



A STUDY OF ARTIFICIAL INTELLIGENCE AND ITS APPLICATIONS

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ABSTRACT

Artificial intelligence is a multidisciplinary field whose things is to automate conditioning that presently bear mortal intelligence. AI has two types in which one is based on capabilities and other is based on functionality .AI is the science and engineering domain concerned with the theory and practice of developing systems that exhibits the characteristics we associate with intelligence in human behaviour, such as perception, natural language processing, problem solving and planning, learning and adaptation and acting on the environment. its main scientific goal is understanding the principles that enable intelligent behaviour in humans, animals and artificial agents. Here application of artificial intelligence explains, AI is a dynamic tool used across industries for better decision making, increasing efficiency and eliminating repetitive work etc...

1. INTRODUCTION

Intelligence describes the ability of learning and problem-solving. Natural intelligence is wired into all living things for survival. Similarly, when a man-made device is able to precise its surroundings and take appropriate action,it is said to have intelligence. However, since that intelligence is a product of human intervention and programming,it is called artificial intelligence.

2. ARTIFICIAL INTELLIGENCE CHARACTERISTICS:

2.1 DEEP LEARNING:

Deep learning is a machine learning technique in which it teaches computer which humans can do naturally easily with example. Innumerable developers use the latest deep learning Innovative technologies to maximum advantage to take their business to their higher leave.Artificial intelligence technology has more number of fields like computer vision, automatic text generation, autonomous vehicles etc,. There is the scope and use of deep learning are increasing now a days.

There is an example for deep learning, a self-driving features in car like Tesla, in whichdeep learning is a key technology enabling them to recognize a stop sign and to distinguish a pedestrian from a lamppost.

2.2. FACE RECOGNITION:

Face recognition in artificial intelligence it recognizes individual faces using biometric mapping. In surveillance technologies has a lead in pathbreaking advancements. Face recognition compares the individual faces with the database of known faces to seek out a match. However, it also faced lots of problems for breach of privacy.

Take an example, an American technology company, gives a surveillance technology for law agencies to monitor the cities with the network of CCTV cameras and every citizen with their social score in real-time.

2.3. AUTOMATE SIMPLE AND REPETITIVE TASKS:

Artificial intelligence has the ability to execute the same work over and over again without any breaking or restriction. Let's take an example of Siri, a voice enabled assistant. It can handle same commands or so many commands at a same time in a single day. it can take notes for a long or short, to rescheduling the calendar for a trip or meeting, to guide us through the streets with the navigation, the assistant can cover all commands. In previous day, these activities have to be done manually it takes lot of time and effort. Automation not only leads to increased efficiency, but also results in lower overhead costs and sometimes a safer work environment.

2.4. DATA INGESTION:

With each passing day, the data we all produce is growing exponentially, and that is where AI is stepping in. Instead of providing this data manually, AI enabled not only collect data, but also analyses it with the help of previous experiences.

Data input is the transfer of knowledge from classified sources to a data storage medium that is frequently accessed, used and analyzed by an organization. AI, with the help of neural networks searches large amounts of such data and helps to make logical inferences from it.

2.5. CHATBOTS:

Chatbot are software that provide a window for solving customer problems through audio and text. Previously bots would only respond to specific commands. If you say wrong, you do not know what to say. The bot was as clever as it was planned. The real change came when there chatbot were powered by artificial intelligence. Now, you don't have to be absurd when talking to a chatbot. It understands not only commands but also language.



Take an example, the Watson assistant, an AI- powered assistant, was developed by IBM that can run on multiple channels such as websites, Messengers and applications and does not require a once-planned human intervention. There are many companies that have switched from voice process executives to chatbots to help customers to solve their problems. Chatbot not only provide services around issues facing customers, but also provide product suggestion to users. The reason for all this is AI.



2.6. QUANTUM COMPUTING:

AI helps in solving complex quantum physics problem with the precision of super computers with the help of quantum neural networks. This will break the path in the future. it is an intermediate field the focuses on developing quantum algorithms to enhance computational tasks within AI, including subfields such as machine learning. the whole concept of quantum-enhanced AI algorithms is in field of conceptual research.

