Ali Agha (full name: Ali-akbar Agha-mohammadi) - CV

NASA-Jet Propulsion Laboratory, Caltech
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Education and Research Experience

NASA-Jet Propulsion Laboratory, California Institute of Technology (Caltech), 2016-present
> Robotics Research Technologist
> Role: Technical Lead, Principle Investigator
> Focus: Robotic autonomy under uncertainty in extreme environments
> Selected as a NIAC NASA Fellow in 2018

Qualcomm Research, 2015-2016
> Research Staff Engineer, Roboticist
> Role: Started Qualcomm's efforts on robotic autonomy; led motion planning and 3D mapping efforts
> Focus: Vision-based SPLAM (simultaneous planning, mapping, and localization) and hazard avoidance for autonomous aerial vehicles
> Selected as a recipient of Qualcomm's Outstanding Contribution Award

Dept. of Aeronautics and Astronautics, Massachusetts Institute of Technology (MIT), 2013-2015
> Postdoctoral researcher
> Laboratory for Information and Decision Systems (LIDS)
> Aerospace Controls Laboratory (ACL)
> Focus: Planning under uncertainty for autonomous quad-copter teams

Dept. of Computer Science and Engineering, Texas A&M University (TAMU), 2009-2013
> PhD in Computer Science (Robotics)
> Graduate Research Assistant in both Aerospace and CS Departments
> Thesis: Algorithmic stochastic control for robot motion planning under motion and sensing uncertainty
> Committee: S. Chakravorty (Aero), N. Amato (CS), P.R. Kumar (ECE), J. Junkins (Aero), D. Shell (CS)

Dept. of Electrical and Computer Engineering, Khaje Nasir Toosi University of Technology, 2005-2008
> M.S. in Electrical Engineering (Control Systems and Robotics), Ranked 1/23
> Graduate Research Assistant in ECE Dept.
> Thesis: Multi-sensor Estimation: High-precision Simultaneous Localization And Mapping (SLAM)

Dept. of Electrical and Computer Engineering, Tabriz University, 2001-2005
> B.S. in Electrical Engineering (Control Systems and Robotics), Ranked 1/30
> Thesis: Robosoccer: Small-size Soccer Robots for Robocup Competitions

Selected Research Grants (2016-present: ~$13.1M, with ~$8.5M as PI)

Principal Investigator, and Task Manager

[1] **Autonomous Robotic Exploration of Lava Tubes (Biologic and Resource Analog Investigations in Low Light Environments -- BRAILLE),** NASA SMD, PSTAR Program, role: JPL PI (NASA Ames is the prime)

[2] **CoSTAR: Collaborative Subterranean Autonomous Resilient Robots to Explore Subsurface Voids,** DARPA Subterranean Challenge.   Team website: https://costar.jpl.nasa.gov/
> *The Team Ranked 1st worldwide in the 2020 DARPA Subterranean Challenge (Urban Competition).*
> *The Team Ranked 2nd worldwide in the 2019 DARPA Subterranean Challenge (Tunnel Competition).*

[3] **NeBula (Networked Belief-aware Perceptual Autonomy): Next Generation Resilient Autonomy Framework for Space Robotics,** Caltech Jet Propulsion Laboratory, Director's Innovation Funding.

[4] **Shapeshifter: Self-assembling Robots to Explore Titan from Rugged Cliffs to Deep Subsurface Voids,**

NASA Innovative Advanced Concepts (NIAC).

[5] **Adaptive Autonomy for Coordinate Navigation of Prototype Mars Helicopter and Mars Rover** NASA, President's and Director's Fund Program.

[6] **Failure-resistant Visual Odometry for Prototype Mars Sample Return Robot,** Caltech Jet Propulsion Laboratory, Mars Program Office.

[7] **Forest Fire Management using UAV Swarms**, Caltech Jet Propulsion Laboratory, BlueSky studies.

[8] **Verifiable and Coordinated Autonomy for Mars Helicopter and Rover Navigation,** NASA, President's and Director's Fund Program.

[9] **Adaptive Autonomy: Domain Knowledge-Assisted Machine Learning for Model and Policy Adaptation,** Caltech Jet Propulsion Laboratory, Data Science Program.

