

MAHSA GHASEMI

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EDUCATION

Doctor of Philosophy (Ph.D.), Electrical and Computer Engineering August 2017–present
University of Texas at Austin, Austin, Texas, USA
Adviser: Prof. Ufuk Topcu

Master of Science in Engineering (M.S.E.), Mechanical Engineering August 2014–August 2017
University of Texas at Austin, Austin, Texas, USA
Adviser: Prof. Ufuk Topcu

Bachelor of Science (B.Sc.), Mechanical Engineering September 2010–July 2014
Sharif University of Technology, Tehran, Iran
Adviser: Prof. Ali Meghdari

EXPERIENCES

University of Texas at Austin August 2014–present

- Graduate Research Assistant (Summer 2017–Present):
 - *Designing efficient algorithms for joint active perception and planning, decision-making under uncertainty, task-oriented perception, and cooperative perception*
 - *Designing task-oriented information sharing schemes under communication constraints*
 - *Developing synthesis algorithms for reactive control of interconnected cyber-physical systems under temporal logic specifications, and data-driven synthesis of controllers through imitation learning*
 - *Developing explainable planning through natural language*
- Mentor (Summer 2019): *Moncrief Undergraduate Summer Internship*
- Graduate Teaching Assistant (Fall 2014–Spring 2017): *‘Managing Product Development and Production’, ‘Interdisciplinary Design Project’, ‘Design Methodology’, ‘Design Project’*
- Instructor (Summer 2015): *‘Differential Equations’*

Rah Rail Tima Corporation July 2012–January 2013

- Member of R&D team: *Modeling of a passenger coach using SolidWorks, Simulating the crash test of a railway passenger coach according to international standards by means of PAM-Crash software.*

Sharif University of Technology September 2012–July 2014

- Undergraduate Research Assistant: *Reviving the control system and simulating the dynamics of a rover robot, Working on in-home rehabilitation systems by employing Kinect sensor, Analyzing heat transfer performance of pulsating heat pipes.*
- Undergraduate Teaching Assistant: *‘Solid Mechanics Lab’*

PUBLICATIONS

Journal Papers:

1. M. Ghasemi, L. Feng, K. W. Chang, and U. Topcu, "Towards Natural Language Explanation of Counterexamples in MDP Verification," *Manuscript in preparation*, 2019.
2. R. Dimitrova^{*}, M. Ghasemi^{*}, and U. Topcu, "Reactive Synthesis with Maximum Realizability of Linear Temporal Logic Specifications," *Acta Informatica Special Issue on Synthesis*, 2019.
3. A. Hashemi, M. Ghasemi, H. Vikalo, and U. Topcu, "Randomized Greedy Sensor Selection: Leveraging Weak Submodularity," *Under review*, 2019.

Conference Papers:

1. M. Ghasemi, A. Hashemi, H. Vikalo, and U. Topcu, "Identifying Low-Dimensional Structures in Markov Chains: A Nonnegative Matrix Factorization Approach," *Under review*, 2019.
2. M. Ghasemi and U. Topcu, "Perception-Aware Point-Based Value Iteration for Partially Observable Markov Decision Processes," *International Joint Conferences on Artificial Intelligence (IJCAI)*, Macao, China, August 10-16, 2019.
3. M. Ghasemi^{*}, A. Hashemi^{*}, U. Topcu, and H. Vikalo, "On Submodularity of Quadratic Observation Selection in Constrained Networked Sensing Systems," *American Control Conference (ACC)*, Philadelphia, PA, USA, July 10-12, 2019.
4. M. Ghasemi and U. Topcu, "Online Greedy Active Perception for Partially Observable Markov Decision Processes," *Conference on Decision and Control (CDC)*, Nice, France, December 11-13, 2019.
5. A. Hashemi, M. Ghasemi, H. Vikalo, and U. Topcu, "Submodular Observation Selection and Information Gathering for Quadratic Models," *International Conference on Machine Learning (ICML)*, Long Beach, CA, USA, June 9-15, 2019.
6. R. Dimitrova, M. Ghasemi, and U. Topcu, "Maximum Realizability for Linear Temporal Logic Specifications," *International Symposium on Automated Technology for Verification and Analysis (ATVA)*, Los Angeles, CA, USA, October 7-10, 2018.
7. A. Hashemi, M. Ghasemi, H. Vikalo, and U. Topcu, "A Randomized Greedy Algorithm for Near-Optimal Sensor Scheduling in Large-Scale Sensor Networks," *American Control Conference (ACC)*, Milwaukee, WI, USA, June 27-29, 2018.
8. L. Feng, M. Ghasemi, K. W. Chang, and U. Topcu, "Counterexamples for Robotic Planning Explained in Structured Natural Language," *IEEE International Conference on Robotics and Automation (ICRA)*, Brisbane, Australia, May 21-25, 2018.

