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# Applications of Artificial Intelligence in Theory of Mind

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**Abstract**

The first use of the phrase "Artificial Intelligence" in 1956 is attributed to John McCarthy of the University of Massachusetts. It is a fairly new field which involves programming computers to play games, comprehend and respond to natural language, reproduce neural networks like those of humans and exhibit sensitivity (Hear, see, move, and react to the environment) like humans (this branch is termed robotics). First we must define Artificial Intelligence. A number of proposed definitions would be considered here.

**Keywords**: Artificial Intelligence, Theory of Mind, AI

## Introduction

The first use of the phrase "Artificial Intelligence" in 1956 is attributed to John McCarthy of the University of Massachusetts. It is a fairly new field which involves programming computers to play games, comprehend and respond to natural language, reproduce neural networks like those of humans and exhibit sensitivity (Hear, see, move, and react to the environment) like humans (this branch is termed robotics). First we must define Artificial Intelligence. A number of proposed definitions would be considered here. It is the science and engineering of making intelligent machines, especially intelligent computer programs. The ability of a computer or other machine to perform actions thought to require intelligence… An intelligent machine would be more flexible than a computer and would engage in the kind of "thinking" that people actually do. A branch of computer science dealing with the simulation of intelligent behavior in computers. The capacity of a computer to perform operations analogous to learning and decision making in humans it is also important to define intelligence in general: The ability to learn facts and skills and apply them.

The ability to learn or understand things to deal with new or difficult situations These generalized definitions give an idea, of what this field is concerned with. However an in-depth consideration of the definition of this field from the perspective of professionals in the field of computing and AI would be important. The last section of this paper considers the work of a foremost contributor to this novel field, Alan Turing. In the last 15 years, researchers in the field of computer science have built machines, which have beat humans to competitions which are said to involve the use of intelligence. The two prominent machines in this category are IBM‟s Deep Blue and Watson. The next two sections would consider each of them respectively.

Broadly, artificial intelligence (AI) mainly entails technology constellations such as machine learning, natural language processing, perception, and reasoning since it is difficult to done [1].

Even though the field's application and principles have undergone investigation for more than sixty-five years, modern improvements, attendant society excitement, and uses ensured its return to focus. The influence of the previous artificial intelligence systems is evident, introducing both opportunities and challenges, which enables the integration of future AI advances into the economic and social environments.

It is apparent that most people today view AI as a robotics concept but it essentially incorporates broader technology ranges that are used widely [2]. From search engines to speech recognition, to learning/gaming structures and object detection, AI application has the potential to intensify in the human daily lives. The application is already experiencing use in the world of business as companies seek to study the needs of the consumers, as well as, other fields including healthcare and crime investigation. In this paper, I will discuss the perceptions of consumers regarding artificial intelligence and outline its impact in retail, healthcare, crime investigation, and employment.

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In 1997, Deep Blue computer designed by IBM defeated the 12 time chess world champion Garry Kasparov to a 6 round game of chess. What was behind Deep Blue's victory? In an interview of IBM"s Research Scientist Hsu by Ubiquity in 2005, Hsu admits to the use of "brute force" and pushing computational speed, as Deep Blue's edge over Kasparov. What does brute force involve? Claude Shannon researched on total possible moves for a typical game of chess.

Artificial intelligence in today's world is progressing rapidly with new advanced innovations day in day out. Today's computer systems are designed to perform small tasks, for instance, facial recognition, car driving, and performance of other minor duties. However, the primary goal of artificial intelligence is to develop advanced and more complex systems that would outperform humans at whatever way. This includes the performance of more complicated tasks like playing chess and solving equations. Therefore, the future goal of AI is to perfect all human activities and provide better solutions to problems than the human can do. In the long term, an automated system that does all the human functions from controlling cars to computerized business systems will pose several challenges. More so, in preventing the development of lethal arms that significantly harm humans once they are used to attack. As a result, the development of super AI that undergoes self-improvement, triggering intelligence explosion would leave the human intellectual capacity by far. The development of a super AI will mark the greatest invention in the human history.

**Research Questions**

This research is guided by the following questions:

1- What are the factors which influence the understanding the people thoughts and emotions that affect their own behavior?

2- What is The Impact of Artificial Intelligence on Social Media?

3- How to apply artificial intelligence in development of theory of mind

4- What is types of artificial intelligence

**What Is Artificial Intelligence?**


Artificial intelligence (AI) is the simulation of human intelligence processes by machines, especially computer systems. These processes include learning (the acquisition of information and rules for using the information), reasoning (using rules to reach approximate or definite conclusions) and self-correction. Particular applications of AI include expert systems, speech recognition and machine vision.

