Christian (Duc Vinh) Luu

christianvluu@gmail.com ❖ (909) 312-9108 ❖ U.S. Person

EDUCATION

Carnegie Mellon University **May 2023 (BS) & May 2024 (MS)**

- *BS & MS, Electrical Computer Engineering (3.66/4.0 GPA)* *Pittsburgh, PA*
- **Coursework (Taken)**: Embedded Systems, Mobile Robot Algorithms Lab, Computer Vision, Mechatronics, Computer Graphics, Applied ML, Principles of Imperative Computation, Robot Kinematics & Dynamics.
- **Coursework (In-progress)**: Distributed Systems, Embedded Software Engineering, Space Robotics.

WORK EXPERIENCE

Blue Origin - Software & EGSE **May 2023 – Aug. 2023**

Software Engineering Intern *Kent, WA*

- Improved performance of test software suite (Python) by over 50% via a data caching mechanism.
- Wrote software and configured **real-time** drivers to run on test racks conducting **automated hardware testing** to qualify flight-critical avionics hardware. Interfaced with **programmable instruments** including **PSUs, DMMs,** etc.
- Created Bash script to perform automated testing to check compatibility across different developer environments.
- Drew detailed schematics and wrote documentation for **RF test equipment**.

Caterpillar Inc. – Autonomy and Automation Group **May 2022 – Aug. 2022**

Engineering Intern (ADAS - Advanced Driver Assistance Systems) *Mossville, IL*

- Programmed (C++) **collision detection algorithm** for a variety of Caterpillar machines in a production-intent codebase.
- Improved, updated, and finalized schematics for **HIL/SIL** benches with **CAN/Ethernet** and power faulting capabilities.
- Created customizable and adaptive **GUI** to control HIL/SIL benches. Modular design allows for integration with simulation and automated testing.
- Characterized performance of **object detection cameras** to aid in system design and component selection.

Biorobotics Laboratory – Carnegie Mellon University **Sept. 2019 – May 2022**

Undergraduate Research Assistant *Pittsburgh, PA*

- Paid fellowship under the Summer Undergraduate Research Fellowship (SURF) from Sept. 2021 – May 2022.
- Utilized simulations in **Gazebo (via ROS) and Bullet** as a proof-of-concept for a technique that allows for gait compliance in robots without joint-level torque-sensing.
- Refined adaptive control algorithms using ML for a snake robot with over 15 DoFs to traverse different terrains.
- Fabricated, assembled, and coded a modular, centipede-like robot to adaptively traverse terrain of different slopes.

PROJECTS

Robobuggy (Self-Driving Buggy) **Apr. 2022 – Present**

- Architected autonomous software (Python) and **ROS** stack that incorporated perception, positioning, and controls.
- Wrote formal software requirements specification to ensure alignment between firmware and software teams.
- Mentored and on-boarded 8 people on developer workflow and developer tools (**Docker, Git**).
- **Created simulator** for controls testing; provides a plug and play solution compatible with autonomous software stack (used with Pure Pursuit, Stanley, and MPC).

RTOS + Embedded Software for STM32 ARM Cortex MCU **Aug. 2022 – Dec. 2022**

- Created **bootloader**, implemented **I2C** and **UART** with **interrupts** for serial communication, and wrote **device drivers** to interface with LED display, microphone, and light sensor.
- Created **RTOS** for use with motor controller, servo controller, LED display, light sensor, microphones, serial devices, etc.
- Optimized **ARM Assembly** to achieve a **17x improvement in speed**.

SKILLS & INTERESTS

- **Coding Skills:** Python, C, C++, x86 & ARM Assembly, Bash, MATLAB.
- **Packages/Frameworks:** QT, OpenCV, Pytorch, Scikit-Learn.
- **Technical Tools/Hardware:** ROS, Gazebo, Git, Linux, Docker, Bullet, Virtual Machines, Microcontrollers.