I am fascinated by Computer Science since it has the power of solving interdisciplinary problems, ranging from biology to music, in many ways. Specifically, we can use artificial intelligence algorithms to help people finish repetitive tasks, and the program can even perform the task better than humans. We can build high-performance systems to store data securely and run programs efficiently. We can build applications like TikTok to entertain people. With my passion for computer science, I am inspired to take the next step by entering graduate school, reaching out to cutting-edge knowledge and technologies, and devoting myself to system development.

In order to build a solid understanding of computer science, I took various courses, including Machine Learning, Data Science, Computer Architecture, Functional Programming, and Software Quality Assurance during my undergraduate study at the University of Pittsburgh. With a GPA of 3.91, I have been on the dean's list every semester. Also, I actively participated in research programs and enjoyed demonstrating my ability to solve research problems in Natural Language Processing and Computational Biology. I worked with Dr.Alikhani during my research on NLP. Every week I discussed my research progress with her and shared papers we read. For the project, I collected data from different posts of twitters using the scrappy in Python and trained the datasets using different classifiers. During the COVID-19 pandemic, I took two consecutive gap semesters and had to stay in China. However, as a student majoring in Computer Science, I believe I should keep learning techniques no matter where I am, even if I am not taking classes in the university. Thus, I started three different internships and found my interest in distributed systems, accumulating sufficient pre-preparation for my graduate study.

I believe language is not a barrier, and a good programmer should learn by analogy. During my internship in DiDi, I self-taught Golang, a programming language that is preferred for back-end development. After finishing learning Golang, I implemented a storage algorithm Kim for trajectory compression based on the Facebook Gorilla database's algorithm and made some modifications so that it is suitable for our specific data framework. However, the process of software development is not always smooth. I encountered lots of bugs like panic and null pointer exception, but I never thought of giving up. While debugging, I learnt to debug line by line by printing out logs for each step and compared those messages with the expected output. Additionally, instead of asking help from others, I will often search for the solution online myself first. It was this time that allowed me to feel a sense of belonging and learnt to be patient. Finally, my algorithm worked, achieving a high compression ratio and a fast compression rate, which saved 60% storage space in Fusion, a distributed NoSQL database.

Since then, with joy and a sense of achievement, I decided to become a distributed database-related developer. I really enjoy watching a program work from beginning to end, which makes me feel powerful. To further enrich my knowledge in distributed database systems, I've read DDIA, Designing Data-Intensive Applications, and summary each chapter on my GitHub page. This book intrigued me to learn more about distributed database systems.

To explore more in the field of distributed database systems, I started my third internship in Tencent. During this time, I watched MIT 6.824, distributed system, and finished all the lab with Golang, and

fascinated by its specially designed goroutine and language syntax. To better understand the feature, I went through the source code of some key packages. In addition to absorbing new techniques and theoretical knowledge, I led an intern group to join a competition where we built a distributed timer service with a cluster of five machines. I discussed the framework of the code with my teammates and assigned decoupled tasks to them. To eliminate the need for a master in the cluster, I used Paxos to ensure strong consistency among machines, even though there were no practical instructions on using Paxos in real productions. Therefore, I tried to design my framework in several different ways and test my program repeatedly. Oftentimes, I may just change a single line of code and test the whole program until everything is working. Eventually, I found that I could make a single machine play both the role of proposer and acceptor, and it worked. In this progress, I realized that distributed system is the topic that I want to further explore. Pursuing an advanced study will definitely allow me to prepare for my future career as a system software engineering and solve more complicated challenges efficiently.

With my previous professional and academic experiences in Computer Science, I learned how to handle problems in the industry and conduct research as well as communicate with teammates. However, I realized that it would be easier for me to shoot the problems if I had more wide-ranged knowledge, which led me to pursue an advanced study in Computer Science. Among multiple specific fields in Computer Science, I prefer database management, especially distributed database systems. I love data, since it can carry various information. As there are more and more data, enterprises need to build advanced data storage systems. Besides, system is one of the most important foundations for business. It provides platforms for data analytics, machine learning platforms, and backup for users including individuals and businesses. What is more, an excellent system is the result of long iteration and lots of discussions and research. I enjoy discussing techniques with others. Also, I am a perfectionist, so I love conducting detailed research and thinking deeply. This is why I love being a system developer in the industry after graduation.

University of Wisconsin–Madison has always been my dream school, with a large-scale Computer Science department, including all cutting-edge fields of Computer Science ranging from Artificial Intelligence, Computer Architecture, Database Systems, Human-Computer Interaction, and so on. The courses offered at UWM are attractive and practical. For instance, I am eager to take Topics in Database Management System (CS 764). Additionally, I am very interested in the research of the Database Group at UW-Madison, which is one of the best database groups in the country. A distinguishing characteristic of distributed database systems research is that it requires respects from many other fields in Computer Science, such as Data Science, Machine Learning, and Cloud Computing. This broad encapsulation and the research focus itself pique my interest the most. I hope to do research with professor Arpaci-Dusseau Andrea, who focuses on File and Storage systems, Operating systems, and Distributed systems. Based on my self-motivation, previous internship and research experiences, and a strong background in Computer Science, I also believe I am an excellent candidate for your program and will pursue my enthusiasm in Computer Science at UWM.

All in all, I am longing to attend the University of Wisconsin–Madison!