Artificial Intelligence: An Overview

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Abstract: Tools of increasing sophistication have been developed to serve the human race over many centuries. Digital computers are, in many ways, just another tool. They are capable of performing the same numerical and symbolic manipulations as a normal person, but at a faster and more reliable rate. The purpose of this paper is to provide an overview of artificial intelligence. It provides a brief overview of artificial intelligence, its history, and future prospects.

1.INTRODUCTION

Artificial Intelligence (AI) is a branch of science and engineering concerned with the computational understanding of intelligent behavior and, as a result, the creation of intelligent machines. As shown in Figure 1, AI encompasses a diverse range of methods, techniques, and algorithms, including neural networks, genetic algorithms, symbolic AI, and deep learning. These major areas are and at a breakneck rate and have profound implications in fields as diverse as health care, space, robotics, and military technology. AI would bring a new level of productivity and effectiveness to our lives, thanks to the rising amount of data, pervasive connectivity, high- performance computing, and a range of algorithms at our disposal.

Future technologies complexity. One of the key goals of the AI field is to build completely autonomous intelligent agents that communicate with their surroundings, learn optimal behaviours, and evolve over time through trial and error, much like humans. It's been a long-standing challenge, ranging from robots that can sense and respond to the environment to artificial intelligence agents, who are solely software-based, to the world around them, which can communicate with the natural language and multimedia. Driving, aviation, nursing, online ads, image recognition, and personal assistance are all examples of existing AI applications.

AI's recent success has piqued the attention of both the research community and the general public. Autonomous cars are an example of this, since they have the potential to make intelligent manoeuvring decisions invariable, real-time traffic situations. Another example is Google Deep Mind's Alpha Go and Alpha Zero, which were created to play the board game Go and were the first computers to defeat a professional player. Many people are both excited and afraid of AI as a result of this. In certain fields, robots can outperform human.
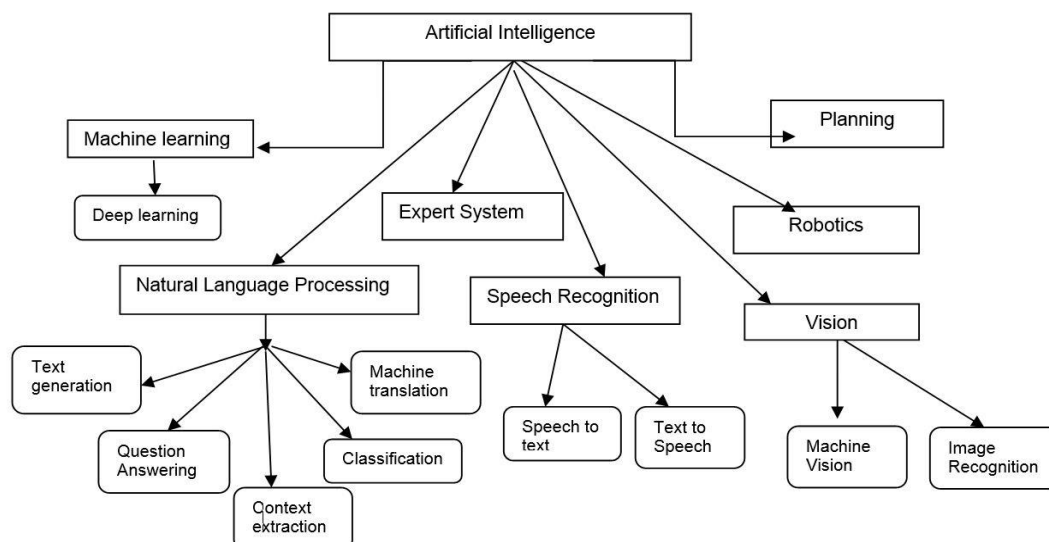
Figure 1: Subfields of Artificial Intelligence

