Teaching and Mentoring Statement
Steven Bethard

Teaching

I am committed to teaching courses that give students from a wide variety of backgrounds an exciting hands-on experience working with state-of-the-art techniques in my field. An example of this is my Neural Networks course, a high-demand course which I designed to fill a significant gap in the University of Arizona's curriculum. The course teaches the theory and practice of a branch of machine learning, neural networks, which has come to dominate the field thanks to its ability to learn complex non-linear patterns. The course regularly has undergraduate and graduate students from departments ranging from Computer Science to Linguistics to Hydrology to Astronomy. Each day, I engage these diverse students in in-class activities to deepen their understanding of the material, e.g., walking each other through forward propagation in a neural network, or discussing what network architectures would be appropriate for an automatic text summarizer. My homework assignments include learning to write Python code using Tensorflow, a high-level framework for defining neural networks that is widely used across both industry and academia. I offer line-by-line feedback on their code via GitHub, a source control management system that is industry-standard. The students appreciated this approach, as evidenced by student comments such as:

> *The instruction of this course was phenomenal. Complex topics were explained in intuitive ways. Questions were always met with good answers. Lectures were informative and intriguing. The assignments were effective at maximizing time spent learning the key concepts. I really liked the modern use of github classroom.*

In the future, I continue to be interested in teaching courses in my areas of specialty: natural language processing, machine learning, information retrieval, and artificial intelligence.

Mentoring

In my mentoring, I get to enjoy the pleasure of engaging hands-on with my new students to get them up to speed with my research field, as well as the pleasure of being taught new approaches by my experienced students as they explore new ideas in my field.

I regularly mentor students at the undergraduate, masters, and doctoral levels. I attract strong undergraduate and masters students from my Neural Networks course to join me in one-semester directed research projects, having mentored 13 undergraduate students and 13 masters students since 2015. I also take on students for undergraduate honors theses (3 students) and masters theses (2 students). Such students have gone on to doctoral programs at prestigious institutions like the University of Washington and Carnegie Mellon University. At the doctoral level, I have successfully mentored 7 Ph.D. students through graduation, with all students moving on to industry research jobs or postdoctoral positions at institutions like Harvard University. I am currently working with 4 Ph.D. students who are making good progress in their degrees, and have also engaged with doctoral students as a co-advisor (2 students), a member of the doctoral committee (19 students), and a mentor for one-semester directed research (5 students).