Search Algorithms

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Contents

I. Introduction

II. Basic Search Algorithms

III. Informed Search

IV. Search Space Representation

V. Search Theory

VI. Relaxed Models

VII. Game Playing

VIII. Search Applications
Objectives

- Understand the mechanics of graph search.
- Implement best-first graph search efficiently.
- Model problems as search problems.
- Understand heuristics as a means to control search.
- Sensibly vary between optimality and relaxation.
- Construct domain-specific search algorithms.
Literature

Books on Heuristic Search

- Edmund K. Burke, Graham Kendall. 
  *Search Methodologies*

  *Artificial Intelligence: A New Synthesis*

- Judea Pearl. 
  *Heuristics*
  Addison-Wesley, 1984.

- Stuart Russel, Peter Norvig. 
  *Artificial Intelligence: A Modern Approach*

- Stefan Edelkamp, Stefan Schrödl. 
  *Heuristic Search: Theory and Applications*
  Elsevier, 2012. [DOI]

The slides of this course closely follow the book *Heuristics* of Judea Pearl.
Further Reading

- Chapter I.
Further Reading (continued)

- Chapter III.
Chapter IV.


Further Reading (continued)

  *A Formal Basis for the Heuristic Determination of Minimum Cost Paths.*  

  *Correction to "A Formal Basis for the Heuristic Determination of Minimum Cost Paths".*  

- Alberto Martelli.  
  *On the Complexity of Admissible Search Algorithms.*  

- László Mérő.  
  *A Heuristic Search Algorithm with Modifiable Estimate.*  

- Robert C. Holte.  
  *Common Misconceptions Concerning Heuristic Search.*  
  Proc. 3rd Annual Symposium on Combinatorial Search (SOCS), pp. 46–51, 2010. [Link]

  *A* *Search with Inconsistent Heuristics.*  
  Proc. 21st International Joint Conference on Artificial Intelligence (IJCAI), pp. 634–639, 2009. [Link]
Further Reading (continued)

- Chapter V.
  - Rina Dechter, Judea Pearl.
    *The Optimality of A* Revisited.*
    Proc. AAAI, pp. 95–99, 1983. [Link]
  - Rina Dechter, Judea Pearl.
    *Generalized Best-first Strategies and the Optimality of A*.*
    J. Association for Computing Machinery, pp. 505–536, 1985. [DOI]
Chapter VI.