. They also include neural networks, fuzzy logic, evolutionary computations and possible methods. Build on connection area with neural network the main purpose of copying the nervous system processes information. Artificial Neural Network (ANN) and the variant allows AI to demonstrate significant progress relative function of "perception". When combined with current multicore parallel computing hardware platforms, several neural layers can be stacked to provide a high level of perceptual abstraction in learning its set of features, thus removing the need for handcrafted facilities; a process which is known as intensive education.

Deep learning is part of machine learning and is usually linked to deep neural networks that consist of a multilevel learning of detail or representations of data. Through these different layers, information passes from low-level parameters to higher-level parameters. These different levels correspond to different levels of data abstraction, leading to

learning and recognition. A number of deep learning architectures, such as deep neural networks, deep convolutional neural networks and deep belief networks, have been applied to fields such as computer vision, automatic speech recognition, and audio and music signal.

Fuzzy logic focuses on the manipulation of information that is often imprecise. Most computational intelligence principles account for the fact that, whilst observations are always exact, our knowledge of the context, can often

be incomplete or inaccurate as it is in many real-world situations. Fuzzy logic provides a framework in which to operate with data assuming a level of imprecision over a set of observations, as well as structural elements to

enhance the interpretability of a learned model recognition and these have been shown to produce cutting-edge results in various tasks.

Evolutionary computing relies on the principle of natural selection, or natural patterns of collective behavior. The two most relevant subfields include genetic algorithms and swarm intelligence. Its main impact on AI is on multi objective optimization, in which it can produce very robust results. The limitations of these models are like neural networks about interpretability and computing power.

Statistical Learning is aimed at AI employing a more classically statistical perspective, e.g., Bayesian modelling, adding the notion of prior knowledge to AI. These methods benefit from a wide set of well-proven techniques and operations inherited from the field of classical statistics, as well as a framework to create formal methods for AI. The main drawback is that, probabilistic approaches express their inference as a correspondence to a population and the probability concept may not be always applicable, for instance, when vagueness or subjectivity need to be measured and addressed.

Ensemble learning and meta-algorithms is an area of AI that aims to create models that combine several weak base learners in order to increase accuracy, while reducing its bias and variance. For instance, ensembles can show a higher flexibility with respect to single model approaches on which some complex patterns can be modelled. Some well-known meta-algorithms for building ensembles are bagging and boosting. Ensembles can take advantage of significant computational resources to train many base classifiers therefore enhancing the ability to augment resolution of the pattern search - although this does not always assure the attainment of a higher accuracy.

Logic-based artificial intelligence is an area of AI commonly used for task knowledge representation and inference. It can represent predicate descriptions, facts and semantics of a domain by means of formal logic, in structures known as logic programs. By means of inductive logic programming hypotheses can be derived over the known background.

Rise of Deep Growth: Rise Machine line pipeline

The idea of making artificial machines is as old as artificial invention of computer. Alan Turing in the early 1950s proposed the Turing test, designed to assess whether the machine can be defined as intelligent. Two of the main leading the field are Pitts and McCulloch, who are in 1943, developed a technique designed to mimic the way a neuron works. Inspired by this work, a few years later, Frank Rosenblatt developed the first real precursor in modern neural networks, called perceptron's. this algorithm describes an automated learning process can discriminate linearly separable data. Was Rosenblatt assuming that perceptual will give rise to an AI system future. The introduction of Perceptron in 1958, indicated beginning of AI development. For about 10 years later, researchers used this approach automatically. While learning to

discriminate data in multiple applications Papert and Minsky performed some important performances limitations of Perceptron.

ROBOTICS AND AI

Building on the advances made in mechatronics, electrical engineering and computing, robotics is developing increasingly sophisticated sensorimotor functions that give machines the ability to adapt to their ever-changing environment. Until now, the system of industrial production was organized around the machine; it is calibrated according to its environment and tolerated minimal variations. Today, it can be integrated more easily into an existing

environment. The autonomy of a robot in an environment can be subdivided into perceiving, planning and execution (manipulating, navigating, collaborating). The main idea of converging AI and Robotics is to try to optimise its level of

autonomy through learning. This level of intelligence can be measured as the capacity of predicting the future, either in planning a task, or in interacting (either by manipulating or navigating) with the world. Robots with intelligence have been attempted many times. Although creating a system exhibiting human-like intelligence remains elusive, robots that can perform specialized autonomous tasks, such as driving a vehicle [52], flying in natural and man-made environments, swimming, carrying boxes and material in different terrains, pick up objects and put them down do exist today.

