

## Research Statement

Science is profoundly governed by social forces; however, we lack systematic ways to understand and build on this reality. I build citizen science platforms that support collaboration between motivated communities and institutional experts. My research agenda pushes on three directions to better understand and design sociotechnical systems for science.

1. Designing novel social computing systems for community-expert collaboration in domains where folk theories abound and scientific evidence lags [Galileo]
2. Deepening technical insights for web-based remote tools for health and well-being that do better than self-reports and correlate well with expert assessments [At-home assessments]
3. Developing digital markers of how people create and use evidence in online communities [Under submission]

My research agenda increasingly builds on the masterful characterization of two models of citizen science by Gwen Ottinger (STS scholar at Drexel University): scientific-authority led citizen science and social-movement driven citizen science [Ottinger Citizen Science]. In my research and teaching, I strive for students to examine the differences between these two models and identify how digital platforms—current and the ones they design—play important mediating roles in defining the future of public participation in science and medicine. All of my work benefits from collaboration with domain-specific experts including institutional scientists (microbiologists, neurologists); sociologists; and anthropologists. Methodologically, my core expertise is in designing social computing systems (typically characterized as CSCW systems). Increasingly—and often driven by the quest to develop a deeper understanding of people's online behavior—my group members and I have picked up a range of methods including qualitative work, digital ethnography, and analysis rooted in seminal sociological theories.

I am sharing a concrete example about my evolution as a Socio-tech researcher. During my CS PhD at UC San Diego, I worked around cognitive science scholars. Unsurprisingly, I practiced combining broad insights from large datasets with person-specific observations. Such in-person contextual enquiry methods worked well to develop a deeper understanding of users' interactions with novel interfaces that I had designed. However, many observational methods also fail to scale to the behavior of groups such as people with the neurodegenerative disorder ALS on Twitter or Tiktok communities around hashtags related to mental health. To infer more from people's posts and related activities, my research group now develops methods that combine digital ethnography (where researchers stay embedded in the community) with concepts from sociology. One such concept is *credibility heuristics* [Epstein] that describes how AIDS activists performed different knowledge and performative work to build their credibility with respect to institutional scientists. We use such concepts to identify building blocks and metaphors with a *designability* lens i.e. we seek to develop insights and lessons that don't stop at descriptive results but yield useful concepts for designing digital platforms that improve the relationship between communities and experts. One consequence of this approach: much of what is framed as misinformation about science increasingly looks like people's attempts at

improving their participation in institutional processes with different forms of evidence of varying quality [Under submission; another in preparation]. Such approaches that combine theory with digital ethnography seem especially useful in problem domains—like clinical trials of novel drugs—where the “truth value” itself is contested, and where smaller communities strategically use visual and verbal media to have outsized persuasive effects.

## References

[At-home assessments] Accuracy and Reliability of At-Home Quantification of Motor Impairments Using a Computer-Based Pointing Task with Children with Ataxia-Telangiectasia. Pandey et al. ACM TACCESS. 2023.

[Epstein] The construction of lay expertise: AIDS activism and the forging of credibility in the reform of clinical trials. Steven Epstein. Science, technology, & human values. 1995.

[Galileo] Galileo: citizen-led experimentation using a social computing system. Pandey et al. ACM CHI 2021.

[Ottinger Citizen Science] Reconstructing or reproducing?: Scientific authority and models of change in two traditions of citizen science. Gwen Ottinger. The Routledge handbook of the political economy of science. 2017.

[Under submission] Knowledge and citizen science: Misinformation or participation in science.