Teaching Statement

Eugene Wu
Computer Science and Artificial Intelligence Laboratory
Massachusetts Institute of Technology
eugenewu@mit.edu

I have had the pleasure to spend time as an undergraduate and graduate student teaching and developing curriculum for a wide variety of courses. These have ranged from introductory courses for high school students with no programming experience to advanced systems courses for machine learning and database researchers. In addition, I have created two hands-on courses in response to the lack of a practical data analysis curriculum at MIT. I love teaching and it is a key reason I want to be a professor.

The most interesting part of teaching is working with students that have very different backgrounds and interests. I strongly believe the job of an instructor is to motivate and excite students about a topic, help remove stumbling blocks, and then operate as support. The Introduction to Data Analysis class (dataiap.github.io) was designed around this philosophy. We replaced traditional hour-long lectures with ten-minute "teasers" that summarize how a type of analysis led to surprising results in an interesting dataset (e.g., US presidential election campaigns sometimes received *negative* donations). Students spent the rest of class working through a detailed lab to replicate the teaser and then applying the analysis to their own data. Despite students with a wide range of abilities — from machine learning experts to non-technical CEOs at local companies — this approach kept everyone engaged throughout the course.

Our lessons from the introductory class evolved into MIT's first Big Data course that I am co-instructing this semester. This course surveys modern techniques and systems to ingest, efficiently process, analyze, and visualize large data sets. Throughout this course, we developed eight labs that give students hands-on experience with the course topics that are relevant in industry. These have ranged from integrating venue data from FourSquare and Locu to graph analysis on Amazon's cloud infrastructure.

In addition to data-oriented courses, I have experience teaching and developing introductory computer science curriculum. MEET is a middle-east peace initiative that brings top Israeli and Palestinian high school students together through an MIT-led business and computer science program that lasts from their sophomore to senior years. The program's Java-centric curriculum had significant pedagogical limitations – Java's syntax-heavy and non-interpreted nature confused students and some instructors – so as Head of Curriculum, I spearheaded the transition to a Python-centric curriculum. During this process, I created a new outline of topics and goals for each semester in the three year program, and developed the first year content centered around drawing and animation in Python. As of this year, MEET has fully transitioned to the new curriculum, and students are achieving by the second year what students previously struggled with in their last year.

I strive to create lab-oriented courses that emphasize student directed projects. I have found that this approach, in conjunction with individual student-instructor meetings to be very effective. Labs let students progress and learn at their own pace, projects allow students to pick a topic that excites them, and meetings let students privately express their concerns while giving the staff a chance to understand student interests. While this requires more commitment by the teaching staff, it is a worthwhile trade-off in the long run.

I am fortunate that my advisor, Samuel Madden, has been extremely supportive of my research and teaching pursuits throughout my graduate career. Not only has he encouraged, co-developed, and at times funded the courses I taught, he showed me the effectiveness of teaching a class by simply vocalizing his own enthusiasm for the topic. I have liberally used many of his teaching techniques, such as live demos and coding, in my own classes. As an advisor, his constant enthusiasm to try anything "cool" and ability to contextualize ideas have been instrumental in my growth as a researcher. I hope to be as influential to my students as Sam has been to me.

I am excited to teach undergraduate courses in databases, data analysis, operating systems, and introductory courses in programming, data structures, or algorithms. At the graduate level, I would like to teach advanced database systems, big data systems, and seminar courses that explore advances in data management and their intersections with other research areas. For example, the intersections of databases with human computation, computational journalism, the web stack, and interactive visualization.

Teaching Experience

Instructor, Big Data Systems (MIT 6.885) Fall 2013

Instructor, Introduction to Data Analysis (dataiap.github.io) Spring 2012

Head of Curriculum, MEET 2011 - 2012

TA, Database Systems (MIT 6.830) Fall 2010

Instructor, MEET Summer 2010

Instructor, Introduction to Java Course (MIT 6.S092) Spring 2010, 2011

TA, Database Systems (UCB CS185) Fall 2006