Ben Blumer

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OBJECTIVE

A physicist turned robotics engineer with 10 years of experience developing prototype and production software (ROS, ROS2, Python, Django, C++, robot localization incl. Kalman filtering), firmware (Raspberry Pi, Arduino), electrical (sensors, actuators), and hardware (robot components & chassis, 3D printers, laser cutters, CNC mills). I've worked with robotics technology (robot arms, mobile robots, ROS, Gazebo, motion planning, vision) in construction, medical, and manufacturing environments. My background in physics (quantum information theory, auroral modeling) allows me to tackle novel, technical, and deeply mathematical problems. I'm seeking a challenging hands-on role to apply technical expertise and contribute to cutting-edge robotics projects.

You can find my portfolio at www.BenBlumer.com

EXPERIENCE

Reify Robotics, Vancouver - *Consultant*

2024

I've worked as a consultant for early and mid-stage startups. My projects include:

- Improved mobile robot localization, using a Kalman filter implemented in ROS. Dockerized the development environment including local and remote network communication.
- Completed electromechanical prototyping of a smart scale. Wrote firmware in C++ using ESP-IDF, building a chassis, and calibrating sensors.
- Wrote an open-source ROS2 driver for augmented reality glasses in C++.

ShapeMeasure, Vancouver — *Founding Engineer*

2018 - 2023

I co-founded ShapeMeasure to automate flooring installation on construction sites. ShapeMeasure reached $500K/year in revenue, served a clientele of 100+, secured a US patent, and raised over $1M in venture capital.

As founding engineer, I

- Built a ROS-enabled novel LIDAR with submillimeter precision from scratch.
- Wrote localization / vision algorithms to parse the point cloud to extract as-built construction features.
- Built a Django application to manage and schedule 1,000+ orders through sales, manufacturing, and logistics.
- Formulated the engineering strategy, technology stack, and product roadmap.
- Developed software and firmware for our novel CNC machine to cut flooring material to fit as-built site conditions.

Istuary, Vancouver—*Director of Robotics*

2017 - 2018

- Designed and developed a product to automate press-brake machinery using a UR5 robot arm.
- Assembled and led a team of 4 members, providing recruitment, training, and guidance
- Created algorithms using C++ and OpenCV to enable precise localization and grasping of sheet material.
- Implemented motion planning in Python to position sheet metal within the press-brake.
- Developed a dockerized ROS-based architecture for communication between system components.

UBC CARIS Lab, Vancouver — *Research assistant in robotics*

2012 - 2016

- Built stereo-vision software to capture high-framerate 3D position data of a ball in flight using OpenCV
- Used Scikit Learn to create probabilistic models of the out outcomes of robot-arm trajectories
- Created a novel motion-planning controller for two robot arms using C++, Python, and ROS.
- Demonstrated the precision and robustness of my controller by having the robots serve a ping-pong ball.

EDUCATION

University of British Columbia, Vancouver — *Masters of Applied Science in Mechanical Engineering* (Thesis: algorithms for two-handed coordination in robot arms)

2012 - 2016

University of Calgary, Calgary—*Bachelors of Science in Physics with first-class honours.*

2006-2011

OPEN-SOURCE CONTRIBUTIONS

WAM ROS Support — *github.com/BenBlumer/catkin-barrett-ros-pkg*

(Update) Allows use of newer versions of ROS to control Barrett WAM. Recommended by Barrett technical support.

Gazebo WAM — *github.com/BenBlumer/Gazebo_WAM*

(Created) Simulates a WAM robot arm in Gazebo and controls it using ROS.

ROS — *github.com/ros-simulation/gazebo_ros_pkgs commit: da23a04*

(Bug fix) allow ROS to interact with robot simulations in Gazebo simulator.

Additional contributions

- (Build fix) Right Hand Robotics Reflexx driver.
- (Support for stereo vision for GH3) Point Grey Camera ROS driver .
- (Build fix) Kinect 2 Skeleton tracking.

AWARDS

Patent: System and method for automating construction and installation of surfaces in construction — US11332942B2

Best Paper (of 100+) — *Robot Interaction Conference (HRI)*

Human- Meet Me Where I'm Gazing: How Shared Attention Gaze Affects Human-Robot Handover Timing.

Third place (of 150+)— *Canadian Undergraduate Physics and Astronomy Conference*

Oral presentation: The Numerical Computation of Single-Qubit Gates Implementable Through Quantum Walks on Graphs.

Atlantis Medal For Computational Physics — *Canadian Undergraduate Physics and Astronomy Conference*

 Oral presentation: The Numerical Computation of Single-Qubit Gates Implementable Through Quantum Walks on Graphs.