MATTHEW BREHMER

TEACHING STATEMENT, DEC. 2021

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Note: In this teaching statement, I refer to papers co-authored with interns using the abbreviations provided in the right column of my publication list.

I am prepared to teach and prepare curriculum related to data visualization, human-computer interaction (HCI), and creative coding at the undergraduate and graduate levels. In this teaching statement, I outline my teaching philosophy and describe my teaching experience. I also summarize my work collaborating with and mentoring research interns. I indicate which existing courses I am capable of teaching, and I propose topics for seminar courses for graduate students and senior undergraduates.

PHILOSOPHY

As a student, my most memorable learning experiences were those that incorporated collaborative learning and peer critique, open-ended project assignments with opportunities for creative expression, and opportunities to debate the sociotechnical implications of how people design and use interfaces with data. My goal is to replicate these experiences for future cohorts of students. From my perspective, HCI and visualization are unique relative to other topics in computer science in that there is seldom an optimal or correct solution to a problem; reasoning about alternative approaches must look beyond the metrics of technical performance and students need to consider the social, political, cultural, and ethical support for their decisions. I believe that all students, regardless of their technical proficiency, have a capacity for creative and critical thinking, and my goal in teaching is to tap into this capacity.

EXPERIENCE

As a graduate student at the University of British Columbia, I was a teaching assistant for two courses: a third-year undergraduate introduction to HCI (taught by professor Karon Maclean) and a fourth-year undergraduate course in advanced HCI methods (taught by Joanna McGrenere); for the latter course, I also contributed to curriculum development. For both courses, I led weekly tutorials, administered quizzes, mentored student project groups, and marked assignments and exams. As a PhD student, I delivered guest lectures for the undergraduate HCI course and for a graduate course in information visualization (taught by Tamara Munzner), in which I spoke about visualization toolkits and libraries. Since graduating, I have given guest lectures (in-person and remotely) at institutions across Canada, USA, and the United Kingdom, hosted by departments spanning computer science, business, journalism, and design.

WORKING WITH STUDENTS

I have been collaborating with junior students and interns since my MSc research (CHI-12), when I worked alongside two undergraduate students. As a PhD student, I provided methodological and writing support for a MSc student (J. Fulda, TVCG-16B). As a postdoctoral researcher at Microsoft Research, **five** collaborations with interns resulted in publications: A. Srinivasan (CHI-18), D. Ren (TVCG-19B), N. W. Kim (CHI-19), Y. S. Kim (ISS-19), and P. Eichmann (CGF-20). Since joining Tableau Research in 2019, I have been able to mentor two interns directly; one of these collaborations is ongoing, while my work with intern Carmen Hull resulted in a publication appearing at IEEE VIS 2021 (TVCG-22A).

EXISTING COURSES

My undergraduate degree in computing specialized in cognitive science, while my MSc degree in computer science specialized in HCI. Given my experience, I am prepared to teach existing courses in **The Design of Interactive Computational Media**, **Computational Thinking**, and **Computers and Society** at the the undergraduate level.

At the graduate level, I am prepared to teach existing courses in **Human-Computer Interaction**, **Information Visualization**, and **Communication for Computer Scientists**. Drawing on my experience and interest in interacting with data on mobile devices, I would also be interested in co-teaching or extending existing topics courses on **Visual and Mobile Computing Systems** and **Mobile Health**.

COURSE PROPOSALS

I envision two topics courses spanning HCI and computer graphics. The first is a course in **Data-Driven Storytelling**, a multimodal synthesis of visualization, animation, text, video, and sound, with projects intended for both passive audience consumption and live performance or installation scenarios. The second course is one dedicated to **Creative Coding and Generative Design**, inspired by my recent work appearing at IEEE VIS 2021 (TVCG-22A); this course would also examine creative approaches to visualization and data art inspired by natural and biological forms.

The format of my courses would draw inspiration from my favorite topic course from my own graduate training, one dedicated to visual display design (taught by Ronald Rensink at UBC). In this course, each seminar session began with a student presentation of theories that explain an aspect of perception or cognition (e.g, motion perception), which was followed by a second presentation about a visual medium (e.g., animated cartoons); small group discussions following both presentations included a critique of brief and anonymized student-authored essays. This format not only encapsulates a balance of theoretical and applied topics, but also speaks to different learning styles and provides multiple ways for students to engage with the content and with each other.