[10] **AI vs. Human: Demonstration of AI-based Drone Navigation vs. Expert Human Pilots at Drone Racing League (DRL)**, Caltech Jet Propulsion Laboratory, Raise-The-Bar Program.

[11] **Fast Traversing Autonomous Rover for Mars Sample Collection,** Caltech Jet Propulsion Laboratory, Mars Program Formulation Office

[12] **Look Before You Leap: Machine learning for Predicting Perception Failures,** Caltech Jet Propulsion Laboratory, Data Science Program.

[13] **Rollocopter: A Hybrid Aerial and Ground Mobility System,** Caltech Jet Propulsion Laboratory, Commercial Program Office.

[14] **Integrated Perception and Planning Under Uncertainty (IP2U2) for Robust Autonomy,** Caltech Jet Propulsion Laboratory, Research and Technology Development Program.

Co-I
[1] **Enceladus Vent Explorer: Phase II,** NASA Innovative Advanced Concepts (NIAC), Phase II.

[2] **Fast Traversing Autonomous Rover for Mars Sample Collection,** NASA Experimental Program to Stimulate Competitive Research (EPSCoR).

[3] **An Ultra-Light-Weight Perching System for Sloped or Vertical Rough Surfaces on Mars,** Caltech Jet Propulsion Laboratory, Research and Technology Development Program.

[4] **Autonomous Approach of Small Unknown Bodies,** Caltech Jet Propulsion Laboratory, Research and Technology Development Program.

[5] **Exobiology Extant Life Surveyor (EELS) Robotic Architecture: Exploring Enceladus and Europa Plume Vents for Liquid Water,** NASA-JPL Space Technology Office.

Publications and patents

Selected Papers

[S1] Ali-akbar Agha-mohammadi, Suman Chakravorty, Nancy Amato, "**FIRM: Sampling-based Feedback Motion Planning Under Motion Uncertainty and Imperfect Measurements**", *International Journal of Robotics Research (IJRR)*, 33(2):268-304, February 2014.

[S2] Ali-akbar Agha-mohammadi, Eric Heiden, Karol Hausman and Gaurav S. Sukhatme, "**Confidence-rich 3D Grid Mapping**", *International Journal of Robotics Research (IJRR)*, 38:1352-1374, 2019.

[S3] Ali-akbar Agha-mohammadi, Saurav Agarwal, Sung-Kyun Kim, Suman Chakravorty and Nancy M. Amato, "**SLAP: Simultaneous Localization and Planning for Physical Mobile Robots via Enabling Dynamic Replanning in Belief Space**," *IEEE Transactions on Robotics (TRO)*, vol.34, no.5, pp.1195-1214, 2018.

[S4] Shayegan Omidshafiei, Ali-akbar Agha-mohammadi, Christopher Amato, Shih–Yuan Liu, Jonathan P. How, John Vian, "**Decentralized Control of Partially Observable Markov Decision Processes using Belief Space Macro-actions**", *International Journal of Robotics Research (IJRR), vol. 36, no. 2, pp. 231-258, 2017.*

Journal Papers

[J1] [under review] Ali-akbar Agha-mohammadi, et. al, "**A Hybrid Semantic-Geometric Approach to Map Merging for Multi Robot Exploration of Perceptually-Degraded Environments**," 2020.

[J2] [under review] Daniel Gaines, Gary Doran, Michael Paton, Brandon Rothrock, Joseph Russino, Ryan Mackey, Robert Anderson, Raymond Francis, Chet Joswig, Heather Justice, Ksenia Kolcio, Gregg Rabideau, Steve Schaffer, Jacek Sawoniewicz, Ashwin Vasavada, Vincent Wong, Kathryn Yu and Ali-akbar Agha-mohammadi, "**Self-reliant Rover Design For Increasing Mission Productivity**,"

[J3] Takahiro Sasaki, Kyohei Otsu, Rohan Thakker, Sofie Haesaert and Ali-akbar Agha-mohammadi, "**Where to Map? Iterative Rover-Copter Path Planning for Mars Exploration**," *IEEE Robotics and Automation Letters (RA-L)*, vol.5, pp.2123-2130, April 2020.

[J4] [accepted] Jared Strader, Kyohei Otsu and Ali-akbar Agha-mohammadi, "**Perception-aware Mast Motion Planning for Planetary Exploration Rovers**," *Journal of Field Robotics (JFR)*, December 2019.

