DSCI-552: Machine Learning for Data Science

Units : 4

Location : OHE 100D / DEN

Instructor : Satish Kumar Thittamaranahalli
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Course Description and Learning Objectives

The learning objectives for students in this course are: (1) broadly understand major algorithms used in Machine Learning; (2) understand supervised and unsupervised learning techniques; (3) understand Bayesian decision theory and nonparametric methods; (4) understand decision trees, dimensionality reduction, clustering, and kernel machines; (5) understand reinforcement learning, Bayesian estimation, hidden Markov models, and graphical models.

This is a foundational course with primary application in data analytics. It is intended to be accessible to students with technical backgrounds as well as to students with less technical backgrounds. The reading material for the course will be based on published technical papers available via the ACM/IEEE/Springer digital libraries or freely available online. All USC students have automatic access to these digital archives. Students can also refer to the textbook "Introduction to Machine Learning", second edition, MIT Press, 2010, by Ethem Alpaydin.

Recommended Preparation

A basic mathematical background in probability, statistics, and linear algebra, as well as basic programming skills and a basic understanding of engineering principles are strongly encouraged.

Description and Assessment of Assignments

Grading will be based on students' understanding of lecture material, the correctness of their programs, and their ability to explore related areas. Students can work in groups of 1-2 but should mention their individual contributions.

Grading Breakdown

Programming Assignments : 49% (7 assignments for 7% each)
Class Participation : 1%
Final Exam : 50%

Assignment Submission Policy

Students are required to submit the assignments on USC's DEN portal. One submission per team is sufficient.

Grading Timeline

Feedback and grades will be available within 1-2 weeks after assignment due dates.

Academic Conduct

Plagiarism—presenting someone else's ideas as your own, either verbatim or recast in your own words—is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, "Behavior Violating University Standards" https://policy.usc.edu/student/scampus/part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct http://policy.usc.edu/scientific-misconduct.

Support Systems

A number of USC's schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the American Language Institute http://ali.usc.edu, which sponsors courses and workshops specifically for international graduate students. The Office of Disability Services and Programs http://dsp.usc.edu provides certification

for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, USC Emergency Information http://emergency.usc.edu will provide safety and other updates, including ways in which instruction will be continued by means of BlackBoard, teleconferencing, and other technology.