Shadi Haddad

PhD student · Applied Mathematics
Santa Cruz, CA
shhaddad@ucsc.edu | shadihdd.github.io | shadihdd

Education

University of California, Santa Cruz — Santa Cruz, CA
PhD in Applied Mathematics — *Ongoing*
- Chancellor's Fellowship (2019)

University of Tehran, College of Mechanical Engineering — Tehran, Iran
M.Sc. in Mechanical Engineering — *January 2018*
- Thesis: "Second Order Sliding Mode Tracking Control of a Piezoelectric Tapered Micro Actuator with Axial Deflection and System Nonlinearity"
- Full Tuition Merit Scholarship

Chamran University of Ahvaz, College of Mechanical Engineering — Ahvaz, Iran
B.Sc. in Mechanical Engineering — *July 2015*
- Full Tuition Merit Scholarship

Publications

Density-Based Stochastic Reachability Computation for Occupancy Prediction in Automated Driving — IEEE Transaction on Control Systems Technology, *2022*
Shadi Haddad, Abhishek Halder, and Baljeet Singh

Boundary and Taxonomy of Integrator Reach Sets — American Control Conference, *2022*
Shadi Haddad, Abhishek Halder

Anytime Ellipsoidal Over-approximation of Forward Reach Sets of Uncertain Linear Systems — CPS IoT Week Workshop, *2021*
Shadi Haddad, Abhishek Halder

The Curious Case of Integrator Reach Sets, Part I: Basic Theory (under review) — arXiv:2102.11423, *2021*
Shadi Haddad, Abhishek Halder

Prediction and Optimal Feedback Steering of Probability Density Functions for Safe Automated Driving — IEEE Control Systems Letters, *2020*
Shadi Haddad, Kenneth F Caluya, Abhishek Halder, Baljeet Singh

The Convex Geometry of Integrator Reach Sets — American Control Conference, *2020*
Shadi Haddad, Abhishek Halder

Observer Based Fault Reconstruction Schemes Using Terminal Sliding Modes — International Journal of Control, *2018*
M. Mousavi, M. Rahnavard, S. Haddad

Analytical Study on Nonlinear 3D Coupled Deformations of Tapered FG Micro-beams Accounting for Size Effects — Iranian Journal of Science and Technology, *2018*
S. Haddad, M. Baghani

Talks and Presentations

American Control Conference — Virtual
Journal Paper and Conference Talk — *2021*
- "Prediction and Optimal Feedback Steering of Probability Density Functions for Safe Automated Driving"

3rd NorCal Control Workshop — Virtual
Conference Talk — *2021*
- "The Convex Geometry of Integrator Reach Sets"

American Control Conference — Virtual
Conference Paper and Talk — *2020*
- "The Convex Geometry of Integrator Reach Sets"

Bay Area Robotics Symposium — University of California at Berkeley
Spotlight Talk and Poster Presentation — *2019*
- "Understanding the Geometry of Integrator Reach Sets for Robotics Applications"

Instructional Experience

Introduction to Dynamical Systems — UC Santa Cruz
Teaching Assistant — *Fall 2021*

Mathematical Methods for Engineering II — UC Santa Cruz
Teaching Assistant — *Winter 2021*

Professional Activities

2021 **Reviewer for 2022 American Control conference (2)**
2021 **Reviewer for 2021 IEEE Control Systems Letters (1)**
2021 **Reviewer for 2021 IEEE Conference on Decision and Control (3)**
2021 **Reviewer for 2021 CPS IoT Week Workshop on Computation-Aware Algorithmic Design for Cyber-Physical Systems (1)**
2020 **Reviewer for 2020 IEEE Conference on Decision and Control (1)**

Honors & Awards

2021 **Student Travel Award**, American Control Conference — *New Orleans, CO (Virtual)*
2020 **Student Travel Award**, American Control Conference — *Denver, CO (Virtual)*
2019 **Chancellor's Fellowship**, University of California at Santa Cruz — *Santa Cruz, CA*
2015 **Full Tuition Merit Scholarship**, University of Tehran — *Tehran, Iran*
2011 **Full Tuition Merit Scholarship**, Chamran University of Ahvaz — *Ahvaz, Iran*

Selected Graduate Courses

Machine Learning, Convex Optimization, Nonlinear Control Theory, Applied Optimal Control — *UC Santa Cruz*
Finite Element Method — *University of Tehran*

Skills

Programming — MATLAB and Simulink, CVX, Python, Matplotlib, TensorFlow, MAPLE, C++, Numerical Methods, Physical Simulations, Scientific Visualization
Engineering, Modelling, and Simulation — SOLIDWORKS, ANSYS, ABAQUS
Technical Writing and Documentation — LaTeX, Jupyter Notebook, Keynote