2. HISTORY OF ARTIFICIAL INTELLIGENCE:

Alan Turing is credited with kicking off AI with his query "CAN MACHINE THINK?". Turing's Turing test, established in 1950, is a test of a machine's ability to reason show intelligent activity that is comparable to, or indistinguishable from, from the perspective of a human. The test stipulated certain conditions for construction. Information representation, natural language, machine learning, and automated reasoning are all needed for a truly intelligent machine. For the full exam, you'll need vision and robotics. Since then, John McCarthy has coined the word AI, and it has been closely associated with the field of "symbolic AI," which was prominent until the1990s.Towards the end of the 1980s. In the 1990s, a new term emerged: "perceptive a representative [13] was discovered. A machine that perceives its environment is referred to as an agent. Climate, and takes steps to improve its chances, of achieving results. Subsymbolic methodologies such as neural networks, fuzzy systems, evolutionary computation, and other computational models began to gain prominence to address some of the short comings of symbolic AI, resulting in the name "subsymbolic AI. "theoretical discernment "As a subfield of AI, it is gaining traction. Various methods

AI employs a variety of techniques and processes. The top-down and bottom-up approaches are two main methodologies or values. The top-down theorists believe in simulating the actions of the human brain with computers. Bottom-up theorists claim that computers are created from the ground up, while bottom-up theorists believe that computers are created from the ground up that creating electronic replicas is the best way to achieve AI, similar to the dynamic network of neurons in the human brain. In recent years, the word AI has come to encompass the whole idea of a system that is intelligent in terms of both operational and social implications.

2. ARTIFICIAL INTELLIGENCE ALGORITHMS AND MODELS:

Algorithms and models are the foundations of AI, which are founded on empirical discoveries such as math, statistics, and biology (Li& Jiang, n. d.). AI is founded on the following principles, a number of versions, including: Ant Colony Algorithm, Immune Algorithm, Fuzzy Algorithm, Decision Tree, Genetic Algorithm, Particle Swarm Algorithm, Neural Network, and Deep Learning are some of the algorithms that are used in this paper. I'll go through a few of the more well-known models in this article, including: The Support Vector Machine, as well as Artificial Neural Networks (ANN) area form of neural network that is used to:

- Support Vector Machine (SVM), which is used to build a classification model by determining the best hyper plane from a collection of training examples (figure 2). It's also been used to classify patterns and forecast trends in a variety of situations. Power transformer fault diagnosis, disease diagnosis, and soon are examples of applications. (Li& Jiang, (n. d.)) treatment optimization.
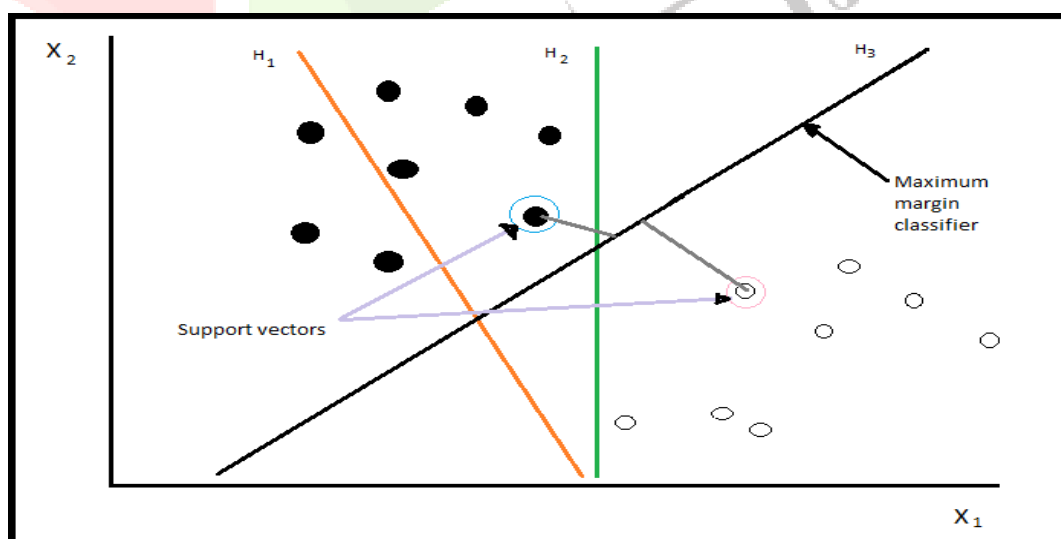

Figure 2: Describe how SVM algorithm being represented in Artificial Intelligence

The Artificial Neural Network (ANN) is a model for comprehending thoughts. In terms of physical connections between neurons, As well as behaviours. As seen in, ANN has been used to solve a number of problems by allowing machines to construct mathematical models that can imitate natural behaviours from the perspective of the brain. The computer would be able to recognise the object using this algorithm. Just like a human's brain, it can solve any problem.