REFERENCES

[1] S. J. Russell and P. Norvig, Artificial intelligence: a modern approach (3rd edition): Prentice Hall, 2009.

[2] I. Lighthill, "Artificial Intelligence: A General Survey," in Artificial

Intelligence: A Paper Symposium. London: Science Research Council, 1973.

[3] M. Minsky and S. Papert, "Perceptrons," 1969.

[4] J. J. Hopfield, "Neural networks and physical systems with emergent collective computational abilities," Proceedings of the national academy of sciences, vol. 79, pp. 2554-2558, 1982.

[5] D. E. Rumelhart, G. E. Hinton, and R. J. Williams, "Learning internal representations by error propagation," DTIC Document1985.

[6] M. Wooldridge and N. R. Jennings, "Intelligent agents: Theory and practice," The knowledge engineering review, vol. 10, pp.115-152, 1995.

[7] L. A. Zadeh, "Fuzzy logic—a personal perspective," Fuzzy Sets and Systems, vol. 281, pp. 4-20, 2015.

[8] N. Spinrad, "Mr Singularity," Nature, vol. 543, pp. 582-582, 2017.

[9] E. Horvitz, "One Hundred Year Study on Artificial Intelligence: Reflections and Framing," ed: Stanford University, 2014.

[10] S. Lohr, "The age of big data," New York Times, vol. 11, 2012.

[11] P. Alston, "Lethal robotic technologies: the implications for human rights and international humanitarian law," JL Inf. & Sci., vol. 21, p. 35, 2011.

[12] A. Young and M. Yung, "Deniable password snatching: On the possibility of evasive electronic espionage," in Security and Privacy, 1997. Proceedings., 1997 IEEE Symposium on, 1997, pp. 224-235.

[13] D. Kirat, G. Vigna, and C. Kruegel, "Barecloud: bare-metal analysis-based evasive malware detection," in 23rd USENIX Security Symposium (USENIX Security 14), 2014, pp. 287-301.

[14] C. Bryant and R. Waters, "Worker at Volkswagen plant killed in robot accident," in Finantial Times, ed, 2015.

[15] J. Andreu-Perez, D. R. Leff, K. Shetty, A. Darzi, and G.-Z. Yang, "Disparity in Frontal Lobe Connectivity on a Complex Bimanual Motor

Task Aids in Classification of Operator Skill Level," Brain connectivity, vol. 6, pp. 375-388, 2016.

[16] J. Harrison, K. Izzetoglu, H. Ayaz, B. Willems, S. Hah, U. Ahlstrom, et al., "Cognitive workload and learning assessment during the implementation of a next-generation air traffic control technology using functional near-infrared spectroscopy," IEEE Transactions on Human-Machine Systems, vol. 44, pp. 429-440, 2014.

[17] A. J. Gonzalez and V. Barr, "Validation and verification of intelligent systems-what are they and how are they different?" Journal of Experimental & Theoretical Artificial Intelligence, vol.12, pp. 407-420, 2000.

[18] S. Ratschan and Z. She, "Safety verification of hybrid systems by constraint propagation-based abstraction refinement," in International Workshop on Hybrid Systems: Computation and Control, 2005, pp. 573-589.

[19] E. Broadbent, R. Stafford, and B. MacDonald, "Acceptance of healthcare robots for the older population: review and future directions," International Journal of Social Robotics, vol. 1, pp. 319-330, 2009.

[20] C.-A. Smarr, A. Prakash, J. M. Beer, T. L. Mitzner, C. C. Kemp, and W. A. Rogers, "Older adults' preferences for and acceptance of robot assistance for everyday living tasks," in Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 2012, pp. 153-157.

[21] R. C. O'Reilly and Y. Munakata, Computational explorations in cognitive neuroscience: Understanding the mind by simulating the brain: MIT press, 2000.

[22] G.-Z. Yang. (2017) Robotics and AI Driving the UK's Industrial Strategy Ingenia.

[23] S. Inc, "Artificial Intelligence (AI)," 2016.

[24] S. Farquhar. (2017). Changes in funding in the AI safety field. Available: https://www.centreforeffectivealtruism.org/blog/changes-in-funding-in-the-ai-safety-field.

[25] T. Reuters, "Web of Science," 2012.

[26] G. Scimago, "SJR—SCImago Journal & Country Rank," ed, 2007.