

# Tools And Techniques Of Artificial Intelligence

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## Abstract

Artificial intelligence can be divided into different categories based on the machine's ability to use past experience to predict future decisions, memory, and self-awareness. IBM developed Deep Blue, a chess program that can recognize chess pieces on the board, but it cannot. They have the memory of predicting future actions. Although this system is useful, it cannot be adapted to other situations. Another type of artificial intelligence, which uses past experience and uses limited memory to predict decisions. An example of this type of artificial intelligence. The system can be found in the decision-making function of autonomous vehicles, where observations support measures taken in the near future that will not remain the same due to frequent changes in observations. At the same time, as technology advances, machines with sense or consciousness may appear. Machines understand the current state of things and can be used to determine what to do.

There is no doubt that artificial intelligence is a very interesting field. It may have an impact on all fields from medicine to data input. Artificial intelligence will never go anywhere. Here are some fields that continue to enjoy the widespread adoption and powerfulness of artificial intelligence.

**Keywords** – AI, Intelligence, Technologies, Machine Learning, Machine, Business, Tools, Techniques.

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## I. INTRODUCTION

Artificial intelligence tools and technologies are two areas that have been actively entering the market recently. Artificial intelligence has existed since the 1980s, but it is only in the last few years that artificial intelligence and its applications have made tremendous developments. Intelligence is the intelligence possessed by machines, and you are most likely to try to create a simulation of the process of human intelligence. AI is the topic of this century because AI is making the world better and easier every day. Well-known companies such as Google, Facebook, and Amazon are already developing frameworks and tools and contributing to artificial intelligence in the form of open-source tools. In this section, we take a look at some of the most common frameworks and tools used in artificial intelligence.

## II. AREAS AND APPLICATIONS OF ARTIFICIAL INTELLIGENCE

### 1. Machine Learning

In machine learning, you define a goal and the machine must learn the steps to achieve it. Let's take the example image of a cat and a lion as an example. In other words, say "yes" every time a picture of a cat appears on the screen. The machine can learn to do this by first exposing it to a large number of images of the cat so that it can learn enough to recognize the cat as soon as it appears on the Screen.

### 2. Robots in artificial intelligence tools

The field of machine learning focuses on the design and manufacture of robots. As we have seen, robots of various shapes exist today. In addition, there are many intelligent robots at work. There are more than 100,000 robots in Amazon warehouses doing transportation work in the warehouse.

### 3. Natural Language Processing (NLP)

The process of processing language or speech and text is called natural language processing. Many important lessons can be learned from NLP. e.g. We can automate the task of categorizing reviews. If some users are happy or sad about the service, we can use NLP to analyze their comments to implement NLP and draw conclusions.

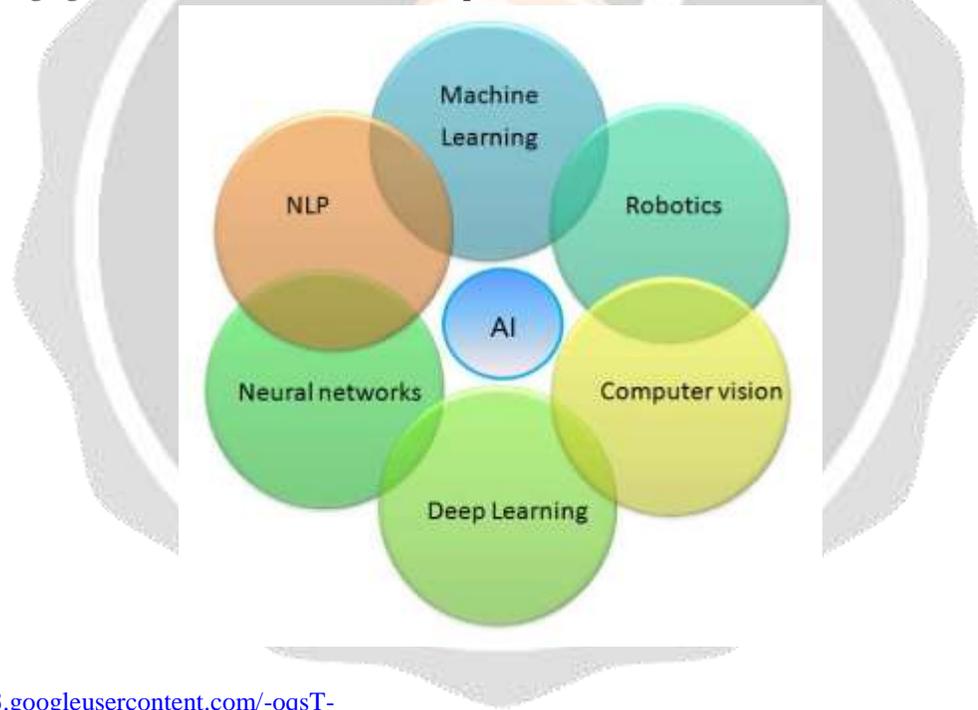
### 5. Autonomous driving and vehicles

This field of artificial intelligence focuses on providing autonomous driving and vehicles. For example, Uber began producing self-driving cars, which are also operating in a handful of cities.

