I have been dreaming of becoming an outstanding scholar since my childhood, when I was exposed to many stories about some great scholars. After I went to university and started to receive basic education on electrical engineering, this desire grew increasingly strong. I made up my mind to be a great scholar and address some of the most difficult issues that are lingering in this field today. However, my current understanding of electrical engineering falls short of equipping me to work on some challenging subjects, such as wireless communication and computer networks, so I want to pursue a Ph.D. degree and receive rigorous training in doing research.

I enjoy tackling interdisciplinary technology challenges that entail hardware, software and algorithm. Specifically, my research interests include computer architecture, networking, embedded system, wireless communication, robotics, VLSI, etc. As a practitioner in wireless communication industry, I am well familiar with the protocols and rationale of the computer network (e.g. TCP/IP) and the cellular network (e.g. LTE). Having hands-on work experience in the wireless communication industry, I am also skillful at programming and clear about how to implement these protocols in code. Wireless and wireline networks have been of my research interest for a long time. I have been working on them since I was an intern at Qualcomm. My unfading interest in these fields urges me to formulate something original and materialize it. To that end, I want to be a Ph.D. student and make my way into the academia.

During the period of my undergraduate and graduate study, I had finished quite a few engineering projects, from which I acquired many useful engineering skills. My bachelor's thesis project was about a ground-based control program used for controlling the orientation of a high-altitude balloon-borne gondola and monitoring its ambient condition. The program was written in LabVIEW. Through the project I got to know virtual instruments and learned how to write PC application software for embedded system.

My master's thesis project was about a flight control computer used for controlling a solar-powered UAV. I completed the hardware design and also wrote part of the software. After I finished the PCB layout and made a prototype circuit board, I wrote the drivers for each peripheral to test its functionality. I also wrote a UART IP core that has the same functionality as 16550, a commercial UART controller chip, and a SPI IP core. Through this project I became adept in hardware design and programming.

These engineering experiences helped me get an internship at Qualcomm in my last postgraduate year. I began to set foot on wireless communication. During my internship, I read a lot of books on LTE, the de facto 4G communication standard, from its overall architecture, to various implementation techniques (e.g. OFDMA, MIMO, CA, air interface protocol stack, etc.). I learned how to use Qualcomm's debugging tools, such as APEX, QXDM, Crashscope and Trace32 to resolve various issues that commonly occur in field tests and lab tests of the Modem chip. I also read the Modem software code in detail and learned how to implement the LTE protocol stack in Modem. These

research experiences not only honed my programming skills and trained my analytical ability but also deepened my understanding of digital and wireless communication.

After I got my master's degree, I joined Qualcomm formally and became a Modem software engineer. Recently, I completed part of Qualcomm’s chipset off target code implementation, successfully verifying a part of the code logic. My daily routine mainly involves code maintenance and technological support. I will fix the bugs in the Modem software code of our products according to the issues or crashes reported by the testing team and customers. During my spare time, I also read some books on computer networks and operating system, which give me a bigger picture of the whole Modem system, shedding light on how different software modules can cooperate with each other, and how they communicate with the networks and the application processor as an integral system. Currently, I also take part in the reconstruction of Qualcomm’s LTE Modem software architecture, which is an effort to integrate both of 5G and 4G modems into a single chip, and also address some problems brought about by their coexistence, such as how to bridge the gap between LTE throughput and NR throughput to ensure the smoothness of data transmission under ENDC mode, how to decrease the transmission latency by refining the data structure and the code logic, and also how to cope with different bearer switches in order to improve user experience, etc.

My undergraduate and postgraduate life, plus my internship and work experience, have laid me a solid theoretical foundation and broadened my horizon on electrical and computer engineering fields. I have basic knowledge of computer networks, wireless communication, operating system, VLSI and so forth. I have also mastered a variety of engineering skills such as C, C++, PCB layout, ARM, FPGA, etc. This breadth of knowledge makes me well prepared for Ph.D. study. I also believe my engineering background will certainly be conducive to my future research. I am confident that I have the potential to be an excellent researcher, not only because of my professional know-how but also my passion, dedication, and concentration.