

Artificial Intelligence

IT 803D

Credit: 3

Introduction

Overview of AI, Problems of AI, AI techniques; Problem Solving - Problem space and search, Defining the problem as state space search, Problem characteristics; Tic-Tac-Toe problem.

AI languages

Basic knowledge of programming languages like Prolog and Lisp.

Basic Search Techniques

Solving problems by searching; Uniform search strategies: breadth first search, depth first search, depth limited search, bidirectional search, comparing search strategies in terms of complexity.

Special Search Techniques

Heuristic Search- greedy best-first search, A* search; Hill climbing search, Simulated annealing search; Genetic algorithms; Constraint satisfaction problems; Adversarial search - Games, Optimal decisions and strategies in games, Minimax search, Alpha-beta pruning.

Symbolic Logic

Syntax and semantics for propositional logic, Syntax and semantics of FOPL, Properties of WFF, Clausal form, Unification, Resolution.

Reasoning Under Inconsistencies and Uncertainties

Non-monotonic reasoning, Truth maintenance systems, Default reasoning & closed world assumption, Predicate completion and circumscription, Fuzzy logic.

Probabilistic Reasoning

Bayesian probabilistic inference, Representation of knowledge in uncertain domain, Semantics of Bayesian networks, Dempster-Shafer theory.

Structured Knowledge

Associative networks, Conceptual graphs, Frame structures.

Expert Systems

Rule based systems, Nonproduction systems: decision tree architectures, blackboard system architectures, neural network architectures.

Learning

Types of learning, general learning model, Learning by induction: generalization, specialization; example of inductive learner.