**Statement of Purpose**

Dear Admissions Committee,

I am writing to express my enthusiasm for joining the M.S. in Natural Language Processing program at the University of California, Santa Cruz. My academic journey at Yuan Ze University, where I am pursuing a triple major in Computer Science, Mechanical Engineering, and Chemical Engineering and Materials Science, has equipped me with a diverse skill set and a passion for interdisciplinary exploration.

Attending numerous robot exhibitions in Taiwan profoundly impacted my academic direction. I was captivated by the robots' remarkable abilities and the intricate blend of engineering and computer science that brought them to life. This curiosity sparked my fascination with robotics, a field that combines mathematics, statistics, mechanics, computer science, and deep learning—areas I'm eager to explore further. During my undergraduate studies, I engaged in cutting-edge research through projects such as "Deterministic Sublinear-Time Approximations for Metric 1-Median Selection," showcasing my commitment to advancing in computer science. Beyond classroom learning, I actively participated in deep learning and maker competitions, where my team's proposal for smart public toilets secured third place in the A+ Smart City IoT Creative Seed Ideation Competition. My self-driving car project earned an honorable mention in autonomous vehicle competitions, showcasing my prowess in machine learning and autonomous control systems. Coupled with my participation in the semester exchange program at UC Berkeley, these experiences further fueled my desire to contribute to the vibrant academic community at your esteemed institution.

I earned recognition in the Marine Debris ImageNet Visual Recognition Challenge and secured the second runner-up position in the Maker Competition 2019 through engaging in extracurricular activities. As a member of the Maker Club and Book Club at Yuan Ze University, I actively contribute to creative projects and intellectual discussions. My involvement in diverse projects, ranging from Robotics to Deep Learning and Mechanical Design, showcases my proficiency in SolidWorks, AutoCAD, Ansys, C++, Python, and more. Beyond technical skills, I possess soft skills such as self-driven learning, innovation, effective communication, and problem-solving.

My collaboration in 2023, using YOLO V5 to classify ocean garbage in the National Marine Debris Image Recognition Challenge, showcased my practical deep learning skills and highlighted my passion for solving environmental problems. I hope to apply these skills and passion to cutting-edge research projects at the University of California, Santa Cruz. Our entry made it to the finals, receiving an honorable mention and achieving notable success on a national stage. These experiences showcased not only my practical deep learning skills but also my strengths in problem-solving, innovative thinking, and collaborative teamwork.

In particular, my project achievements include the development of a Marine Debris Sorting System (awarded in a competition) and the creation of an Automated Watering and Air Pollution Monitoring System. These experiences underscore my commitment to leveraging technology for a positive societal impact. We identified a significant issue in the National Ocean Debris Image Recognition Challenge of 2023. While we were able to assist in classifying types of marine debris, actively collecting the corresponding dataset proved to be challenging. The collection of such data requires manual efforts and, more critically, manual cleaning of the debris, making the process both time-consuming and labor-intensive. Recognizing the potential applications of future learning outcomes, I propose establishing a system to assist in automated marine waste cleanup. This system will leverage the knowledge acquired across various domains to create a fleet of robots capable of automatically classifying and clearing debris. Nevertheless, educating people is paramount; effective recycling can significantly reduce the need for cleanup. Thus, my system will use NLP to increase public awareness and engagement on marine debris issues while educating them on the importance of waste sorting. I aim to use NLP to automate the generation of reports on marine debris collection and sorting activities. This NLP technology can extract critical information from the data collected by the robot and provide feedback and suggestions in easy-to-understand language to help improve future cleanup activities.

This system not only automates the collection of debris but also expeditiously and effectively conducts waste classification. The most valuable part is educating people during its operation to accelerate garbage recycling efforts and contribute to avoiding severe consequences for our collective marine ecosystem and human economic activities.

At UC Santa Cruz, I look forward to interacting with faculty who have extensive industry experience. Based on my experience and what I learn from school, I plan to start my dream project, which is also my Capstone project. My practical experience as an Operations Assistant at Huanzhong Co., Ltd., where I enhanced key functions at a fuel station, demonstrates my ability to streamline processes, manage teams, and ensure compliance with industry regulations. Notably, my role in implementing cost-saving measures, such as self-service fueling, underscores my commitment to efficiency and sustainability.

In conclusion, I am enthusiastic about the prospect of pursuing the M.S. in Natural Language Processing at the University of California, Santa Cruz, as it aligns seamlessly with my aspirations to excel in robotics and artificial intelligence. The meticulously designed courses, such as Data Science and Machine Learning Fundamentals and Deep Learning for NLP, promise to provide me with a profound understanding of deep learning technology. This comprehensive knowledge, spanning theoretical foundations, practical applications, and cutting-edge research, will undoubtedly equip me to contribute substantially to my desired field.

The invaluable opportunity to engage with industry leaders at UC Santa Cruz is a unique facet of the program. This exposure will enable me to gain real-life insights, navigate challenges, and assimilate best practices in practically implementing robotics and deep learning across diverse domains. I eagerly anticipate meaningful interactions with esteemed professors and like-minded peers, engaging in thought-provoking conversations that foster rare academic research opportunities.

My academic achievements, practical experience, and passion for interdisciplinary collaboration align seamlessly with the ethos of UC Santa Cruz. I am eager to contribute to the vibrant community of scholars and researchers and am excited about the prospect of furthering my academic and professional journey at your institution. In essence, I am confident that my time at UC Santa Cruz will propel me toward achieving my career goals, allowing me to maximize every aspect of the program to its fullest potential.

Thank you for considering my application. I look forward to contributing to and learning from the diverse and intellectually stimulating environment at the University of California, Santa Cruz.

Sincerely,

Jou-yi Lee