

MASIH HASELI

Curriculum Vitae

Department of Computing and Mathematical Sciences
California Institute of Technology

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RESEARCH

- Dynamical Systems and Control Theory
- Operator Theoretic Approaches in Dynamical Systems
- Machine Learning
- Robotics

EMPLOYMENT

Postdoctoral Scholar Research Associate Department of Computing and Mathematical Sciences California Institute of Technology Advisor: Prof. Joel W. Burdick	Jul. 2025 - present
Postdoctoral Scholar Department of Mechanical and Aerospace Engineering University of California, San Diego Advisor: Prof. Jorge Cortés	Sep. 2022 - Jun. 2025

EDUCATION

Ph.D. in Engineering Sciences (Mechanical Engineering) University of California, San Diego Advisor: Prof. Jorge Cortés	Sep. 2017 - Aug. 2022
M.Sc. in Electrical Engineering – Control Amirkabir University of Technology, Tehran	Sep. 2013 - Oct. 2015
B.Sc. in Electrical Engineering – Control Amirkabir University of Technology, Tehran	Sep. 2009 - Sep. 2013

HONORS & AWARDS

• IEEE Control Systems Letters Outstanding Paper Award	2025
• Robert Skelton Systems and Control Dissertation Award UCSD Center for Control Systems and Dynamics	2023
• Best Student Paper Award The 2021 American Control Conference, New Orleans, Louisiana	2021
• Bronze Medal Iran's National Mathematics Competition	2014
• Silver Medal Iran's National Physics Olympiad	2008

PUBLICATIONS *Journal Articles*

(J1) Modeling nonlinear control systems via Koopman control family: universal forms and subspace invariance proximity
M. Haseli, J. Cortés
Automatica 185 (2026), 112722

- (J2) Two roads to Koopman operator theory for control: infinite input sequences and operator families
M. Haseli, I. Mezić, J. Cortés
 IEEE Transactions on Automatic Control, *submitted*
- (J3) Koopman operators in robot learning
 L. Shi, **M. Haseli**, G. Mamakoukas, D. Bruder, I. Abraham, T. Murphey, J. Cortés, K. Karydis
 IEEE Transactions on Robotics, *to appear*
- (J4) Recursive forward-backward EDMD: guaranteed algebraic search for Koopman invariant subspaces
M. Haseli, J. Cortés
 IEEE Access 13 (2025), 61006-61025
- (J5) Invariance proximity: closed-form error bounds for finite-dimensional Koopman-based models
M. Haseli, J. Cortés
 Systems and Control Letters, *submitted*
- (J6) Generalizing dynamic mode decomposition: balancing accuracy and expressiveness in Koopman approximations
M. Haseli, J. Cortés
 Automatica 153 (2023), 111001
- (J7) Temporal forward-backward consistency, not residual error, measures the prediction accuracy of extended dynamic mode decomposition
M. Haseli, J. Cortés
 IEEE Control Systems Letters 7 (2023), 649-654
IEEE Control Systems Letters Outstanding Paper Award Winner
- (J8) Parallel learning of Koopman eigenfunctions and invariant subspaces for accurate long-term prediction
M. Haseli, J. Cortés
 IEEE Transactions on Control of Network Systems 8 (4) (2021), 1833-1845
- (J9) Learning Koopman eigenfunctions and invariant subspaces from data: Symmetric Subspace Decomposition
M. Haseli, J. Cortés
 IEEE Transactions on Automatic Control 67 (7) (2022), 3442-3457

Conference Proceedings

- (C1) Koopman operator extensions for control: bridging infinite input sequences and operator families
M. Haseli, I. Mezić, J. Cortés
 Proceedings of the IEEE Conference on Decision and Control, Rio de Janeiro, Brazil, 2025, to appear
- (C2) Real-time learning of predictive dynamic obstacle models for robotic motion planning
 S. B. Kombo, **M. Haseli**, Skylar X. Wei, J. W. Burdick
 Proceedings of the IEEE International Conference on Robotics and Automation, 2026, *submitted*
- (C3) Temporal forward-backward consistency, not residual error, measures the prediction accuracy of extended dynamic mode decomposition
M. Haseli, J. Cortés
 Proceedings of the American Control Conference, San Diego, 2023

- (C4) Data-driven approximation of Koopman-invariant subspaces with tunable accuracy
M. Haseli, J. Cortés
 Proceedings of the American Control Conference, New Orleans, Louisiana, 2021, pp. 469-474
Best Student Paper Award Winner
- (C5) Fast identification of Koopman-invariant subspaces: parallel symmetric subspace decomposition
M. Haseli, J. Cortés
 Proceedings of the American Control Conference, Denver, Colorado, 2020, pp. 4545-4550
- (C6) Efficient identification of linear evolutions in nonlinear vector fields: Koopman invariant subspaces
M. Haseli, J. Cortés
 Proceedings of the IEEE Conference on Decision and Control, Nice, France, 2019, pp. 1746-1751
- (C7) Approximating the Koopman operator using noisy data: noise-resilient extended dynamic mode decomposition
M. Haseli, J. Cortés
 Proceedings of the American Control Conference, Philadelphia, PA, 2019, pp. 5499-5504

TEACHING EXPERIENCE	<ul style="list-style-type: none"> • Nonlinear Control (UCSD MAE 281B) Spring 2021 Graduate Teaching Assistant Instructor: Prof. Jorge Cortés
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INVITED TALKS	<ul style="list-style-type: none"> • SIAM Conference on Applications of Dynamical Systems, Denver, Colorado May 2025 Talk Title: Koopman Control Family and Universal Finite-Dimensional Forms • U.S. Association for Computational Mechanics, Student Chapter Seminars Mar. 2024 Online: YouTube • Safe Autonomous Systems Lab Seminars Jan. 2024 Department of Mechanical and Aerospace Engineering, University of California, San Diego • Scalable Optimization and Control Lab Seminars Sep. 2023 Department of Electrical and Computer Engineering, University of California, San Diego • 2022 International Symposium on Nonlinear Theory and Its Applications Dec. 2022 • <i>Data-Driven Reduced-Order Methods for System Control Mini-symposium</i> Sep. 2021 Mechanistic Machine Learning and Digital Twins for Computational Science, Engineering & Technology Conference • 37th Southern California Control Workshop, University of California, San Diego Jan. 2020
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PROFESSIONAL SERVICE	Reviewer for: Automatica, IEEE Open Journal of Control Systems, IEEE Access, IEEE Control Systems Letters, Physica D: Nonlinear Phenomena, Journal of Dynamic Systems Measurement & Control, IEEE Conference on Decision and Control (CDC), American Control Conference (ACC), International Symposium on Mathematical Theory of Networks and Systems (MTNS), Resilience Week Symposium, Indian Control Conference, IFAC World Congress, International Conference on Robotics and Automation (ICRA), The Journal of Supercomputing, Mathematics of Control, Signals, and Systems
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