### 4. Vision in AI Tools

In artificial intelligence tools, This field enables the machine to see. This capability can be transferred to, for example, a robot or car that can be viewed through a camera using digital signal processing technology.

The Following figures shows in brief tools & techniques of AI functions.



Source:-

[ [https://lh3.googleusercontent.com/-oqsT-FGCMLI/XvmLAWR7xtI/AAAAAAAAQA/68vD7Nf\\_TN4iONKWwxMOKayM8L0dpJZmwCNcBGAsYHQ/s1600/1593412350210890-0.png](https://lh3.googleusercontent.com/-oqsT-FGCMLI/XvmLAWR7xtI/AAAAAAAAQA/68vD7Nf_TN4iONKWwxMOKayM8L0dpJZmwCNcBGAsYHQ/s1600/1593412350210890-0.png) ]

## III. TOOLS FOR ARTIFICIAL INTELLIGENCE (AI) DEVELOPMENT

Artificial Intelligence (AI) is a copy of human knowledge by machines, especially PC systems. These practices include learning (obtaining data and data usage standards), reasoning (applying guidelines to arrive at approximate or positive solutions), and self-correction. Today artificial intelligence is appropriately called narrow artificial

intelligence because it is designed for a small task, and narrow artificial intelligence can defeat people on any specific task, such as any mental task.

Artificial intelligence (AI) is not limited to only science fiction.

### **1. Amazon Web Services**

According to Amazon, AWS provides your company with the most comprehensive and in-depth tools to create effective machine learning solutions faster.

This is why more than 10,000 customers (from the largest companies to the latest startups) choose AWS Machine Learning more than any other cloud platform.

Finally, AWS provides AI Stages, which customers can use to avoid the hassle of creating internal AI scripts. Amazon Machine Learning and Apache Spark on Amazon Elastic MapReduce (EMR) provide a way to run AI businesses using AWS. Amazon's machine learning stage provides a direction that allows customers who do not understand the technology to develop artificial intelligence skills. Amazon describes it as a "highly adaptable" asset that can provide consistent performance during the network streaming phase. Customers can also use Apache Spark and apply it to Amazon EMR for Hadoop-related processing. This includes using many open-source Apache devices to create perfect utilities for customers.

Amazon Web Services (AWS) comes with multiple AI developer toolkits. For example, AWS Rekognition uses artificial intelligence to interpret images and recognize faces in applications with general biometric security features.

In addition, AWS Lex is an open-source tool that is the foundation of the personal assistant Amazon Alexa. This ai technology enables developers to integrate chatbots into mobile/device and web applications. On the other hand, AWS Polly uses AI to convert speech into written text in 24 languages and 47 voices.

### **2. Deep Learning 4J**

Deeplearning4j or Deep Learning for Java is the leading open-source deep learning (DL) library written for Java and Java Virtual Machine (JVM). It is specifically designed to run in business applications such as Apache Spark and Hadoop.

Also contains:

- Boltzmann machine
- Deep Autoencoder
- Deep Persuasion Network
- Doc2vec
- Recurrent Neural Tensor Network
- Noise Accumulation Autoencoder
- Word2vec

### **3. APACHE MAHOUT**

Apache Mahout is a Scala DSL and distributed linear algebra framework with mathematical expression capabilities, which enables mathematicians, statisticians, and data scientists to quickly implement their own algorithms. Other distributed backends.

- Scala DSL with mathematical expression capabilities
- supports multiple distributed backends

- Modular native solver for CPU/GPU/CUDA acceleration

This is a MapReduce paradigm implemented on Apache Hadoop Scalable machine learning algorithm library. Therefore, when all big data is stored in the Hadoop distributed file system & HDFS you can use the data analysis tools provided by Apache Mahout to discover the value of these large data sets Pattern.

The main benefit of the Apache Mahout project is that it is much easier and much faster to get real value from big data.

#### 4. Open Neural Networks Library

OpenNN (Open Neural Networks Library) is a software library written in C++ programming language to implement neural networks and is an important research field in the field of deep learning. General Public License.

This is another open-source tool, essentially a class library for stimulating neural networks written in C++ programming language for SL.

Using this OpenNN tool, you can implement a neural network with high performance and deep architecture.

Some other open-source machine learning tools to consider are:

- Microsoft Distributed Machine Learning Toolkit
- NuPIC
- Oryx 2

In the near future, you may see more AI and machine learning tools and look forward to keeping up with the rapid pace of development. In this room. As Canada develops into an artificial intelligence innovation center, you can also expect more advanced intelligent technologies to appear in North America.

#### 5. AI ONE

Analyst Toolbox is based on Nathan ICE, which is our patented, biology-based voice core technology. Analyst Toolbox Engine is a BrainDocs application that provides a platform for processing document libraries, creating agents, and analyzing results. This API can be used by enterprise developers for application development and is part of our cloud service hosted on MS Azure.

