Career objective: I plan to focus on computing education research as a tenure-track faculty at a Computer Science department or in an iSchool. My goal is to create more pathways to computing expertise through research, teaching, and mentorship of students. A postdoctoral CI Fellowship with Professor Eleanor O'Rourke at Northwestern University will expand my research expertise, prepare me to be an effective mentor, and help me establish my presence in the human-computer interaction (HCI) research community. Professor O'Rourke has experience applying to positions at the intersection of computing education and HCI, making her an ideal mentor.

Developing skills in building interactive systems: My aim is to create accessible programming learning approaches that invite a broader population of learners to engage with programming. In my prior research, I have studied programming learning and learners' behaviors in laboratory contexts, and begun to imagine "purpose-first programming", a new approach to learning to program. In my postdoctoral position, I plan to develop skills in designing, building, and evaluating interactive systems. With this expertise, I aim to not only create novel computational learning environments to improve the process of learning programming, but also explore new ways to study learning in those environments. The development of learning environments is a natural progression for my work that allows me to reach a greater number of learners and have a larger impact.

Professor O'Rourke is an expert in building interactive systems that are informed by learning theory (e.g. [1]) and has particular expertise in real-time feedback and log file analysis. She is an ideal mentor to advise on both the development of new educational technology, as well as the analysis of student learning based on trace data.

Gaining experience in innovative mentorship: As a postdoctoral researcher mentored by Professor O'Rourke, I will be a part of the Delta Lab, a collaborative HCI research group of four faculty, about a dozen PhD students, and many undergraduates. Delta Lab has enacted several innovative mentorship and feedback models for its students [2], including Pair Research, assistance in activity planning, and distributed opportunities for help-seeking. These mentorship procedures make the process of supporting junior researchers visible through assistive tools like spreadsheets and activity logs. Through my participation in these experiences, I will learn a variety of mentorship models that go beyond traditional one-to-one mentoring. This experience will inform the creation of my own mentoring strategies in the future.

This highly collaborative and supportive lab structure provides varied opportunities to guide future computing education researchers. While in the past I have mentored several undergraduate students in individual research projects, the structure of the Delta Lab means that I will have more frequent opportunities to support students on more varied tasks. I will also co-advise junior PhD students in Professor O'Rourke's group. Mentoring these students in computing education or other STEM education projects will prepare me to be an effective advisor when I begin my faculty position.

Establishing my presence in computing education and HCI: Northwestern University is a center for HCI research, home to many HCI researchers within the Delta Lab as well as more broadly in the Technology and Social Behavior program. In Northwestern's Computer Science and Learning Science program, many researchers build systems to improve and re-imagine computing learning. This setting is an ideal "community of practice" where I can establish my presence in HCI research for computing education contexts.

I will use my skills in building new learning environments to continue to publish in computing education research venues like ICER and SIGCSE, as well as in HCI venues. Professor O'Rourke will provide mentorship in the development of research papers for these venues, particularly CHI, where she has a strong record of publication.

I will also gain insights into the funding environment for HCI. Building on my experience writing for CyberLearning in the past, I will learn about the requirements for proposals in the CHS subdivision of NSF CISE by reviewing Professor O'Rourke's grant applications. To further develop my own proposal-writing skills, I plan to apply for an industry grant in computing education, such as the Google CS-ER.

References

[1] Joshua Hibschman, Darren Gergle, Eleanor O'Rourke, and Haoqi Zhang. 2019. Isopleth: Supporting Sensemaking of Professional Web Applications to Create Readily Available Learning Experiences. ACM Trans. Comput.-Hum. Interact. 26, 3, Article 16 (April 2019), 42 pages.

[2] Haoqi Zhang, Matthew W. Easterday, Elizabeth M. Gerber, Daniel Rees Lewis, and Leesha Maliakal. 2017. Agile Research Studios: Orchestrating Communities of Practice to Advance Research Training. In Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing (CSCW '17).