

APPLICATIONS AND THE IMPORTANCE OF ARTIFICIAL INTELLIGENCE IN COGNITIVE SCIENCE

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ABSTRACT

Artificial intelligence (AI) is a branch of research which, in very broad terms, concerns itself with the making of machines that can solve complex problems in a 'human way'. AI is traditionally assigned to the computer sciences but it overlaps many other areas also, such as psychology, biology, and the cognitive sciences, as well as mathematics and philosophy. This paper provides a general overview of cognitive science, the area of the field involving artificial intelligence. In addition, the paper will elaborate on current research for cognitive science artificial intelligence, highlight the importance of this research by providing specific examples of its applications in present society, and briefly discuss future research opportunities for the overlapping fields of cognitive science and artificial intelligence.

Keywords: *Humans, Artificial intelligence, Cognitive science, Intelligent agents, Planning Cognition*

I. INTRODUCTION

Artificial intelligence (AI) and cognitive science are two distinct disciplines, with overlapping methodologies, but rather different goals. AI is a branch of computer science and is concerned with the construction and deployment of intelligent agents as computer programs and with understanding the behavior of these artifacts. Cognitive science is an explicitly interdisciplinary field that has participation from AI, but also from linguistics, philosophy, psychology, and subfields of other social and biological sciences. The unifying goal of cognitive science is to understand and model human intelligence, using the full range of findings and methodologies of the complementary disciplines.

A. Artificial Intelligence in Cognitive Science

The central principle of cognitive science is that a complete understanding of the mind cannot be obtained without analyzing the mind on multiple levels. In other words, numerous

techniques must be used to fully evaluate and understand a process of the mind. Artificial intelligence is a powerful approach that allows researchers in cognitive science to study behavior through computational modeling of the human mind. There are numerous approaches to simulating how the mind is structured with approaches ranging from creating and observing artificial neurons to representing the mind as a high-level collection of rules, symbols, and plans.

B. Cognitive Science in Artificial Intelligence

In addition to simulating intelligence to model and study the human mind, artificial intelligence involves the study of cognitive phenomena in machines and attempts to implement aspects of human intelligence in computer programs. These programs can be used to address a variety of complex problems with the goal of doing so more efficiently than a human. New theories in the cognitive science field often influence improved artificial intelligence agents that better simulate the human thought process. Achievements in cognitive science help improve artificial simulation of the human mind. In turn, more accurate artificial intelligence provides better models of the human mind for cognitive science researchers to use. Although the goals of cognitive science and artificial intelligence differ, collaboration between the two fields is essential for their success. Cognitive science artificial intelligence refers to the interdisciplinary study that overlaps these areas in attempt to achieve both cognitive science and artificial intelligence goals.

II. COGNITIVE SCIENCE IMPORTANT FOR ARTIFICIAL INTELLIGENT

As AI immerses itself into a variety of professions and aspects, the use of cognitive science becomes extremely important. For any industry to benefit, they need to understand what will work for the human mind and how to please it. Since AI sets foot in these industries, it will have to perform to these standards.

Here are a few examples that prove why Cognitive Science is important for AI,

The study of the mind is an invaluable resource for almost every organization, especially education, psychology, and research. Educational organizations adopt technology to teach better and they could use AI effectively if it understands the needs of the students better. Engineering and medicine tools and devices need to be better equipped to gauge the coping of the human brain and simplify it for them. For example, automated cars also need to be designed in a way humans are able to understand how to work them. Human resources can use cognitive

science to better productivity levels in individuals and grow them to the best of their potential. Any field that interacts with humans will need to have an understanding of the mental and emotional processes in human beings. Banking professionals providing automated financing services would also need to have a great understanding of the human mind and how to appeal to them. The tools powered by AI offered by them need to be easy for people to use. Personalized features in the usability of Apps need to ask the right questions to understand customer preferences and how to provide it to them. For example, personalized shopping experiences, social media face detection, social media showing related content, etc.

III. CURENENT RESEARCH IN ARTIFICIAL INTELLIGENCE

AI Research is divided into subfields that focus on specific problems or on specific approaches or on the use of a particular tool or towards satisfying particular applications. The central problems or goal of research reasoning, knowledge, planning, learning, natural language processing perception and the ability to move and manipulate objects. General is among the field's long-term goals. Approaches include statistical methods, computational intelligence, soft computing (e.g. machine learning), and traditional symbolic AI. Many tools are used AI, including versions of search and mathematical optimization, logic, methods based on probability and economics.

