Zachary Witte

Robotics Software Engineer

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EXPERIENCE

Marble Robot, Inc., San Francisco — *Founding Robotics Software Engineer*

February 2016 - PRESENT

Focusing on perception including sensor fusion, on-robot machine learning, scene understanding, and perception ground truth evaluation systems. Joined as Marble's first robotics software engineer and have touched most parts of the software system. Code in C++ and Python.

- Designed and led development on an automatic evaluation and regression testing framework for object detection, tracking, classification systems against a diverse ground truth dataset.
- Implemented end-to-end pedestrian detection system fusing multiple cameras and LIDAR sources using a combination of machine learning (YOLOv3 and ICNet) and geometric methods.
- Implemented a drivable area detection system combining RGB semantic segmentation (ICNet) and depth sensors into an obstacle grid.
- Built a teleop system operating over LTE including video streaming using webRTC and a robust and safe controls protocol. Used VP8 hardware encoding & camera ingestion on nvidia TX2.
- Architected and led development on a web-based command and control dashboard for our robot fleet.
- Implemented a robot routing system similar to driving directions using A* directed graph.
- System-wide diagnostics aggregation and reporting framework.

HandUp.org, San Francisco — *Co-founder & CTO*

May 2013 - January 2016

Co-founded a philanthropic public benefit corporation to fight urban poverty through technology and building human relationships. Won Google.org grants and venture backing from top angel investors including Jason Calacanis, SVAngel, and Marc Benioff.

PubNub, San Francisco — *Lead Engineer*

October 2011 - July 2013

Joined as employee #1, pre-funding and continued to work as lead engineer and architect. I designed, implemented, and maintained mission-critical systems processing up to 2 million messages per second

SKILLS

C++, Python, Javascript

Sensor fusion

Computer vision

Machine learning (Tensorflow, data ingestion)

Robotics platform & infrastructure

ROS

Linux administration

Real-time video streaming

Distributed systems

Full-stack web development

ACTIVITIES & AWARDS

Udacity Self-Driving Car Nanodegree

Software Group Leader, IEEE Robotics Team, UW–Madison

Innovative Schools Scholarship

Dean's List

US CITIZEN

in production with a globally distributed architecture. I built a continuously aggregating analytics system processing terabytes of log data. Every component was designed from the ground up to be parallel, decentralized, and fully redundant. In addition to my role as a lead engineer I played an important part in business strategy and product design.

Used Python, C, MongoDB, Cassandra, various AWS products, ZeroMQ, nginx, d3.js, backbone.js, wrote HyperLogLogDB.

Castlight Health, San Francisco — *Data Warehousing Engineer*

July 2010 - October 2011

Backend engineer focusing on data warehousing & analytics. I managed business interests and implemented our internal content management tools. Later, as I transitioned to a data warehouse focus, designing and building our custom, highly dimensioned reporting and analytics framework written from scratch in Python / MySQL. Met with business interests to establish priorities, a roadmap, and onboarded new engineers.

Self-employed, San Francisco & Chicago

March 2001 - July 2010

Full-stack consulting and contracting services.

midVentures, Chicago — *CTO*

January 2009 - August 2009

Small firm involved in several consulting and contracting projects.

PEAK6 Investment, Chicago — *Infrastructure Engineer*

January 2009 - August 2009

Worked in the core technologies group responsible for development of distributed application infrastructure with OptionsHouse, the options brokerage arm of PEAK6, a Chicago hedge fund and capital management group. Responsible for integrating a new Java Messaging System for inter-server communications platform using SwiftMQ and successfully carried out a zero downtime rollover to the new technology. Developed a framework for distributed stress testing, integration testing, unit testing and benchmarking with realistic traffic simulations covering numerous use-cases. Defined metrics to measure performance of each critical application component. Identified and attacked bottlenecks, optimizing infrastructure by leveraging low-level knowledge of Linux and highly multi-threaded applications. Wrote an intelligent, application-specific, real-time, continuous database diff tool to synchronously compare live production databases during migration from Oracle to Postgres.

EDUCATION

University of Wisconsin - Madison — *B.S. Computer Science*

Graduated 2008

Study abroad year at Kingston University in London