Paul Schmitt — Diversity Statement

My personal values regarding diversity, equity, and inclusion strongly align with the university's mission, and this alignment informs my interactions with students and the research topics I choose to pursue. My commitment to diversity can be mapped to different responsibilities of a tenure-track faculty member:

- Teaching and Mentoring: how can I promote different perspectives in the field of computer science?
- Research: how can my work create impact in the global and local communities and benefit others, particularly those that experience systems of oppression?

Teaching and Mentoring

The field is strengthened by increasing participation of people with diverse perspectives. Teachers and mentors must actively seek to listen, understand, and work to bolster a diverse academic community in order for it to thrive. Though I, myself, am not a member of an under-represented group in computer science, I am deeply committed to the principles of broadening participation in computing. For example, during my time as a graduate student, I took a course on contemporary approaches in the areas of learning, instruction, cognition, and cultural models of education. In the course we discussed inequities that are present in traditional learning environments and pedagogical methods that aim to rectify them, such as increasing the transparency in curriculum, which has been proven to narrow the achievement gaps between students that are first generation or low-income and their peers from more privileged socioeconomic groups. As a professor, I will continue striving to improve my pedagogical techniques through courses that are focused on broadening participation in computing[1].

Though I have yet to hold a tenure-track position, I have experience teaching as an adjunct instructor in addition to serving as a teaching assistant during my graduate work. In the classroom I have always sought to relate to students on a personal level. I believe that if students feel valued as individuals, they are more open to expressing their opinions and contributing to the classroom environment. For example, in all of my classes I spent the time to learn all of the students' names and majors. While this is may be a small gesture, it serves to further reinforce the idea that I see the students as the individuals that they are.

Given a diverse community, it is crucial to both recognize and plan for diversity in terms of academic background and learning styles. While an adjunct at the University of St. Thomas, I proactively engaged with students from historically under-represented groups both inside and outside of the classroom, making it clear that their unique perspectives were valued and that they strengthened the learning experience for all of the students in the course. Through my interactions I also learned more about the modes of learning that each student found effective, and I worked to tailor my teaching style to cover a wide range of learning modes. My efforts led to a noticeable increase in participation and engagement for the entire class.

Socially-Impactful Research

I aim to create technologies through my work that create positive impact in the global community in a tangible sense. During my graduate studies, I was fortunate to have the opportunity to conduct research that was grounded in the context of solving practical connectivity challenges related to bridging the digital divide. My work brought me to a number of different resource-challenged communities to conduct field research, including the Za'atari refugee camp in Jordan. My research on qualitative divides of cellular infrastructure in Za'atari helped local aid organizations better understand the divides that exist even within a relatively small geographic area such as a refugee camp. Using our findings, we developed systems to alleviate infrastructure overload in highly dynamic environments, and we produced practical recommendations to assist aid organizations in refugee camp planning. We designed a cellular measurement platform to be usable by non-experts; as a result our work has subsequently been used by the United Nations High Commissioner for Refugees (the UN agency mandated to aid refugees) and USAID to better understand the on-the-ground connectivity performance in other locations, such as the Bidibidi refugee camp in Uganda, at the time the largest refugee settlement in the world. The information gathered by our system gives the agencies data that they are able to use to approach cellular operators when negotiating infrastructure changes to improve connectivity.

[1] https://bpcnet.org/resources-one-page/

I also seek to improve my local community through my work. During my graduate work, I designed a protocol that enables communities to design and deploy wireless ISP (WISP) networks using low-cost commodity WiFi hardware. WISP networks are an increasingly popular solution for rural areas as major ISPs often will not provide last-mile connectivity to such areas due to lack of subscriber density. The work reduces the amount of technical expertise required when building such networks, making it easier for non-experts to connect their communities.

My postdoctoral research has been informed by my graduate studies working with people experiencing systems of oppression. When I met with refugees during my work in Jordan they spoke not only of the challenges surrounding the simple presence or absence of connectivity, but also of their concerns surrounding ongoing censorship and surveillance that they experienced when connecting to the Internet or using their cell phones in the camp. These concerns have led to my line of research that seeks to enhance privacy in the cellular architecture and the global DNS system—systems that underpin much of modern connectivity.

In general, I design privacy-preserving systems that remove the need to trust that a third party (*i.e.*, DNS or cellular operators) will do the right thing with respect to privacy despite little evidence of having done so in the past. Our work on DNS privacy includes a mechanism by which DNS providers can no longer map queries to user identity (*i.e.*, IP address), and has been met with interest from industry, and our techniques have been adopted in an implementation by Cloudflare, Apple, and Fastly, which will increase web privacy for hundreds of millions of users. In the cellular context, we have designed Pretty Good Phone Privacy (PGPP), a fundamental change to the cellular architecture that provides identity and location privacy—by default—to users from both targeted attacks and from bulk surveillance conducted by cellular operators *themselves*. In both the DNS and cellular cases we created technical solutions that included novel research elements while also improving privacy for real people.