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LUKE SHIMANUKI

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EXPERIENCE

Senior Software Engineer (Motion Planning) *Aurora Innovation* 2022 - present
Developed models for predicting and planning semantic driving behaviors such as merging and lane changing.

SDE II --> Senior SDE (Planning & Controls) *Magna Electronics (formerly Optimus Ride)* 2020 - 2022
Designed and implemented probabilistic model for inferring trajectories and interactions between road users.
Formulated requirements and algorithmic design for ADAS features following auto industry safety standards.

Intern (Prediction) *Cruise Automation (General Motors)* Summer 2018

SWE Intern (Perception) *Optimus Ride (L4 self-driving)* Summer 2017

Intern (Machine Learning / Vision) *RightHand Robotics (warehouse picking)* January 2017

Developer *Tanius Technology (proprietary trading)* 2015 - 2016

RESEARCH

MIT CSAIL Learning and Intelligent Systems Group 2017 - 2020

WAFR 2018 & IJRR 2021	Lower bounds for 2D motion planning under obstacle uncertainty
WAFR 2022	Fixed-parameter algorithm for motion planning under obstacle uncertainty
CoRL 2019 & IJRR 2021	Value functions for guiding task-and-motion planning using graph networks
[unpublished]	Safe control avoiding moving obstacles with unobservable policies
[unpublished]	Leveraging hierarchies to efficiently solve robotic planning tasks / POMDPs

Stanford Autonomous Systems Laboratory Summer 2015

ICRA 2016	Efficiency of vehicle routing algorithms based on real-world ride requests
Intel STS 2016	Vehicle routing algorithm with 10% improvement over state-of-the-art in simulation

EDUCATION

Massachusetts Institute of Technology 2016 - 2020
M.Eng Electrical Engineering & Computer Science (AI Concentration), GPA 5.0 (out of 5)
S.B. Double Major in Computer Science and Brain & Cognitive Science, GPA 4.9 (out of 5), 5.0 in-major (CS)

ACTIVITIES

Site Manager *Food for Free COVID-19 Relief Program* 2020
Directed team of volunteers for packing and delivering groceries to ~300 households weekly.

Program Director, Head Webmaster *MIT Educational Studies Program* 2017 - 2020
Directed educational programs reaching ~3000 MS/HS students with ~1000 classes taught by ~500 teachers and run by ~100 volunteers. Mentored future directors. Maintained website used by ~5000 students.

Software Lead *AVBotz* 2012 - 2016
Led the software team (~12 members) for fully-autonomous submarine for manipulating objects, aiming and shooting torpedoes, and navigating around obstacles. International finalist (7th Place) at RoboSub 2015.

Co-President, HPMS Branch Director *ACE Coding* 2013 - 2016
Managed ~16 volunteers to teach weekly programming lessons to ~100 middle school students annually. Organized ACE Code Day, an 8 hour event attracting ~300 students. Taught machine vision workshop.

Middle School Tutor *Cambridge School Volunteers* 2019 - 2020

SKILLS

Proficient in:	C	C++	Python	Javascript	Java	UNIX Shell
Familiar with:	C#	LabView	Matlab	Simulink	Scala	x86 Assembly

AWARDS

USA Computing Olympiad Platinum Division
Eagle Scout
Intel Science Talent Search 2016 Semifinalist
MIT Battlecode 2018 Finalist (9th place)

PROJECTS

C++	Low latency audio streaming to enable remote musicians to play in-sync
C	Web browser using Chromium's rendering engine with configurable vi-like key bindings
C	C compiler to convert C code to x86 assembly
Java	Neural network AI for a multiplayer platformer fighting game
Python	Musical autocomplete to assist chord and melody composition
Python	Gridded workspace manager for the i3 Window Manager