TEACHING STATEMENT   MICHAEL BERNSTEIN

Human-computer interaction (HCI) is unusual in Computer Science education: not only do design problems have many possible solutions, but there is rarely any objective measure of which solution is best. This lack of measurable feedback is most problematic from the pedagogical perspective of deliberate practice, which requires that students receive immediate feedback and then iterate. To enable a deliberate practice loop in HCI, I draw on the studio education model and engage students in project-based work with expert feedback. However, studio education is designed for small groups: how do we scale up studio education to meet the growing needs of Stanford's Computer Science department?

CS 376: HCI RESEARCH. Our core HCI sequence teaches students the fundamentals of user-centered design and design thinking, but HCI research features a complementary set of skills focused on novel user experiences and social scientific questions. I redesigned our graduate-level research course (CS 376) to augment paper discussions with a new lecture component that contextualizes the readings in broader research trends. These lectures teach students the foundational and recent research in HCI areas from ubiquitous computing to social computing to design tools. To achieve scale, I split the class into parallel rooms for discussion and rotated discussion groups so all students had a small-group discussion with me at least weekly. In the class, teams conceive and execute original research projects in an area of their interest. Many of these students, including undergraduates, have translated their projects into posters at top-tier HCI conferences.

CS 247: HCI DESIGN STUDIO. The HCI Design Studio course is the second required course for HCI track majors in Computer Science. Students leave the introductory course (CS 147) with knowledge of the human-centered design process, having executed it once. My goal in CS 247 is to deepen students' skills of human-centered design through project-based work focused on specific skills such as rapid prototyping. My challenge has been to meet student demand without sacrificing our pedagogical goals of studio education. The course had historically been co-taught as a studio by two faculty to 30–40 students. By the time I arrived at Stanford in 2013, the class was stretched to its breaking point at 80 students, with few students getting much instructor time, and we needed to teach 120 students per year. So, with the support of the Computer Science department, I redesigned the course to scale in 2014 by recruiting six industry professional designers and researchers to lead studios of twenty people each. Over the next few years, I iterated on and refined this approach. We succeeded in supporting all students in taking the course, but I observed variability in the quality of these industry studio instructors. I then worked to hire two part-time lecturers into the HCI Group with the support of Stanford's SEEF program, the Computer Science Department and the School of Engineering. I again redesigned CS 247 in 2018 to integrate these lecturers, and I continue to iterate on the course. We have now transitioned to a fully studio-based educational model, allowing students to get in-depth feedback. My student evaluations in CS 247 are consistently high relative to peers teaching the course.

EDUCATIONAL LEADERSHIP. My main goal when I arrived at Stanford was to ensure that our HCI program remained vital even though faculty departures had reduced our number from four to one. I took on every HCI service position in the department: in the BS/MS curriculum, the Ph.D. breadth, the Ph.D. quals, HCI Lunch, and our public lecture series called the Seminar on People, Computers and Design (CS 547).

I also work to support Stanford's broader educational mission. Along with Ramesh Johari (MS&E), I spent over two years creating and co-leading the Carta course exploration platform (http://carta.stanford.edu), which over 80% of Stanford undergraduates now use each quarter. To complement this, I engage students in research: thirteen Stanford students and visiting undergraduates who have worked with me—including eight women—have now gone on to PhD programs. This year, I am leading the department's undergraduate research program (CURIS). I work to share these opportunities globally: our Crowd Research efforts engaged over 1,500 people worldwide in collaborative research with PIs at Stanford, Cornell, and UC Santa Cruz, and its alumni now are at top universities.