This is a tool that allows developers to create smart wizards in almost any software application. AI One Analyst Toolbox, often referred to as biologically inspired intelligence, is equipped with the following:

- API
- Building Agents
- Document Library

The main benefit of this tool is the ability to transform data into in-depth general rule sets, machine learning, and artificial intelligence structures.

### IV. APPLICATIONS OF ARTIFICIAL INTELLIGENCE

The various applications of artificial intelligence are described below.

- AI is used in the financial industry to collect personal data, which can then be used for financial advice.
- AI is used in education and can automatically score and measure student performance to improve learning.
- In the health sector, artificial intelligence is used to more accurately diagnose when to use technology to understand natural language and answer questions. In addition, computer programs such as chatbots are used to help customers make appointments and simplify the billing process.
- AI uses robotic process automation in enterprises to automate repetitive human tasks. To improve customer satisfaction, machine learning algorithms are combined with analysis to collect information that helps understand customer needs.
- AI is used in smart home devices, security, and surveillance, navigation, and travel, music and media streaming, video games, etc.

## V. ADVANTAGES OF ARTIFICIAL INTELLIGENCE

Let us consider the advantages of artificial intelligence from the following key points:

### 1. Daily life

- In our daily needs, smartphones have become the fourth human need in addition to food, clothing, housing, and transportation.
- Indirect use of a smartphone means that you use artificial intelligence either intentionally or unintentionally.
- The development of automation technology through learning and perception has become commonplace in our daily lives.
- We have Our Lady of Siri for iOS devices or Cortana for Windows devices to help us.
- We also prefer GPS support for long-distance travel and commuting. The smartphone is a daily example of how we use the power of artificial intelligence to eliminate obstacles in our daily lives.
- In the utility section, we can discover how they predict what we will write and suggest correcting human spelling errors. Regardless of the industry and freelancers, it is one of the most widely used smart machines at work.
- In terms of custom social media utilities, artificial intelligence algorithms use artificial intelligence to recognize and recognize human faces and tag people when we post photos on social media.
- AI is widely used by financial institutions and the banking industry to organize and manage data. Fraud detection takes advantage of one of the greatest benefits of artificial intelligence participating in smart card-based system transactions.

## 2. 24-hour availability

- Machines do not need to rest and eat snacks as often as humans.
- It can be programmed to work continuously for a long time without becoming bored, distracted, or even tired.
- Even when using machines, regardless of time, time, etc., we can expect the same results that humans cannot expect.

## 3. Perform repetitive tasks

- Repetitive tasks are inherently boring. With the help of artificial intelligence algorithms, this type of work is easy to complete. These types of jobs do not require a lot of intelligence between processes.
- Machines can think much faster than humans and can perform multiple tasks at the same time to get the best results. Artificial Intelligence can be used to perform dangerous tasks that may harm the data subject. You can configure its parameters here. Its speed and time can be adjusted according to calculation needs.
- When a person controls a machine like a game or launching a computer-controlled robot, it means that we are actually interacting with an artificial intelligence machine.
- In computer games, the machine plays the role of the opponent based on our activities in the game. The machine plans its movement based on the user's response, so we can say that games are one of the most common ways to use it. artificial intelligence.

## 4. Medical application

- One of the biggest advantages of artificial intelligence is its application in the medical field. We can identify various medical applications that rely on artificial intelligence.
- doctors/doctors evaluate patient health data and inform customers of the risk factors of medical equipment through artificial intelligence.
- It can help patients understand the side effects of various drugs, and it can also work like personal digital care. The artificial surgery simulator is a great artificial intelligence innovation. It is very efficient for people who always like to use trainers to treat professionals.
- We currently have excellent neurological disorder detection and monitoring software that can simulate the functions of the human brain. Robotics
- is widely used to treat mental patients to help them get rid of depression and stay active in the real world.
- Artificial intelligence is widely used in the modern medical industry-radiosurgery. It helps us to operate on tumors without damaging surrounding and unaffected tissues.

## 5. Digital assistance

- Highly developed organizations have implemented machines on behalf of humans in order to interact with customers through “avatars”. Digital assistants or copies can help reduce staffing requirements.
- For artificial intelligence machines, emotions can only be recognized through rational thinking.
- The robot cannot judge the user's emotional factors. In fact, he was just programmed to think logically and make correct software decisions based on the experience he learned on the machine.
- Emotions cannot be recognized by machines that may be dissatisfied with customers. In this case, we need manual intervention. This delay attempts to eliminate the intelligence of the machine. But it still helps in other ways.

## VI. CONCLUSION

Artificial intelligence mainly refers to computer machines with functions similar to humans; in artificial intelligence, machines perform tasks such as speech recognition, problem-solving, and learning. If machines have enough information, they can operate and act like humans. important role. To implement knowledge engineering, establish the relationship between objects and attributes.

AI has a huge impact on our lives. Companies are also taking steps to adapt to artificial intelligence technology, which can open up new ways for them to perform tasks and understand data structures for maximum performance.

## VII. ACKNOWLEDGMENT

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