

CS 434 – Machine Learning and Data Mining

Catalog Description: Introduction to machine learning and data mining algorithms (supervised learning, unsupervised learning, and reinforcement learning) tools that are widely employed in industrial and research settings.

Credits: 4

Prerequisites: CS325

Courses that require this as a prerequisite: None

Structure: Three 50-minute lectures per week

Instructors: Xiaoli Fern

Course Content:

- Supervised learning for prediction problems (learn to predict)
- Unsupervised learning for clustering data and discovering interesting patterns from data (learn to understand)
- Reinforcement learning for learning to select actions based on positive and negative feedback (learn to act)

Learning Resources:

- *Machine learning*, Tom Mitchell, McGraw-Hill 1997 (Optional reference)
- *Machine learning and pattern recognition*, Chris Bishop, Springer (Optional reference).

Measurable Student Learning Outcomes:

At the completion of the course, students will be able to...

1. **Apply** supervised learning algorithms to prediction problems and **evaluate** the results (ABET outcomes: A, B, C)
2. **Apply** unsupervised learning algorithms to data analysis problems and **evaluate** results (ABET outcomes: A, B, C)
3. **Apply** reinforcement learning algorithms to control problem and **evaluate** results (ABET outcomes: A, B, C)
4. **Decide** what kind of problem (supervised, unsupervised, or reinforcement) it is, given a description of a new problem (ABET outcomes: B, C)

Students with Disabilities:

Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737-4098.

Link to Statement of Expectations for Student Conduct, i.e., cheating policies
<http://oregonstate.edu/admin/stucon/achon.htm>