Independant Study Specification

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Purpose

To gain a basic understanding of the fundamental topics in Aritifical Intelligence. Rather than an in-depth study of a couple subjects, the plan is to hit a few specific points in nearly all the topics. This study should set up a good base for continued learning, most likely in the graduate level independant study next year.

Books

1) Russel, S., Norvig, P. (2002). Artificial Intelligence *A Modern Approach*.

2) Mitchel, T. M. (1997). Machine Learning.

Russel is going to be the main book for this study, using Mitchel as a supplement for thinner chapters. Neither book goes very in-depth about genetic algorithms, so hopefully their content will complement each other.

Material

1) **Introduction:** Chapter 1 from Russel. Just a quick read-through.

2) **Intelligent Agents:** Chapter 2 from Russel. Just a quick read-through.

3) **Search and Exploration:** Chapter 4 from Russel. Focus on sections 1 and 3, heuristic search strategies and local search/optimization problems respectively.

4) **Knowledge Representation:** Chapter 10 from Russel. General ontology, categorizing objects, represenation of actions, knowledge and beliefs.

5) **Uncertainty:** Chapter 13 from Russel. Making rational decisions based on the likelihood that the goals will be achieved when not all conditions are known.

6) **Probabilistic Reasoning:** Chapter 14 from Russel, and chapter 6 from Mitchel. Capturing and representing uncertain knowledge using bayesian networks. Using probabilistic algorithms to reason when exact inference is infeasible.

7) **Statistical Learning Methods:** Chapter 20 from Russel, and chapter 4 from Mitchel. Learning probabilistic theories about the environment from experience. Methods of learning models, using both bayesian and neural networks.

Projects

As of right now there aren't any predefined projects for this study. Projects will be assigned based on the weekly meetings througout the quarter.

Additional Comments