Purpose Statement

Name: Jiajun Hu
Interests: Electrical and Computer Engineering, Robotics, Signal Processing System
Affiliated Institution: University of Nottingham, Ningbo, China

Currently I am a final year undergraduate in the University of Nottingham, China Ningbo Campus, majoring in Electrical and Electronic Engineering. Our campus of the University of Nottingham carries a complete British education, where English is the official working language.

During my undergraduate education, the professional and research-oriented engineering program inspired me to investigate further and deeper in the field of Electrical Engineering, including contemporary signal processing System, interdisciplinary Robotics, and modern computing modules such as embedded system and computer engineering.

My goal is to become an expert in Electrical and Computer Engineering filed including an experienced engineer and an insightful researcher. Therefore, a master's degree will benefit me in both choices.

My passion for Electrical and Computer Engineering is developed gradually through my whole four-year undergraduate study. In my freshman year study, I had acquired solid academic English abilities both in writing and speaking so that I was capable of reaching to the state-of-art technological information including Electrical Vehicle, Robotics, and Artificial Intelligence.

In the later year2 fundamental program, I was enlightened to investigate the image processing field by constructing an auto-navigate electrical vehicle using Raspberry Pi and Arduino. Later, I joined the University Robotics Team as a member of visual computing group for auto-aiming function. So far, I have dived further and wider into Electrical Engineering filed and gained invaluable project experience.

Furthermore, I came across signal processing and embedded system in my third-year project. Although I participated both in power and control energy system project and electronic embedded system project at the same time, I found it is my pleasure and passion to communicate with hardware and software using magic programming language and well-trained mathematic methodology. The proper outputs of whole system provide me a sense of achievement, which encourages me to research further and design more advanced devices that interact and perform better.

Besides the course's materials, I have also gained some research experiences and trying to investigate further those interested topics.

In the summer of 2019, I engaged in a blockchain-based car insurance development group leading by Dr. David-Cho as a research assistant. The whole system is aiming for automatic insurance and claims, using the decentralized trust transaction system of blockchain. Applying blockchain in insurance industry can reduce the possibility of insurance fraud and improve the claim efficiency. The whole project then can be integrated with another driver behavior-based auto-pricing algorithm, to form a complete insurance transaction system. My task was to develop a front-end to interact

with the back-end smart contract including user registration, account setting and transaction issue.

In the next 2020 summer, I joined another speech processing group led by Dr. Shun Bai. This group is aiming to develop an integrated audio processing system, which is a more portable and end-to-end hardware product.

As an extent summer research, focusing on audio speech processing using Python, I choose a graduate project which combines hardware (FPGA) and software together (C/C++ and VHDL) to drive hardware acceleration on audio signal processing. This hardware accelerator mainly focuses on using High-Level-Synthesis (HLS), a tool that interacts with Xilinx designed FPGA with various optimized configurable IP solution to speed up the software algorithm.

This project not only has met my initial expectation that communicating and interacting with both hardware and software, but also can guide me into the modern emerging area where machine learning is the dominate strategy of signal processing. I believe the solid and strict requirements of this project and previously taught modules will benefit me in later study and working.

Although I have well trained and practiced in fundamental skills, I am still lacking advanced trouble shooting skills and knowledges, especially in machine learning, signal processing and hardware devices operation. Therefore, I am pursuing a higher degree that can provide me with unique skills and enhance my employment competitivity.

Carnegie Mellon University is one of the most inspiring and leading institutions in Electrical and Computer Engineering over the world. The numerous academic resources in CMU carries interesting research which can provide me lots of help and insightful views. At the same time, for my interests, signal processing and hardware accelerator, CMU posses the most talented and powerful academic staff in these areas appealing and guiding me to investigate further in these domains.