

SADRA SADRADDINI

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ACADEMIC POSITIONS

Postdoctoral Associate

Feb 2018- Present

Computer Science and Artificial Intelligence Lab (CSAIL)
Massachusetts Institute of Technology, Cambridge, MA
Supervisor: Russ Tedrake

Graduate Research Assistant

May 2014- Jan 2018

Hybrid and Networked Systems Lab
Boston University, Boston, MA
Advisor: Calin Belta

EDUCATION

Doctor of Philosophy

Sep 2013 - Jan 2018

Mechanical Engineering Boston University, Boston, MA

Master of Science,

Sep 2013 - Sep 2017

Mechanical Engineering

Boston University, Boston, MA

Bachelor of Science

Sep 2009- July 2013

Mechanical Engineering

Bachelor of Science

Sep 2009- July 2013

Aerospace Engineering

(Dual Major Program)

Sharif University of Technology, Tehran, Iran

RESEARCH INTERESTS SUMMARY

The central theme in my research is bridging the gap between formal methods and control theory. I develop methods to design controllers that are correct-by-design, optimal, efficiently computed and easily implemented. Applications include a broad range of cyber-physical systems, with a particular focus on robotics and transportation networks.

PUBLICATIONS

Peer-Reviewed Journals

- J2. Sadra Sadraddini, Calin Belta, *Formal Synthesis of Control Strategies for Positive Monotone Systems*, IEEE Transactions on Automatic Control, 2018
- J1. Sadra Sadraddini, Sivaranjani S, Vijay Gupta, Calin Belta, *Provably Safe Cruise Control of Vehicular Platoons*, IEEE Controls Systems Letters, 2017

Peer-Reviewed Conference Proceedings

- C12. Curtis Madsen, Prashant Vaidyanathan, *Sadra Sadraddini*, Cristian Ioan Vasile, Nicholas DeLaetour, Ron Weiss, Douglas Densmore, Calin Belta, *Metrics for Signal Temporal Logic Formulae*, IEEE Conference on Control and Decision (CDC), Miami Beach, Florida, 2018 it (submitted)
- C11. *Sadra Sadraddini*, Calin Belta, *Formal Guarantees in Data-Driven Model Identification and Control Synthesis*, ACM International Conference on Hybrid Systems: Computation and Control (HSCC), Porto, Portugal, 2018 (**Best Paper Award Nominee**)
- C10. *Sadra Sadraddini*, Calin Belta, *Distributed Robust Set-Invariance for Interconnected Linear Systems*, American Control Conference (ACC), Milwaukee, WI, 2018
- C9. Eric S. Kim, *Sadra Sadraddini*, Calin Belta, Murat Arcaç, Sanjit Seshia, *Dynamic Contracts for Distributed Temporal Logic Control of Traffic Networks*, IEEE Conference on Control and Decision (CDC), Melbourne, Australia, 2017
- C8. *Sadra Sadraddini*, Calin Belta, *Formal Methods for Adaptive Control of Dynamical Systems*, IEEE Conference on Control and Decision (CDC), Melbourne, Australia, 2017
- C7. *Sadra Sadraddini*, Janos Rudan, Calin Belta, *Formal Synthesis of Distributed Optimal Traffic Control Policies* , International Conference on Cyber-Physical Systems (ICCPS), Pittsburgh, PA, 2017
- C6. Sivaranjani S, *Sadra Sadraddini*, Vijay Gupta, Calin Belta, *Distributed Control Policies for Localization of Large Disturbances in Urban Traffic Networks* , American Control Conference (ACC), Seattle, WA, 2017
- C5. *Sadra Sadraddini*, Calin Belta, *Feasibility Envelopes for Metric Temporal Logic Specifications*, IEEE Conference on Control and Decision (CDC), Las Vegas, NV, 2016
- C4. Iman Haghghi, *Sadra Sadraddini*, Calin Belta, *Robotic Swarm Control From Spatio-Temporal Specifications* , IEEE Conference on Control and Decision (CDC), Las Vegas, NV, 2016
- C3. *Sadra Sadraddini*, Calin Belta, *Safety Control of Monotone Systems with Bounded Uncertainties*, IEEE Conference on Control and Decision (CDC), Las Vegas, NV, 2016
- C2. *Sadra Sadraddini*, Calin Belta, *A Provably Correct MPC Approach to Safety Control of Urban Traffic Networks*, American Control Conference (ACC), Boston, MA, 2016
- C1. *Sadra Sadraddini*, Calin Belta, *Robust Temporal Logic Model Predictive Control*, 53rd Annual Allerton Conference on Communication, Control, and Computing, Urbana, IL, 2015

Invited Talks (Submitted Abstracts)

