Chang (Kevin) Liu

Phone: (412)251-9235 E-Mail: kevinliu2021@cmu.edu LinkedIn: www.linkedin.com/in/chang-liu-0716

EDUCATION

Carnegie Mellon University

Master of Science in Electrical and Computer Engineering - Applied Program (GPA: 3.86/4.0)

Wuhan University

Bachelor of Engineering in Automation (GPA: 3.73/4.0)

COURSEWORK

Computer System	Sensor Signal Processing	Embedded Operating S
Modern Control Theory	Computer Vision	Machine Learning

WORK EXPERIENCE

Tesla, Inc.

Embedded Software Development Engineer Intern

• Designed the solution for eFuse self-test; conducted design review with the team; implemented the design.

- Refined the hardware overcurrent detection problem by utilizing the interval voltage reading to detect overcurrent direction.
- Improved system response on component MIA, shortening the response time to one-fifth of the original.

Xiamen Saimo Jesoo Technology Co., Ltd.

Software Development Engineer Intern

- Modified a low-cost Segway chassis to build Automated Mobile Robot (AMR) and applied STM32 with FreeRTOS on it.
- Reduced core utilization by using DMA to collect data from peripherals (I2C, SPI, and USART)
- Utilized Lidar, IMU, encoder, and built up SLAM application; optimized repeat positioning accuracy to under 10cm by applying Google's Cartographer algorithm and customized control strategy to chassis.

PROJECTS

Robot System Dev.: The 14th Intelligent Car Race

- Aimed at designing a model race car that can avoid randomly placed obstacles on racetrack; won champion in South China Division Competition (1/25) and first award in National Competition (9/174).
- Developed control system using ROS framework and simulated it in Gazebo environment.
- Increased pose estimation frequency to 5 times by adding inertial navigation to overcome lidar frequency bottleneck.
- Collaborated with team to integrate modules and eliminate delay between modules, increased car speed by 50%.

Embedded System Dev.: The 13th Intelligent Car Race

- Aimed at building two autonomous model cars to race on track; won 2nd award in competition.
- Initiated new circuit design for competition and used Altium Designer for schematic and PCB layout design.
- Delivered circuit design to production, tested it using logic analyzer and oscilloscope; ensured circuits reliability throughout the competition.
- Collaborated with team, accelerated software iteration by encapsulating operations of hardware registers and peripherals into library and providing standard API.

Parallel Processing Project: SSAA

- Designed supersampling anti-aliasing (SSAA) circle-drawing kernel for x86 architecture using SIMD instructions.
- Analyzed calculation process, identified useful instructions, experimented on their properties (throughput and latency), and designed kernel accordingly.
- Improved performance by hiding instruction latencies, eliminating instruction bubbles in pipelines, and balancing workload between functional units.
- Implemented design and tested, achieved 6 times improvement in running speed.

SKILLS

Programming Skills: C, Embedded C, C++, Python, X86 Assembly, Bash Embedded System Dev.: MCS-51, ARM(AVR, STM32, MK60), Raspberry Pi; Logic Analyzer Environment and Tools: Git, IAR, Keil, Altium Designer; Linux, FreeRTOS, Robot Operating System(ROS) ML & CV: Pytorch, Keras; numpy, scikit, matplotlib; OpenCV

Pittsburgh, PA Expected Dec. 2022 Wuhan, China May 2020

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Palo Alto, CA Summer 2022

Xiamen, China Winter 2020

Summer 2019

Summer 2018

Fall 2021