MASOUMEH GHANBARPOUR MAMAGHANI

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| Address:  Department of Electrical & Computer Engineering  University of California, Santa Cruz | Email: [maghanba@ucsc.edu](mailto:maghanba@ucsc.edu)  [Homepage](https://masoumehgm.github.io/) [Google scholar](https://scholar.google.com/citations?user=vFsfAxEAAAAJ&hl=en) [LinkedIn](https://www.linkedin.com/in/masoumeh-ghanbarpour-mamaghani-a5301812/) |

RESEARCH INTERESTS

Automation and Control Systems

Optimization, Model Predictive Control

Uncertainty Quantification and Stochastic Systems

Reinforcement & Machine Learning

EDUCATION

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| --- | --- |
| 2018 – Present | **University of California Santa Cruz, Santa Cruz, USA**  Graduate Student |
|  | **RWTH Aachen, Aachen, Germany**  Master of Science (M.Sc.)  Communication Engineering (GPA: **3.65/4**) |
|  | **Azad University Central Tehran Branch, Tehran, Iran**  Bachelor of Science (B.Sc.)  Electrical Engineering (GPA: **3.42/4**) |
|  | **Iran University of Science & Technology, Teheran, Iran**  Bachelor of Science (B.Sc.)  Applied Mathematics (GPA: **3.29/4**) |

PUBLICATION

*[A Converse Robust-Safety Theorem for Differential Inclusions](https://arxiv.org/pdf/2208.11364.pdf) (Submitted, IEEE Transactions on Automatic Control)*

[*Sufficient conditions for robust safety in differential inclusions using barrier functions*](https://arxiv.org/pdf/2208.10829.pdf) *(Submitted, Automatica)*

[*On the Feasibility and Continuity of Feedback Controllers Defined by Multiple CBFs*](https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=9867227) *(ACC2022)*

[*Barrier Functions for Robust Safety in Differential Inclusions, Part II: The Converse Problem*](https://ieeexplore.ieee.org/document/9682926) *(CDC 2021)*

[*Barrier Functions for Robust Safety in Differential Inclusions, Part I: Sufficient Conditions*](https://ieeexplore.ieee.org/document/9683684) *(CDC 2021)*

[*A Duality Approach to Set Invariance and Safety for Nonlinear Systems*](https://ieeexplore.ieee.org/document/9683698) *(CDC 2021)*

[*Centralized non-convex model predictive control for cooperative collision avoidance of networked*](https://ieeexplore.ieee.org/document/6967623) *vehicles (ISIC)*

RESEARCH EXPERIENCE

Research Assistance at UCSC from 2018:

* Smart grid, control of power systems
* Safety analysis of nonlinear continuous systems using Mirror decent optimization
* Safety and Inverse Safety problem of differential inclusion systems using Barrier Functions
* Optimal and continuous safety control synthesis for inclusion systems using non-smooth Control Barrier Functions
* Safety of stochastic dynamical system using uncertainty quantification techniques

Research Assistance at Institute of Automatic Control (IRT)

* Development of a Model Predictive Control Concept for Vehicle Collision Avoidance

WORK EXPERIENCE

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| 11/2016 – 05/2017 | Production Engineering of E-Mobility Components (PEM), Germany  Control & Indoor Navigation for a Quadcopter |
| 01/2016 – 08/2016 | Institute of Automatic Control (IRT), Aachen, Germany  Pressure Estimation Using Structural Vibration Measurements of Diesel Engine |
| 12/2014 – 03/2015 | Fraunhofer Institute for Production Technology (IPT), Aachen, Germany  Accurate Wave front-based Active Alignment of Multi-element Optical System |
| 2011 – 2012 | Institute of Automatic Control (IRT), Aachen, Germany  System Identification: Neural Networks & Local Linear Model Tree (LOLIMOT)  Automatic Control and Dynamic Optimization (Acado) Toolkit |
| 07/2006 – 09/2006 | Mobile Communication Company of Iran, Tehran, Iran  Mobile Essential Basis |

TEACHING EXPERIENCE

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| --- | --- |
| Summer 2022 | Applied Discrete Mathematics |
| Spring 2022 | Probability and Statistics for Engineers |
| Winter 2022 | Computer Systems and C Programming |
| Spring 2020 | Digital Signal Processing |
| Winter 2020 | Modern Electronic Technology and How It Works |
| Fall 2019 | Electrical Circuits |

COURSES

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| --- | --- | --- |
| Dynamical Systems | | Hybrid Dynamical Systems, Nonlinear Control, Optimal Control,  Applied Dynamical Systems |
| Optimization | | Convex Optimization, Numerical Optimization,  Optimization and Control for Smart Grid |
| Data Science | Machine Learning, Decision Theory, Foundations of Data Science,  Statistical Learning and High Dimensional Data Analysis | |
| Stochastic | Fundamentals of Uncertainty Quantification in Computational Science and Engineering,  Stochastic Differential Equations, Applied PDEs | |

PROGRAMMING

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| MATLAB, Python, C, C++, R |

LANGUAGE KNOWLEDGE

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| Persian, English, German |
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