CS 536 – Artificial Intelligence II – Spring 2004
MWF 11:00-11:50 a.m., Faner 2204

See the course web page for more complete information about the course and course policies. This page is accessible via the CS Dept. page (http://www.cs.siu.edu/) under CS Course Descriptions On-Line.

Professor: Dr. Norman Carver, Faner 2132, phone 453-6048.
Office hours: MWF 1:00-3:00p.m. (or by appointment).


Workload (very tentative!): midterm exam (30% total), final exam/project (30%), homeworks and Lisp programming assignments (40%).

While we are not strictly enforcing the CS 436 (Artificial Intelligence I) prerequisite, most of the class will probably have had CS 436 or an equivalent undergraduate AI course. We will spend some time at the start of the course reviewing basic AI topics (particularly search and logic). However, those students that have no previous AI experience will have to read and study these topics in more detail. Once we have finished with the review portion of the course, we will focus on a small number of topics in AI that we will study in some detail. The particular topics that will be covered—as well as the number of topics we will cover—will depend on how fast we move and how well students are picking up concepts. The initial plan is to look at (1) decision-theoretic methods, (2) learning, and (3) agents and multi-agent systems. Much of what we will study will be from the text, but we will also look at some papers.

We will probably have students give final presentations rather than having a final exam. Each student will select a paper on a topic of interest, read and research the paper, and then give a presentation to the class. We will discuss this in class, to see what people want to do.

Programming assignments will be a significant aspect of the course, since this is one of the best ways for students to get a good understanding of the complexity of AI problems. All programming will be done in Lisp. Again, prior experience with Lisp is not a requirement, but it is expected that most students in the class will have experience with Lisp. Students that have no Lisp background must have reasonable programming skills so they can pick up the language mainly on their own (handouts and other material will be provided). Many of the programming assignments will revolve around building “intelligent agents” to play different versions of the Wumpus World game described in the text.

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Course Outline: (tentative)

1. Review: Introduction to AI (chap 1–2)
   - what AI is about and the “intelligent agent” view

2. Review: Search (chaps 3–4)
   - problem solving as search, state space models, and uninformed and heuristic search

3. Review: Logic (chap 7–9)
   - propositional and first order logic, inference, and representation issues

4. Review: Reasoning under uncertainty (chap 13–14 + non-text)
   - Uncertainty and nonmonotonicity
   - Probabilistic representations and Bayesian/belief networks

5. Reasoning under uncertainty and decision theory (chap 14–17)
   - Belief networks
   - Decision theory, MDPs

6. Learning (chaps 18–21)
   - Symbolic learning: inductive, reinforcement, and unsupervised
   - Subsymbolic learning: neural networks and genetic algorithms

7. Intelligent agents and multiagent systems (mainly non-text)

8. Other advanced topics

Attendance at the class lectures is considered important for this course, and excessive absences will result in a lowering of your final grade! So, if you are not planning on attending virtually every lecture, drop the course. (You have been warned.) If you are absent from any lectures it will considered your responsibility to find out about the material that was covered. You are also expected to read the assigned chapters in the text. Material from the book may be included on exams even if it is not covered in class!

The course web page has links to much useful information. Please check the site from time to time and explore some of the links. Reduced-size versions of some lecture overheads will be made available via the web, and you are strongly encouraged to obtain copies.

Allegro Lisp is available in the CS Dept. lab on the Windows machines via: Start → Programs → ACL Enterprise Ed. 5.0.1 → ACL Enterprise Ed. 5.0.1 (with IDE). Note that there is a great deal of documentation online that can be accessed via the ACL menu. Students wishing to use other machines are advised to download and install the free version of Allegro from the Franz website (www.franz.com).