[J5] Ali-akbar Agha-mohammadi, Eric Heiden, Karol Hausman and Gaurav S. Sukhatme, "**Confidence-rich 3D Grid Mapping**," *International Journal of Robotics Research (IJRR)*, vol.38, pp.1352-1374, 2019.

[J6] Sung-Kyun Kim, Rohan Thakker and Ali-akbar Agha-mohammadi, "**Bi-directional Value Learning for Risk-aware Planning Under Uncertainty**," *IEEE Robotics and Automation Letters (RA-L)*, vol.4, no.3, pp.2493-2500, March 2019.

[J7] Max Pflueger, Ali-akbar Agha-mohammadi and Gaurav S. Sukhatme, "**Rover-IRL: Inverse Reinforcement Learning with Soft Value Iteration Networks for Planetary Rover Path Planning**," *IEEE Robotics and Automation Letters (RA-L)*, vol.4, no.2, pp.1387-1394, 2019.

[J8] Ali-akbar Agha-mohammadi et al., Saurav Agarwal, Sung-Kyun Kim, Suman Chakravorty and Nancy M. Amato, "**SLAP: Simultaneous Localization and Planning for Physical Mobile Robots via Enabling Dynamic Replanning in Belief Space**," *IEEE Transactions on Robotics (TRO)*, vol.34, no.5, pp.1195-1214, 2018.

[J9] Kyohei Otsu, Ali-akbar Agha-mohammadi, and Michael Paton, "**Where to Look? Predictive Perception with Applications to Planetary Exploration**", *IEEE Robotics and Automation Letters (RAL)*, 3 (2), 635-642, 2018.

[J10] Shayegan Omidshafiei, Ali-akbar Agha-mohammadi, Christopher Amato, Shih–Yuan Liu, Jonathan P. How, John Vian, "**Decentralized Control of Partially Observable Markov Decision Processes using Belief Space Macro-actions**", *International Journal of Robotics Research (IJRR),* 36 (2), 231-258, 2017.

[J11] Beipeng Mu, Liam Paull, Ali-akbar Agha-mohammadi, Jonathan P. How, John J. Leonard, "**Two-Stage Focused Inference for Resource-Constrained Collision-Free Navigation**", *IEEE Transactions on Robotics (T-RO)*, 99 (1), 1-17, 2017.

[J12] Ali-akbar Agha-mohammadi, Suman Chakravorty, Nancy Amato, "**FIRM: Sampling-based Feedback Motion Planning Under Motion Uncertainty and Imperfect Measurements**", *International Journal of Robotics Research (IJRR)*, 33 (2), 268-304, 2014.

[J13] Bernard Michini, Thomas Walsh, Ali-akbar Agha-mohammadi, Jonathan How, "**Bayesian Nonparametric Reward Learning from Demonstration**", *IEEE Transactions on Robotics (T-RO)*, 31 (2), 369-386, 2015.

[J14] Ali-akbar Agha-mohammadi, Saurav Agarwal, Suman Chakravorty, "**Periodic-node Graph-based Framework for Stochastic Control of Small Aerial Vehicles**", The *ASME Journal of Dynamic Systems, Measurement & Control*, Special Issue on Stochastic Models, Control and Algorithms in Robotics, 137 (3),

031005, 2015.

[J15] Shayegan Omidshafiei, Ali-akbar Agha-mohammadi, Yufan Chen, Nazim Kemal Ure, Shih-Yuan Liu, Brett Lopez, Rajeev Surati, Jonathan P. How, John L. Vian, "**Measurable Augmented Reality for Prototyping Cyberphysical Systems: A Robotics Platform to Aid the Hardware Prototyping and Performance Testing of Algorithms**", *IEEE Control Systems Magazine (CSM)*, 36 (6), 65-87, 2016.

Refereed Conference Papers

[C1] [under review] Ali-akbar Agha-mohammadi, et al., "**Autonomous Aerial Exploration Drones for DARPA Subterranean Challenge**," 2020.

[C2] [under review] Ali-akbar Agha-mohammadi, et al., "**Towards autonomous aerial scouting using multi-rotors in subterranean tunnel navigation**," 2020.

[C3] David D. Fan, Ali-akbar Agha-mohammadi and Evangelos A. Theodorou, "**Deep Learning Tubes for Tube MPC**," *Robotics: Science and Systems (RSS)*, Corvallis, OR, 2020.

