Artificial Intelligence(AI)

Definitions:

- The ability of a digital computer to perform tasks commonly associated with intelligent beings.
- Machines that complete tasks which involve a certain degree of intelligence which was previously done by humans only. This includes learning, reasoning and self correction.
- The capabilities of a machine to imitate intelligent human behaviour

NB In a nut shell " it has to do with how well a computer can imitate or go beyond in comparison to human being"

Types of Artificial Intelligence(AI)

Type1:

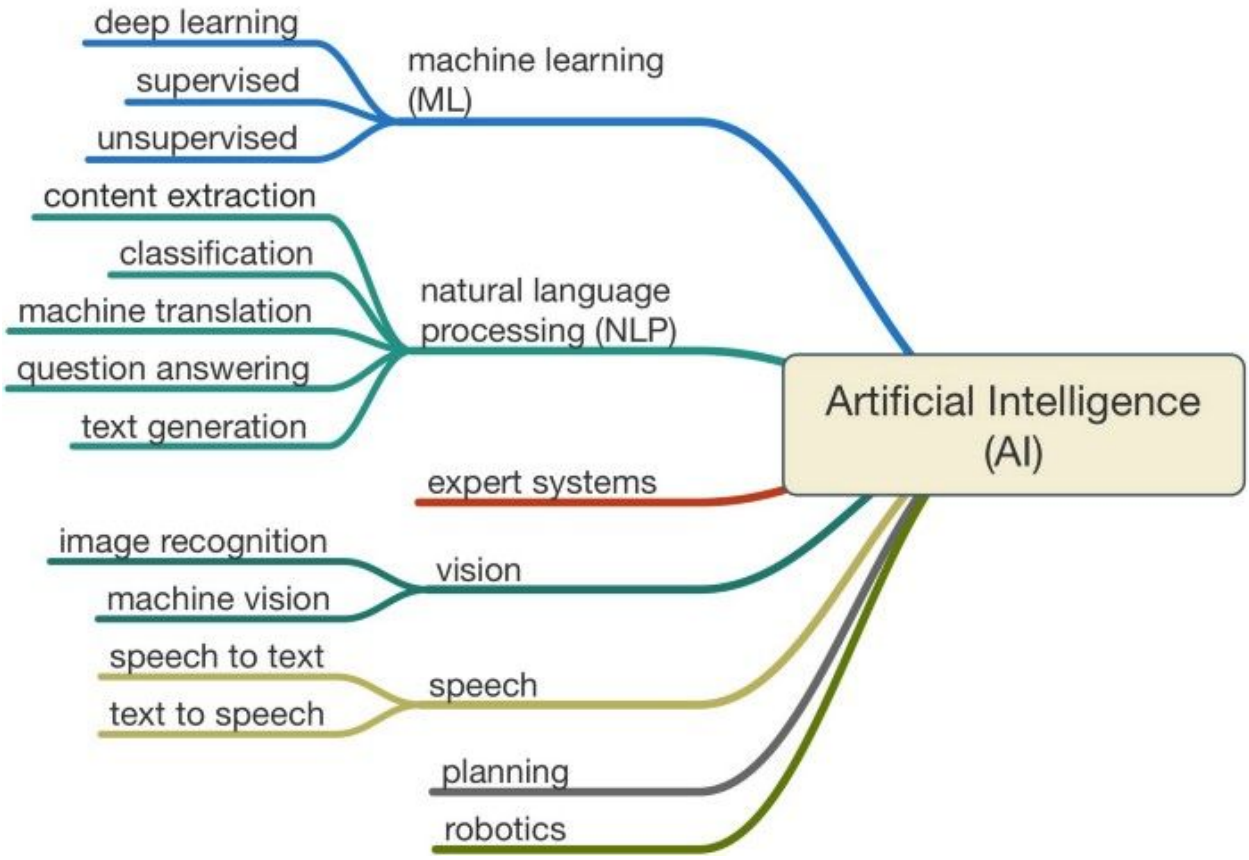
1. **Weak AI** or **Narrow AI:** It is focused on ***one narrow task***, the phenomenon that machines which are not too intelligent to do their own work can be built in such a way that they seem smart. An example would be a ***poker game*** where a machine beats human where in which ***all rules and moves*** are fed into the machine. Here each and every possible scenario need to be entered beforehand manually. Each and every weak AI will contribute to the building of strong AI .
2. **Strong AI:** The machines that can actually think and perform tasks on its own just ***like a human being***. There are no proper existing examples for this but some industry leaders are very keen on getting close to build a strong AI which has resulted in rapid progress.

Type2(based on functionalities**):**

1. **Reactive Machines**: This is one of the basic forms of AI. It doesn't have past memory and cannot use past information to information for the future actions. Example:- IBM chess program that beat Garry Kasparov in the 1990s.

