# Teaching Statement

Amy Pavel

As an educator, my goal is to empower students with a variety of backgrounds, abilities, and goals to create and critique technology. I aim for students I mentor or teach to build strong technical skills, and increase their enthusiasm for pursuing related opportunities in the future. To encourage student learning and future persistence, I employ evidence-based practices for creating engaging and inclusive learning environments including: (1) supporting individual goals, abilities, and backgrounds of students, (2) engaging students through active learning and student-driven projects, and (3) building technical skills through practice and feedback.

## TEACHING

In Summer of 2018, I served as the sole instructor for the CS 160 - Human Computer Interaction — an upper-level undergraduate CS class at UC Berkeley with 77 students — after TA-ing the course in Summer 2017. The course covers full-stack web development, and the theory and practice of designing technology for use by humans (e.g., cognitive science, experiment design, design methods). Importantly, this course is typically the students' first course about how humans will use the technology that they build. I was honored to receive an EECS **Outstanding Graduate Student Instructor Award** for my instruction of this course, and the highest teaching effectiveness score (6.1 of 7) for the class in the prior 3 years.

I aimed to first understand the backgrounds, goals, and abilities of the students and the staff of 1 head TA and 3 part-time TAs. First, the 3 part-time TAs and I decided to divide their work by their individual expertise areas (UX research, visual design plus HTML/CSS, and software engineering) by setting up expert office hours and rotating discussion section responsibility weekly. The TAs liked the efficiency, and the students used **expert office hours** for specific project assistance, feedback, and career questions. In the future, I will invite outside experts for "guest critiques" (a technique I learned in Kimiko Ryokai's aesthetics class) to let students gain feedback from practitioners. For students, I split my typical office hours into very **short reservable meetings** 3 times during the semester. The slots boosted attendance for those who did not otherwise attend office hours, and students asked questions about preparedness, accessibility accommodations, careers, research, topics not covered, and group work. In the future, I will continue to invite students to use multiple ways of communicating with course staff to express their needs, and improve based on the feedback. I will also better anticipate and design for a variety of student needs by employing practices from Fostering Inclusive Classrooms (1 of 4 evidence-based teaching seminars I attended at CMU's Eberly Center) and Universal Design for Learning guidelines.

I helped students build technical skills during lectures using well-motivated explanations and active learning exercises (e.g., think-pair-share) for new concepts, and a once a week **flipped-classroom studio session** where students reviewed material in advance then worked on an exercise (e.g., design an experiment to evaluate their final project, analyze data from a class-wide experiment) while asking questions and receiving feedback from peers and TAs. To build a supportive class environment I dedicated studio time to learn how to give and receive feedback, and newly, how to pair program. To improve participation in active learning exercises, I later instituted no-wrong-answers warm ups at the beginning of the class that prompted students to talk about personal or hypothetical experiences given a question relevant to the topic of the lecture. Course evaluations summarized: *"Best CS instructor I've ever had!," "Overall a very effective teacher: slide design is excellent, lecture content is clear and succinct, and uses active learning techniques well. Enthusiasm for the subject shines through in lecture, and thoughtfulness for the students is readily apparent. Totally aspire to be as good a teacher as Amy!,"* and *"Good job at maintaining classroom engagement, as well as the variety of think–pair–share questions during lecture."* Finally, I included a student-driven component for each assignment in addition to the final project. For assignments that included implementation or design, I allowed students to pick the topic of their assignment while exercising specific design or implementation skills. For set exercise style assignments, I asked students to perform a subset of

required exercises, then select the final exercise from a set. Students reported assignments to be: *"very interesting and organized," "interesting and engage with the material well,"* and *"very thought out and contained very clear instructions."* The final project encouraged students to design a storytelling application of their choice augmented with a computational component. Student's implemented applications such as a video-based language learning application that predicts and defines uncommon words as you watch, and creates a quiz after each episode.

## MENTORSHIP

The opportunity to mentor both undergraduate and graduate students in research is my primary motivation for seeking a faculty position. As a mentor, I closely work with each student to tailor their projects and specific tasks based on their experience, project interests, learning aims (e.g., gain technical depth, gain qualitative research experience), and long-term goals. I have mentored **11 undergraduate students** (4 have already moved on to PhD programs at UC Berkeley, University of Washington, Columbia, and UCLA), 1 masters student, and also served a mentorship role on projects with 3 PhD students. Undergraduate students have been involved in all stages of research from brainstorming and formative work, to implementation, evaluation, and writing. For instance, I recently mentored Bruce Liu, a CMU undergrad, through conducting formative interviews with blind users to find factors that made videos inaccessible, collecting a dataset, and implementing techniques to automatically detect inaccessible video portions (e.g., fast-paced visual content, unexplained pronoun references to visual content). Bruce conducted a user study finding our predictions aligned with blind user's perceptions of accessibility, and evaluated an explanation-based search interface with blind users who had to use less trial and error when searching videos with predicted accessibility. For each step, we brainstormed a plan together, Bruce drafted the protocol, then I provided detailed feedback. This work resulted in a **first author paper accepted to CHI** (for Bruce) and I'm continuing to mentor in a co-advisory role on the public deployment of this work in a CS PhD program. Through the REU program at CMU I mentored 2 students in 2019 (Emma McCamey and Christina Liu) who built the start of a system Twitter A11y which was presented as a poster at ASSETS. The REU students were co-authors on a follow up paper which received **CHI Best Paper Honorable Mention.**

## CAMPUS

Beyond teaching my own classes, I have sought opportunities to spread knowledge about CS, human-centered computing, and my research areas of accessibility and video. First, I taught CS Kickstart Workshop, a CS fundamentals course for incoming underrepresented CS major and non-major students without formal CS experience. In one intensive week, we taught necessary technical knowledge, while helping students develop their self-efficacy as scientists and engineers; then, students implemented their own image processing algorithms. I have also taught guest lectures to **non-major CS classes** (*Beauty and Joy of Computing* and *Data Science for Digital Humanities* at UC Berkeley) to introduce students to human-centered computing and HCI research, as well as CS major classes (Human-AI Interaction and Human Factors at CMU).

## COURSES

In addition to general Computer Science courses, I would be happy to teach a variety of upper-level undergraduate courses and graduate courses in topics related to human-centered computing (*e.g.,* HCI, Visualization, Applied ML). Some specific courses I would teach and create include: *Human Computer Interaction* (undergraduate, graduate), *Human-AI Interaction*, *Designing Accessible Technology*, *Applied Machine Learning*, *Information Visualization for Text and Video*, and *Interactive Systems for Digital Humanities*.