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Summary

Software developer and robotics engineer with a strong history designing, developing, and delivering robust solutions. Significant experience in backend / API development, front-end web development, and automated test, build, and deployment pipelines. Robotics specialities include electrical integration, embedded controllers and complex algorithms, especially localization, navigation, and computer vision. Looking to further my experience with robotics, computer vision, and machine learning. More at https://joshvillbrandt.com/.

Work Experience

Gravitr, Inc. – Cofounder and CTO   March 2019 - August 2019
- Led development of gravitr.com marketing platform; tracked development in weekly sprints w/ Jira
- Front-end built with Typescript and React; back-end built with Python, Django, and Django REST Framework
- Automated test pipeline with CircleCI; automated deployment using AWS for staging and for production
- AWS technologies used: EC2, ECS, Fargate, Route53, ECR, RDS, S3, CloudWatch, and Certificate Manager

inVia Robotics – Lead Engineer, Robot Management System (RMS)   December 2018 - March 2019
- Led a team to rebuild Robot Management System from scratch with increased throughput for 100+ robots per deployment

inVia Robotics – Software Developer   November 2017 - December 2018
- Created our Automated Storage and Retrieval System (AS/RS) application which integrates between customer WMS's and our RMS
- AS/RS application provides a REST framework, business logic, unit tests, and automated documentation
- Created an orchestration framework for our apps to automate merge request testing, customer deployments, and nightly simulations
- Created a Monte Carlo framework to simulate a large state space to gain confidence in new features before customer rollout
- Technologies: Python, Django, Django REST Framework, PostgreSQL, Ansible, Systemd, Grafana, AWS, EC2, S3, Gitlab CI

SpaceX – Software Developer   January 2014 - November 2017
- Led a team to create a design tool for complex avionics systems; now used by hundreds of people for all three major vehicles
- Managed team sprints (using JIRA Agile) and quarterly priorities to deliver features with the most impact to the company
- Data-driven system design used as a foundation for automating vehicle harness design, system analysis, and integrated test procedures
- Developed primary application schema and supporting RESTful HTTP APIs using MongoDB, Python, and Eve
- Developed front-end interface as an Angular SPA including rich viewers for avionics components and systems using Raphael and D3
- Utilized continuous integration with Bitbucket and Bamboo and automated deployment to AWS GovCloud
- Technologies: JavaScript, Angular, Autobahn, Lodash, D3, Raphael, Karma, Jasmine, Protractor, LESS, Bootstrap, Brunch, Vagrant, S3

SpaceX – Avionics Systems Integration Engineer   April 2011 - January 2014
- Designed avionics systems architecture for Dragon 2 pad abort capsule and related propulsion test article
- Designed vehicle-in-the-loop test racks to simulate spacecraft sensors during mission simulations

Blue Robotics – Cofounder and Engineer   January 2014 - February 2016
- Designed an autonomous surfboard with solar panels, thrusters, and a satellite comm link; numerous successful ocean trials (blog, github)
- Developed end-to-end, real-time satellite communication using Rock Seven API, Heroku, and MongoLab (github, github)
- Developed a real-time mission monitoring website including Google Maps integration, live telemetry plots, and vehicle control (github)

Projects

Mecanumbot   July 2012 - January 2016
- Designed and built a power monitoring and distribution PCB with Arduino bootloader using Eagle (blog, github)
- Software projects included Hector SLAM (github) and a following algorithm using point clouds through C++ and ROS (blog, github)

USC AeroDesign Team – Performance Captain   January 2009 - July 2010
- Created a multidisciplinary design optimizer in MATLAB to determine ideal plane specifications based on mission requirements

Popular Github Repos: wireless, goprohero, elp-stereo-camera-ros-pkg

Education

M.S. Computer Science (Intelligent Robotics)   Fall 2012
University of Southern California (USC)

B.S. Aerospace Engineering, minor in Computer Science   May 2011
University of Southern California (USC)