

Personal Statement of Purpose

I. Why M.S. in CS at Syracuse University

During the summer vacation in 2017, I travelled to the U.S. and visited Syracuse University for the first time. The visit was love at first sight. I was drawn to the gorgeous architecture and beautiful scenery in Syracuse University. The thought of studying at Syracuse University came to me after the visit. After conducting some research afterwards, I found that the M.S. in CS at Syracuse University is a great fit for me, as I can make full use of my experiences to better understand the theories taught in this program. In return, Syracuse University's prestige faculty and wide platform will provide me with the opportunities to study in-depth specialization about this subject. This is why I am motivated to pursue the M.S. in CS at Syracuse University.

II. Academic & Professional Accomplishments

I accumulated a fair amount of knowledge during my undergraduate studies and developed many interdisciplinary skills from my experiences in different areas. I believe I am well-qualified for the M.S. in CS at Syracuse University because of my strong will, hands-on skills, and teamwork spirits shown from the following experiences.

Learning & Competitions My knowledge of Data Mining mainly derives from my undergraduate courses and academic competitions. In 2019 Mathematical Contest in Modeling, I led my teammates to complete a project about Opioid Crisis. We analyzed the data from National Forensic Laboratory Information System, and found the growth pattern of drug reported quantity and the important demographic features to make a breakouts prediction, *i.e.*, when and where a drug epidemic will occur. Besides, in my final projects in *Introduction to Data Mining* course, I made a prediction for NBA players' salary by analyzing the correlation between their performance and earnings. From these experiences, I become familiar with the process and methods of Data Mining, which could be of great value to the concentration of Prof. Mohan in Data Mining, Prof. Zafarani and Yu in Social Mining.

Research & Publications Since my sophomore year, I have conducted research in Inplus Lab and focused on Blockchain technology and its application. I proposed a two-layer Stackelberg Game data trading mechanism in Blockchain-based Internet of Vehicles and evaluated the robustness and efficiency of my algorithms by implementing several smart contracts on Rinkeby, a test net of Ethereum. I completed a paper *Blockchain-Based Digital Goods Trading Mechanism in Internet of Vehicles: A Stackelberg Game Approach* with my colleagues and submitted it to 2020 IEEE Cloud. During this process, I realized that we need to take more factors into consideration to ensure the stability and efficiency of operation in the system. During my research in Inplus, I also participated in *Perishable Digital Goods Trading Mechanism for Blockchain-based Vehicular Network*, *BCShare: A Decentralized Data Storage and Sharing on Blockchain*, and published a survey *Application of Blockchain in IoT Data Trust and Information Available Technology*. The research in Inplus Lab not only helps me to master Blockchain technology, but also deepens my understanding of Game Theory, Trustworthy Systems, Security and Privacy, *etc.*, which inspires me to explore more of these topics at Syracuse University.

Internship Based on my knowledge and experiences in Machine Learning, I put into practice knowledge of Reinforcement Learning while interning in the Institute of Automation, Chinese Academy of Sciences, and participated in StarCraft team to build StarCraft II Learning Environment. I trained the soldiers with the Multi-Agents Deep Deterministic Policy Gradient algorithm and improved the winning rate of soldiers from 26% to 43% with only 120 training epochs. From this internship, I picked up more knowledge in Reinforcement Learning, including traditional algorithms, training methods, evaluating criteria, *etc.*, and learned more about business cases where Reinforcement Learning methods are being applied, which inspires me to integrate them into other studies in the future. I believe my work in this internship matches well with Prof. Oh and Fioretto's research in Multi-agents Systems and Artificial Intelligence, and I am well-prepared for further studies in these fields.

III. Interests & Plans

If admitted with honor, I am inclined to work on Data Mining, Game Theory, Artificial Intelligence, Security and Privacy to make full use of my experiences. In the short term, upon obtaining my Master degree, I expect to complete my program with excellent performance to broaden my horizon and consolidate my knowledge. In the next 3-5 year, I aspire to become a reliable researcher by pursuing my Doctor degree. In the long run, I would like to work as a professor to guide the students and to promote promising technologies to better our lives. I firmly believe I can lay a solid foundation and learn useful skills at Syracuse University to achieve my dream.