The most popular and latest AI applications used in the real world

Siri

Apple's personal assistant, Siri is very popular among people today. It is, perhaps, one of the top AI applications being used today. . Apple's Siri is the world's most popular intelligent assistant. It is a virtual assistant that is a part of Apple's iPadOS ,macOS etc. Driven by Artificial Intelligence, Apple's Siri uses voice queries and a natural-language user interface to answer questions, make recommendations, and perform actions by analyzing voice commands. It can perform multiple functions such as find information, give directions, add events to calendars, send messages and so on. Siri is an intelligent digital personal assistant that uses machine-learning technology to get smarter and better for being able to predict and understand our questions and requests.

Alexa

Let's have a look at one of these major applications of Artificial Intelligence. Amazon's Alexa is a virtual assistant driven by Artificial Intelligence. Alexa is capable of doing a number of things such as voice interaction, music playback, making to-do lists, setting alarms, streaming podcasts, playing audiobooks, and providing weather, traffic, sports, and other real-time information such as predicting weather conditions. AI-powered Alexa can also control several smart devices by using itself as a home automation system. Its ability to decipher speech from anywhere in the room has made it a popular product that has revolutionized the market space. we can shop, schedule appointments, set alarms and do a million other things using Amazon's Alexa., it is one of the latest Artificial Intelligence examples dominating the business space now. we can hire an AI developer to incorporate incredible AI benefits such as these in business projects.

Netflix

Netflix is one of the top AI applications that uses AI techniques to predict customer likings and render an improved customer experience by offering suggestions tailored to your preferences. Netflix uses AI algorithms to analyze customer data so as to make accurate predictions. It is one of the major Applications of Artificial Intelligence that analyzes billions of records to suggest films that you might like based on your previous reactions and choices of films. With more advancements being made in the technology, Netflix is becoming smarter and smarter.

Pandora

Pandora's A.I. is possibly one of the most revolutionary technologies prevailing in the market now. It's often called musical DNA. Pandora analyzes a database of music that contains certain attributes. Based on these musical characteristics, each song is manually analyzed by a team of professional musicians and later recommended. A bot can annotate music only to a certain extent based on the data. Along With this data, a team of musicians fine-tune the recommendation engine using Artificial Intelligence. It wouldn't be wrong to say that AI-driven Pandora is one of the latest Artificial Intelligence examples.

DataBot

DataBot is an AI-powered virtual assistant, and it's available on Windows 10, Android, and iOS. It's also available on Xbox One, iPad, iPod, Android tablets, and Windows phones WE can customize DataBot according to preference of language, voice, etc. DataBot can speak and

understand English, Italian, Spanish, French, German, and Portuguese. Using DataBot, you can share information using SMS, email, and social media.

IV. THE FUTURE OF COGNITIVE SCIENCE ARTIFICIAL INTELLIGENCE

Although there have been many breakthroughs in the cognitive science artificial intelligence field, researchers are continually working to improve intelligent agents. The human mind has the impressive capability of performing numerous mental and physical tasks with little mental strain on the other hand, computer simulated intelligence is limited by the speed and capacity of hardware for performing computations. The development of advanced nanotechnology to increase hardware speed and memory will reduce this restraint on simulating human level intelligence. Furthermore, while theories of cognitive science artificial intelligence have fostered improved understanding of the human mind, advancements in the psychology and cognitive science fields, that help better understand human behavior, can be used to further improve intelligent agents. Finally, an issue more acknowledged by the public than researchers in the field, include ethical and organizational concerns with the coevolution of humans and intelligent systems; these issues may one day have to be addressed. For instance, society would have to address restrictions on how a human-simulating robot can behave.

V. CONCLUSIONS

AI is bound to integrate into the human world with a lot of effort, first being conquering the ability to think independently and with empathy. While scientists will use Cognitive science to replicate intelligence in AI, eventually AI will be using cognitive science to understand humans better. It will develop the ability to learn new things, make decisions by rationalizing and provide useful insights for human beings. The future is smart for AI and easier for us.

VI. REFERENCES

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