2. **Limited Memory**: AI systems can use past experiences to inform future decisions. Some of the decision-making functions in ***self-driving cars*** have been designed this way. Observations used to inform actions happening in the not so distant future, such as a car that has changed lanes. These observations are not stored permanently and also ***Apple's Chatbot Siri.***
3. **Theory of Mind**: This type of AI should be able to understand people's ***emotions, beliefs, thoughts, expectations*** and be able to ***interact socially .***Even though a lot of improvements are there in this field this kind of AI is not complete yet.
4. **Self-awareness:** An AI that has it's own conscious, super intelligent, self-awareness and sentient (In simple words **a complete human being**). Of course, this kind of bot also doesn't exist and if achieved it will be one of the milestones in the field of AI.

There are many ways AI can be achived some of them are as follows:



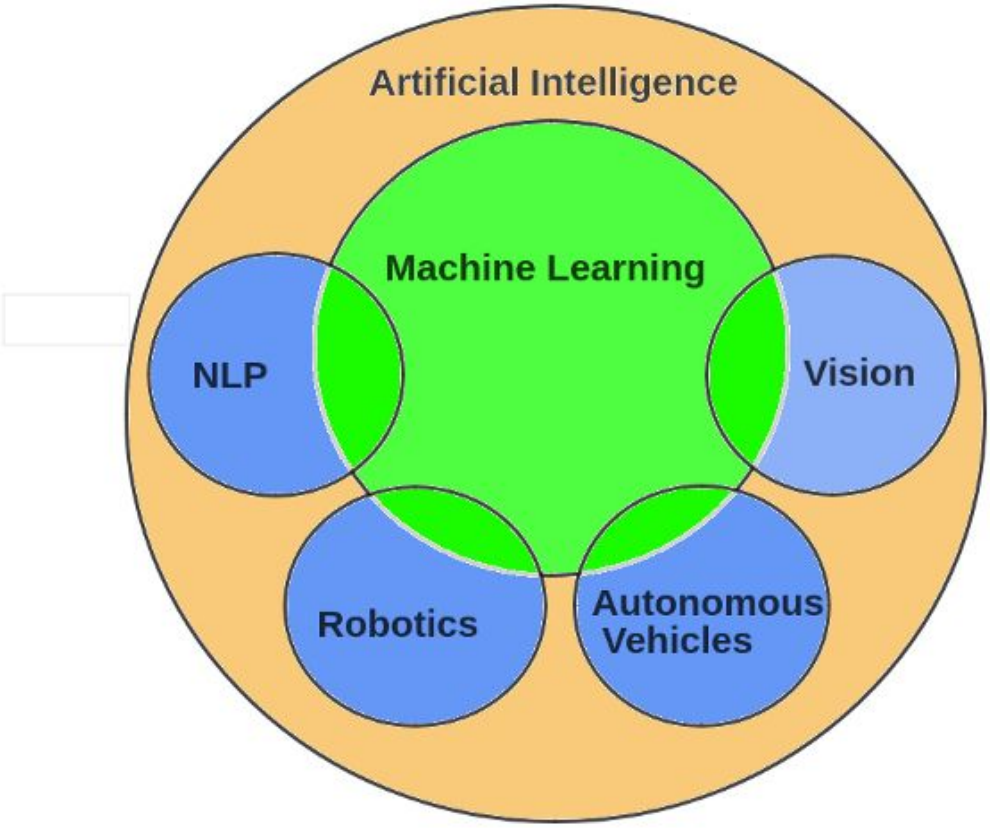
The most important among them are as follows:

1. **Machine Learning (ML)**: It is a method where the ***target***(goal) is defined and the ***steps to reach*** that target is learned by the machine itself by ***training***(gaining experience).For example to identify a simple object such as an apple or orange. The target is achieved not by explicitly specifying the details about it and coding it but it is just as we teach a child by showing multiple different pictures of it and therefore allowing the machine to define the steps to identify it like an apple or an orange.
2. **Natural Language Processing (NLP):** Natural Language Processing is broadly defined as the **automatic manipulation of natural language**, like **speech** and

text, by software. One of the well-known examples of this is email spam detection as we can see how it has improved in our mail system.

3. **Vision:** It can be said as a field which enables the machines to see. Machine vision captures and analyses visual information using a **camera**, analog-to-digital conversion, and digital signal processing. It can be compared to ***human eyesight*** but it is not bound by the human limitation which can enable it to **see through walls**(now that would be interesting if we can have implants that can make us see through the wall). It is usually achieved through machine learning to get the best possible results so we could say that these two fields are interlinked.
4. **Robotics:** It is a field of engineering focused on the design and manufacturing of robots. Robots are often used to perform tasks that are ***difficult for humans to perform or perform consistently***. Examples include car assembly lines, in hospitals, office cleaner, serving foods, and preparing foods in hotels, patrolling farm areas and even as police officers. Recently machine learning has been used to achieve certain good results in building robots that interact socially(**Sophia**)
5. **Autonomous Vehicles:** This area of AI has gathered a lot of attention. the list of vehicles includes cars, buses, trucks, trains, ships, submarines, and autopilot flying drones etc.

The fields above in simple terms can be shown as below and we can see why machine learning plays a major role in achieving AI.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