Ideas In Artificial Intelligence

<u>Introduction</u>: The field of Artificial Intelligence (AI) was officially born and christened at a workshop organised by John McCarthy in 1956 at the Dartmouth Summer Research Projects on Artificial Intelligence. The goal was to investigate ways in which machines could be made to simulate aspects of human intelligence, which has been an essential idea that has continued to drive the field forward ever since. McCarthy is credited with the first use of the term "Artificial Intelligence" in the proposal he co-authored for the workshop with Marvin Minsky, Nathaniel Rochester, and Claude Shannon.

Many of the people who attended soon led significant projects under the banner of AI, including Arthur Samuel, Oliver Selfridge, Ray Solomonoff, Allen Newell, and Herbert Simon.

Although the Dartmouth workshop created a unified identity for the field and a dedicated research community, many of the technical ideas that have come to characterise AI existed much earlier.

- In the eighteenth century, Thomas Bayes provided a framework for reasoning about the probability of events.

- In the nineteenth century, George Boole showed that logical reasoning, dating back to Aristotle, could be performed systematically in the same manner as solving a system of equations.

- By the turn of the twentieth century, progress in the experimental sciences had led to the emergence of the field of statistics, which enables inferences to be drawn rigorously from data.

Primitive Robots

Robots refer to the agents or system of machines which could sense and act autonomously. In Alan Turing's essay, "Computing Machinery and Intelligence", he imagines the possibility where computers are used to simulate intelligence, which also explores the possibility of how machines might automatically learn.

With advent of primitive mechanisation in production, development of internet, mobile technologies, electronics, nano-technology, digital applications, mechatronics has sped up like never before.

STRIPS

STRIPS, which stands for "STanford Research Institute Problem Solver," was the planner used in Shakey, one of the first robots built using AI technology.

The features that describe the world were divided into primitive and derived features. Definite clause are used to determine derived feature values from values of primitive features in a given state. STRIPS representation is used to determine, values of primitive features in a state based on previous state and action agent takes. It's representation is based on the fact that most of the things stay unaffected by a single action. In this, all features which aren't mentioned are False.

Graph Plan

This takes planning problems expressed in STRIPS as an input and produces sequence of operations required to reach goal state if possible. Facts that can't be true and actions that cannot execute together are also maintained in knowledge base. The graph contains constraints which are propagated as the graph is built. This serves as improvement to STRIPS, in order to standardise AI planning with PDDL which was created to express physics of domain, i.e. what actions are possible, what effect it has on another action that can be taken.