

Statement of Teaching Interests — Joelle Pineau

I view teaching as an integral part of academic life, and it is with great pleasure that I foresee this aspect of a faculty appointment. Throughout my experience as a teacher—starting with swimming and music instructions in my late teens, to undergraduate and graduate courses in robotics more recently—I have always found the interaction with students to be extremely rewarding, and have invariably found that the learning experience goes both ways between student and teacher.

With my undergraduate degree in systems design engineering and my graduate education in robotics and computer science, I believe I am well qualified to teach a number of courses in those areas, including introductory-level programming, data structures and algorithms, probability and statistics, artificial intelligence, numerical methods, control theory, and optimization. At the graduate level, I would be most interested in courses pertaining to machine learning and robotics, including topics such as pattern recognition, planning and decision-making, game theory, statistical information retrieval, and text processing.

While at Carnegie Mellon, I had the opportunity to assist in the teaching of an undergraduate course on Robotic Manipulation. My responsibilities included lecturing duties and office hours, during which I developed a strong connection with the students. I learned to assess the students' level of understanding and adapt instruction accordingly. Throughout the course, I was heavily involved in the preparation and marking of assignments, exams and other course material. The course also included a laboratory component. I was involved in designing lab assignments that appropriately reflected class material, as well as providing in-lab support and ensuring proper operation of the robotic equipment.

Also at Carnegie Mellon, I recently provided instructional and technical support for a class on Assistive Robotic Technology in Nursing and Health Care. This course provided unusual challenges because it involved students from Computer Science, Engineering, Nursing and Bio-informatics; these students ranged from undergraduates to masters and PhD-levels. This was mostly a project-class, requiring groups of students to explore through practical demonstration the feasibility of using a mobile robot to provide assistance for a human subject. My primary responsibility was to instruct all students regarding the operation of the robotic platform. This required me to prepare written material, in-lab demonstrations, and hands-on sessions that were accessible to students of all backgrounds and levels. In this case, it was critical to ensure that the non-technical students became active participants, while keeping the technically-experienced students engaged and involved. Another challenge with this course came from the fact that it was being taught for the first time, therefore the curriculum was entirely new. The course was an overall success, resulting in some of the students presenting their results at a leading robotics conference. This course has now become part of the regular curriculum at the Robotics Institute.

Most students learn best when deeply engaged by the material at hand. I believe it is important to offer learning opportunities where the students are challenged and actively involved in the topic area. Project and laboratory courses are well-suited to offer this type of experience. For example robotics can be a great medium to stimulate learning and act as a catalyst to bridge the gap between theoretical concepts and actual practice. It is also a topic which for many sparks curiosity, innovation, hands-on experience, and hard work, all components of a meaningful learning experience.

I look forward to teaching a variety of classes, at both the undergraduate and graduate levels. Regardless of level, or topic, I strongly believe in forming a connection to the students, keeping the curriculum up-to-date and relevant, and always striving to teach better.