Extended Abstracts:

1. M. Ghasemi and U. Topcu, "Perception-Aware Point-Based Value Iteration for Partially Observable Markov Decision Processes," *Workshop on "Structure & Priors in Reinforcement Learning" at International Conference on Learning Representations (ICLR)*, New Orleans, LA, USA, May 6, 2019.
2. R. Dimitrova, M. Ghasemi, and U. Topcu, "Maximum Realizability for Linear Temporal Logic Specifications," *Seventh Workshop on Synthesis (SYNT)*, Oxford, UK, July 18, 2018.

Theses:

1. “Synthesis of Reactive Controllers for Reconfigurable Networked Systems,” Master’s Thesis, University of Texas at Austin, 2017.
2. “Reviving the Control system and Simulating the Dynamics of a Shrimp Robot,” Bachelor’s Thesis, Sharif University of Technology, 2014.

PRESENTATIONS

1. “Submodular Optimization,” *Tutorial*, UT Austin, 2019.
2. “Task-Oriented Active Perception and Planning in Environments with Partially Known Semantics,” *Poster presentation at Robot Learning Workshop*, Lehigh University, 2019.
3. “Perception-Aware Point-Based Value Iteration for Partially Observable Markov Decision Processes,” *Poster presentation at Texas Robotics Consortium Symposium*, UT Austin, 2019.
4. “Perception-Aware Point-Based Value Iteration for Partially Observable Markov Decision Processes,” *Poster presentation at Rising Stars in Computational and Data Sciences*, UT Austin, 2019.
5. “Counterexamples for Robotic Planning Explained in Structured Natural Language,” *Poster presentation at UT Robotics Consortium Symposium*, UT Austin, 2018.

SELECTED ACADEMIC PROJECTS

- **Spring 2018** Robust Bayesian Experimental Design for Quadratic Models
- **Fall 2017** Partially-Constrained Distributed Synthesis with Minimal Communication
- **Spring 2017** Accelerated Approximation Algorithm for Maximizing Monotone Functions with Bounded Curvature
- **Fall 2016** Cognitive Modeling of Human Navigation via Modular Reinforcement Learning
- **Spring 2015** Optimal Control of a Fixed-Wing Aircraft at Constant Velocity
- **Fall 2014** Design and Fabrication of a 1-DOF Human Gait Rehabilitation Robot

SCHOLASTIC HONORS

- 1 of 11 selected for participation in 2019 Princeton Pathway into the Academy Program
- Recipient of Travel Grant for Robot Learning Workshop, Lehigh University, 2019
- Recipient of ICML Travel Award, 2019
- Recipient of SPiRL at ICLR Travel Award, 2019
- Selected for poster presentation at Rising Stars in Computational and Data Sciences, UT Austin, 2019
- 1 of 5 finalists for the best student paper award, American Control Conference, June 2018
- Recipient of Cockrell School of Engineering Fellowship, 2014-2015
- Inclusive Classrooms Leadership Certificate, UT Austin, February 2015
- Professional Teaching Assistant Certificate, UT Austin, August 2014

- Qualified as an Exceptional Talent eligible to enter Graduate Studies without entrance exam, Sharif University of Technology, December 2013
- Recipient of Iranian National Elite Foundation Fellowship, 2010-2014
- Ranked 65th among more than 277,000 participants in the Nationwide University Entrance Exam for B.Sc. degree, 2010.
- Admitted to Iranian National Organization for Development of Exceptional Talents

PROFESSIONAL MEMBERSHIPS AND SERVICES

- Technical program committee member for ADVCOMP 2018 & 2019, and eLmL 2019
- Reviewer for ICRA 2016, FM 2018, CDC 2018, ICRA 2019, TAC, CAV 2019, FAoC, Science Robotics, ICML 2020
- Member of IEEE (2016-present), SIAM (2016-present), and ASME (2016-2018)
- 6th & 7th Industrial Festival of Sharif Mechanical Engineering, Sharif Mechanical Engineering Public Relations Committee, Sharif Mechanical Magazine

SKILLS

- Proficient in Python, MATLAB, C++, SolidWorks, AutoCAD, Abaqus, Pam-Crash
- Working knowledge in TensorFlow, ROS, OpenUxAS, OpenAMASE, LabVIEW, OpenSim, Proteous, Codevision AVR, Shell Scripting

SELECTED COURSES

UT Austin: Advanced Algorithms, Nonlinear Dynamics and Control, Stochastic Detection and Estimation and Control, Linear Systems Analysis, Applied Intelligence, Optimal Control, Digital Signal Processing, Advanced Dynamics, Robot Mechanism Design, Musculoskeletal Biomechanics, Automated Logical Reasoning, Synthesis and Verification of Cyber-Physical Systems, Robot Learning, Probability and Stochastic Processes, Special Topics in Machine Learning, Large Scale Optimization, Deep Probabilistic Modeling (Audited), Online Learning

REFERENCES

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| <ul style="list-style-type: none"> • Dr. Ufuk Topcu
Assistant Professor
Department of Aerospace Engineering and Engineering Mechanics
The University of Texas at Austin
Email: utopcu@utexas.edu | <ul style="list-style-type: none"> • Dr. Richard Crawford
Professor
Department of Mechanical Engineering
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| <ul style="list-style-type: none"> • Dr. Haris Vikalo
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