Artificial intelligence is a branch of computer science that aims to create intelligent machines. It has become an essential part of the technology industry. Research associated with artificial intelligence is highly technical and specialized. The core problems of artificial intelligence include programming computers for certain traits such as: Knowledge, Reasoning, and Problem solving, Perception, Learning, Planning, and Ability to manipulate and move objects Knowledge engineering is a core part of AI research. Machines can often act and react like humans only if they have abundant information relating to the world. Artificial intelligence must have access to objects, categories, properties and relations between all of them to implement knowledge engineering. Initiating common sense, reasoning and problem-solving power in machines is a difficult and tedious task.

Machine learning is also a core part of AI. Learning without any kind of supervision requires an ability to identify patterns in streams of inputs, whereas learning with adequate supervision involves classification and numerical regressions.

Classification determines the category an object belongs to and regression deals with obtaining a set of numerical input or output examples, thereby discovering functions enabling the generation of suitable outputs from respective inputs. Mathematical analysis of machine learning algorithms and their performance is a well-defined branch of theoretical computer science often referred to as computational learning theory.

AI can be categorized as either weak or strong. Weak AI, also known as narrow AI, is an AI system that is designed and trained for a particular task. Virtual personal assistants, such as Apple's Siri, are a form of weak AI. Strong AI, also known as artificial general intelligence, is an AI system with generalized human cognitive abilities. When presented with an unfamiliar task, a strong AI system is able to find a solution without human intervention.

Machine perception deals with the capability to use sensory inputs to deduce the different aspects of the world, while computer vision is the power to analyze visual inputs with a few sub-problems such as facial, object and gesture recognition. Robotics is also a major field related to AI. Robots require intelligence to handle tasks such as object manipulation and navigation, along with sub-problems of localization, motion planning and mapping.

**Types of artificial intelligence**

Arend Hintze, an assistant professor of integrative biology and computer science and engineering at Michigan State University, categorizes AI into four types, from the kind of AI systems that exist today to sentient systems, which do not yet exist. His categories are as follows:

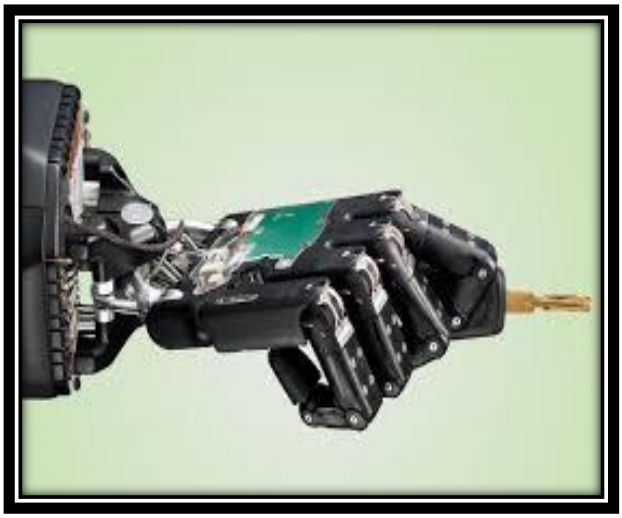
**REACTIVE MACHINES**

The most basic types of AI systems are purely reactive, and have the ability neither to form memories nor to use past experiences to inform current decisions. Deep Blue, IBM’s chess-playing supercomputer, which beat international grandmaster Garry Kasparov in the late 1990s, is the perfect example of this type of machine. Deep Blue can identify the pieces on a chess board and know how each moves.

It can make predictions about what moves might be next for it and its opponent. And it can choose the most optimal moves from among the possibilities. But it doesn't have any concept of the past, nor any memory of what has happened before. Apart from a rarely used chess-specific rule against repeating the same move three times, Deep Blue ignores everything before the present moment. All it does is look at the pieces on the chess board as it stands right now, and choose from possible next moves. This type of intelligence involves the computer perceiving the world directly and acting on what it sees.

It doesn't rely on an internal concept of the world. In a seminal paper, AI researcher Rodney Brooks argued that we should only build machines like this. His main reason was that people are not very good at programming accurate simulated worlds for computers to use, what is called in AI scholarship a "representation" of the world. The current intelligent machines we marvel at either have no such concept of the world, or have a very limited and specialized one for its particular duties. The innovation in Deep Blue's design was not to broaden the range of possible movies the computer considered. Rather, the developers found a way to narrow its view, to stop pursuing some potential future moves, based on how it rated their outcome. Without this ability, Deep Blue would have needed to be an even more powerful computer to actually beat Kasparov.

