

CS595 INTERACTIVE AND TRANSPARENT MACHINE LEARNING

FALL 2017

SYLLABUS

Course Description

This course will discuss how humans and machine learning systems can collaborate for more effective decision making. We will primarily focus on interactivity and transparency for enabling a fruitful collaboration between humans and machine learning systems. Topics include expert systems, recommender systems, active learning, reinforcement learning, computer-aided diagnosis, and human-centered machine learning. Students are expected to read and present several academic papers, analyze several datasets using machine learning algorithms, inspect implicit and explicit biases present in the analytical process, and build a fully interactive and transparent machine learning system.

Prerequisites

CS584 or CS522

Related Video

See <https://www.youtube.com/watch?v=Tx3yuKG9wwY>

Topics – Tentative

1. Background on machine learning
 - a. Rule-based machine learning
 - b. Decision trees
 - c. Linear models
 - i. Naïve Bayes, logistic regression, linear regression, linear SVMs
 - d. Nonlinear models
 - i. Nonlinear SVMs, nonlinear neural network architectures
 - e. Graphical models
 - i. Bayesian networks
2. Expert systems
3. Recommender systems
4. Reinforcement learning
5. Robotics
6. Active learning
7. Intelligent user interfaces
8. Computer supported cooperative work

9. Computer-aided diagnosis
10. Citizen science
11. Human-centered machine learning
12. Literature on transparency

Date and Location

Tuesdays & Thursdays, 3:15pm – 4:30pm
Rettaliata Engineering Center - 025

Instructor

Mustafa Bilgic
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Teaching Assistant

None.

Textbook

None. However, there will be required readings mainly chosen from the machine learning literature.

Online Tools

For questions and answers, please use Piazza: <https://piazza.com/iit/fall2017/cs59501>

Course slides, assignments, and projects will be handled through Blackboard: <https://blackboard.iit.edu/>

Grading

Attendance: 15%
Assignments: 55%
Presentation: 10%
Project: 20%

Programming Language

Python 3.6.

Late Submission Policy

Assignments will be submitted via Blackboard. Every late minute will cost you 1 point. No exceptions!

Code of Academic Honesty

<https://web.iit.edu/student-affairs/handbook/fine-print/code-academic-honesty>

Americans with Disabilities Act (ADA) Policy

Reasonable accommodations will be made for students with documented disabilities. In order to receive accommodations, students must obtain a letter of accommodation from the Center for Disability Resources. The Center for Disability Resources (CDR) is located in 3424 S. State St., room 1C3-2 (on the first floor), telephone: 312.567.5744 or disabilities@iit.edu.