

# Daniel A. Hagen, PhD

Salt Lake City, UT

(626) 340-6994  
daniel8hagen@gmail.com

daniel8hagen.com  
linkedin.com/in/daniel-a-hagen

## EDUCATION

### University of Southern California, Viterbi School of Engineering

Doctor of Philosophy, Biomedical Engineering (GPA: 3.955, Provost Fellow)

May 2016 - Jun 2020

Master of Science, Biomedical Engineering (GPA: 3.95)

Jan 2015 - May 2016

### University of Arizona

Bachelor of Science, Mathematics (GPA: 3.60)

Aug 2007 - May 2010

## EXPERIENCE

### Sarcos Technology and Robotics Corp.

Jun 2022 - Present

Senior Robotics Controls Engineer

Salt Lake City, UT

- Integrate various walking models and path planning algorithms with a whole-body, task space controller in order to generate bipedal locomotion of a humanoid robot in a simulated environment
- Lead academic collaborations with two prominent Universities; coordinating meeting and milestones, guiding technical development, and co-authoring peer-reviewed publications (in review)
- Estimate the position and orientation of a floating base robot by formulating an extended Kalman filter to fuse together joint angle measurements with IMU measurements from a robot's base and feet
- Maintain code repositories and libraries utilizing proper Gitflow and documentation to allow for algorithms to be more readily shared and adapted across teams/projects
- Guide biweekly sprint planning and backlog grooming meetings to help identify friction points, avoid project-creep, and provide timely support when needed

### Sarcos Technology and Robotics Corp.

Nov 2020 - Jun 2022

Controls Engineer I

Salt Lake City, UT

- Developed a whole-body, task space controller for a hybrid exoskeleton/humanoid robot capable of accomplishing a variety of goals like balancing and end-effector position/orientation tracking
- Designed and conducted multiple experiments for validating various sensor measurements
- Standardized internal documentation through the use of version-controlled LaTeX documentation repositories aimed at increasing both project progress observability and cross-team collaboration

### University of Southern California

May 2016 - Jun 2020

Graduate Research/Teaching Assistant

Los Angeles, CA

- Pioneered a novel machine learning algorithm that estimates posture in tendon-driven robots from non-collocated sensors to produce estimates  $<0.01$  degree in accuracy as an alternative to traditional on-location joint encoders (IEEE/RSJ IROS 2020 Peer-Reviewed Abstract)
- Designed physics-based simulation platforms in both Python and MATLAB to simulate and control redundant tendon-driven robotic manipulators in order to increase our understanding of biological motor control
- Taught complex concepts in mathematics and physiology to groups of  $>15$  students during weekly office hours

## SKILLS

**Languages:** Python, MATLAB/Simulink, C/C++, JavaScript, LaTeX, HTML/CSS

**Tools:** Rigid Body Dynamics, Optimal Control, Spatial/Linear Algebra, Signal Processing/Filtering, Bipedal Locomotion, Serial Manipulators, Physics Simulations (MuJoCo, Simscape), Object-Oriented Programming, Machine Learning, Git, Travis CI

**Coursework:** Linear Systems Theory, Nonlinear and Adaptive Control, Neuromuscular Systems, Lagrangian Mechanics, Inverse Kinematics, Path Planning, Physiological Control Systems

**Soft Skills:** Persistent, Detail-Oriented, Curious, Self-Driven, Collaborative, Problem-Solving, Flexible