Personal Statement

After completing the National College Entrance Examination, I was admitted to the Department of Transportation at Chang'an University, where my academic journey began. While the field of transportation engineering initially attracted me for its potential to improve society, it was my exposure to programming during my freshman year that truly shaped my academic path.

My fascination with programming began with an elective course in Fortran, where I quickly realized the power of coding to solve complex problems. This newfound interest motivated me to teach myself additional programming languages, including MATLAB, C, and Python. My passion for coding grew rapidly, and it wasn't long before I took on the role of the main programmer in my first project.

In this project, I was responsible for developing and implementing the core algorithms, an experience that deepened my appreciation for the power of algorithms in transportation systems. This hands-on involvement not only honed my technical skills but also sparked a deep interest in the world of algorithms, particularly in how they can be applied to optimize transportation systems.

Recognizing that deep learning represents the cutting edge of algorithmic development, I took the initiative to learn about neural networks and their applications. I began integrating deep learning techniques into my projects, which allowed me to tackle more complex problems with greater accuracy and efficiency. For example, in my project on **Passing Efficiency of Highway Free Flow Tolling Systems**, I developed and optimized a traffic simulation model using cellular automata. As the lead programmer, I was tasked with designing and coding the algorithms that drove the simulation. This project culminated in a published conference paper and a patent application, both of which underscored the effectiveness of the algorithms I developed.

My deepening expertise in algorithms led me to further explore their applications in real-world scenarios. In the **Long-Term and Short-Term Speed Prediction at Tunnel Exits** project, I developed an optimization algorithm based on deep learning models to enhance prediction accuracy. This involved extensive data processing and the construction of deep learning networks in Python. The success of this project, which was submitted to the TRB 2025, is a testament to my growing proficiency in both programming and algorithm development.

Beyond deep learning, I have also become deeply interested in the field of autonomous vehicle trajectory planning. After exploring several research papers, I became captivated by the challenges and possibilities in this area. The idea of applying advanced algorithms to improve autonomous driving systems aligns perfectly with my interests and expertise. Moving forward, I am eager to delve deeper

into this field, where I believe my programming skills and algorithmic knowledge can make a significant impact.

As I look to the future, my goal is to continue advancing my understanding of reinforcement learning and its applications in intelligent transportation systems. I have great admiration for Professor Zuduo Zheng's work at The University of Queensland, particularly his pioneering research in autonomous driving. Professor Zheng’s contributions to the field, especially in advancing our understanding of mixed traffic involving connected and automated vehicles, have inspired me to pursue research that not only advances technology but also enhances safety and efficiency in transportation. His innovative approaches and commitment to shaping the future of autonomous driving resonate deeply with my own aspirations. I am eager to contribute to his team, where I believe my strong foundation in programming and algorithm development can help drive forward groundbreaking research. Joining Professor Zheng’s team would not only be an incredible opportunity for me to learn from a leader in the field but also to contribute meaningfully to research that has the potential to shape the future of transportation.