[C4] Kamak Ebadi, Yun Chang, Matteo Palieri, Alex Stephens, Alex Hatteland, Eric Heiden, Abhishek Thakur, Benjamin Morrell, Luca Carlone and Ali-akbar Agha-mohammadi, "**LAMP: Large-Scale Autonomous Mapping and Positioning for Exploration of Perceptually-Degraded Subterranean Environments**," *IEEE International Conference on Robotics and Automation (ICRA)*, Paris, France, 2020.

[C5] Andrew Kramer, Carl Stahoviak, Angel Santamaria-Navarro, Ali-akbar Agha-mohammadi and Christoffer Heckman, "**Radar-Inertial Ego-Velocity Estimation for Visually Degraded Environments**," *IEEE International Conference on Robotics and Automation (ICRA)*, Paris, France, 2020.

[C6] David D. Fan, Jennifer Nguyen, Rohan Thakker, Nikhilesh Alatur, Ali-akbar Agha-mohammadi and Evangelos A. Theodorou, "**Bayesian Learning-Based Adaptive Control for Safety Critical Systems**," *IEEE International Conference on Robotics and Automation (ICRA)*, Paris, France, 2020.

[C7] Takahiro Sasaki, Kyohei Otsu, Rohan Thakker, Sofie Haesaert and Ali-akbar Agha-mohammadi, "**Where to Map? Iterative Rover-Copter Path Planning for Mars Exploration**," *IEEE International Conference on Robotics and Automation (ICRA)*, Paris, France, 2020.

[C8] Sina Sharif Mansouri, Farhad Pourkamali-Anaraki, Miguel Castano, Ali-akbar Agha-mohammadi, Joel Burdick and George Nikolakopoulos, "**Unsupervised Learning for Subterranean Junction Recognition Based on 2D Point Cloud**," *Mediterranean Conference on Control and Automation (MED)*, Saint-Raphael, France, 2020.

[C9] Christoforos Kanellakis, Petros Karvelis, Sina Sharif Mansouri and Ali-akbar Agha-mohammadi, "**Vision-driven NMPC for Autonomous Aerial Navigation in Subterranean Environments**," *International Federation of Automatic Control (IFAC)*, Santa Barbara, CA, 2020.

[C10] David Fan, Rohan Thakker, Barlett Tara, M. B. Miled, L. Kim, Evangelos Theodorou and Ali-akbar Agha-mohammadi, "**Autonomous Hybrid Ground/Aerial Mobility in Unknown Environments**," *International Conference on Intelligent Robots and Systems (IROS)*, Macau, China, November 2019.

[C11] Thomas Lew, David Fan, Barlett Tara, Angel Santamaria-Navarro, Rohan Thakker and Ali-akbar Agha-mohammadi, "**Contact Inertial Odometry: Collisions Are Your Friends**," *International Symposium on Robotics Research (ISRR)*, Hanoi, Vietnam, October 2019.

[C12] Angel Santamaria-Navarro, Rohan Thakker, David Fan, Benjamin Morrell and Ali-akbar Agha-mohammadi, "**Towards Resilient Autonomous Navigation of Drones**," *International Symposium on Robotics Research (ISRR)*, Hanoi, Vietnam, October 2019.

[C13] Max Pflueger, Ali-akbar Agha-mohammadi and Gaurav S. Sukhatme, "**Rover-IRL: Inverse Reinforcement Learning with Soft Value Iteration Networks for Planetary Rover Path Planning**," *IEEE International Conference on Robotics and Automation (ICRA)*, Montreal, Canada, May 2019.

[C14] Sung-Kyun Kim, Rohan Thakker and Ali-akbar Agha-mohammadi, "**Bi-directional Value Learning for Risk-aware Planning Under Uncertainty**," *IEEE International Conference on Robotics and Automation (ICRA)*, Montreal, Canada, May 2019.

[C15] Petter Nilsson, Sofie Haesaert, Rohan Thakker, Kyohei Otsu, Cristian-Ioan Vasile, Ali-akbar Agha-mohammadi, Richard Murray and Aaron Ames, "**Toward Specification-Guided Active Mars Exploration for Cooperative Robot Teams**," *Robotics: Science and Systems (RSS)*, Pittsburgh, Pennsylvania, June 2018.