4. APPLICATIONS AND FUTURE TRENDS OF (AI)

AI is widely used and has expanded beyond computer science to include applications in areas such as health, security, Education, music, art, and business. Many AI applications are currently in development. Every industry's infrastructure is deeply rooted. In a few years, AI is expected to hit nearly every industry, And there are several ways AI is and will change those industries trades. Medical diagnosis, electronic trading networks, robot control, and remote sensing are all examples of where AI is currently being used.

Finance, healthcare, education, transportation, and robotics are only a few of the fields and industries where it has been used to grow and advance.

Many methods have been developed by AI researchers to solve the most challenging problems in computer science and other fields. The current state of AI success is divided into three categories: subhuman, optimal, and superhuman. Face recognition, speech recognition, object recognition, image detection, and surpassing human-level intelligence in the Game are only a few of the tasks that AI applications can solve. Go, Chess, Dota 2, and Star Craft II are some of the most common games. Another field where AI technologies are focused is in the intersection between science and technology. With the advent of federated learning and privacy-perceiving machine learning, healthcare and privacy are becoming more relevant. AI used in medical diagnosis as clinical decision support systems Companion robots and computer-aided medical image interpretation. Computer-generated music for stress and pain relief may be used in a medical environment.

Further more, Google Magenta, A project run by Google, is a good example. The Google Brain team is investigating whether artificial intelligence (AI) is capable of performing such tasks. Making compelling art and music is one of my greatest passions.

The use of AI to build other AI is another active area of AI science. Google's Auto ML project, for example, is working on developing new neural network topologies. With new architectures and topologies, all previously published Image Net efficiency is surpassed. This extends to the current research of Generative Adversarial Networks, and the work of a research team from the visual computing community at the Technical University of Munich and Stanford University created Face2Face, a software that animates the face of a target individual by transposing the facial expressions of an external source. Since then, other deep neural network-based approaches have been demonstrated, giving rise to them on iker" Deep Fake".

Research in quantum machine learning, hierarchical reinforcement learning, bayesian deep learning, affective computing & Human-Centered AI, neuro science, self-driving cars, and conversational agents has recently emerged as new research avenues, foci, and initiatives.

5. DESIGN MODELS OF AI

There are many AI applications all around us, and in this article, I will address some of the most popular AI applications that we use every day, such as Virtual Assistants like Siri, Cortana, and others. Smart assistants have become a very popular technology in recent years. Most smart devices are getting smarter, and most importantly, these assistants are getting smarter, at any time. In addition to the fantastic assistance they offer, each of these appshas its own set of features. Artificial Intelligence is divided into four stages: obtaining the data,

As shown in the figure 3, clean/manipulate/prepare the data, train the model, evaluate the data, and develop the data. A business must check the data's accuracy before accessing it to ensure that it satisfies the requirements.
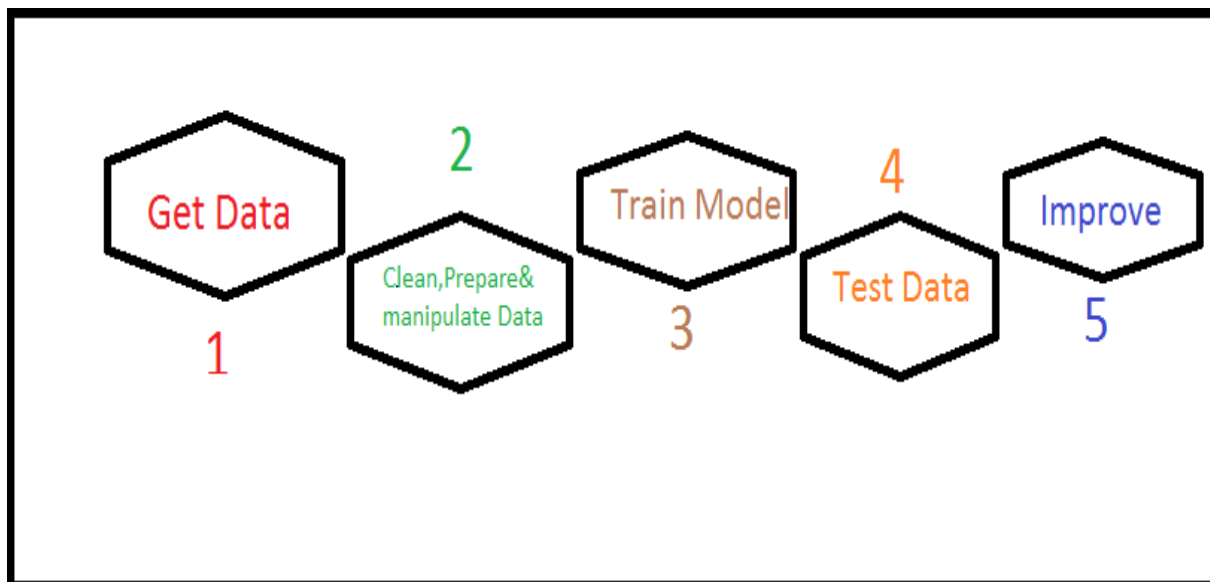
Figure 3: Describes Phases of Developing Artificial

