

PERSONAL STATEMENT

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New datasets of digital traces open an unexplored frontier in organizational and communication research. Taking advantage of these “big data” sources requires novel skills and tools uncommon in the social sciences. My experience as a programmer, researcher, and student has prepared me to develop new computational techniques for understanding online communities. My community service and organizing experience motivates me to do path-breaking social science research that will make a broad impact by empowering communities in the public sphere to solve complex problems.

Although not a common path, I feel that my experience as a technologist has prepared me for a career as social scientist. In my employment as a developer for Microsoft from 2012–2014, I designed and constructed large-scale, cutting edge commercial software on Bing.com, writing code that runs millions of times every day. Engineering software professionally broadened my technical knowledge to include machine learning, natural language processing, search engines and distributed systems. Collaborating with teams in China, India, and England taught me about working as part of an international community. Embedded in a world class mega-corporation, I could observe workers and managers navigating the complex web interactions of culture, incentives, and organizational structure that produce ambiguous values and direction. This experience motivates me to understand coordination of workers and activities in an alternative organizational modes.

In 2015, I worked as an independent consultant to create data-driven tools that help patients avoid rehospitalization and to help healthcare workers identify patients who should be evaluated for hospice. This work spreads knowledge of data analysis tools and statistics to the home health and hospice industries, creates efficiencies in the healthcare system, and ameliorates unnecessary suffering. It has prepared me for graduate school by giving me experience applying statistical research methods and communicating results to non-technical audiences.

In addition to advanced computational skills, I have engaged in research with three groups. From 2008-2010, at Pacific Northwest National Laboratory, I developed a method of analyzing digital images to measure the expansion of samples of simulated nuclear waste as it was melted into glass through a vitrification process. My method, which used Photoshop and basic calculus, was effective and became a workhorse of the research group. I wrote about my work in a technical report and two academic publications. This work advanced material science knowledge and the nuclear waste clean-up project at the Hanford site. My early success instilled confidence and a love for the research process and motivates me to mentor young researchers in the future.

I next participated in two research projects with Whitworth faculty. The first attempted to use genetic algorithms to design nonlinear control systems. The second was a biotechnology project that attempted to engineer an enzyme for the treatment of celiac disease. I participated in the exploratory phase of both projects, and neither came to fruition, but they gave me experience researching independently and taking on ambitious challenges in a modest research group.

Also as an undergraduate, I collaborated remotely with a research group at University of Illinois Urbana-Champaign. I contributed an auto-complete system to an experimental structured search engine. In contrast to my research at Whitworth, this project was well-funded industrial computer engineering. My experiences with the research process, working in in large and small groups, and writing for academic publication have prepared me to become a STEM leader through my graduate

training.

Additionally, my community service and organizing experiences are foundational to my character. Twice a month to from 2005–2007, I volunteered at community meeting in the town of White Swan on the Yakama Indian reservation, providing childcare. Working with underprivileged children and youth gave me first hand knowledge of problems like addiction, poverty and neglect. Despite the efforts of the organization I worked with, I also witnessed how the outsider status of volunteers can create obstacles to desired change. I learned that community members are often the only ones who can effectively address such problems. I applied these lessons in my work with International Justice Mission at Whitworth University where I helped organize awareness raising events and studied the economics of human trafficking. These experiences reflect the values of democracy, collectivity, and humanism that motivate me to make a broad impact by empowering communities with the technical, social, and organizational tools they need to make a difference.

Graduate studies at the University of Washington, in a top communication department with strengths in science and technology studies, organizational communication, and new media studies, will prepare me to become a leading scholar by connecting me to excellent mentors and a broad intellectual community. My training in the evaluation of evidence and ideas from qualitative and interpretive investigations will empower me to communicate my quantitative findings to a broad community. The department has a constant stream of contact with the iSchool and the department of Human Centered Design and Engineering so I am embedded in an interdisciplinary community of technology scholars.

This academic diversity will enable me to identify salient questions for study and communicate my findings to the public. As a communication scholar, I will create social and intellectual pathways between the STEM community and that of social science and humanities scholars that will broaden the scope of questions that STEM fields address. Because my research topic is both interdisciplinary and of public concern, it is pertinent to a wide range of academics. It will create connections between computer and social science that are translatable to the public.

I am deeply committed to disseminating the skills and tools I use in my own research – especially among groups that are underrepresented in STEM fields. I think the lack of diversity in computer science is partly caused by the fact that many women and minorities expect that computer science is not interested in understanding their condition or helping them solve the problems they face. I hope that by doing work that applies computation to understand social organization and collective action, I will begin to redefine these expectations.

Towards these ends, I have been actively involved in outreach projects. For example, since fall of 2014, I have volunteered as an instructor with the Community Data Science Workshop (CDSW) at the University of Washington. In these workshops, I have helped teach hundreds of students and community organizers – most of them women – the basics of programming, data acquisition, and data visualization. Guiding these students through their first programming experiences is rewarding because they can use their computational skills in their efforts to make the world a better place by studying digital traces, solving scientific problems, and advancing knowledge. I plan to continue to contribute to the CDSW during my time at UW.

More importantly, I see workshops like the CDSW that aim to democratize skills used by technologists and academics as inspiration and a template for making STEM knowledge and skills accessible to boader and more diverse audiences. For example, the CDSW uses peer production

to compose and distribute educational materials and workshops on data science and to attempt to involve others in replicating the workshops and in creating spinoffs. With better understanding of peer production, the CDSW could reach more people or similar processes could produce materials for Community Material Science Workshops, Community Mechanical Engineering Workshops, or Community 3D Printing Workshops. My research will create pathways for activist, faith, educational, neighborhood, and workplace communities to cooperate effectively on complex tasks by utilizing peer production and STEM tools for organizing volunteer resources.

In the ways I have detailed, I am well placed and well prepared to take full advantage of the resources that an NSF graduate research fellowship would provide. With the fellowship, I know I can make a significant contribution to the science of communication and organization. I know I can make an impact on the nation and the world.