[C16] Kyohei Otsu, Ali-akbar Agha-mohammadi and Michael Paton, "**Where to Look? Predictive Perception with Applications to Planetary Exploration**," *IEEE International Conference on Robotics and Automation (ICRA)*, Brisbane, Australia, March 2018. **The Best Paper Award Finalist.**

[C17] Sofie Haesaert, Petter Nilsson, Cristian-Ioan Vasile, Rohan Thakker, Ali-akbar Agha-mohammadi, Aaron Ames and Richard Murray, "**Temporal Logic Control of POMDPs via Label-based Stochastic Simulation Relations**," *IFAC Conference on Analysis and Design of Hybrid Systems (ADHS)*, Oxford, UK, July 2018.

[C18] Daniel Gaines, Joseph Russino, Daniel Gaines, Joseph Russino, Gary Doran, Ryan Mackey, Michael Paton, Brandon Rothrock, Steve Schaffer, Ali-akbar Agha-mohammadi, Chet Joswig, Heather Justice, Ksenia Kolcio, Jacek Sawoniewicz, Vincent Wong, Kathryn Yu, Gregg Rabideau, Robert Anderson and Ashwin Vasavada, "**Self-reliant Rover Design For Increasing Mission Productivity**," *The International Symposium on Artificial Intelligence, Robotics and Automation in Space (i-SAIRAS)*, Madrid, Spain, June 2018.

[C19] Kamak Ebadi, Ali-akbar Agha-mohammadi and Kyohei Otsu, "**Localization of A Mars Rover in Mars Helicopter-Generated Maps: Preliminary Results**," *The International Symposium on Artificial Intelligence, Robotics and Automation in Space (i-SAIRAS)*, Madrid, Spain, June 2018.

[C20] Daniel Gaines, Joseph Russino, Ali-akbar Agha-mohammadi, Gary Doran, Chet Joswig, Heather Justice, Ksenia Kolcio, Ryan Mackey, Michael Paton, Gregg Rabideau, Brandon Rothrock, Jacek Sawoniewicz, Steve Schaffer, Vincent Wong, Kathryn Yu, Robert Anderson and Ashwin Vasavada, "**Self-reliant Rover Design For Increasing Mission Productivity**," *The International Conference on Automated Planning and Scheduling (ICAPS)*, Delft, Netherlands, June 2018.

[C21] Eric Heiden, Daniel Pastor, Pradyumna Vyshnav, and Ali-akbar Agha-mohammadi, "**Heterogeneous Sensor Fusion via Confidence-rich 3d Grid Mapping: Application to Physical Robots**," *International Symposium on Experimental Robotics (ISER)*, Buenos Aires, Argentina, November 2018.

[C22] Kamak Ebadi, Ali-akbar Agha-mohammadi and Kyohei Otsu, "**Aerial-to-Ground Localization for a Helicopter-Rover Team in Mars-like Environments**," *International Symposium on Experimental Robotics (ISER)*, Buenos Aires, Argentina, November 2018.

[C23] Eric Heiden, Ali-akbar Agha-mohammadi, Karol Hausman, Gaurav S. Sukhatme, "**Confidence-rich 3D Grid Mapping**", in *International Symposium on Robotics Research (ISRR)*, Puerto Varas, Chile, December 2017.

[C24] Eric Heiden, Karol Hausman, Gaurav S. Sukhatme, Ali-akbar Agha-mohammadi, "**Planning High-speed Safe Trajectories in Confidence-rich Map**", in *International Conference on Intelligent Robots and Systems (IROS)*, Vancouver, Canada, September 2017.

[C25] Brian Ichter, Edward Schmerling, Ali-akbar Agha-mohammadi, Marco Pavone, "**Real-Time Stochastic Kinodynamic Motion Planning via Multiobjective Search on GPUs**", in *IEEE International Conference on Robotics and Automation (ICRA)*, Singapore, May 2017.

[C26] Beipeng Mu, Matthew Giamou, Liam Paull, Ali-akbar Agha-mohammadi, John J. Leonard, Jonathan P. How, "**Information-Based Active SLAM Via Topological Feature Graphs**," in IEEE Conference on Decision and Control (CDC), Las Vegas, NV, December 2016.