## 2. LIMITED MEMORY



This Type II class contains machines can look into the past. Self-driving cars do some of this already. For example, they observe other cars' speed and direction. That can't be done in a just one moment, but rather requires identifying specific objects and monitoring them over time. These observations are added to the self-driving cars' preprogrammed representations of the world, which also include lane markings, traffic lights and other important elements, like curves in the road. They're included when the car decides when to change lanes,

To avoid cutting off another driver or being hit by a nearby car. But these simple pieces of information about the past are only transient. They aren't saved as part of the car's library of experience it can learn from, the way human drivers compile experience over years behind the wheel. So how can we build AI systems that build full representations, remember their experiences and learn how to handle new situations? Brooks was right in that it is very difficult to do this.

## 3. THEORY OF MIND

We might stop here, and call this point the important divide between the machines we have and the machines we will build in the future. However, it is better to be more specific to discuss the types of representations machines need to form, and what they need to be about. Machines in the next, more advanced, class not only form representations about the world, but also about other agents or entities in the world. In psychology, this is called "theory of mind" – the understanding that people, creatures and objects in the world can have thoughts and emotions that affect their own behavior.

This is crucial to how we humans formed societies, because they allowed us to have social interactions. Without understanding each other's motives and intentions, and without taking into account what somebody else knows either about me or the environment, working together is at best difficult, at worst impossible. If AI systems are indeed ever to walk among us, they'll have to be able to understand that each of us has thoughts and feelings and expectations for how we'll be treated. And they'll have to adjust their behavior accordingly.

## 4. SELF-AWARENESS

The final step of AI development is to build systems that can form representations about themselves. Ultimately, we AI researchers will have to not only understand consciousness, but build machines that have it. This is, in a sense, an extension of the "theory of mind" possessed by Type III artificial intelligences. Consciousness is also called "self-awareness" for a reason. ("I want that item" is a very different statement from "I know I want that item.") Conscious beings are aware of themselves, know about their internal states, and are able to predict feelings of others. We assume someone honking behind us in traffic is angry or impatient, because that's how we feel when we honk at others. Without a theory of mind, we could not make those sorts of inferences. While we are probably far from creating machines that are self-aware, we should focus our efforts toward understanding memory, learning and the ability to base decisions on past experiences. This is an important step to understand human intelligence on its own. And it is crucial if we want to design or evolve machines that are more than exceptional at classifying what they see in front of them.

**The Impact of Artificial Intelligence on Social Media**

Why Artificial Intelligence Is Important to Marketers

To explain why AI is important, Mike shares a comparison from Andrew Ng, an AI and machine learning expert. Andrew says AI is the new electricity. Just as electricity started being used to power everything 100 years ago, AI is being added to everything now. The advent of electricity changed everything, including transport, factories, and more. Similarly, AI will change the knowledge economy.

For marketers, the coming changes are important because your business will benefit from being aware of AI-based tools and techniques before your competitors are. If you work on the agency side, you want to help your clients lead with AI. Although marketers don't need to understand AI in great detail, they do need to know enough about AI to spot opportunities.

The Hollywood version of AI features robots with guns turning us into paperclips. The reality is more mundane and incremental.

We're a long way off from AI that can run Google campaigns or send your kids to school and cook dinner. However, artificial narrow intelligence (also shortened to *narrow intelligence* or ANI) is likely to start replacing an increasing number of human tasks.

You can think of ANI as incredibly smart software. Mark thinks, in a very optimistic version of the future, smart machines will enable us to do things that we can't do today or will do tasks we can do much, much better. In other words, ANI will enable us to hand over menial tasks so we have more time for creative, strategic, or compassionate work.

**Conclusion**

There is no question that AI will have profound impacts on media markets. While automation of production may play some role, the unique properties of media goods mean the more important effects are likely to occur on the demand side. Here, there is great potential for social good, as AI can make it easier for consumers to navigate the bewildering mass of online content through search and personalized recommendations, and to identify cases where third parties are attempting to manipulate them. There is also cause for concern, as AI may tilt content more heavily toward consumer demand in domains where this is at odds with social good, and AI tools may be used to more effectively persuade and deceive.

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