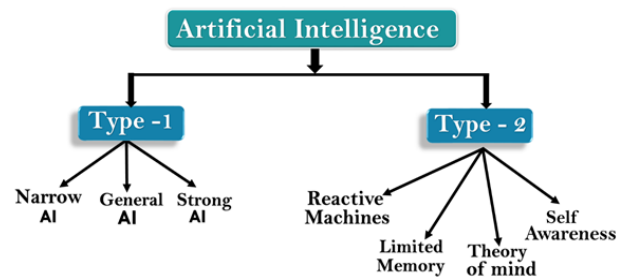
Take an example, Google AI Quantum is a pioneer in this field, aiming to develop super conducting guide processors and quantum-assisted upgrades for various applications.

2.7. CLOUD COMPUTING:

The next artificial intelligence feature is cloud computing with such a large amount of data being ejected every day, data storage in a physical form would have been a big problem. AI capabilities operate in the business cloud computing environment. Finally, while living in our present, we have seen that AI is a window into our future. It's applications across the domains are innumerable.

3. TYPES OF ARTIFICIAL INTELLIGENCE:

Artificial intelligence can be divided into several Atypes, mainly of two main types, which are based on capabilities and functional based on AI. Below is a flow diagram explaining the types of AI.



TYPES OF ARTIFICIAL INTELLIGENCE:

3.1. BASED ON CAPABILITIES

3.1.1. WEAK AI OR NARROW AI:

Short AI is type of AI that can perform a dedicated task intelligently. The most common and currently available AI in the world of artificial intelligence is short AI. Short AI cannot operate beyond its field or limit because it is trained. For a specific task. Hence it is also called weak AI. Short AI will not pass in unpredictable ways if it will go beyond its limits.

Apple Siri is great example of Narrow AI, but it works with limited pre-defined functions. IBM's Watson supercomputer also falls short of AI, as it uses an expert system approach combined with machine learning and natural language processing. There is some example of Narrow AI include playing chess, buying referrals on the e-commerce site, self-driving cars, speech recognition and image recognition.

3.1.2. GENERAL AI:

General AI is the type of artificial intelligence that can perform any intellectual task as efficiently as a human being. The idea of common AI to create such a system that is intelligent and can think like a human being. At

present, there is no such system that can come under public AI and perfect any task as a human being. Researchers worldwide are now focusing on developing machines with common AI. Since systems with common AI are still under research, it will take a lot of effort and time to develop such systems.

3.1.3. SUPER AI:

Super AI is the level of intelligence of computers in which machines surpass human intelligence and can perform any task better than humans with cognitive properties. This is the general result. Some of the key characteristics of super AI include thinking ability, reasoning, puzzle solving, judging, planning, learning and self-communication. Super AI is an imaginary one of artificial intelligence. In fact creating such systems is still the task of changing the world.

3. 2. BASED ON FUNCTIONALITY

3.2.1. REACTIVE MACHINES:

Fully reactive machines are the basic types of artificial intelligence. AI systems like this do not store memories or past experiences for future actions. These machines focus only on the current situation and operate according to the best possible action.

An example of IBM's Deep Blue system reaction machines, An example
Google's AlphaGo reactive engines.

3.2.2. LIMITED MEMORY:

Limited memory machines can take down the past experiences or some data for a small period of time. These machines can only use data stored for a limited time. Self-driving cars are one of the best example of limited memory systems. These cars can store the latest speed of nearby cars, distance of other cars, speed limit and other information to go on the road.



3.2.3. THEORY OF MIND:

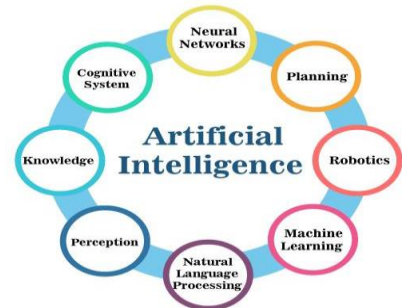
Theory of the mind AI must understand human feelings, people, beliefs and be able to communicate socially as human beings. This type of AI machine has not yet been developed, but researchers have been making lot of efforts and advances to create such AI machines.

