Personal History Statement (Draft)

When I was a child, even a small piece of candy was a rare luxury. I could never have imagined that one day I would be living in another country over ten thousand kilometers from my hometown, speaking a foreign language, and studying subjects far beyond my early reach. My parents, traditional rural-urban migrants, believed that education could transform lives, but we lacked the proper access to educational resources. They couldn't afford extra tutoring materials, nor could they guide me through my studies. This gap shaped my early educational journey. Fortunately, as my parents' business slowly flourished, so did our access to more educational opportunities. I began to reflect on my parents' words that "education could impact one's destiny." Reading *Poor Economics* by Abhijit Banerjee and Esther Duflo, a book investigating the causes of poverty through data and real-world experiments, I was struck by the role that education plays in intergenerational mobility, which inspired me to understand and address social issues through the lens of data.

In high school, I conducted a study on the inequality of educational resources in China and their impact on intergenerational mobility. I applied the probit model and studied the Lorenz curve and the Great Gatsby curve to represent inequality across generations. Despite being new to these concepts, I found the process of cleaning and organizing an extensive stratified database from multiple provinces to be the most challenging yet rewarding part of the work. It was through handling this raw data that I began to see the bigger picture of educational inequality in China, and this project was eventually published in IEEE MSIEID. It was during this time that I realized how powerful mathematical models could be in uncovering societal issues.

This experience led me naturally to a joint major in Economics and Computer Science at WUSTL, with Mathematics as a second major, where I could continue using data to address social problems. A turning point came when my mathematics advisor, Prof. John E. McCarthy, introduced me to a new way of thinking, "learning isn't linear." He encouraged me to borrow ten books, read two, and return the rest. This method of self-directed exploration became a cornerstone of my learning. It was through this process that I discovered my love for topological data analysis and information geometry. These fields offered innovative and non-traditional approaches to visualize and interpret data. The beauty of using geometry and topology to uncover patterns in data captivated me, and I knew that these areas would become central to my studies.

Last summer, I was selected as a fellow for the MIT Summer Geometry Initiative (SGI), where I worked on four distinct projects that significantly broadened my understanding of computational geometry. One of the most impactful experiences came from my interactions with Prof. Silvia Sellán. Not only is she an experienced researcher, but she is also a strong advocate for inclusivity. We had deep discussions about her paper, "Sex and Gender in the Computer Graphics Research Literature," which addresses the challenges faced by underrepresented groups in academia, especially the LGBTQ+ community. Silvia herself identifies as part of this community, and our conversations resonated deeply with me as I had been going through a period of self-discovery. I was struggling with my own identity and initially felt pressured by my parents to see a psychotherapist. However, the sessions turned out to be beneficial: they helped me recall personal experiences and understand how they shaped my identity. Sharing these insights with Silvia allowed me to connect on a personal level and find solidarity. Inspired by her example, I want to promote a supportive and inclusive environment in my future community and career, helping others feel understood and empowered. This commitment aligns closely with UCB's goal of fostering diversity and inclusivity, and I would love to contribute to these efforts by joining the Unbounded Representation (URep) group for underrepresented communities. Through URep, I hope to advocate for equity and inclusivity and build a network of support for students facing similar challenges.

SGI also exposed me to inspiring talks by industry and academic leaders, including Jesse Louis-Rosenberg, cofounder of Nervous System, who discussed generative puzzle design, and Prof. Mina Konaković Luković (MIT), who presented on conformal geometry and auxetic materials for art and design. These experiences reinforced the deep connection between theory and application, and further fueled my interest in combining computational tools with geometry.

Reflecting on my journey—from moving to another country and pulling through multifarious academic and life challenges to hearing new voices and perspectives from valuable guides both

within and outside my field—I've come to appreciate how these experiences have shaped my academic interests. My exposure to different cultures and disciplines has refined my taste in mathematics, guiding me toward areas where the theoretical and applied aspects meet. I'm deeply grateful to my professors and classmates for their support and inspiration, and I look forward to continuing this journey as I further explore the world of mathematics. Moreover, UCB's strong support for teaching through programs like DRPs and SMART mentoring, which aligns with my love for teaching, provides a perfect environment to engage with students in meaningful ways. UCB's esteemed researchers in computational geometry and graphical studies would also offer excellent opportunities to expand my research in these areas, allowing me to delve deeper into the interplay between mathematical theory and visualization.