SARAH STROHKORB SEBO | Teaching Statement

My goal as an educator is to support the development of students into independent and creative learners through hands-on educational experiences. I am excited to pursue a career that enables me to teach, mentor, and work alongside students as they discover their academic passions and desired career impact. I also recognize the unique influence educators have to broaden participation in computing, and am devoted to providing accessible, diverse, and inclusive learning environments for students.

MENTORING

Mentoring undergraduate and high school students has served as a significant motivation for my desire to become academic faculty. During my Ph.D., I have had the privilege of mentoring 16 undergraduate and 4 high school students. Of these students, a majority have published or are publishing their work with me (12 of 19) and 43% have been women. The students I have mentored have participated in every part of the life cycle of a research project: conducting thorough literature reviews, designing experiments, running human-subjects studies, annotating and analyzing data, and writing significant portions of top-tier research papers.

I have closely mentored and supervised four high school students through an internship program run through the Social Robotics Lab. It has been my great joy to help these students grow in their programming abilities, to expose them to robotics and AI research through their contributions to my research projects, and to join and collaborate with a team comprised of undergraduates. The high school students I have mentored have entered top-tier engineering programs: the University of Michigan, Cornell University, New York University, and Yale University.

TEACHING PHILOSOPHY

My perspective on teaching has been most significantly shaped by my experiences as a teaching assistant and my undergraduate background at Franklin W. Olin College of Engineering, a pioneer in innovating engineering education. I believe that my focus on providing hands-on collaborative learning opportunities, promoting design-based thinking and interdisciplinary work, and broadening participation in computing will equip students to be successful in the careers they pursue after graduation.

Providing hands-on collaborative learning opportunities. My undergraduate experience at Olin college exposed me to a new way of learning in the classroom. Hour-long lectures and tests were rare. Instead, classes involved students working together on problem sets, small instructional examples, or project-based work, where the instructional material was introduced either in outside-of-class reading or through brief (< 10 min) lectures within class. As an educator, I plan to emulate this way of teaching and learning in order to encourage students to deeply understand the material they are learning through hands-on application in the classroom. Additionally, I believe that collaborative course projects give students the chance to explore an application area that excites them and take an even more focused dive into a course topic. I have had experience guiding and mentoring project teams as a TA for Yale's Intelligent Robotics lab course, designed for graduate students and senior-level undergraduate students, where students pursue a semester long research project of their choosing. Two of the projects that I have mentored in this course were further developed into top-tier conference publications [1,2].

Promoting design-based thinking and interdisciplinary work. It is essential that computing students understand that the technology they build is designed to meet the needs of people, and often requires interdisciplinary work. An example of how I plan to do this is through the *Designing Socially Assistive Robotics* upper undergraduate and graduate level course I would like to design. This course would have students form semester-long project teams and charge them with designing and developing a socially assistive robot. Students would first identify the group of people they want to assist (e.g. elderly people recovering from a stroke, visitors to the university, elementary school students). Then, students would interact with and interview that group of people, identify some of their values and needs, and iteratively design and develop a robot to address the values and needs of that specific group of people. Through in-depth interactions with the target consumers and engagement with the multiple disciplines necessary

(e.g. design, computer science, engineering, psychology) to develop their socially assistive robot, students will gain first hand experience in designing and building technology to help people.

Broadening participation in computing. I am committed to creating inclusive learning environments for all students including underrepresented minorities, women, people with disabilities, and other groups historically underrepresented in computing. For classes that I teach, I aim to be transparent about expectations and grading criteria, to make help accessible to those who desire it through office hours, and to create opportunities for class projects where the project difficulty can be individually scoped to challenge each student. My experiences leading a small weekly section of 12 students in the introductory CS50 programming course at Yale has given me the opportunity to foster and promote inclusive learning environments comprised of students with varying skill levels, experiences, and backgrounds. For example, one student in my section was a senior humanities major who was always interested in computer science but had never taken a course in it. Another student, a sophomore from an underrepresented minority, emailed me at the end of the semester saying, "I wanted to thank you for a wonderful semester in CS50. It was hard (a lot of late nights) but it seems to have been really worth it! I came into the semester not knowing any CS and now I can actually make a website (albeit I have a ways to go when it comes to css)."

TEACHING INTERESTS

My background in computer science and engineering has prepared me to teach a range of classes including robotics courses, artificial intelligence courses, and human-computer interaction (HCI) courses. Additionally, I am interested in developing new courses to enrich the existing curriculum. At the undergraduate level, I would be excited to teach *Introduction to Human-Robot Interaction*, were students would learn about topics such as robot perception of human mental states, decision making, interaction design, and human-subjects studies. Using either physical or simulated robot platforms, I would plan to give students opportunities to directly apply each of the concepts taught in the course. At the upper undergraduate and graduate level, I would be excited to teach *Designing Socially Assistive Robots* and *Multi-Party Human-Robot Interaction*. Both of these classes would involve semester-long projects where student design and develop a robot. *Designing Socially Assistive Robots* would specifically focus on the design process and engaging with the desired user group throughout the semester. *Multi-Party Human-Robot Interaction* would focus on academic research and state-of-the-art perception and decision making computational models pertaining to robots interacting with groups of people. This course would also involve the pursuit of a research project pursuing a novel human-robot interaction study or perception/decision-making framework for multi-party human-robot interaction.

OUTREACH

Engaging in outreach has given me the ability to raise awareness and excitement about robotics and artificial intelligence to diverse groups of young students, many of whom had not before been exposed to robotics and artificial intelligence research. I have organized lab tours for local schools, one of which included all of the 4th grade students at a local New Haven elementary school. I have also participated in laboratory open houses for hundreds of visitors, spoken to local robotics club groups, and presented to several 200-student sessions of students from around the world interested in engineering and science.

REFERENCES

[1] Nicole Salomons, Michael Van der Linden, Sarah Strohkorb Sebo, Brian Scassellati (2018). Humans Conform to Robots: Disambiguating Trust, Truth, and Conformity. In *Proceedings of the Thirteenth ACM/IEEE International Conference on Human Robot Interation (HRI)*.

[2] Shannon Yasuda, Devon Doheny, Sarah Strohkorb Sebo, Nicole Salomons, Brian Scassellati (2020). Perceived Agency of a Social Norm Violating Robot. *ACM Transactions on Human-Robot Interaction (THRI)*. [In Preparation]