3.2.4. SELF-AWARENESS:

Self-Awareness AI is the future of artificial intelligence. These machines are very intelligent and have their own senses, emotions and Self-Awareness. These machines are smarter than the human mind. Self-Awareness AI is not really there yet and it is a fantasy concept.

4. MAIN GOALS OF AI AND ITS TYPES:

The main goal of artificial intelligence is to do all necessary works which are done by human beings is to do by a machine by a human comment is the main goal of an artificial intelligence which is going to be happen in upcoming years. In other word it is said to be to enable a computer to make a decision making or a problem solving understanding human communication and translating languages understand in their own language.



The next important goal is to make this procedure available to all people can get beneficiary of this technology do people in rural and urban areas are been continuously using this technology and even poor labor can make use of the create invention of the generation. Also helps in the following procedures of knowledge management, Robotics learning management, neural networks, planning, session learning machine learning, Natural language processing, cognitive system are easily taught to unknown or illiterate.

4.1. METHODS IN AI:

The methods of artificial intelligence are the ways to accomplish the following above methods to a great success, it is classified on the basis of its techniques classifies into several type namely

Strong AI: The term strong AI was introduced for this category of research in 1980 by the philosopher John Searle of the University of California at Berkeley. The ultimate aim of this method is to produce provide a machine with the high level knowledge that a man can do and cannot be able to do, can be easily by a computer in a few seconds.

Applied AI: Applied AI, also known as advanced level of system management in which providing a successful software networks to help the humans. For example: 'expert' a medical diagnosis software and a trading system.

Cognitive Simulation: In cognitive simulation, it is a method to release by a computer, which the given information is a right one or wrong, useful or a useful one provided for a computer. In other words, it is a technique of checking the theory done by humans to provide for a computer.



5. APPLICATIONS OF AI:

5.1. AI Application in E-Commerce:

5.1.1. Personalized Shopping:

Artificial Intelligence technology is used to create better interactions with your customers. The recommendations are shown with their browsing history and interests. It made improving your relationship with your customers and them Hope you brand.



5.1.2. AI-powered Assistants:

Shopping assistants and chatbots helps us to improve the experience of user while shopping in internet. Natural Language Processing is used to make the conversation sound as human as possible. This assistant can have real-time involvement with your customers.

5.1.3. Fraud Prevention:

Credit card frauds and fake reviews are two of the most common issues that E-Commerce companies deal with them. By considering these problems, AI can help to reduce the possibility of credit card frauds taking place. Most of the customers prefer to buy a product or service based on customer reviews. AI can help identify and handle fake reviews

5.2. Applications of AI in Education:

Education sector is the one most influenced by humans, Artificial Intelligence has slowly start to leak its roots in the education sector as well. Even in the education sector, this slow change of

Artificial Intelligence had helped in increase the productivity among faculties and helped them to concentrate more on students than office and administration work.

Some of these applications in this sector include:

5.2.1. Creating Smart Content:

Digitalization of the contents like video lectures, conferences, and text book guides can be made using Artificial Intelligence. We can use different interfaces like animations and learning content through customis for students from different ranks. Artificial Intelligence helps create a rich learning experience by generating and providing audio and video summaries and integrated syllabus.

5.2.2. Voice Assistants:

Even without the direct involvement of the lecturer or the teacher, a student can access extra learning material or assistance via Voice Assistants. By this, printing costs of temporary handbooks and also provide answers to common questions easily.

5.2.3. Personalized Learning:

Using AI technology, hyper-personalization technique can be used to monitor the student data fully, and habits, lesson plans, study guides, flash notes, revision, etc., can be easily generated.

5.3. Applications of Artificial Intelligence in Lifestyle:

Artificial Intelligence has a lot of influence on our lifestyle.