Siri Virtual Assistant:

Siri is a well-known virtual assistant that uses voice recognition and typed commands to carry out specific tasks on a computer. Siri is one of the most common AI applications. The application simply takes the user's input (for example," call dad")and attempts to find the most related keywords used in this command. Siri attempts to eradicate conflicting results by using a language pattern recognizer, then moving on to active ontology by searching through contacts, then attempting to relate the contact called "Dad" and performing the job, which in this case is "Calling," and finally the performance of this operation will be" calling dad," and to consider all possible scenarios refer to figure 4.
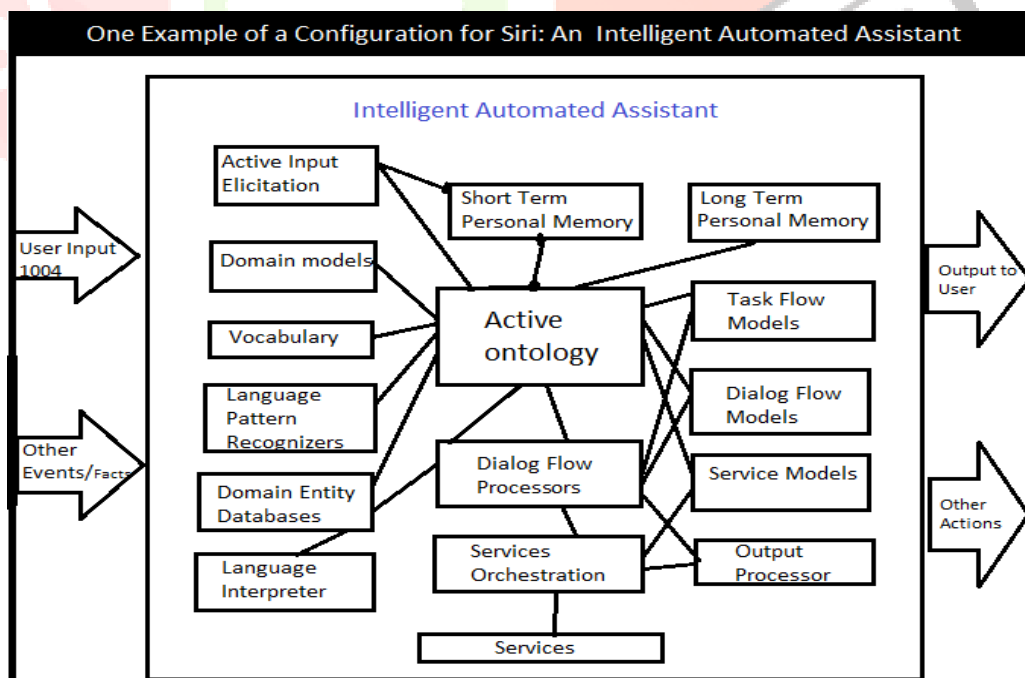

Figure 4: Describes one Examples of configuration for Siri.

