

**SHILOH S. S. CURTIS**

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shilohc.github.io/portfolio

<b>EXPERIENCE</b>	<b>Robotics Engineer Intern</b> <i>C++, Python, Bazel, MediaPipe, gRPC, scikit</i> Robust AI Palo Alto, CA Summer 2020 Modified MediaPipe to use RealSense D435i for hand skeleton tracking Collected dataset of hand poses; designed and developed ML pipeline to classify hand skeletons into pose categories
Artificial Palo Alto, CA Summer 2019	<b>Robotics Engineer Intern</b> <i>Python, asyncio, OpenCV, Docker</i> Designed 2-finger gripper interface for robot software framework Developed drivers for Robotiq 2F-85 and OnRobot RG2 Created demo of object detection and reactive grasping using Precise Automation PF400 arm Used OpenCV to detect objects with colored markers
MIT CSAIL - DRL Cambridge, MA Fall 2018 - Spring 2019	<b>UROP Research</b> <i>C++, Python, ROS</i> Implemented ROS node to segment RGB-D data into object point clouds using pretrained Mask R-CNN model on depth data Refactored monolithic planar segmentation node into efficient, unit-tested C++ library with backward-compatible ROS wrapper
Iron Ox San Carlos, CA Summer 2018	<b>Robotics Engineer Intern</b> <i>C++, Python, ROS, Gazebo, OnShape</i> Implemented fiducial-based localization using ROS Created static fiducial maps using Ceres Solver Used robot_localization to fuse pose estimates from fiducial map with other sensor data Helped design power/safety circuits for 1,000 lb Module Mover robot
Google Mtn. View, CA Summer 2017	<b>Engineering Practicum Intern</b> <i>C++, gRPC, gUnit, Bazel</i> Developed C++ backend for internal data storage debug tool Helped design RPC API (protocol buffer) to interface with frontend Integrated with access control system to protect sensitive user data
Fetch Robotics San Jose, CA Winter 2015-16	<b>Robotics Engineer Intern</b> <i>Python, ROS, Gazebo</i> Developed autonomous mapping ROS node, incorporating research on Next-Best-View problem to select navigation goals Used Voronoi diagrams for room segmentation in 2D grid map Mapped large, unstructured office environment using "Freight" robot
<b>EDUCATION</b>	<b>Massachusetts Institute of Technology</b> <i>EECS (Course 6-2)</i>
BS 2020	6.834 Cognitive Robotics
MEng 2021	6.881 Intelligent Robot Manipulation
GPA: 4.8/5.0	6.141, 6.832 Intro to Robotics, Underactuated Robotics
	6.302, 2.151 Feedback Systems, Advanced System Dynamics and Control
	6.036 Intro to Machine Learning
	6.008, 6.041 Intro to Inference, Intro to Probability
<b>PATENT</b>	U.S. Patent 62/920,958 (pend.)
<b>PROJECTS</b>	<b>ADDITIONAL SKILLS</b> ROS (Robot Operating System), RViz, Gazebo Embedded C for Atmel AVR microprocessors, MicroPython, Arduino Surface-mount and through-hole soldering; PCB design (gEDA) 3D printing and 3D CAD (SolidWorks, OnShape)  See my portfolio for more details!

PROJECTS	DESCRIPTIONS
<b>map2gazebo</b> 2020 - present	<b>Tool that converts maps to Gazebo worlds</b> <i>Python, trimesh, ROS</i> Created ROS package providing a skeleton Gazebo world and a node that converts 2D maps to 3D meshes by extruding occupied pixels up Can also be used to generate a mesh from a drawing published as a map Project page: <a href="https://github.com/shilohc/map2gazebo">github.com/shilohc/map2gazebo</a>
<b>Handle Detector</b> 2019 - 2020	<b>Handle identifier using quadric fitting</b> <i>Python</i> <i>Class project for 6.881 Intelligent Robot Manipulation.</i> Designed and implemented handle detection pipeline for use on a segmented point cloud, using a recent algorithm for fast approximate quadric fitting and some simple heuristics on quadric shape Read more: <a href="https://shilohc.github.io/blog/posts/handle_detector/6881_paper.pdf">shilohc.github.io/blog/posts/handle_detector/6881_paper.pdf</a>
<b>“Typewriter”</b> 2018 - 2019	<b>Custom mechanical keyboard</b> <i>OnShape, QMK</i> Designed, 3D printed MX-switch adapters for vintage typewriter keys Assembled keyboard using DZ60 PCB, 3D-printed case, Kailh Box Navy switches, and typewriter keys Used open-source QMK firmware to program custom keyboard layout Read more: <a href="https://shilohc.github.io/blog/posts/typewriter_keyboard">shilohc.github.io/blog/posts/typewriter_keyboard</a>
<b>Sting Operation</b> 2016 - present	<b>Telepresence robot</b> <i>MicroPython, ROS, git</i> Augmented wheeled robot base with LIDAR, Pyboard, Raspberry Pi, iPad Wrote motor and LIDAR controllers in MicroPython for Pyboard Designed serial protocol between Pyboard and Raspberry Pi
<b>H-NAV</b> 2013 - 2015	<b>Navigation aid for the blind</b> <i>C, gEDA, AVR, git</i> Designed, built, and tested LIDAR-based haptic navigation aid hat Designed rigid and flexible PCBs Wrote C software for Atmel microprocessors (ATMega324, ATTiny2313) 2015 Bronze Medalist, International I-SWEEP National Today Show Make the Future Award 2014 Project of the Year, California State Science Fair Americas Regional Finalist, Google Science Fair National Finalist, Junior Science and Humanities Symposium National Popular Mechanics Next Generation Breakthrough Award Read more: <a href="https://shilohc.github.io/blog/posts/hnav">shilohc.github.io/blog/posts/hnav</a>
<b>Turtlebot</b> 2012	<b>Mock turtlebot</b> <i>Python, ROS, SolidWorks, git</i> Designed, built robot consisting of iRobot Create, automotive mother-board, Asus Xtion depth camera, USB foam-dart turret Brought up, calibrated ROS navigation stack Wrote ROS nodes to control foam-dart turret, process joystick input
<b>Doohingus Maximus</b> 2011 - 2013	<b>Tablebot</b> <i>NXC</i> Constructed LEGO Mindstorms NXT robot for Tabletop Challenge (an autonomous robot on a table must locate a block and push it into a goal) Wrote software in NXC, a C-like programming language for the NXT 2011 - 13 RoboGames Tabletop Challenge medalist (2 gold, 1 silver)
<b>Ausgangssucher</b> 2010 - 2011	<b>Floor-based robot</b> <i>Python</i> Replaced Neato XV11 dustbin with BeagleBoard running Linux Designed, implemented subsumption behavioral controller
<b>ORGANIZATIONS</b>	Member: SWE, IEEE, ACM, ARRL