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*

2023

Projects:

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

ShapeMeasure, Vancouver — *Founder & CTO*

2018 - 2023

I founded ShapeMeasure to automate flooring installation on construction sites.

We delivered our service using:

- A tool to scan walls and generate a point cloud
- Software that converted point clouds to solid bodies and then to instructions for a CNC machine to cut flooring
- CNC machine to automatically cut the material so that installers simply clicked the material into place.

As founder, I:

- Successfully managed the sales, manufacturing, and technical teams to sell and deliver on over $500K/yr.
- Secured over $1M in venture capital from prominent investors including SOSV, NewFund, and AngelList.
- Established a strong customer base, serving over 100 clients, including the largest flooring supplier in Canada.

Technical accomplishments at ShapeMeasure:

- Formulated the engineering strategy, technology stack, and product roadmap.
- Built a Django application to manage and schedule 1,000+ orders through sales, manufacturing, and logistics.
- Created mechanical designs, jigs, and fixtures for the production line, using Fusion 360, wood and metal working techniques, rapid prototyping, and outsourced fabrication.
- Developed software using Numpy and scikit-learn in Python to parse and transform point clouds into GCode for our heavily customized CNC machine, automating cutting.

Istuary, Vancouver—*Director of Robotics*

2017 - 2018

- Designed and developed a product to automate press-brake machinery using a 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*
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.