Advanced Dynamic Programming for Fall 2017 OR 774

Prereq: OR 674 or permission of instructor Instructor: Dr. Rajesh Ganesan

This course covers advanced topics on the theory and practice of dynamic programming, i.e. optimal sequential decision making over time in the presence of uncertainties. The course will stress on the mathematical foundations and will introduce the theory, computational aspect, and applications of approximate dynamic programming for stochastic DP problems. The course will use Matlab to show the concept but you can code in any language.

Text: Approximate DP, Warren Powell, Wiley Publishers, second ed

Notes prepared from

- Neuro-Dynamic Programming (Optimization and Neural Computation Series, 3) by Dimitri P. Bertsekas, John N. Tsitsiklis
- Markov Decision Processes: Discrete Stochastic Dy. Programming by M. L. Puterman
- Reinforcement Learning by Sutton and Barto

Topics

Review: Dynamic Programming Algorithm

Deterministic Systems, Shortest path Algorithm

Stochastic DP

Introduction to ADP Algorithms

Stochastic Approximation

Convergence and optimality

Reinforcement learning

ADP: value function approximation

Student Evaluation Criteria

Mid-term: 30% Project 30% Final Exam: 40%

Academic Policy:

All academic policies as given in the Honor System and code will be strictly followed. Visit URL http://oai.gmu.edu/mason-honor-code/

Grades:

Letter grades will be decided as follows:

97% and above $-A^+$, 94-96%- A, 90-93% $-A^-$, 86-89- B+, 83-85%-B, 80-82%-B-, 76-79%- C^+ , 73-75%- C, 70-72%- C^- , 66-69%- D^+ , 63-65%-D, 60-62%- D^- , at or below 59%-F

Please visit http://mason.gmu.edu/~rganesan/class to check for announcements and notes