5.3.1. Autonomous Vehicles:

Automobile manufacturing companies like Toyota, Audi, Volvo, and Tesla are used machine learning to train computers to think and developing like humans when it comes to driving in any environment and detected object to avoid accidents. AI can improve the in-vehicle experience and provide additional systems like emergency braking, blind-spot monitoring, and driver-assist steering.

5.3.2. Spam Filters:

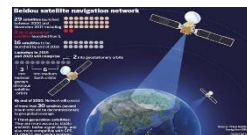
The email that we use in our day-to-day lives has AI that filters out spam emails sending them to spam folders. By this, we can see only the filtered content. The popular email provider, G-mail, has managed to achieve a filtration capacity of approximately 99.9%.

5.3.3. Recommendation System:

Various platforms that we use in our daily lives like e-commerce, entertainment websites, social media, video sharing platforms, like Instagram, etc., all use the recommendation system to get users data and provide customized recommendations to users to increase involvement. This is a widely used Artificial Intelligence application in almost all companies.

5.4. AI Applications in Navigation:

Based on research from MIT (Massachusetts Institute of Technology), GPS technology can give users with accurate, timely, and detailed information to improve safety. This technology uses a combination of Convolutional Neural Network and Graph Neural Network, which makes lives easier for users by automatically detecting the number of lanes and road types behind restricted areas on the roads. AI is heavily used by Ola and many logistics companies to improve operational efficiency, analyze road traffic, and optimize the routes.



5.5. AI Applications in Robotics:

Robotics is another field where AI applications are commonly used. Robots powered by AI use real-time updates to find abstracts in its path and pre-plan its journey instantly.

It can be used for

- Carrying goods in hospitals, factories, and warehouses
- Cleaning offices and large equipment
- Inventory management



5.6. AI Applications in Human Resource:

Artificial Intelligence helps us with blind hiring. Using machine learning software, you can examine applications based on specific parameters. AI drive systems can scan job candidate's profiles, and resumes to provide recruiters an understanding of the talent pool they must choose from.

- Scanning resumes
- Employee churn reduction
- Chatbots

5.7. AI Applications in Healthcare:

Artificial Intelligence finds many applications in the healthcare sector. AI applications are used in healthcare to build advanced machines that can detect diseases and identify cancer cells. Artificial Intelligence can help analyze chronic conditions with lab and other medical data to ensure early diagnosis. AI uses the combination of historical data and medical intelligence for the discovery of new drugs.

5.8. AI Applications in Agriculture:

Artificial Intelligence is used to identify defects and nutrient deficiencies in the soil. AI can analyze where weeds are growing. This is done using computer vision, robotics, and machine learning applications. AI bots can help to harvest crops at a higher volume and faster than human laborers

5.9. AI Applications in Social Media:

- Instagram: On Instagram, AI considers your likes and the accounts you follow to determine what posts you are shown on your explore tab.
- Facebook: Artificial Intelligence is also used along with a tool called DeepText. With this tool, Facebook can understand conversations better. It can be used to translate posts from different languages automatically.
- Twitter: AI is used in Twitter for fraud detection, removing campaign, and hateful content. Twitter also uses AI to recommend tweets that users might enjoy, based on what type of tweets they involve with.

5.10. AI Applications in Marketing:

intelligence (AI) applications are popular in the marketing as well. Using AI, marketers can deliver highly targeted and personalized ads with the help of behavioral analysis, pattern recognition, etc. It also helps with re-targeting audiences at the correct time to ensure better results and reduced feelings of distrust and irritations. AI can help with content marketing in a way that matches the brand's style and voice.

Chatbots powered by AI, Natural Language Processing, Natural Language Generation, and Natural Language Understanding can analyze the user's language and respond in the ways humans can. AI can provide users with

real-time personalization based on their behavior and can be used to edit and optimize marketing campaigns to fit a local market's needs.

