

Reflections on My SURF Experience at Caltech

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Introduction

Hi, I'm a rising senior majoring in Computer Science. Before the SURF program, my academic focus was primarily on natural language processing (NLP). During my junior year, I explored self-preference biases and potential attacks in language models within Retrieval-Augmented Generation (RAG) settings. I also gained industrial experience during an internship at Google, improving subject detection in group photos through clustering heuristics and machine learning. Additionally, I'm pursuing a double major in economics, with interests in behavioral economics, game theory, and microeconomics.

Applying for SURF

My interest in the SURF program at Caltech began in my sophomore year. I was eager to experience American culture and campus life while balancing research experience. Initially, I considered the Computer Science department at Caltech but found its focus on theoretical computer science misaligned with my interests. Instead, I discovered Professor Colin Camerer, whose work integrates machine learning techniques into behavioral economics.

My background in computer science and programming, combined with my interest in behavioral neuroscience, made Professor Camerer an ideal mentor. His research aims to enhance economic analyses of decisions, games, and markets using methods from psychology and neuroscience. I was fortunate to benefit from the positive reputation of NTU students at Caltech. When I reached out to Professor Camerer in December, he responded quickly, confirming funding for my SURF participation. Through several online meetings, we decided on my research direction in rational inattention. For future applicants, I recommend leveraging connections when seeking research opportunities.

Research Experience

Caltech's reputation as a research-oriented institution was evident upon my arrival. The resources were astonishing, with ample funding and state-of-the-art equipment. A highlight of my time there was the numerous academic activities, workshops, and lectures. I attended many events, including inspiring talks by Nobel laureates that brought complex topics to life. The vibrant research discussions, where everyone actively engaged in each other's projects, contrasted sharply with my experiences in Taiwan, where meetings often lacked interaction and focused more on discussions with the PI. The collaborative environment at Caltech was both inspiring and intellectually stimulating.

Another significant takeaway was the difference in research approaches between social sciences and technical fields like computer science. While the latter often focuses on optimizing technical skills, social science research relates closely to real-life situations, making it more engaging and allowing for fresh insights.

My coding background was put to good use in Professor Camerer's lab. I contributed to various projects, particularly those requiring model development. This experience deepened my understanding of the lab's ongoing research and maximized the impact of my skills. In addition to my main project on rational inattention, I implemented a behavioral game interface using PsychoPy, classified strategy reports with a pretrained BERT model combined with PCA, and conducted probability weighting using regression. These experiences highlighted the direct applications of my skills in behavioral research.

SFP Events

The SURF program also provided a wealth of resources and events to support aspiring researchers. The school organized professional talks across various fields, expanding my knowledge beyond my primary focus. Workshops on the PhD application process covered how to write a compelling personal statement and prepare competitive recommendation letters, offering insights from admissions committee members and current PhD students. These resources gave me a clearer understanding of what pursuing a PhD entails.

Outside of academics, the program emphasized enjoying cultural experiences. Weekends were spent exploring local attractions like Griffith Observatory and the Huntington Museum. My favorite experience was attending a concert at the Hollywood Bowl, where the LA Philharmonic performed music by John Williams. The chance to hear these compositions live was truly special.

The campus also offered a variety of social events, including table tennis tournaments, movie nights, and picnics. The creativity and energy of the American students were contagious, immersing me in a vibrant culture.

Life in General

One of the unexpected joys of my time at Caltech was the work-life balance I maintained. With fewer obligations during the summer, I pursued personal interests outside of research, including practicing piano at the Music House. I enjoyed the flexibility of working from various locations, whether in the library, a café, or outdoors. Living in a single room for the first time contributed to my sense of independence. I found that I enjoyed living alone more than I anticipated, efficiently managing household chores and cooking. While the lack of social interaction could be isolating, regular video calls with family and friends helped maintain my mental well-being.

Reflections and Thoughts

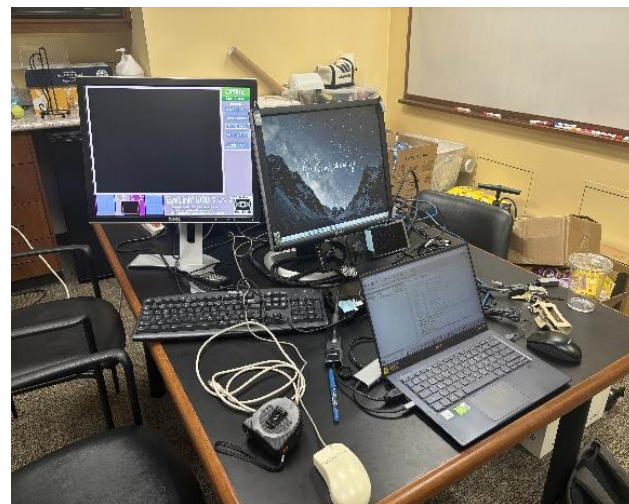
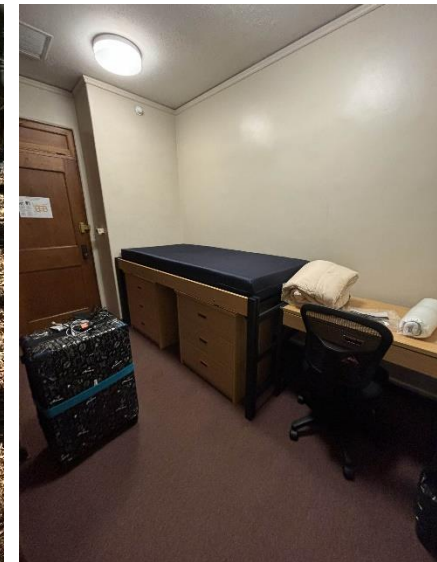
The most significant takeaway from my SURF experience was the clarity it provided regarding my future career path. Before SURF, I was uncertain about pursuing research as a long-term career. However, my time at Caltech confirmed my passion for the research lifestyle. I found immense satisfaction in asking questions, conducting experiments, and achieving meaningful results.

That said, I realized I'm not ready to apply for a PhD immediately after graduation. While I am fascinated by research, I still want to take time to explore different fields. My experience at SURF has shown me that, while I'm interested in machine learning, social science research is also compelling. Preparing a PhD application requires substantial effort, and I do not want to rush the process. Taking an additional year to reflect on my interests and test my commitment to research will allow me to make a more informed decision about my future.

Overall, SURF was a transformative experience that clarified my career goals and fostered greater independence in my life and thinking. The cultural, intellectual, and value exchanges with other SURF students made me more responsible for my choices. Since returning to Taiwan, I've been more intentional about what I want in my life and more willing to take action to achieve my goals. This shift in mindset has given me the courage to pursue my ambitions confidently.

For anyone interested in research and not averse to living abroad, I highly recommend the SURF program. If you're certain about pursuing a PhD, SURF can help you explore potential areas of specialization. If you're unsure about further studies, experiencing the research lifestyle firsthand can provide clarity. Even if research is a passing interest, SURF offers a unique opportunity to immerse yourself in the life of a researcher, soak up American culture, and enjoy Caltech's world-class academic resources.

Photos [Campus]



Photos [Traveling]



Photos [Group Photos with NTU SURF Students]