In a different example, the architecture of the virtual assistant is seen in (figure 5). As can be shown, the system's flow begins with the user's feedback, and then the system decides what to do next. The conversation strategy module, which is a response from the dialogue management, is to be used. An NLP module receives a classification module's answer. Finally, the conversation history database is used to examine the knowledge base construction module, which will respond to do main knowledge based on the information provided, as detailed in (figure5).
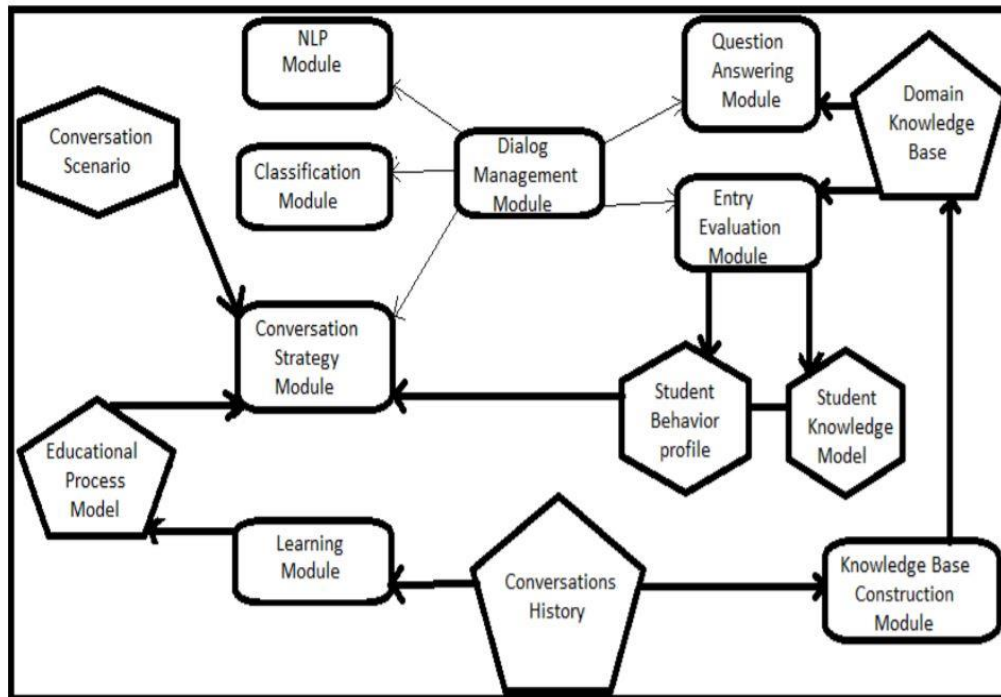
Figure 5: Describes Proposed Conversational agent architecture

6. ADVANTAGE AND DISADVANTAGE OF AI

AI provides reliability, cost-effectiveness, and the ability to solve complex problems and make decisions; additionally, AI prevents data from being lost. Nowadays, AI is used in almost every field, including business and engineering. The term "reinforcement learning" refers to one of AI's most powerful techniques. Which is focused on real-world monitoring of performance and failure in order to improve application reliability.

Unfortunately, AI's capability and functionality are minimal. (n. d.)(" Sadek")

Despite the fact that Artificial Intelligence has madeour lives simpler and saved us more time than ever before, scientists expect that mankind will become extinct as a result of our overwhelming reliance on AI. Scientists claim that making AI machines would result in people losing their jobs, and therefore their sense of living. This may be the cause of our demise because computers are learning and doing things more efficiently and effectively in a timely manner

7. CONCLUSION

The successes and failures of AI in the past have taught us a lot. Between application-specific projects and visionary research, rational and harmonic interactions are required. Ideas to keep AI moving forward. To ensure that society as a whole benefits from the evolution of AI, a clear strategy is required that considers the associated ethical and legal challenges. Early on, AI and its potential negative consequences are mitigated. On the There's a lot of excitement about AI, but there's also a lot of scepticism, There are also concerns about technology's impact on our society. Such fears should not stifle AI's progress, but rather encourage the creation of a systematic framework on which future AI can thrive. Most importantly, it is critical to separate. From the real ms of science fiction to the realms of reality. With consistent funding, AI is about to transform the future, thanks to responsible investment and innovation. our society, economy, and way of life.

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