New Course Offering on Machine Learning

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Title: Machine Learning for Engineers

Course Description

Machine learning, artificial intelligence, and "big data" are disrupting all professions and the engineering profession is no exception. Modern engineering systems, ranging from autonomous vehicles, communications systems, and manufacturing plants to power grids, medical imaging equipment, and wearable devices are increasingly relying on machine learning for improved user experience and state-of-the-art performance. Despite such widespread adoption of machine learning in engineering systems, machine learning courses are typically either offered in non-engineering departments, often at the graduate level, or as professional courses for working engineers. This course, which is primarily targeted at undergraduate engineering students, is meant to change this trend and help prepare a modern engineering workforce that is well versed in the use of machine learning to solve engineering challenges.

This course—which will be offered in the Department of Electrical and Computer Engineering as an elective intended for undergraduate engineering students, but open to graduate engineering students—will serve as an introduction to machine learning for engineers. The content of this course will be a mix of the mathematics behind machine learning, computational methods for machine learning, and hands-on machine learning for engineering problems. The outcomes of this course will include rigorous understanding of the mathematical principles underlying supervised and unsupervised machine learning, and ability to solve mid- to large-scale machine learning problems on real-world engineering datasets.

Prerequisites

Students interested in enrolling in this course must have taken the following courses (or their equivalents):

- ECE 226: Probability and Random Processes (or equivalent, from any department)
- ECE 345: Linear Systems and Signals (or equivalent, from any department)
- Math 250: Introductory Linear Algebra (or equivalent, from any department)

In addition, students must be prepared to program in Python. The hands-on component of this course will, in particular, involve the use of Jupyter Notebooks (http://jupyter.org/).

Waiver of Prerequisites

Students who have not formally taken the listed prerequisite courses but who are informally prepared for them should send a request to the course instructor for waiver of these prerequisites along with a rationale for the waiver request. Such requests will be evaluated on a case-by-case basis and waivers will be issued through the Undergraduate Director's office.