Shih-Hsiang Cheng

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EDUCATION

Georgia Institute of Technology **Jan. 2023 – Present**
Ph.D. in Computer Science, Advisor: Tom Conte *Atlanta, GA*

Georgia Institute of Technology **Aug. 2021 – Dec. 2022**
Master of Science in Computer Science, GPA: 4.0/4.0 *Atlanta, GA*

National Taiwan University **Sep. 2021 – Jun. 2021**
Master of Science in Computer Science and Information Engineering, GPA: 4.06/4.3 *Taipei, Taiwan*
- Thesis: The Design and Implementation of Submillimeter 3-dimensional inspection framework of LGA Socket Using VCSEL Array

National Taiwan University **Sep. 2015 – Jan. 2019**
Bachelor of Science in Computer Science and Information Engineering, GPA: 4.07/4.3 *Taipei, Taiwan*

WORK EXPERIENCE

Green Hills Software **Jun. 2022 – Aug. 2022**
Software Engineering Intern *Santa Barbara, CA*
- Worked on Green Hill's INTEGRITY RTOS laptop, which executed a VM hypervisor on the INTEGRITY secure layer.
- Discovered and fixed bugs in the USB driver for guest VMs, which enabled the USB boot functionality of guest VMs.
- Configured an external PXE server and a DHCP server to install Windows on guest VMs through the network.
- Performed denial-of-service attacks on the internal VPN to verify the reconnection capability on session expiration.

NEWS Lab, NTU **Jan. 2020 – Jun. 2021**
Research Assistant *Taipei, Taiwan*
- Worked on the software development of an automated optical inspection system for LGA 1155 CPU sockets.
- Simulated the laser array structured light in Matlab to optimize the positioning of stereo cameras and the focal plane.
- Developed a 3D algorithm for socket measurements that reached an accuracy of 17 μm, including laser speckle extraction in OpenCV and stereo correspondence matching in Python.
- Introduced correspondence searching heuristics based on vicinity in rectified image space to the 3D algorithm and refactored it in C++ to gain 120x speedup without losing the accuracy.
- Created a GUI with PyQt that incorporates guided instructions on setting up automatic calibration and measurements.

Firsttech Software **Sep. 2019 – Jan. 2020**
Software Engineering Intern *Taipei, Taiwan*
- Worked on a real-time alert system based on StreamBase and Java for suspected unauthorized transactions of credit cards.
- Built a configuration file parser to automatically remove redundant logic for transaction filters and minimize database accesses, which improved the processing rate from 50k to 100k transactions per day.
- Created randomly-generated transaction data varying in content and incoming rate to test the correctness and the capacity of the dashboard showing real-time transactions.

Lilee Systems **Feb. 2019 – Mar. 2019**
Software Engineering Intern *New Taipei, Taiwan*
- Created a balanced labeled dataset of 1000 images out of four hours of road testing videos to strengthen the recall rate of the road sign detection system from 72% to 85%.
- Automated the model fine-tuning pipeline by integrating the ROS bag file parser and the Yolov3 model trainer.

PROJECTS

Robofood | *Python, OpenCV, ROS* **Nov. 2020 – Jan. 2021**
- Built a food preparation robot, which utilized an RGB camera and the robotic arm that grab prongs and knives.
- Performed kitchenware localization with OpenCV through customized image markers as visual hints.
- Designed a motion planning algorithm for the robotic arm that cut the food based on the shape of the food.

jLite Compiler | *Java* **Sep. 2018 – Dec. 2018**
- Implemented a compiler using Java that created ARM assembly from the jLite programming language.
- Generated a three-address code intermediate representation with Jflex lexical analyzer and static type checking.
- Performed optimizations on the three-address code and created a linker that determined memory layout of the assembly.

TECHNICAL SKILLS

Programming Languages: Python, C, C++, Java, HTML/CSS, JavaScript, SQL, Unix Shell Scripting
Toolkits: OpenCV, Matlab, Matplotlib, Git, Docker, PyQt, ROS, GDB