JOSHUA LIU

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EDUCATION

Carnegie Mellon University
M.S. Electrical and Computer Engineering 2020

University of Michigan
B.S.E. Computer Engineering 2018
GPA: 3.7/4.0

COURSEWORK

Master's Coursework
Foundations of Computer Systems | Introduction to Machine Learning (Master's) | Embedded Software Engineering

Bachelor's Coursework
Autonomous Robotics Design Experience | Introduction to Machine Learning | Introduction to Operating Systems | Embedded Control Systems | Embedded System Design | Data Structures and Algorithms | Introduction to Computer Organization

EMPLOYMENT

General Motors — Warren, MI
Software Engineer - AV Mapping & Localization — Mar. 2019 to Aug. 2019
- Developed mapping algorithms for GM's highly advanced autonomous driving system.
- Implemented a proof-of-concept SQLite database to store heavy volumes of complex map data in a robust, efficient schema.
- Evaluated and refined map data models to more accurately represent road signs, traffic lights, and road markings.
- Interfaced with other algorithm developers, data scientists, and system architects to achieve extremely capable self-driving vehicles.

General Motors — Milford, MI
Software Integration Engineer — July 2018 to Mar. 2019
- Integrated and tested software features for GM's Co-pilot and Supercruise active safety autonomous platforms.
- Lead troubleshooting vehicle level integration issues including hardware, software, calibration, and instrumentation.
- Validated software integration functionality using a bench and/or vehicle.

Goldman Sachs — New York City, NY
Software Engineering Intern — June 2017 to Aug. 2017
- Responsible for backend development of Java application to query financial data.
- Created RESTful API to connect Java application backend to fleet of financial data calculators to deliver to customer.
- Configured pool of direct computing hosts to allow single threaded applications to run in parallel.
- Revised and expanded team's SQL data model to provide additional functionality to fulfill user requirements.

Ford Motor Company — Dearborn, MI
Product Development Intern — May 2016 to Aug. 2016
- Developed an interoperability analysis matrix to provide a roadmap for future electric vehicle testing.
- Conducted root cause analysis of software issues used in Vector CANalyzer software.
- Performed vehicle level testing for DC fast charge interoperability.

PROJECTS

"Designated Sinkers": Beer Pong Thrower — Mar. 2018
Autonomous Robotics Design Project
- Robotic arm used in conjunction with an Xbox Kinect camera to play a highly successful game of beer pong.
- Implemented forward & reverse kinematics algorithms, as well as a torque regression model for a successful throw.
- RexArm robotic arm consisting of 5 Dynamixel motors and a 3D printed gripper.

"Mbot": Robot Mapping and Exploration — Feb. 2018
Autonomous Robotics Design Project
- 2-wheeled robot capable of exploring and mapping an unknown environment using SLAM.
- Implemented occupancy grid mapping algorithm, Monte Carlo Localization, and SLAM.
- Mbot equipped with a 2D lidar, magnetic wheel encoders, and a MEMS 3-axis IMU.

"BP Champs": Ping Pong Shooter — Mar. 2017
Embedded System Design Project
- Ping Pong ball shooter using DC and servo motors controlled via a Nintendo-64 controller using an ARM Cortex M3 based prototyping board.
- Implemented DC motor and servo motor functionality, as well as LCD display interface.
- Ping pong shooter integrated with computer vision to allow simple autonomous control.

SKILLS

PROGRAMMING: C++, Python, C, Java, MATLAB, Bash, SQL, HTML/CSS
APPLICATIONS: Actel Libero, Altera Quartus, INCA, Microsemi SoftConsole, Simulink, Vector CANalyzer, Vehicle Spy
OPERATING SYSTEMS: Linux, Ubuntu, macOS, Windows

ACTIVITIES

University of Michigan HAIL — 2018 to Current
Alumni Interviewer
- Interview prospective Michigan Engineering applicants in comfortable conversational settings.
- Share my personal Michigan experience and establish personal connections with applicants.

Vehicle Engineering TRACK 101 — 2018 to 2019
VE TRACK 101 Advisory Board Lead
- Coordinated seminars for TRACK engineers to develop their technical knowledge ranging from vehicle systems to workplace skills.
- Facilitated networking through interaction with leadership and other TRACK engineers.
- Organized Autonomous and Electric Vehicle sessions, Resume Workshop, and Interview Workshop.