Teaching Statement
Matus Telgarsky

I have always treated teaching as an integral part of the academic experience: I was a teaching assistant for 4 courses during my 6 semesters as an undergraduate at CMU, and similarly for 4 courses during my 6 years as a graduate student at UCSD. During my current postdoc, I have prepared and presented three lectures for a graduate course in learning theory.

Beyond this innate motivation for teaching, I have also had two very strong influences: both my PhD advisor Sanjoy Dasgupta and my final undergraduate mentor Avrim Blum took teaching very seriously, something I witnessed as their student, as a researcher under them, and also as their teaching assistant. They both taught with great clarity and simplicity but without sacrificing content, which I will seek to emulate when teaching my own courses.

Undergraduate courses

I feel I am best suited to teach general undergraduate courses in discrete mathematics, algorithms, and introductory machine learning, as well as an advanced machine learning course covering a fair amount of learning theory.

In the introductory course in machine learning, my goal would be to quickly bring students up to speed with both mathematical and computational aspects of machine learning. This course would cover a lot of material and evolve a fair bit, as the field is currently revisiting many core methodologies (e.g., the use of HMMs and Gaussian mixtures in speech transcription has been displaced after many decades).

In the advanced course, I would aim to get students able to do their own research and produce their own algorithms. Ideally, this course would help students decide whether to apply for graduate school, and also whether to engage in undergraduate research. Furthermore, I would enjoy serving as a research mentor for these undergraduate students.

In the case of algorithms, my prior experience is being a teaching assistant for the senior-level algorithms course at CMU (15-451 under Avrim Blum), and two stints as a teaching assistant for the analogous course at UCSD (CSE-101 under Sanjoy Dasgupta). For discrete mathematics, I was a teaching assistant at UCSD (CSE-21 under Ronald Graham). Thanks to these experiences, despite not publishing in pure theoretical computer science venues, I feel well-versed in this material and its presentation.

I have also been a teaching assistant for a programming languages course (15-212 at CMU), a systems programming course (15-213 at CMU), and an operating systems course (CSE-120 at UCSD). Consequently, I would feel comfortable teaching courses of a more applied nature than the majority of my research.

Graduate courses

Here once again I would provide first a machine learning course, a more intensive variant of the undergraduate course aimed to quickly bring students up to speed with machine learning. An additional goal in this graduate version would be for students to be comfortable reading papers in machine learning, and additionally replicating their implementation and analysis.

Advanced courses would come in two varieties. A first variety would be more rigid courses based on my expertise. One is simply an intensive learning theory course, intended to cover all the main trends. A second course would specialize in advanced topics in statistical learning theory (e.g., dealing with unboundedness, fast rates, and a few other topics).

A second variety would be special topics courses in the style of a large reading group, where I would spend the first few lectures establishing common basics, and then the bulk of the course would be paper presentations by students, possibly with students additionally choosing and presenting their own projects. I took two courses with this format under my PhD advisor Sanjoy Dasgupta, both with and without the final project, and enjoyed both experiences immensely.