CS827 Artificial Intelligence

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Office hours: Wednesday 12 noon - 5pm

Course Description: Advanced topics in artificial. Topics include logic and planning, probability and reasoning with uncertainty, and learning.

Prerequisites: Students must be know the following (topics that are covered in cs627):

Search:
Must be able to use search methods, e.g. depth-first, breadth-first, A*, iterative deepening. Must understand their time and space complexity. Must be able to recognize when each method is appropriate.

Games:
Must understand alpha-beta minimax. Must be able to construct game trees.

Constraint Propagation:
Must understand different types of constraints. Must know about arc consistency, backtracking search, forward checking, local search and other basic techniques.

Logic:
Must be able to translate from English to either propositional or predicate (first-order) logic. Must understand basic terms such as soundness, completeness, model, interpretation, syntax, semantics, resolution, etc.

Planning:
Must understand planning as search and as constraint satisfaction. Must understand plan graphs. Must know the critical path method.

Uncertainty:
Must understand how to use random variables. Must be able to perform basic probabilistic reasoning. Must be able to apply Bayes Rule and Bayesian Networks to problems.

Learning:

Must be able to create decision trees from data. Must understand overgeneralization and overfitting. Must know neural networks and k-nearest neighbors.

Course Objectives: After completing this course, students will:

Understand planning,

Understand probabilistic reasoning and Bayesian networks,

Understand hidden markov models,

Understand markov decision processes and partially observable markov decision processes,

Understand various methods of learning, including version space learning, explanation-based learning and reinforcement learning.

Grading:

There will be a final exam, which is the qualifying exam for those students who wish to take it. In addition, there will be a number of homework assignments. The course grade will be determined by the scores received in the following areas:

Homework Assignments   50%
Final Exam   50%

There will be **no curves** given for individual assignments. At the discretion of the instructor, a curve may be used for final course grades. The grading scale will be no more stringent than the following:

A: 93-100
A-:   90-93
B+:   87-90
B: 83-87
B-:   80-83
C+:   77-79
C: 72-76
C-:   68-71
D+:   62-67
D: 60-61
F: 0-59

Course Policies:

The University disability policy requires that students seeking an accommodation must contact the Office of Disability Services at (212) 346-1526 in New York City or (914) 773-3710 in Westchester.

You are expected to abide by the CSIS Statement of Student Responsibilities, particularly its policy on academic integrity. Any violations of these rules will be handled as described in that document. This policy can be found at http://csis.pace.edu/~benjamin/teaching/Responsibilities.pdf

Attendance is required, as the material covered in class requires team participation and will be difficult or impossible to make up later. Please inform the instructor as soon as possible if you must miss a class meeting. Accommodations will be made for illness or emergency.

If you must miss a test for any reason, you must inform the instructor **BEFORE the test.** Unless there is an emergency or a serious illness, make-up tests will NOT be given.