

Jessica Austin

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Education

Carnegie Mellon University, Robotics Institute

M.S., Robotics, August 2013 - December 2014

Coursework included: Kinematics, Dynamics, Control, Robotic Manipulators, Computer Vision, Machine Learning, Mathematics for Robotics, Educational Technology

California Institute of Technology

B.S., Mechanical Engineering, with minor in Control and Dynamical Systems, June 2008

Work Experience

Senior Software Developer, Axiom Data Science

June 2016–Present

Axiom provides data management and analysis services for organizations conducting research and management in the ecological, geological and ocean sciences. My projects include:

- Setup Spark cluster to analyze AIS vessel traffic data; processed one year of data in less than a day
- Redesign of model and sensor real-time ingestion systems for increased scalability and reliability
- Development of internal dashboards and notifications system

Senior Software Developer, Resource Data, Inc.

January 2015–June 2016

Resource Data, Inc. is a custom software and GIS consulting company based in Anchorage.

My projects involved working with various local Alaskan organizations, including the Alaska Housing Finance Corporation and the North Pacific Research Board.

Student Researcher, Geyer Lab, Carnegie Mellon University

September 2013–December 2014

The Geyer Lab focuses on principles of human motor control, with application to prosthetics and rehabilitation. I collaborated with other students in the lab to evaluate neuromuscular control models on a robotic leg, and investigated the use of compact nonlinear springs for increased bandwidth and torque resolution in Series Elastic Actuators (see publications below).

GrubHub.com

GrubHub is the nation's leading online and mobile food ordering platform. During my time there, the company grew from 40 employees to over 300, and from 13 cities to nationwide.

Manager, Quality and Release Engineering Team

May 2012–June 2013

- Maintenance and expansion of a full-scale pre-production environment, which allowed 5 different teams to work independently before merging to trunk
- Designed and constructed continuous deployment build pipeline in Jenkins and led the associated process changes, increasing deployment frequency from monthly to weekly

Senior Software Developer

April 2010–June 2012

- Worked within a cross-functional team to develop new products, including: full implementation of new credit card payment processor, development of sweepstakes game that increased diner order frequency, and creation of data entry API to allow third-party data entry for menus
- Led the development group on testing best practices, leading to increased code quality and sustainability even in a time of rapid company growth

Consultant/Software Developer, ThoughtWorks, Inc.

August 2008–April 2010

ThoughtWorks is a global IT consultancy specializing in custom software and is a pioneer in AGILE software development. My work included: working for a large educational company to improve their deployment process; development for a major US airline to redesign their booking website and create a marketing website that featured user-generated content.

Skills

Tools and Platforms: Docker, Amazon AWS, PostgreSQL, Linux, MATLAB, Simulink, Robot Operating System (ROS), Mathematica, Player/Stage, MySQL, SQL Server,
Languages and Frameworks: Java, Javascript, AngularJS, Ansible, Kafka, Python, SQL, shell scripting, Android SDK, iOS, C#.NET, Web Services, C++

Projects

Please see <http://jessicaaustin.net/projects> for more information on these and other projects.

Makerspace GreeterBot, based on the OSRF TurtleBot

Inspired by the OSRF TurtleBot, I'm currently working on a "greeter" robot for the Anchorage Makerspace. The base is a iRobot Roomba 510, with a laptop, a Kinect, and an Arduino for controlling a camera on a pan/tilt unit and other sensors. The platform runs the ROS TurtleBot stack, and, when complete, will interact with and greet visitors to the Makerspace.

ChiBots SRS Robomagellan 2011 and 2012, collaboration with Bill Mania

In this competition, the robot must navigate a field autonomously as quickly as possible, earning extra points by finding bonus waypoints along the way. In 2011, we built our robot from the ground up. In 2012, we used the CoroWare CoroBot as our platform, and supplemented it with camera, rangefinders, IMU, and wheel encoders. Our software was based off of ROS python, and included:

- Kalman filter for sensor fusion of IMU and wheel encoder data
- Odometry based on dead reckoning, localization using a very sparse map
- OpenCV-based algorithm to find waypoints marked by orange traffic cones

We overcame challenges using ROS navigation packages with low-grade hobby hardware, and despite only having time on weekends, we succeeded in completing 50% of the course.

Iohannes, a mobile robot powered an Android Phone

Cellphones are ubiquitous and as powerful as some laptops—why not use them as the "brains" of a robot? For this project, I used the SparkFun IOIO board to interface between a robot platform and an Android phone, and presented to the local GTUG.

DARPA Urban Challenge, Team Caltech

This competition featured autonomous ground vehicles maneuvering in a mock city environment. Our entry was a Ford E-350 van with LADARs, stereo cameras, GPS, IMU, and custom software written in C++.

- As the Simulation Team Coordinator, I developed traffic simulation software capable of realistically modeling competition scenarios, so lab simulations were a precursor and even replacement for field testing.
- As a software developer for the Systems and Navigation teams, I developed controller to make team vehicle stop safely at stop lines and improved the simulation software to realistically mimic sensor noise.

Publications

Austin, Jessica, Alexander Schepelmann, and Hartmut Geyer. "**Control and evaluation of series elastic actuators with nonlinear rubber springs.**" *Intelligent Robots and Systems (IROS), 2015 IEEE/RSJ International Conference on*. IEEE, 2015.

Schepelmann, Alexander, Jessica Austin, and Hartmut Geyer. "**Evaluation of decentralized reactive swing-leg control on a powered robotic leg.**" *Intelligent Robots and Systems (IROS), 2015 IEEE/RSJ International Conference on*. IEEE, 2015.

Volunteer Work

Anchorage Makerspace

Board Member and Facility Manager, September 2015–Present