Artificial Intelligence

Course Description

The quest for artificial intelligence (AI) has captured humanity's interest for many decades and has been an active research area since the 1960s. This course will give a detailed overview of the historical developments, successes, and set-backs in AI, as well as modern approaches in the development of artificial intelligence.This course gives an introduction to reinforcement learning, a process similar to how humans and animals experience the world: exploring the environment and inferring the best course of action.This course also covers the principles of natural language processing and computer vision, both of which are key ingredients for an artificial intelligence to be able to interact with its environment.

Contents

1. History of AI
   1. Historical Developments
   2. AI Winter
   3. Expert Systems
   4. Notable Advances
2. Modern AI Systems
   1. Narrow versus General AI
   2. Application Areas
3. Reinforcement Learning
   1. What is Reinforcement Learning?
   2. Markov Chains and Value Function
   3. Time-Difference and Q Learning
4. Natural Language Processing (NLP)
   1. Introduction to NLP and Application Areas
   2. Basic NLP Techniques
   3. Vectorizing Data
5. Computer Vision

5.1 Introduction to Computer Vision

1. Image Representation and Geometry
2. Feature Detection
3. Semantic Segmentation