Personal Statement

I have always been the biggest fan of sci-fi. It often gave me an optimistic outlook on the relationship between technology and society. Ever since I started my computer science journey at the University of Toronto, it seemed to me that the line between fantasy and reality had been getting blurrier day by day enabled by constant breakthroughs of artificial intelligence near me. Inspired by endless opportunities, I took the initiative and grasped onto my fascination with this ever-growing field for my professional development.

During my undergraduate studies, I was first introduced to the world of AI in a visual computing course notorious among students for its challenging mathematical concepts not suited for the faint-hearted. Throughout the course, I studied and implemented numerous algorithms for real-world computer vision applications that I never thought to be possible before, and this led me to explore advanced concepts such as machine learning. I utilized the opportunity to take every AI-related course the CS department had to offer and excel in them. Most of these upper-level courses were cross-listed with the graduate department and gave me a glimpse of the life of a graduate student long before graduate school. In my senior year, I worked as a research student under the supervision of Dr. Anna Goldenberg at Toronto's Hospital for Sick Children. Initially funded by a grant from the Canadian government, I then continued my position as a research employee after graduation. During my two years at the hospital, I was involved in integrating a machine learning model in the ICU to monitor patient status and predict deterioration, such as cardiac arrest events, in order to alert staff to apply preemptive measures, which can be critical in moments of life and death. I built data streaming pipelines that dealt with both live data and historical data, contributed to the usability design in the ICU, and eventually

delivered the tool to its clinical trial. Furthermore, I employed NLP techniques using Transformer models to de-identify patient information in medical records to provide data for future research. I was fortunate enough to have gained much project experience, witnessing the incredible synergy of combining AI with healthcare. This rather new effort not only minimized the stress on paramedics but also enabled the automatic detection and analysis of patient conditions. While the work demanded the repetition of various experiments and occasionally posed challenges, the sense of fulfillment and pride was truly gratifying, as I saw impactful change in the medical industry.

While I worked on my master's degree in software engineering at Carnegie Mellon University, I continued to take ML courses and got involved with more ML research throughout my entire degree. I was part of an object recognition project at CMU in collaboration with Walmart where I processed image data and trained Visual Transformer models. I am currently involved in another computer vision research project under Dr. Asim Smailagic exploring an innovative approach in medical image analysis combining neural network with wavelet transformation that removes unnecessary details in the image preserving privacy and reducing computation without impacting performance, and we are in progress to publishing our work. Aside from ML work in this project, I was able to revisit the mathematical side of computer vision, which took me back to when I first discovered the wonders of AI algorithms. I utterly enjoyed my research experiences working with different aspects of AI, as they have shown me how much good AI can bring to our current society in a world of data and I am dedicated to continuing my journey furthering myself.

In addition to research, I have had two years of industry experience working at State Street as a cloud software engineer. I eagerly seized the opportunity to master a range of software development tools and refine my software-building skills. This experience has prepared me for

my master's studies in software engineering and helped me gain a valuable understanding of the tech industry. This experience has also equipped me with the beneficial insights of collaborating within a team, both in person and remotely. My industry experience, coupled with pragmatic software engineering training that I have done during my master's degree, has shown me practical aspects that are as beneficial as theoretical knowledge in research work.

Perhaps with a different concept of self-worth, I am more captivated with chiseling into the unknown, a diversion from the common goal of my peers in my industry-oriented program of "making big money" straight out of graduation as a software engineer. With my growing interest in using ML to improve life, I deem that the elevation of myself in research is imperative. I am anxious to work with professors with overlapped interests in ML at Columbia. I have a deep yearning to boost my individual research ability as well as the capacity to resolve tech problems innovatively. The academic prowess here has been world-renowned and the ML research has been diverse in various areas among which I would like to learn more in. I look forward to being an active member in the CS program, and to studying and working in a vigorous community. After my PhD studies, I look forward to working as a scientist, extending my studies in the ML field, and contributing to the development of AI in the real world. I want to dive deeply into my own expertise, especially in healthcare and the application of new AI technologies, and I am very optimistic about my career paths after completing a PhD as a scientist. I'm confident that I will be content in a field of prosperous innovation bridging reality and sci-fi. I know that it will be far from a smooth ride, but I await to broaden my skill set and knowledge with pleasure, knowing what I will be trying to do is unique, inspiring more intelligent development in the areas that benefit mankind's future.

Huang, Xi