Taylor "Sequoia" Alexander

Senior Robotics Engineer She/Her Oakland, CA (831) 663-7901

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Technical Skills

Software Development - Python, C++, Bash, Linux, Docker, Redis, ROS, Git, Web, Android/Java, Embedded

PCB Design - Altium, KiCAD, SMT PCB Assembly, Embedded Systems, Radio Systems, Brushless Motor Control, Sensors, Switching Power Supplies, Ethernet, Oscilloscopes, Work With Chinese PCBA CMs

CAD/CAM - OnShape, Solidworks, MasterCAM, CNC Machining, 3D Printing, Design for Manufacturing, CNC Plasma Cutting, Aluminum MIG Welding

Robotics - CAN bus, RS485, LIDAR, Cameras, TOF sensors, IMUs, High Resolution Magnetic and Induction Encoders, Motor Control, Safety Systems

Patents

US10086894B2 - Motorcycle Helmet Safety Device
US20200391378A1 - Robot Grip Detection Using Non-Contact Sensors
US10682774B2 - Sensorized robotic gripping device

Professional Experience

Twisted Fields - San Gregorio, CA - Robotics Lead

Designer & Sole Engineer for 4+ years (since inception), autonomous solar powered farming robot

March 2019 - Present

- Software
  - Wrote a clean-slate python robotics stack with full autonomy using RTK GPS.
  - Software also included a python/redis database server and web UI.
  - Worked with Linux kernel devs on github to update the CAN-ISOTP kernel module.
  - Wrote C++ motor control and CAN bus interface code.
- Hardware
  - Designed all electronics including Raspberry Pi CM4 motherboard, brushless motor controllers (60v 50A), induction angle sensor, power management, and others.
  - Designed and fabricated aluminum tube frames with plasma cutting and welding.
  - Designed and fabricated integrated robotic powered casters for off road use.
- Community
  - Launched a community forum and youtube channel, produced promo videos.
  - Launched a non-profit crowdfunding portal with thousands of dollars of donations.

Adecco at Google [X] Robotics - Mountain View CA - Manufacturing Software Engineer

July 2017 - Feb 2019

- Wrote python libraries and programs to support testing of robotic components, subassemblies, and complete assemblies with code review to Google standards.
- Used GRPC and C++ to write a control program for a windows-only sensor DLL that could be controlled from a linux test station.

Adecco at Google [X] Robotics - Mountain View CA - Mechatronics Prototype Engineer

FEB 2017 - July 2017

- Designed a custom sensor for robotics including 3 revisions of PCB design (Altium) and complete C++ embedded drivers. (see patents)

Toyota InfoTechnology Center - Mountain View CA - Robotics Software Engineer

AUGUST 2016 - FEB 2017

- Software Engineer for Toyota's HSR (Human Support Robot) platform running ROS.
- Developed C++ software that allows the robot to locate a specific person in any room.
- Created an end to end demo to pick up a water bottle and bring it to a person.
- Built robot training web page with javascript, bootstrap, and roslibjs.

Electric Movement at Google - Mountain View CA - Robotics Software Engineer

JULY 2015 - July 2016

- Wrote ROS nodes for Human Robot Interaction, LIDAR data processing, and more.
- Designed operator web interface with bootstrap and javascript.
- Participated in customer strategy meetings and created a 24 month development timeline.

Flutter Wireless - Los Gatos CA - Founder and sole Engineer

JAN 2013 - Jan 2018

- Raised $150k from 1600 backers on Kickstarter for Arduino-based wireless device.
- Designed ARM-powered production radio hardware that passed FCC and CE tests.
- Wrote radio communication stack including low level drivers & frequency hopping logic.
- Managed overseas production and testing of 8000+ PCBAs

AWS Inc - San Jose CA - Mechanical Engineer

MAY 2006 - JUNE 2013

- Responsible for mechanical design, manufacturing, and daily machine shop operations at an industrial torque sensor manufacturer.
- Wrote Windows, Windows CE, and Android apps with SQLite databases.
- Worked with Chinese CMs to bring 1000+ PCBAs to production.

Personal Projects

Rover: 3D Printed Four Wheel Drive Vehicle NOV 2017 - PRESENT

- Designed two versions of a 4WD vehicle with brushless motors and planetary gearboxes.
- Used four cameras and NVIDIA Jetson Xavier to collect image data, hand labeled it for image segmentation, and trained a model to detect off road trails and walking paths.

Brushless Linear Motors DEC 2011 - JAN 2013

- Simulated motor designs in LUA using FEMM, an open source magnetics simulator.
- Designed motor controller, 6-cell lithium battery charger, non-contact position sensor.
- Filed a patent which included 30+ pages of text and diagrams.

Education

Santa Clara University, Santa Clara CA - Mechanical Engineering - **2003 - 2007**

Publications

Alexander, Taylor L. "Sanctuary, The Machine, and reboot.love: Stories of robots that bring us closer together." Self Published May 2018. PDF at: tlalexander.com/static/zine.pdf

Alexander, Taylor L. "The Future of Robotics Technology." *Circuit Cellar* #308 (March 2016): http://circuitcellar.com/cc-blog/the-future-of-robotics-technology/

Alexander, Taylor L. "3D Print a Badass RC Race Car" *MAKE* #46 (August-September 2015): http://makezine.com/projects/3d-print-badass-rc-race-car/