

# Introduction to Machine Learning (CS 491) – Spring 2013

**Lectures:** Tuesdays and Thursdays, 2:00pm – 3:15pm

**Instructor:** Dr. Brian Ziebart <bziebart@uic.edu>

**Description:** Machine learning is the study of systems that improve automatically based on past experience. This course will introduce common machine learning tasks (e.g., classification, density estimation, clustering, bandit learning) and some of the successful machine learning techniques and broader paradigms that have been developed for these tasks. The course is programming-intensive and a large emphasis will be placed on tying machine learning techniques to specific real-world applications through hands-on experience.

**Prerequisites:** CS401; STAT 381 or IE 342; MATH 310 or MATH 320; or consent of the instructor

**Textbook:** Machine Learning: a Probabilistic Perspective by Kevin Murphy

**Grading:** Grades will be separately curved for graduate and undergraduate students.

- Homework Assignments (40%) due approximately bi-weekly (5 total)
- Midterm exam (20%)
- Final exam (20%)
- Course project (20%) including: project proposal, progress report, final report, presentation

**Main topics:**

- Overview of machine learning tasks
- Instance-based learning
- Bayesian networks
- Margin-based learning
- Bandit algorithms and online learning
- Clustering and dimensionality reduction
- Simulation-based approaches