Teaching Statement
Behnaz Arzani

I want to teach students how to think for themselves. I have been exposed to teaching from an early age. My mom is a high school teacher, my aunts are middle school and elementary school teachers and school principals and my dad and three of my uncles are university professors. I learned how fun teaching can be attending my mother’s classes. Her style of teaching was always to find creative examples and experiments that helped students grasp the concepts that she taught and to think through them. I used to help grade her exam papers throughout the time I was growing up (until I graduated college) and learned what constitutes reasonable exam questions and how to include questions that would challenge highly motivated students in a way that does not exceedingly tax or demoralize those that are falling behind in their studies. I plan to follow my mom’s example as a teacher.

My goal is to challenge students in my classes while taking into account that not all students learn at the same rate. I believe that no student should be left behind. However, this should not come at the expense of holding back motivated and driven students. I plan to facilitate different levels of learning by presenting the material taught in class in new and creative ways. For example, one can teach traffic engineering or congestion control by mapping it to an example more familiar to students such as traffic planning in a city. I also plan to discuss thought-provoking, open-ended questions in my classes for motivated students to think about as extra credit opportunities.

1 Teaching Experience

Back in Iran, while completing my undergraduate studies, I served as a physics tutor at a private institute where I coached students one-on-one to prepare for the national university entrance exams. While at the University of Pennsylvania I served as a substitute teacher for a class where I had to develop the class material for two sessions on networking protocols. I served as a TA for a course in introduction to probability for undergraduate students. Also, I was one of the 5 TA's that helped Prof. Santosh Venkatesh create his Coursera course on elementary probability. Our role as TAs was to help with the design of homework for the class as well as to help with the overall course design. In addition to these experiences, I also TA’ed for many courses during my undergraduate studies at Sharif University of Technology holding office hours and serving as a lab instructor.

I enjoy developing a course, finding new ways of engaging students, and designing new homework problems that help students gain a better understanding of the course material. I think that the first task of a teacher is to help students think for themselves. I believe that students are more likely to remember and understand a networking protocol if they can work out the necessity of the design decisions that were made themselves rather than being told what those designs are in advance.

Therefore, my style of teaching, especially in networking classes, has always been more towards putting forward a series of questions and walking through those questions with the students to find the right answers and only then exploring the protocols that have been developed in the past and comparing them to the solutions that we discussed. Many research ideas come out of such discussions. The strategy can be adapted to classes of larger size, for example, an approach where students write down answers to questions on pieces of paper that are collected and then raffled to read representative answers. Another approach, which Dr. Lyle Ungar at the University of Pennsylvania used in his machine learning courses (over 150 students), was to use clickers for students to vote on answers to questions in real-time and to project statistics about how many student’s thoughts align with a particular answer. To summarize, I think that classes are much more likely to leave a lasting impression if students are engaged and if they contribute to the discussion.

I like to assign creative class projects that draw from everyday life to demonstrate how the concepts taught in class can be used in practice. It is much more memorable for students to, for example, design a chat messaging protocol for a social media application in an operating systems class, or to come up with their own distributed systems startup in a networking class.
2 Potential Courses

Based on my experiences, I can teach undergraduate and graduate courses in the areas of networking protocols and fundamentals, network theory, distributed systems, and data center networking. I am also interested in teaching undergraduate courses on introductory machine learning, applied machine learning, and introductory probability.

Also, given my research experience, I would like to help develop a course titled: Where theory and systems meet: an application of theoretical concepts to systems problems. The course would be targeted at senior undergraduate and first/second-year graduate students in computer science that are interested in research that sits at the boundary of theory and practice. It would describe how systems problems can be modeled through different theoretical concepts such as probability, optimization, verification, and game theory and how these models can help systems researchers design systems with stronger theoretical guarantees. A final project for the course could be that students apply what they have learned to a systems problem of their choice.

3 Mentoring Experience

During my PhD studies and my post-doc at Microsoft Research, I collaborated and engaged with many talented masters and PhD students many of whom I had the opportunity to mentor. My style of mentoring is to identify the student’s strengths and move projects they are working on in directions that takes full advantage of those strengths.

For example, last year at Microsoft Research, I had an intern from Princeton University, who worked with me on helping Azure reduce the efficiency of their diagnosis systems. Early on, I realized that the student’s strength was in data analysis (learning new insights by analyzing large datasets) and extracting insights from conversations with network operators. Therefore, I moved the project direction towards a measurement study that would aim to understand the sources of inefficiency in Azure’s diagnosis systems and that would tease out insights about what monitoring information could be used in the diagnosis process to improve it. The project has been a huge success, with Albert Greenberg, the CVP of Azure networking, taking notice and recognizing its impact. Since then, I have been collaborating with PhD students in Harvard and University of Pennsylvania to use the insights we have learned to provide algorithmic solutions to improve Azure’s diagnosis process. Throughout this collaboration, I have made sure that the division of work between the students is such that it takes full advantage of their individual areas of strength.

In summary, I believe that the job of a mentor is to understand the strengths of students and to help them take advantage of those strengths in the projects they undertake. My experience in industry, as well as my more theoretical background (from my electrical engineering days), allows me to be able to see various angles to each research problem that would help achieve this more effectively.

4 Diversity

I believe that women in teaching positions should set an example for what women can achieve in higher education and facilitate opportunities for growth not just for women but also for other minority and under-represented groups. Within Microsoft Research I have tried to ensure that I was available to help the women interns in our group and to ensure that they knew they had an ally and friend when they needed one. I plan to continue this in any job I undertake in the future.