Statement of Purpose

TU Lin | **Program**: Master of Software Engineering - Scalable Systems | **Contact**: trusaidlin@gmail.com **Revisions: 4 @2212130146 (CMU MSE-SS)**

After my first experience using Windows XP in elementary school, I was captivated by its practical window function. This sparked my interest in programming and computer science, and I began to self-study by purchasing books on the subject. In junior high, I developed software to calculate rankings and was praised by my classmates. This boosted my **confidence** in using programs to help others **solve problems**. However, before graduating from university, I realized that my knowledge was **not sufficient** to build a **practical** and **reliable** system like **Google's** search engine while there are many development details and technical complexities involved in creating such a system. That's why I am eager to continue learning about software engineering through **Carnegie Mellon's MSE Scalable Systems program** in an effort to fulfill my dream of developing a **large-scale** and **widely-used** system.

In order to join in the development of large-scale projects used by many people, I participated in the TAT App project in my freshman year as a **lead** developer. TAT is a campus life tool developed using the **Flutter** framework and used by **thousands** of students at the National Taipei University of Technology. During this period, our 4-member team has fixed many existing problems. For example, we established a **Kanban** Board for the project and defined the **requirements** and **use cases** for each Release **milestone**. In the code part, we put most of the existing business logic split into different **submodules**, combined with **Clean Architecture** and **Null Safety** concepts to **refactor** and maintain a unit test coverage rate of more than **90%**. The most difficult challenge I faced was that I was short of the concept to design the operation process when I wanted to fix the problem of account login failure without warning. Therefore, I tried to clarify the login process by drawing a step-by-step **flow chart**. Surprisingly, I was able to solve those problems. The experience of overcoming these challenges has made me want to further explore how to develop software **architecture** and manage **quality**.

I interned at LINE to gain experience in developing the most widely used chat app in Taiwan and exploring its engineering mysteries. Through agile development on the LINE SHOPPING App project, I improved my team **collaboration** skills and learned the importance of asking "**useful questions**" in problem-solving. I also developed strong **communication** skills and eventually **led** a 3-member team in the backend department to develop a new **microservice** architecture system. In this role, I guided team members in using clean architecture and carefully considered the impact of changes on system **performance** and **security**. I also learned how to deploy containers to **Kubernetes** and **monitor** and **schedule** them. These experiences have further fueled my interest in learning more about developing large-scale systems. At LINE TECHPULSE 2022, I shared my experiences of wanting to improve my **implementation** skills through internships and my work experiences, which helped me **structure** my thoughts and express complex ideas **effectively**. It was also a great opportunity to experience the feeling of **presenting** a world-class product, just like Craig Federighi at Apple's WWDC conference.

As the **scrum master** for the "Software Engineering" course project, I tried to use my agile development experience from the LINE SHOPPING App team to help our 5-person team successfully deploy an open-source project data visualization system using **Spring Boot**. However, I found that refactoring the backend system and adding new Web API designs was a challenging task, and it will be even more difficult for future large services like GitHub. Therefore, I want to further study the knowledge of **refactoring** and **API design** to achieve my goal of maintaining large systems.

My passion for object-oriented programming led me to score 99% in the course with the same name and even recreate a game called "BaBa is You" using **OOP** in the following year's implementation course. To reduce complexity in the command-passing between objects, my partner and I created a centralized character movement command publishing and **collision detection** system using the **observer** and **command** patterns. After we completed the game, I realized that I am eager to explore the application of **design patterns** in the interactions of game characters or develop new software using more advanced OOP methods. Besides, my curiosity about new technology led me to take the "Smart Contracts" course in my third year. Our team ended up creating a fundraising platform for dog lovers that uses **Ethereum** and **ERC-20** fungible token to facilitate transactions.

To summarize, I want to be a part of a development team in a **large** technology company like **Google**, **Microsoft**, or **Apple** in the future. Programming is my **passion** and **expertise**, and using it to change the way the world operates is my core goal. Although I have some ability now, I still feel that I need to study software engineering more **deeply** to solve more **complex** problems. I also hope to have the opportunity to live in the United States to increase my participation in **offline activities** with large technology companies and related **communities**.

Therefore, **Carnegie Mellon's** MSE-SS program is the best choice for me. Through the program, I can gain these abilities because CMU has world-class **courses** and teaching **resources**, and **communities**. More importantly, almost all of the program's courses are very **helpful** to me, such as "Software Architecture", "Communications for Software Leader", and "Data-intensive and Scalable Systems". After graduating from this program, my short-term goal is to join Google within two years and find a team that suits me, accumulating more practical experience in the workplace. Then, I hope to become a **leader** of development teams like **Gmail**, **Chrome**, and **GCP** in the distant future, leading the direction of world-class software services. Finally, I sincerely ask you to consider my application, and for the realization of my wish, the **Carnegie Mellon's** MSE-SS program is undoubtedly indispensable.