5.11. AI Applications in Finance

It had been reported that 80 percent of banks recognize the benefits that AI can give. Whether it's personal finance, corporate finance, or consumer finance, the highly developed technology that is offered through AI can help to particularly improve a wide range of financial services. For example, customers looking for help regarding wealth management solutions can easily get the information they need through SMS text messaging or online chat, all AI-powered. Artificial intelligence can also detect changes in transaction patterns and other potential red flags that can signify fraud, which humans can easily miss, and thus saving businesses and individuals significant loss. Aside from fraud detection and task automation, AI can also better predict and assess loan risks.

6. REAL TIME APPLICATIONS OF AI:

6.1. AI IN TESLA VEHICLES:

Tesla plays an important role in producing of electric vehicles and it is being a tech pioneer. Tesla wants to fulfill their customers' needs, so, they turned their focus into the electric vehicles. They give most importance for the AI technologies. AI technologies were using in Tesla cars based on the unsupervised machine learning. These types of cars increased the curiosity among the people.

6.1.1. AI INTEGRATED CHIPS:

Tesla decided to create AI integrated chips that will make the cars easy to navigate from one point to another point through freeways and even if it is traffic.

6.1.2. DUAL AI CHIPS:

The Tesla system consists of dual chips for better road performance. Each AI chip has the separate assessment of the traffic situation. The assessment of both chips is matched by the system and it executes input from both is same.

6.1.3. AUTO PILOT MODE:

Autopilot features enable the car to steer, accelerate and brake automatically in the lane.

6.1.4. OPTIMISED DESIGN:

These AI chips have been optimized to run at 2GHz and perform 36 trillion operations per second, achieving this level of performance by dismissing all generic functions and channeling the focus on the only important ones.



6.1.5. CONCLUSION:

Tesla when came to developing their own chips,they made no exception. Artificial intelligenceand data analysis has enabled the company to design autonomous cars with the potential to revolutionize the way we drive cars.

6.2. THE FIRST AI CONFLICT?ISRAELS GAZA OPERATION GIVE GLIMPSEOF FUTURE

For the first time artificial intelligence is used in the war. It plays a major role in the key component and power multiplier in fighting against the enemy an IDF intelligence corpse senior officer said.‘this is a first of its kind of war with the help of AI technologies. They implemented new methods and designs some kind of operations and they used developed technologies that was a force multiplier for the entries IDF soldiers were in unit 8200 an intelligence corpse elite unit pioneered algorithms and the code helps led to many new programs is called ‘alchemist’, ‘gospel’,and ‘depth of wisdom’, which were developed and used during thefighting

COLLECTINGDATA:

- signal intelligence(SIGINT)
- Visual intelligence(VISINT)
- Human intelligence(HUMINT)
- Geographical intelligence(GEOINT) and more,

The “Gospel” used AI to generate recommendation for troops in the research division of,military intelligence, which used them to produce quality targets and then passed them on to the AI to strike

“for the first time,a multidisciplinary centre was created that produces hundreds of targets relevant to developments in the fighting,allowing the military to continue on fight as long as its needs to with more and more new targets,themilitary use of ai has become a more pressingtopic globally, and the development of weapons that employ the technology is underway. a report commissioned by the un. security council, for example, stated that small Turkish -made drones equipped with ai to automatically attack enemies without human intervention may have been used during Libya civil war.



CONCLUSION

AI is the center of a new enterprise to make computational models of intelligence. The main assumption is that intelligence can be specified in terms of coding structures and coding functions that can be programmed into a digital computer. There is important debate as to whether such a meetly programmed computer would be a mind, or would simply pretend one, but AI experimenters need not stay for the conclusion to that debate, nor for the academic computer that could model all of mortal intelligence. Aspects of intelligence gests, similar as



working problems, making consequence, literacy and understanding languages, have formerly been enciphered as computer programs, and within veritably limited disciplines, similar as relating conditions of soybean shops, AI programs can outperform mortal experts. Now the great challenge of AI is to find ways of representing the firm knowledge and experience that enable people to carry out everyday conditioning similar as holding a wide-ranging discussion, or chancing their way along a busy road. Conventional digital computers may be able of running similar programs, or we may need to develop new machines that can support the complexity of mortal study.

REFERENCE WEBSITES:

Britanica

Simplearn.com

Xalitus.com