[C27] Shayegan Omidshafiei, Ali-akbar Agha-mohammadi, Christopher Amato, Shih-Yuan Liu, Jonathan P How, John Vian, "**Graph-based Cross Entropy Method for Solving Multi-Robot Decentralized POMDPs**", in *IEEE International Conference on Robotics and Automation (ICRA)*, Stockholm, Sweden, May 2016.

[C28] Beipeng Mu, Ali-akbar Agha-mohammadi, Liam Paull, Matthew Graham, Jonathan How, John Leonard, "**Two-Stage Focused Inference for Resource-Constrained Collision-Free Navigation**", in *Robotics: Science and Systems (RSS)*, Rome, Italy, July 2015.

[C29] Shayegan Omidshafiei, Ali-akbar Agha-mohammadi, Christopher Amato, Jonathan P How, "**Decentralized Control of Partially Observable Markov Decision Processes using Belief Space Macro-actions**", in *IEEE International Conference on Robotics and Automation (ICRA)*, Seattle, Washington, May 2015.

[C30] N. Kemal Ure, Shayegan Omidshafiei, Brett Thomas Lopez, Ali-akbar Agha-mohammadi, Jonathan P. How, John Vian, "**Heterogeneous Multiagent Learning with Applications to Forest Fire Management**", in *International Conference on Intelligent Robots and Systems (IROS)*, Hamburg, Germany, September 2015.

[C31] Shayegan Omidshafiei, Ali-akbar Agha-mohammadi, Yu Fan Chen, N. Kemal Ure, Jonathan P. How, John Vian, Rajeev Surati, "**Measurable Augmented Reality for Prototyping Cyber-Physical Systems (MAR-CPS)**", in *AIAA Infotech*, Kissimmee, FL, January 2016.

[C32] Ali-akbar Agha-mohammadi, Nazim Kemal Ure, Jonathan P. How, John Vian, "**Health-aware Stochastic Planning for Persistent Package Delivery Missions using Quadrotors**", in *International Conference on Intelligent Robots and Systems (IROS)*, Chicago, Illinois, September 2014.

[C33] Ali-akbar Agha-mohammadi, Saurav Agarwal, Aditya Mahadevan, Suman Chakravorty, Daniel Tomkins, Jory Denny, Nancy Amato, "**Robust Online Belief Space Planning in Changing Environments: Application to Physical Mobile Robots**", in *IEEE International Conference on Robotics and Automation (ICRA)*, Hong Kong, China, May 2014.

[C34] Ali-akbar Agha-mohammadi, Suman Chakravorty, Nancy Amato, "**Graph-based Stochastic Control with Constraints: A Unified Approach with Perfect and Imperfect Measurements**", in *American Control Conference (ACC)*, Washington, DC, June 2013.

[C35] Ali-akbar Agha-mohammadi, Suman Chakravorty, Nancy M. Amato, "**Sampling-based Nonholonomic Motion Planning in Belief Space via Dynamic Feedback Linearization-based FIRM**", in *International Conference on Intelligent Robots and Systems (IROS)*, Vilamoura, Portugal, October 2012.

[C36] Ali-akbar Agha-mohammadi, Suman Chakravorty, Nancy M. Amato, "**On the Probabilistic Completeness of the Sampling-based Feedback Motion Planners in Belief Space**", in *IEEE International Conference on Robotics and Automation (ICRA)*, Saint Paul, Minnesota, May 2012.

[C37] Ali-akbar Agha-mohammadi, Suman Chakravorty, Nancy M. Amato, "**FIRM: Feedback Controller-Based Information-State Roadmap, A Framework for Motion Planning under Uncertainty**", in *International Conference on Intelligent Robots and Systems (IROS)*, pp.4284-4291, San Francisco, CA, Sep 2011.

[C38] Ali-akbar Agha-mohammadi, Dezhen Song, "**Robust Recognition of Planar Mirrored Walls Using a Single View**", in *IEEE International Conference on Robotics and Automation (ICRA)*, pp.1186-1191, Shanghai, China, May 2011.

[C39] A. Tamjidi, Hamid D. Taghirad, Ali-akbar Agha-mohammadi, "**On the Consistency of EKF-SLAM: Focusing on the Observation Models**", in *International Conference on Intelligent Robots and Systems (IROS)*, pp.2083-2088, St. Louis, US, Oct. 2009.

