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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 automotive industry safety standards.		
	Intern (Prediction)	Cruise Automation (General Motors)	Summer 2018
	SWE Intern (Perception)	Optimus Ride	Summer 2017
	Intern (Machine Learning / Vision)	RightHand Robotics	January 2017
	Developer	Tanius Technology (prop trading firm)	2015 - 2016
RESEARCH	MIT CSAIL Learning and Intelligent Systems Group		2017 - 2020
	Proved NP-hardness of 2D motion planning under obstacle uncertainty. WAFR 2018 & IJRR 2021		
	Developed efficient fixed-parameter algorithm for motion planning under obstacle uncertainty. WAFR 2022		
	Modeled value functions for guiding task-and-motion planning using graph networks. CoRL 2019 & IJRR 2021		
	Defined constraints for safe control in the presence of mobile obstacles with unobservable policies. (preprint)		
	Designed system leveraging hierarchies to efficiently solve robotic planning tasks / POMDPs. (unpublished)		
	Stanford Autonomous Systems Laboratory		Summer 2015
	Developed simulations comparing vehicle routing algorithms based on real-world ride requests. ICRA 2016		
	Designed vehicle routing algorithm with 10% improvement over state-of-the-art in simulation. Intel STS 2016		
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)		
	Embedded Systems	Quantum Computation (G)	Natural Language Processing
	Machine Learning (G)	Theory of Computation (G)	Advanced Data Structures (G)
	Operating Systems (G)	Robotics Science & Systems	Computational Linguistics (G)
			Computational Intelligence (G)
			Computational Cognitive Science
			Design & Analysis of Algorithms
ACTIVITIES	Site Manager	Food for Free COVID-19 Relief Program	2020
	Directed team of volunteers for packing groceries and handing off to drivers to deliver to ~300 households weekly.		
	Program Director, Head Webmaster	MIT Educational Studies Program	2017 - 2020
	Directed educational programs (Splash, Summer HSSP) reaching ~3000 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
	Managed the programming team (~12 members) for autonomous submarine capable of 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++
	Familiar with:	C#	LabView
	Libraries:	ROS	OpenCV
			Python
			Javascript
			Java
			UNIX Shell
			Matlab
			Simulink
			Scala
			x86 Assembly
			Theano
			PyTorch
			ReactJS
			TensorFlow
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 musicians to play together in-sync remotely using UDP hole-punching	
	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 autocompleter to assist chord and melody composition	
	Python	Gridded workspace manager for the i3 Window Manager	