My interest in computing started during the summer of 2016, when participating in the STRONG research program. Prior to this I had a personal goal of learning to program but couldn’t find the necessary means or resources. Then a senior researcher in the program recommended a beginner’s course in Python on CodeAcademy, which helped me gain the necessary confidence and skills to take on an introductory course in computer science. The fascination further blossomed when exploring courses in the subdisciplines of algorithms and human computer interaction.

Attraction toward the former can be attributed to my interest and background in mathematics while curiosity for the latter arose from research and teaching opportunities, as well as an introductory course in cognitive science. My fascination first spawn during a data analysis project in physics research, when a lab mate pointed out that I had a knack for optimizing the efficiency of Mathematica notebooks. Soon I gained formal exposure to the wealth of interdisciplinary approaches available in this flourishing field, as well as the insights about human cognition and behavior that these techniques can help us achieve. Thereafter, I declared a cognitive science concentration and started applying to research opportunities in related fields.

These efforts brought me to the 2018 REU program for software engineering (REUSE) at Carnegie Mellon University, where I worked with Professors Brad Myers, Aniket Kittur and graduate student mentor Michael Xieyang Liu. [Inject Brad and Niki’s expertise in the areas] Over the summer we evaluated programming tasks and implemented design improvements to the comparison table - a visual model developed for representing information gathered in foraging sessions. After reviewing literature to understand past findings and current objectives, I analyzed the model’s usability by assessing its adaptability to more than 200 Stack Overflow questions, and found that [add results of this analysis] The results of this investigation culminated in a first-author publication for the Visual Learning and Human-Centric Computing conference, where I presented these findings in person during the next semester. After this initial analysis I learned ReactJS to improve the interface of UNAKITE -- a Chrome extension that leverages the visual model to support and document a programmer’s information collection process. Finally, I designed and ran user tests on a small sample population to gather user feedback and gauge the potential usability of our system.

Some of these experiments continued during the next academic semester when my Oberlin research advisor and I began remote collaboration with the UNAKITE group. Over the course of a year we designed, conducted and improved user studies, qualitatively coded raw results from 16 participants and evaluated our inter-rater reliability using intraclass correlation as the standard of measurement, and wrote about our observed improvements in a programmers’ ability to understand technical problems and solutions with the aid of a comparison table in several conference submissions.

As the project grew we conducted more usability studies for the system, honing our technique in conducting the tests and enhancing features of UNAKITE. These efforts resulted in a second-author publication that recently received honorable mention at the 2019 ACM Symposium on User Interface Software and Technology. Currently, I continue the explorations with Stack Overflow in my senior honors project, where I use data mining and qualitative analysis to construct a formalized and verifiable rubric for successfully formulated question posts, since previous research has primarily focused on answer post qualities.

[Tie in Bernstein’s social computing and crowdsourcing systems research]

From these experiences I reaped foundational knowledge that has supported my understanding and appreciation for these techniques when they were formally introduced in my junior year HCI seminar. While theoretical, the perspectives gained from this course proved to be a considerable asset during my internship at IBM, where we applied these methods of user-centered thinking toward a real-world problem: my team of four interns worked together to conduct extensive user research with the aim of identifying target personas (multicloud application managers using Kubernetes for orchestration) and some of their painpoints. These investigations consisted of in-depth interviews and walkthroughs, which equipped us with critical insights that motivated our design, testing, and enhancements of a navigational interface for the terminal. This exposure to industry helped me recognize the importance of collaboration between users, designers, and engineers. It was also enlightening to experience first-hand how some of the approaches from HCI research (such as principles from design thinking) can be successfully applied to industry projects while other methods may be limited by proprietary restrictions.

My various roles thus far have taught me the importance of observation, empathy and intentionality in analysis, design and execution. In my graduate studies, I aspire to further strengthen my communicative and technical abilities, and continue making new discoveries about human behavior in computing, on both individual and collective scales. Equipped with these findings, I strive to move closer toward the greater objective of strengthening and empowering our society.

UCSD: Philip Guo’s research on women on Stack Overflow

Georgia Tech: social and human-centered computing