- T4. *Control of Performance-Critical Systems*, Distributed Robotics Lab, Computer Science and Artificial Intelligence Lab (CSAIL), Massachusetts Institute of Technology (MIT), Cambridge, MA, 2017
- T3. *Control of Performance-Critical Systems*, Robot Locomotion Group, Computer Science and Artificial Intelligence Lab (CSAIL), Massachusetts Institute of Technology (MIT), Cambridge, MA, 2017
- T2. *Controlled Invariance for Uncertain Positive Monotone Systems* (Invited session extended abstract), 22nd Symposium on Mathematical Theory of Networks and Systems, Minneapolis, MN, 2016

T1. *Model Predictive Control of Urban Traffic Networks with Temporal Logic Constraints* (Tutorial Session Invited Talk), American Control Conference (ACC), Boston, MA, 2016

Posters

P2. *Sadra Sadraddini, Calin Belta, Distributed Robust Set-Invariance for Linear Interconnected Systems*, The 2nd Symposium on the Control of Network Systems (SCONES), Boston, MA, 2017

P1. *Iman Haghighi, Sadra Sadraddini, Calin Belta, Robotic Swarm Control From Spatio-Temporal Specifications*, Boston University Graduate Student Symposium, Boston, MA, 2016

TEACHING EXPERIENCE

- **Teaching Assistant**, Boston University, Boston, MA
 - Linear Algebra (College of Eng.) Fall 2013
 - Dynamics and Lab. (Department of Mech. Eng.) Spring 2014
- **Teaching Assistant**, Sharif University of Technology, Tehran, Iran
 - Flight Dynamics (Department of Aero. Eng.) Spring 2013
 - Mechanics of Materials Lab. (Department of Mech. Eng.) Spring 2013
 - Numerical Computations (Department of Mech. Eng.) Fall 2012
- **Instructor**, Iran 2007-2013
I taught courses for physics and astronomy olympiads at many high Schools in Iran.

INTERNSHIPS

- Marine Engineering Lab** Summer 2013
Undergraduate Internship *Sharif University of Technology, Tehran, Iran*
 - Mechanical design of multi-axis load-cell for measuring drag forces on ship models in testing basin
- Poladish Internship Group** Summer 2012
Undergraduate Internship *Tabriz, Iran*
 - Fixture design for machining in manufacturing differential cases

HONORS AND AWARDS

- Best Paper Award Nominee for the paper *Formal Guarantees in Data-Driven Model Identification and Control Synthesis*, ACM International Conference on Hybrid Systems: Computation and Control (HSCC), Porto, Portugal, 2018
- Teaching Fellowship, Boston University, Department of Mechanical Engineering, Sep 2013-May 2014
- Fellowship, as a member of Iran's National Elites Foundation (INEF), 2008-2012, Iran
- Gold Medal, 2nd International Olympiad on Astronomy and Astrophysics, Bandung, Indonesia, 2008 (also the winner of *the best in theoretical competition award* and *the most creative solution in data analysis competition award*)
- Silver Medal, National Physics Olympiad, Iran, 2007
- Diploma III, 11th International Astronomy Olympiad, Mumbai, India, 2006

- Gold Medal, National Astronomy Olympiad, Iran, 2006
- Silver Medal, National Astronomy Olympiad, Iran, 2005

REVIEW SERVICE

Peer-Reviewed Journals

- Automatica
- IEEE Transactions on Automatic Control
- IEEE Transactions on Robotics
- IEEE Robotics and Automation Letters
- IEEE Transactions on Aerospace and Electronic Systems

Peer-Reviewed Conferences

- IEEE conference on Decision and Control (CDC), 2017, 2018
- American Control Conference (ACC), 2017, 2018
- Hybrids Systems Computation and Control (HSCC), 2016, 2017
- International Conference on Cyber-Physical Systems (ICCPS), 2018
- International Conference on Robotics and Automation (ICRA), 2015, 2017, 2018
- Workshop on the algorithmic foundations of robotics (WAFR), 2016
- International Conference on Intelligent Robots (IROS), 2018
- Robotics Science and Systems (RSS), 2017
- IFAC Symposium on Control in Transportation Systems (CTS), 2018
- Workshop on Distributed Estimation and Control in Networked Systems (NecSys), 2016

MEMBERSHIPS

- Institute of Electrical and Electronics Engineers (IEEE), Member, 2016-present
- Iran's National Elites Foundation (INEF), Member, 2013-present

OTHER SKILLS

Computer Languages	Python, C/C++, MATLAB
Operating Systems	Linux (ubuntu), MAC OS, Windows
Software & Tools	Git, LaTeX, MS Office, HTML, Arduino, ROS, Processing, SolidWorks
Language Proficiency	Azerbaijani, Persian (Native) English, Turkish (Fluent)