



CS 470 ARTIFICIAL INTELLIGENCE

Winter 2006, Instructor: Jeffrey Horn

ANNOUNCEMENTS (Tuesday, April 25, 2006)

LATEST:

- Quiz 5, due Thursday April 27. click [here](#)
- Quiz 4, due Thursday April 27. click [here](#)

Not so New (Older Announcements):

- Colloquium this week features [Dr. Chakroborty](#), an invited speaker. I recommend that you attend his 2pm talk, which involves some machine learning for classification of data, but do not go to his 4pm talk! (Come to class instead.)
 - [NMU Celebration of Student Research and Creative Works](#)
 - [John Laird](#)
 - [Gary Parker](#)
 - [Dean Hougen](#)
 - Fixed dates on Project 2 and Quiz 2 (Proj. 2 due Friday, March 24, 2006, Quiz 2 due TODAY! March 21, 2006)
 - Computer Science Colloquium today, Thursday, at 4pm in NSF 1205
 - QUIZ 2: see below
 - Finally, have added Project 2 (I am now calling the programs *projects*). Go [here](#).
 - [Cool news](#) bit from NSF.
 - Quote: "*It's also got remarkably good artificial intelligence; how often do you hear us saying that about any game?*" ([GameSpot review](#) of [Galactic Civilizations II](#))
 - [Here](#) is the alternative version of HW 1 ("Scheme-lite"). Officially assigned TODAY! Due in ONE WEEK (2-24-06)
 - Here are some [SCHEME TIPS](#)
 - (And [here](#) is the pseudo code for the uninformed state space search algorithm **WITH LOOP CHECKING**).
 - Goto class on Tuesday!
 - 1. You MUST watch the Machine Learning video with Dr. Dietterich. It is classic! And it is the only NN prep you will get for Correy's Thursday lecture AND it has more on machine learning than our text. It is a one hour VHS tape.
 2. You should pick up the A* article in class on Tuesday.
 - QUIZ 1 (RL500 Simulator) is here (see [below](#)). This one you can do off the web.
 - Homework 1 Assigned! See below.
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- [Original Course Announcement](#)
 - Syllabus
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[LINKS](#)

POSSIBLE TOPICS

- **AI as SEARCH**
 - Planning
 - State Space Search
 - Heuristic Search
 - Adversarial Search
 - **STIMULUS-RESPONSE AGENTS**
 - Look-up tables
 - Braitenberg Vehicles
 - Classifier Systems
 - Prisoners' Dilemma
 - **NEURAL NETWORKS**
 - **ARTIFICIAL LIFE and EVOLUTION**
 - **ROBOTICS**
 - **AUTOMATED LOGIC**
 - Knowledge bases and deduction engines
 - Why HAL went insane: brittleness
 - Fuzzy logic, an answer to brittleness
 - **MACHINE LEARNING**
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• HOMEWORKS & PROGRAMS

- Project 1 : Automated Planning as State Space Search ([here](#))
 - And [here](#) is the alternate version.
 - Here are some [SCHEME TIPS](#)
- Project 2 (I am now calling the programs *projects*). Go [here](#).
- Project 3 (first micro-assignment): ***Genetic Algorithms for Intelligent Design (optimization)***
 - Goal: Become familiar with the GA and its application and behavior through optimization of a known, hard, and open problem (NYC Tunnels)
 - Tasks:
 1. Use the GA code, I distributed. But I suggest you update the files [NYCTBlackBoxBoxGA.java](#) and [NYCTBlackBoxNICHING.java](#).

Run it on the NYC Tunnels problem with the following 10 random seeds:

- 000xy, 111xy, 222xy, 333xy, 444xy, 555xy, 666xy, 777xy, 888xy, 999xy
 - where "xy" is your individual two digit number in the class (obtain from me).
2. Experiment with the GA parameters until you get "good" performance using maximum 1,000,000 cost. This means that you find the \$38.79 million solution on at least one of your random seeds, and you find the second best known solution (\$39.062 million on at least half of your random seeds).
 3. Show me a plot of convergence for one of the runs.

TESTS AND QUIZES

- QUIZ 1: **RL500 (robomow) simulator** ([here](#)) Handed out Tuesday, Feb. 7, Due: Thursday, Feb. 9, to me by [webCT](#) or [email](#).

- QUIZ 2: **Hungarian Rings Puzzle.** ([Barry's web site](#)) Handed out Thursday, March 16, 2006, Due: Tuesday, Feb. 21, to me by [webCT](#) or [email](#).

Pick one of the versions of the Hungarian puzzle (in case several are given), and show how to solve with state-space search using A*:

- (1) Describe the state space (e.g., outline the data structure for the state descriptor, and the operators that would change a state to another state). (This part should be easy for this puzzle.)

- (2) Design and describe an admissible heuristic that can be used in an A* search of the state space. Explain why it is admissible (i.e., always underestimates the actual cost). Is it "locally admissible" too? (extra credit if it is!)

Also, I want everyone to stick around. We have some important material to cover for Project 2 today, and I want to make sure we have enough time. So I am asking everyone who can to stay until 6pm today just in case we need it (if you cannot, that is OK). Unlike last time, when I was the speaker and discussion went on until 5:30 or so, this time we can "cut out" at 5pm. If the colloquium crowd does not clear out of 1205 by 5pm, we can move to 1207 next door. We'll play that by ear.