# ARTIFICIAL INTELLIGENCE (AI) - AN OVERVIEW

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**ABSTRACT**

*The computers are fundamentally well suited for performing mechanical computations, using fixed programmed rules. This allows the artificial machines to perform some simple monotonous tasks efficiently and reliably, something humans are ill-suited to. For more complex problems, things get more difficult. Unlike humans, some computers have trouble understanding some specific situations, and adapting to new situations. Artificial Intelligence aims at improving the machine behaviour in tackling such complex tasks.*

*Together with this, some of the AI research is allowing us to understand our intelligent behaviour. Humans have an interesting approach towards problem-solving, based on abstract thought, high-level deliberative reasoning and pattern recognition. Artificial Intelligence can help us understand this process by recreating it, and potentially enabling us to enhance it beyond our current capabilities.*

**Key words:** Artificial Intelligence, computer, robot, computer science

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**INTRODUCTION**

AI is one of the newest sciences, along with computer technology which gave us an electronic computer introduced in 1950. The technology is used to create machine intelligence. The word AI was first introduced at the Dartmouth conference in 1598, and then the AI started being used longer for the theories and principles developed by the researchers. The history of AI was slow to develop than was expected, but the development process continues. There have been various artificial intelligence functions and they have impacted technical advancements **[Bean lands G A, 1994]**. Knowledge representation and knowledge engineering are the central part of AI research. Many of the problems were expected to be solved with the help of extensive knowledge about the world.

Artificial Intelligence is the intelligence of machines and the area of computer science focussing on creating machines that can engage on behaviours that human consider intelligent. It is also called machine intelligence. Some software technologies make a computer or robot to perform equal or better than normal human computational ability in accuracy, capacity and speed **[Luger G F, 2005]**.

There are two types of AI research approaches. They are

1. Performance Oriented: Here the researcher tries to maximise the performance of the agents. This is a "Computer Scientists Approach" [Russell S J, 2009].
2. Simulation Oriented: Here the researcher tries to understand how the agents produce responses.

**The two main goals of AI are:**

1. To create some useful smart programmes those are able to do the tasks that require a human expertise.
2. To understand human intelligence and test their theories on human intelligence by writing programmes which emulate it.

**HISTORY OF AI**

The computer technology had started using AI from 1920. It started to discriminate between machines and human intelligence. Simon and Newell developed the theorem of Logic and it was considered as the first AI program since 1935. The AI programme represents a problem as a binary model whereof, a correct solution is found.
Since 1976, John McCarthy considered as the father of Artificial intelligence, they organized a two month workshop at Dartmouth in the summer of 1950. There were 10 attendees in all, including Trenchard more from Arthur Samuel from IBM, Oliver Selfridge, Princeton and Ray Solomon off and from MIT.

The Dartmouth workshop did not lead to any new breakthroughs, but it did introduce all the major figures to each other. It was identified in that the workshop that for the next 20 years, the field would be dominated by these people and their students and colleagues at CMU, Stanford, MIT and IBM **[Geraghty P J, 1993]**.

Some human beings solve most of the problems using fast, intuitive judgments rather than the conscious and step-by-step deduction that early AI research was able to model. AI has made some progress towards "sub-symbolic" problem solving which approaches and emphasise the importance of sensor motor skills towards high reasoning. The neural net research attempts to simulate the structures inside the human and animal brain that give rise to this skill.

Early AI researchers had developed algorithms which used a step by step reasoning which humans were often assumed to be using when they solve puzzles, play board games or make logical deductions. In the early 1980-s and the 90-s AI research developed highly successful methods for dealing with the uncertain or incomplete information.
Perhaps encouraged by the progress in solving the sub problems of AI, researchers had also started to look at the "whole agent" problem again. The work of Allen Newell, John Laird, and Paul Rosenbloom on SOAR is the best-known example of complete agent architecture. AI systems have become so common in web based applications that the "-boot" suffix has entered everyday language. Moreover, AI technologies underlie many Internet tools, such as search engines, recommender systems, and web site construction systems **[Hoppe T, 1993]**.

One consequence of trying to build complete agents is the realisation that the previously isolated subfields of AI might need to be reorganised somewhat when their results are to be tied together. In particular, it is now widely appreciated that sensory systems (vision, sonar, speech recognition, etc.) cannot deliver perfectly reliable information about the environment. Hence, reasoning and planning systems must be able to handle uncertainty. A second major consequence of the agent perspective is that AI has been drawn into much closer contact with other fields, such as control theory and economics that also deal with agents **[Loehle C, 1990]**.

Most of these algorithms required enormous computational resources for difficult problems. The “combinatorial explosion" which is the amount of memory or computer time required becomes astronomical when the problem goes beyond a certain size. Searching for more efficient problem solving algorithms is the highest priority for all AI researches.

**FOUNDATIONS OF AI**

AI is a mixture of contributions from various disciplines. Some of the disciplines that contributed in making AI, the technology of the new age are presented below:

1. Computer Engineering
   For artificial intelligence to succeed, we need two things: intelligence and an artifact. The computer is the artifact of the choice.
2. Control theory and Cybernetics
   Calculus and matrix algebra, the tools of control theory, lend themselves to systems that are describable by fixed sets of continuous variables; furthermore, exact analysis is typically feasible only for linear systems. Artificial Intelligence was founded in part as a way to escape from the limitations of the mathematics of control theory in the 1980s. The tools of logical inference and computation allowed AI researchers to consider some problems such as language, vision, and planning, that fell completely outside the control theorist’s purview **[Lawanda R, 1991]**.
3. Linguistics
   Modern linguistics and AI grew up together, intersecting in a hybrid field called computational linguistics or natural language processing. The problem of understanding language was turned out to be more complex than it seemed in 1967. Much of the early work in knowledge representation was tied to language and informed by the research in linguistics, which was connected in turn to decades of work on the philosophical analysis of language **[Scherer W, 1995]**.

**TECHNIQUES IN AI**

The computers are suited for performing mechanical computations, using fixed programmed rules. This allows the AI to perform some simple tasks efficiently and reliably. Humans are not suited to do this. Things get more difficult for more complex problems. Computers have some trouble in understanding specific situations, and adapting it to new situations. AI aims to improve the machine behaviour in tackling such complex tasks.

**APPLICATIONS DOMAINS OF AI**

AI has been identified useful in almost all the domains. However, some of the most noteworthy domains in which AI is applied are:

1. Industry and Agriculture
2. Transportation
3. Hazardous Environments
4. Exploration
5. Health care
6. Personal Services
7. Entertainment

8. Human Augmentation
9. Music
10. Aviation Industry
11. Mining

**WHAT AI IS DOING TODAY**

1. Game playing
2. Logistics Playing
3. Logistics planning
4. Objects Recognition
    - Biometric identification
    - Content based image retrieval
    - Handwriting recognition
    - Brightness based recognition
    - Feature based recognition

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