SHILOH CURTIS
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shilohc.github.io/portfolio

EXPERIENCE

Robotics Engineer Intern — Python, asyncio, OpenCV, Docker, git
Artificial
Palo Alto, CA
Summer 2019

- Designed 2-finger gripper interface for robot software framework
- Developed drivers for Robotiq 2F-85 and OnRobot RG2
- Designed and developed demo of object detection and reactive grasping using Precise Automation PF400 arm
- Used OpenCV to detect objects with colored markers

UROP (Undergraduate Research) — C++, Python, ROS, git
MIT CSAIL - DRL
Cambridge, MA
Fall 2018 - Spring 2019

- 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

Robotics Engineer Intern — C++, Python, ROS, Gazebo, OnShape, git
Iron Ox
San Carlos, CA
Summer 2018

- Implemented fiducial-based localization using ROS
- Created static fiducial maps using Ceres Solver
- Used robot_localization to fuse pose estimates derived from fiducial map with other sensor data
- Helped design power/safety circuits for 1,000 lb Module Mover robot

Engineering Practicum Intern — C++, gRPC, gUnit, Bazel
Google
Mtn. View, CA
Summer 2017

- Developed C++ backend for internal data storage debug tool
- Helped design RPC API (protocol buffer) to interface with frontend
- Integrated with proprietary access control system to protect access to sensitive user data

Robotics Engineer Intern — Python, ROS, Gazebo, git
Fetch Robotics
San Jose, CA
Winter 2015-16

- Developed autonomous mapping ROS node
- Incorporated recent autonomous mapping research on Next-Best-View problem of navigational goal selection
- Used Voronoi diagrams for room segmentation in 2D grid map
- Mapped large, unstructured office environment using "Freight" robot

Summer Intern — Java, Python, ROS, git
OLogic, Inc.
Sunnyvale, CA
Summer 2014
Summer 2013

- Augmented Android app for early-access dev release of Google's Project Tango to publish point-cloud and odometry data via ROS
- Brought up, calibrated Willow Garage Turtlebot, replacing XBox Kinect with Hokuyo LIDAR
- Developed ROS node and customer demo for a prototype LIDAR

EDUCATION

MIT / 2020 — BS CS/EE (Course 6-2)
GPA: 4.8/5.0

- 6.881 Intelligent Robot Manipulation (upcoming)
- 6.141, 6.832 Intro to Robotics, Underactuated Robotics
- 6.302, 2.151 Feedback Systems, Advanced System Control (upcoming)
- 6.002, 6.004 Circuits and Electronics, Computer Architecture
- 6.006, 6.046 Algorithms
- 6.036 Intro to Machine Learning
- 6.008, 6.041 Intro to Inference, Intro to Probability

PATENT

U.S. Patent 62/920,958 (pend.)

PROJECTS

ADDITIONAL SKILLS

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)

PROJECTS	DESCRIPTIONS
2018-2019	**Typewriter Keyboard: a custom mechanical keyboard** OnShape, QMK 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
2016-present	**Sting Operation: a telepresence robot** MicroPython, ROS, git Augmented minimal base with LIDAR, Pyboard, Raspberry Pi, iPad Wrote motor and LIDAR controllers in MicroPython for Pyboard Designed serial protocol between Pyboard and Raspberry Pi
2013-2015	**H-NAV: a navigation aid for the blind** C, gEDA, AVRs, git 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-SWEEEP 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
2012-present	**Turblebot: a mock turtlebot** Python, ROS, SolidWorks, git Designed, built robot consisting of iRobot Create, automotive motherboard, 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
2011-2013	**Doohingus Maximus: a tablebot** NXC Constructed LEGO Mindstorms NXT robot for Tabletop Challenge (autonomous robot must, while remaining on a table, locate a block and push it into a goal) Wrote software in NXC, a C-like programming language for the NXT 2011-2013 RoboGames Tabletop Challenge medalist (2 gold, 1 silver)
2010-2011	**Ausgangssucher: a floor-based robot** Python Replaced Neato XV11 dustbin with BeagleBoard running Linux Designed, implemented subsumption behavioral controller
ORGANIZATIONS	Member: SWE, IEEE, ACM, ARRL