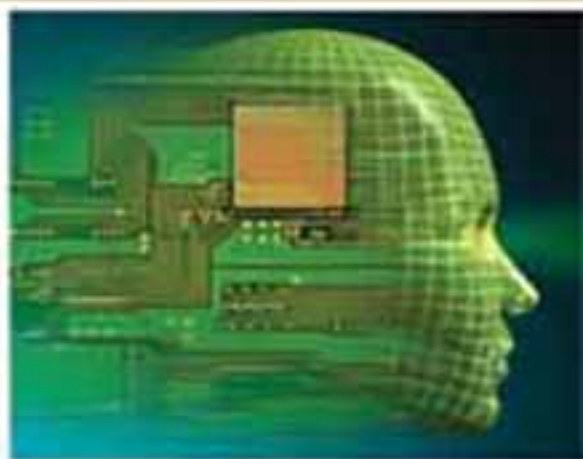


Revised Edition

ARTIFICIAL INTELLIGENCE

A PRACTICAL APPROACH



Er. RAJIV CHOPRA

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**ARTIFICIAL
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A PRACTICAL APPROACH

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Er. RAJIV CHOPRA

PREFACE

Many books on AI are available in market but they tend to be very formal and dry. My attempt is to make AI very simple so that a student thinks as if a teacher is sitting behind him and guiding him. AI has two main goals — building intelligent machines and understanding the nature of intelligence. Expert systems are computer-based systems that use knowledge often acquired from human experts to solve problems reading such expertise as in medical diagnosis, legal advising, tax planning, image interpretation and engineering design. AI and ES are linked via Knowledge Engineering (KE). KE is concerned with reducing a large body of knowledge to a set of facts and rules of a knowledge base and the inference procedures required for utilizing that knowledge for problem solving. KE is concerned with the task of building expert systems using appropriate tools.

This text is bolstered with many solved and unsolved problems, CASE STUDIES, experiments of AI in LISP and PROLOG programming of all Indian Universities. Every effort has been made to alleviate the treatment of the book for easy flow of understanding of students as well professors alike.

Any suggestions to enhance the quality of the book will be highly acknowledged and welcomed.

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Er. RAJIV CHOPRA

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GGSIU B.TECH (CSE/IT) (SEM VIII)

Paper: Artificial Intelligence 2010-11

Code No.: ETCS 402

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Paper: Artificial Intelligence

3 1 4

Instructions to Paper Setters:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, students may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT-1

Scope of AI: Games, theorem proving, natural language processing, vision and speech processing, robotics, expert systems, AI techniques-search knowledge, abstraction.

Problem Solving (Blind): State space search: production systems, search space control; depth-first, breadth-first search.

Heuristic Based Search: Heuristic search, Hill climbing, best-first search, branch and bound, problem reduction, constraint satisfaction end, means-end analysis.

[No. of Hrs: 12]

UNIT-II

Game Playing: Game tree, minimax algorithm, alpha beta cutoff, modified minimax algorithm, horizon effect, futility cut-off.

Knowledge Representation: Predicate Logic: Unification, modus Ponens, modus tolens, resolution in predicate logic, conflict resolution, forward chaining, backward chaining, declarative and procedural representation, rule-based systems.

Structured knowledge representation: semantic nets: slots, exceptions and default frames, conceptual dependency, scripts.

[No. of Hrs.: 12]

UNIT-III

Handling Uncertainty: Non-monotonic reasoning, probabilistic reasoning, use of certainty factors, fuzzy logic.

Natural language processing: introduction, syntactic processing, semantic processing, pragmatic Processing.

[No. of Hrs.: 10]

UNIT-IV

Learning: Concept of learning, learning automation, genetic algorithm, learning by inductions, neural nets.

Expert systems, need and justification for expert systems, knowledge acquisition, case studies: MYCIN, RI.

[No. of Hrs.: 10]

GGSIPIU B.TECH (CSE/IT) (SEM VIII)
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Code No.: ETCS 402 Total
Total number of lecturers: 40
Total number of tutorials: 16

| S. No. | Topics to be covered | Total no. of lectures | Total no. of tutorials |
|--------|---|-----------------------|------------------------|
| | First Term | | |
| | Scope of AI: Games, theorem proving, natural language processing, vision and speech processing, robotics, expert systems, AI techniques-search knowledge, abstraction. | 3 | 3 |
| | Problem Solving (Blind): State space search; production systems, search space control; depth-first breadth-first search. | 1 | |
| | Heuristic Based Search: Heuristic search, Hill climbing, best-first search, branch and bound, problem reduction. | | |
| | constraint satisfaction end, means-end analysis. | | |
| | Knowledge representation: predicate logic: unification, modus ponens, modus tolens, resolution in predicate logic, conflict resolution, forward chaining, backward chaining, declarative and procedural representation, rule-based systems. | 4 | 2 |
| | | 2 | |
| | | 6 | 2 |
| | Structural knowledge representation: semantic nets: slots, exceptions and default frames, conceptual dependency, scripts. | 2 | 1 |
| | Second Term: | | |
| | Game Playing: Game Tree, minimax algorithm, alpha beta cutoff, modified minimax algorithm, horizon effect, futility cut-off. | 4 | 2 |
| | Handling Uncertainty: Non-Monotonic reasoning, probabilistic reasoning, use of certainty factors, fuzzy logic. | 4 | |
| | Expert System: Need and justification for expert systems, knowledge acquisition, case studies: MYCIN, RI. | 5 | 2 |
| | Learning: Concept of learning automation, genetic algorithm, learning by inductions, neural nets. | 5 | 2 |
| | Third Term | | |
| | Natural language processing: introduction, syntactic processing, semantic processing, pragmatic processing. | 4 | 2 |

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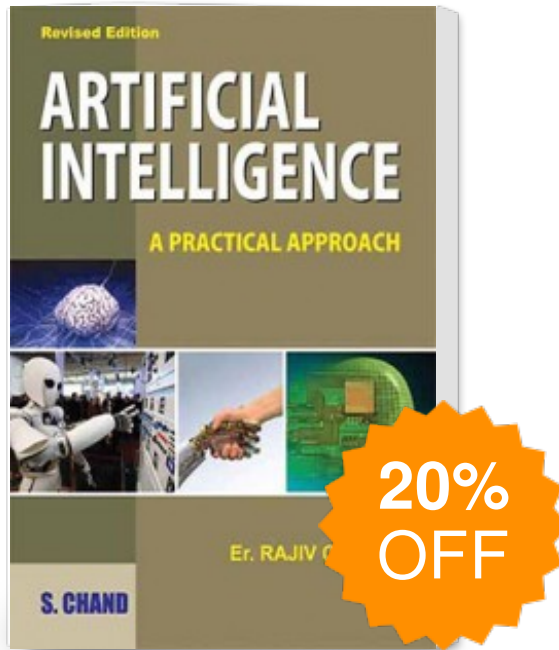
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Artificial Intelligence



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