My passion for robotic systems was ignited in my freshman year of college, when I was introduced to an online course taught by Professor Vijay Kumar from the UPenn GRASP Lab. From that course, I learned the basics of robotics locomotion and control. For the first time, I was struck by the beauty of math theories applied in robotics. As my knowledge grew, I was exposed to more advanced topics in this field. I enjoyed studying topics such as kinematics and dynamics, probabilistic estimation, optimal control, and I was amazed by their mathematical elegance.

As a Tsinghua University undergraduate in Mechanical Engineering, I excelled in my major. I ranked XXX in my department. My early exposure to robotics showed me the field's interdisciplinary nature, and, for that reason, I decided to minor in Computer Science. My major in Mechanical Engineering provided me with a deep understanding of dynamics, design techniques, and control principles, while my minor in Computer Science armed me with strong coding skills and a solid foundation in algorithms and computer hardware systems. By staying knowledgeable of the latest open-source tools and robotics publications, I am working towards becoming a full-stack robotics researcher.

Equipped with a repertoire of software and hardware skills, I seized opportunities to conduct research in various labs. In my junior year, I had a valuable experience studying abroad at UC Berkeley for one semester. There, I enrolled in four Mechanical Engineering courses and achieved a 4.0 GPA. In addition to my courses, I worked on two robotic projects. Under Professor XXX's supervision, I worked on robotic manipulators. In our work, we have shown that robots can XXX. We developed a new algorithm capable of XXX, and verified the algorithm for the first time with experimentation. This was my first independent and holistic research experience. I designed the algorithm, coded the programs, and carried out the experiments. I was very excited to be the primary author of our research paper and submit it to XXX, the premier robotics conference.

In my second project, I worked with Professor XXX, in cooperation with the startup SuitX, to develop exoskeletons for children with cerebral palsy. I worked on the mechanical design of the exo-hip which utilized the motion of a series elastic actuator and allowed for feedback in forces. I also derived mathematical expressions for hip angle trajectory and implemented the algorithm on an electronic board. Our work was ultimately adapted into the next-generation of SuitX's exoskeleton. This was the first time my work was actually used in products that would improve people's quality of life, and I felt thrilled for the powerful impact that could be made via robotic systems. My projects at Berkeley familiarized me with product-oriented mechanical design, robotic planning and computer vision algorithms, and mechatronic systems design.

While my previous projects focused on the dimension of "making things work", my internship at Aptiv (formally known as Delphi) offered me an opportunity to make things work well enough, so they can be deployed in industrial applications. At Silicon Valley's Aptiv Labs, I worked independently on autonomous vehicle lane detection and developed a new algorithm that achieved state-of-the-art performance (50Hz). In this process, I taught myself caffe (a deep learning framework) and opencv (a computer vision library). Beyond developing a workable algorithm, this project showed me the importance of improving the speed and robustness of algorithms, dimensions I had not explored before. Based on my performance, Aptiv offered me employment opportunity. However, I am aiming beyond a comfortable position as an average

engineer. I declined the offer as I planned to pursue graduate study in order to acquire a more sophisticated foundation, and make even greater impact with my research.

From my experience in various labs and companies, I have come to recognize that robotics is a field where there is still a significant gap between lab innovation and industrial practice. My long-term goal is to become a researcher, with a focus on adapting state-of-the-art technology from academia to an industrial standard. Industrial standards pose very high demands for software and hardware, and many cutting-edge technologies from labs cannot be easily transplanted to industrial applications due to their complexity. Some key bottlenecks include speed and success rate. I want to work on the "landing" of research findings in industry. To achieve this, we need to develop hardware systems and algorithms that are not only able to produce stunning demos, but can also be massively delivered as products with reliability. This is how the research emerging from labs can truly benefit society as a whole**.**

I believe I am well-prepared for graduate studies. Through conversations with graduate students and university faculty, I learned that there were many more advanced subjects I wanted to study in order to prepare myself for advanced robotics research. I enrolled in several graduate courses covering topics in control and optimization, and taught myself through five classic textbooks in control, robotics, and reinforcement learning. The knowledge acquired through this process helps me better understand other people's research as well as what I want to work on.

Eager to deepen my knowledge in Robotics and Controls, I am applying to the MS program at UCLA MAE. For graduate research, I plan to focus on designing robust planning and control algorithms for robotic systems. I would love to verify and demonstrate these algorithms in an experimental setting. Some possibilities include autonomous vehicle or aerial robots. Beyond classic methods, I also wish to explore the application of reinforcement learning techniques on these robotic testbeds. I find several UCLA faculty's research projects match my interest. I am very interested in Prof. Dennis Hong's research on various robotic systems, and would love to design and add new robot members to RoMeLa. Prof. Tsu-Chin Tsao's research projects on the control of various mechatronic systems also matches my background, and I am particularly interested in the project of the omnidirectional multicopter.

In discussions with MAE students, I was informed that UCLA offers a great variety of opportunities in robotics and a very exciting research atmosphere. In the MS program, I know I can acquire the knowledge and experience needed for a career in robotics research. To be a part of the robotics community, to solve the key problems and bring about technology that can potentially transform human society, is the most exciting opportunity I could imagine. I cannot begin to express my eagerness to become a part of the group of researchers who will lead these changes. With my passion in control and robotics, interdisciplinary background, and extensive past experiences, I strongly believe I can contribute to the program and, ultimately, to the advancement of the entire robotics industry.