# David Millard

https://davidmillard.info

CEO/CTO                                          Greater Los Angeles Area
Azalea Robotics Corporation                      david@azalearobotics.com

## Education

**University of Southern California** Los Angeles, California          August 2018 - September 2023
    Ph.D., Department of Computer Science                                          GPA 4.00/4.00
    Advised by Prof. Gaurav Sukhatme

**University of Georgia** Athens, Georgia                              August 2010 - May 2014
    Bachelor of Science, double major in Math and Computer Science          GPA 3.94/4.00

## Awards

**NASA Space Technology Research Fellowship** Four-year graduate fellowship, awarded for NSTRF proposal *Interpretable Robotic Manipulation of Deformable Objects*

**Computer Science Outstanding Undergraduate with Distinction** University of Georgia. Awarded to the best student in the Computer Science department.

**Foundation Fellowship** The University of Georgia's top academic undergraduate four-year scholarship, awarded to approximately 20 students per class.

## Conference Papers

D. Millard, D. Pastor, J. Bowkett, P. Backes, and G. S. Sukhatme, "Granulargym: High performance simulation for robotic tasks with granular materials," presented at the Robotics: Science and Systems (Daegu, Korea), Jul. 2023.

E. Heiden, C. E. Denniston, D. Millard, F. Ramos, and G. S. Sukhatme, "Probabilistic inference of simulation parameters via parallel differentiable simulation," presented at the IEEE Conference on Robotics and Automation (Philadelphia, USA), May 2022.

D. Millard, J. A. Preiss, J. Barbič, and G. S. Sukhatme, "Parameter estimation for deformable objects in robotic manipulation tasks," presented at the International Symposium on Robotics Research (Geneva, Switzerland), Sep. 2022.

J. A. Preiss, D. Millard, T. Yao, and G. S. Sukhatme, "Tracking fast trajectories with a deformable object using a learned model," presented at the IEEE Conference on Robotics and Automation (Philadelphia, USA), May 2022.

E. Heiden, D. Millard, E. Coumans, Y. Sheng, and G. S. Sukhatme, "Neuralsim: Augmenting differentiable simulators with neural networks," presented at the IEEE International Conference on Robotics and Automation (Xi'an, China), Sep. 2021.

# Workshop Papers

D. Millard, J. A. Preiss, J. Barbič, and G. S. Sukhatme, "Direct system identification of deformable objects using differentiable finite element dynamics," presented at the IROS 2022 3rd Workshop on Robotic Manipulation of Deformable Objects (ROMADO-SI) (Kyoto, Japan), Oct. 2022.

J. A. Preiss, D. Millard, T. Yao, and G. S. Sukhatme, "Deep recurrent models for nonlinear model predictive control in deformable manipulation tasks," presented at the ICRA 2022 2nd Workshop on Representing and Manipulating Deformable Objects (Philadelphia, USA), May 2022.

E. Heiden, D. Millard, E. Coumans, and G. S. Sukhatme, "Sparse-input neural network augmentations for differentiable simulators," presented at the NeurIPS 2020 Workshop on Differentiable Computer Vision, Graphics, and Physics in Machine Learning (Virtual), Dec. 2020.

E. Heiden, D. Millard, and G. Sukhatme, "Real2sim transfer using differentiable physics," presented at the RSS 2019 Workshop on Closing the Reality Gap in Sim2real Transfer for Robotic Manipulation (Freiburg, Germany), Jun. 2019.

# Preprints

E. Heiden, D. Millard, E. Coumans, and G. S. Sukhatme, "Augmenting differentiable simulators with neural networks to close the sim2ueal gap," *arXiv preprint arXiv:2007.06045*, Jul. 2020.

D. Millard, E. Heiden, S. Agrawal, and G. S. Sukhatme, "Automatic differentiation and continuous sensitivity analysis of rigid body dynamics," *arXiv preprint arXiv:2001.08539*, Jan. 2020.

E. Heiden, D. Millard, H. Zhang, and G. S. Sukhatme, "Interactive differentiable simulation," *arXiv preprint arXiv:1905.10706*, May 2019.

# Work experience

**Azalea Robotics Corporation** Los Angeles, CA                                    September 2023 -
    *Co-Founder, CEO, and CTO*
    Developing robotic systems for the air cargo industry.

**NASA Jet Propulstion Laboratory** Pasadena, CA                  July 2022 - September 2023
    *Visiting Technologist*
    Granular material simulation and manipulation for sampling autonomy on Europa Lander. Published at RSS 2023 (GranularGym).

**NASA Ames Research Center** Mountain View, CA                  June 2020 - December 2020
    *Visiting Technologist*
    Deformable object manipulation projects for the ISAAC project. Resulted in conference publication.

**Robotics at Google, now Google DeepMind** New York, New York         January 2020 - June 2020
    *Research Intern, Learning and Control Group*
    Research projects in differentiable physics simulation, with applications to indetification and control of robotic systems. Resulted in conference publication.

**Iron Ox** San Mateo, California                                    May 2019 - August 2019
    *Roboticist Intern*
    Designed and implemented software for kinodynamically limited trajectory optimziation for industrial arm planning in a robotic agriculture context.

**Robotics Embedded Systems Lab** University of Southern California     August 2018 - September 2023
>    *Graduate Research Assistant*

**X (formerly Google X)** Mountain View, California                     December 2015 - June 2018
>    *Software Engineer, Everyday Robots Project*
>    Built perception systems for mobile base navigation
>    Designed and developed sequence learning models for dynamic obstacle prediction and avoidance

**Microsoft Corporation** Redmond, Washington                         July 2014 - November 2015
>    *Software Development Engineer, Windows 10 Photos*
>    Developed photo viewer application served to millions of customers (C#/C++)

# Leadership

**GradAMP USC Mentorship Program**                                       2021-2023
>    Mentored undergraduates interested in research and graduate school during applications for internships
>    and graduate programs.

**Greyhills Academy Robotics Pilot** Tuba City, Navajo Nation, Arizona            April 2018
>    With another Googler, organized and taught a two day robotics pilot course for students living in the
>    Navajo nation.
>    Developed a continuing partnership between Google and Greyhills academy, and set the schedule for
>    future collaboration.

**UGA Mathcounts Outreach** University of Georgia
>    *President*                                                       August 2013 - May 2014
>    Coordinated board meetings and set organizational direction for a 200+ member student volunteer
>    tutoring organization.
>    Expanded reach from 8 to 11 middle schools and increased focus on students in need.
>    *Volunteer Coordinator*                                           August 2012 - May 2013
>    Coordinated 200+ student volunteers at 8 local middle schools, distributing curriculum materials and
>    establishing contact with school administrations.

**Free IT Athens** Athens, Georgia                                     August 2009 - May 2014
>    *Staff Member*
>    Trained volunteers in building computers and interacting with customers.
>    Taught classes in basic computer use to low-income Athens residents.