COURSE OBJECTIVES

Artificial intelligence (AI) is a research field that studies how to realize intelligent human behaviors on a computer. The ultimate goal of AI is to make a computer that can learn, plan, and solve problems autonomously. The main purpose of this course is to provide the most fundamental knowledge to the students so that they can understand what AI is visualize the most common cores for AI techniques and to be able to understand the possible applications of AI in real systems.

Lecture one

Introduction to Artificial Intelligence

Topics that must be covered in this lecture:

- What is Intelligence?
- What is Artificial Intelligence?
- Some branches of AI
- Some Application of AI systems

What is Intelligence?

- Intelligence is the ability to learn about, to learn from, to understand about, and to interact with one's environment.
- Intelligence is the computational part of the ability to achieve goals in the world. Varying kinds and degrees of intelligence occur in people, many animals, and some machines.

What is Artificial Intelligence?

It is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence. Or maybe defined as the branch of computer science concerned with making computers behave like humans.

This requires many processes: -

1- Learning: - acquiring the knowledge and rules that used this knowledge.

2- Reasoning: - Used the previous rules to access nearly reasoning or fixed reasoning.

As a result, AI is concerned with developing computer systems that can store knowledge and effectively use the knowledge to help solve problems and accomplish tasks.

Some Applications of AI systems:

1- **Game Playing**

Much of the early research in state space search was done using common board games such as checkers, chess, and 8 puzzles. Most games are played using a well-defined set of rules.

2- **Problem Solving: -** the objective of this particular area of research is how to implement the procedures on AI systems to solve problems like Human Beings.

3- **Natural Language Understanding**

The main goal of this problem is can ask the question to the computer in our mother tongue the computer can receive that particular language and the system gives the response within the same language. The effective use

of a computer has involved the use of a Programming Language that uses a set of Commands that we must use to Communicate with the Computer. The goal of natural language processing is to enable people and languages such as English, rather than in a computer language.

AI Translators – spoken to and printed what one wants in foreign languages.

4- Expert Systems: Diagnostic Systems

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MYCIN system for diagnosing bacterial infections of the blood and suggesting treatments

5- Robotics:

A robot is an electronic–mechanical device that can be programmed to perform manual tasks. The Robotics Industries Association formally defines a robot as a "Programmable multi-functional manipulator designed to move material, parts, tools, or specialized devices through variable programmed motions for the performance of a variety of tasks".

Robotics was becoming increasingly important in various areas like games, to handle hazardous conditions. For example:

automated cars.

6- **Automated theorem proving**

use inference methods to prove new theorems.

7- **Computer Vision:** It is a simple task to attach a camera to a computer so that the computer can receive visual images. People generally use vision as their primary means of sensing their environment. We generally see more than we hear, feel, smell, or taste. The goal of computer vision research is to give computers this powerful facility for understanding their surroundings. Currently, one of the primary uses of computer vision is in the area of Robotics.

8- **Heuristic Classification:** - The term Heuristic means to Find & Discover., find the problem and discover the solution. Solving complex AI problems requires lots of knowledge and some represented mechanisms in the form of Heuristic Search Techniques., i.e. referred to as Heuristic Classification.