[C40] Ali-akbar Agha-mohammadi, A. Tamjidi, Hamid D. Taghirad, "**A Solution for SLAM through Augmenting Vision and Range Information**", in *International Conference on Intelligent Robots and Systems (IROS)*, pp.1037-1042, Nice, France, Oct. 2008.

[C41] Ali-akbar Agha-mohammadi, A. Tamjidi, Hamid D. Taghirad, "**SLAM Based on the LRF Information as the Only Data Source**", in *International Federation of Automatic Control, (IFAC),* pp.14657-14662, Seoul, Korea, July 2008.

[C42] Ali-akbar Agha-mohammadi, Hamid D. Taghirad, A. Tamjidi, Ehsan Mihankhah, "**Feature-Based Range**

Scan Matching for Accurate and High Speed Mobile Robot Localization", in *European Conference on Mobile Robots (ECMR)*, Freiburg, Germany, pp.253-258, 2007.

Non-refereed Conference/workshop Papers and Posters

[W1] Arash Kalantari, Thomas Touma, Leon Kim, Rianna Jitosho, Kyle Strickland, Lopez, Brett T. and Ali-akbar Agha-mohammadi, "**Drivocopter: A concept Hybrid Aerial/Ground Vehicle for Long-endurance Mobility,**" *IEEE Aerospace Conference*, Big Sky, MT, March 2020.

[W2] Kyohei Otsu, Tepsuporn Scott, Thakker Rohan, Tiago Vaquero, Jeffrey A. Edlund, William Walsh, Michael T. Wolf and Ali-akbar Agha-mohammadi, "**Autonomous Exploration and Mapping of Communication-degraded Environment with a Robot Team,**" *IEEE Aerospace Conference*, Big Sky, MT, March 2020.

[W3] Andrea Tagliabue, Stephanie Schneider, Marco Pavone and Ali-akbar Agha-mohammadi, "**The Shapeshifter: a Multi-Agent, Multi-Modal Robotic Platform for the Exploration of Titan,**" *IEEE Aerospace Conference*, Big Sky, MT, March 2020.

[W4] Jong Tai Jang, Angel Santamaria-Navarro, Brett T. Lopez and Ali-akbar Agha-mohammadi, "**Analysis of State Estimation Drift on a MAV using PX4 Autopilot and MEMS IMU During Dead-reckoning,**" *IEEE Aerospace Conference*, Big Sky, MT, March 2020.

[W5] Ali-akbar Agha-mohammadi, Karl L. Mitchell and Penelope Jane Boston, "**Robotic Exploration of Planetary Subsurface Voids in Search for Life,**" *American Geophysical Union (AGU)*, San Francisco, CA, Dec 2019.

[W6] Sahand Sabet, Ali-akbar Agha-mohammadi, Andrea Tagliabue, David Elliott and Parviz E. Nikravesh, "**Rollocopter: An Energy-Aware Hybrid Aerial-Ground Mobility for Extreme Terrains,**" *IEEE Aerospace Conference*, Big Sky, Montana, March 2019.

[W7] David Chan and Ali-akbar Agha-mohammadi, "**Autonomous Imaging and Mapping of Small Bodies Using Deep Reinforcement Learning,**" *IEEE Aerospace Conference*, Big Sky, Montana, March 2019.

[W8] Ali-akbar Agha-mohammadi, Jason Hofgartner, Pradyumna Vyshnav, Jose Mendez, Daniel Tikhomirov, Fernando Chavez, Jonathan Lunine and Issa Nesnas, "**Exploring Icy Worlds: Accessing the Subsurface Voids of Titan through Autonomous Collaborative Hybrid Robots,**" *International Planetary Probe Workshop (IPPW)*, Boulder, CO, June 2018.

[W9] Vincenzo Pesce, Ali-akbar Agha-mohammadi and Michèle Lavagna, "**Autonomous Navigation for Small bodies Mapping,**" *IEEE Aerospace Conference*, Big Sky, MT, March 2018.

[W10] Max Pflueger, Ali Agha, Gaurav Sukhatme, "**Soft Value Iteration Networks for Planetary Rover Path Planning,**" NIPS workshop on Acting and Interacting in the Real World: Challenges in Robot Learning, Long Beach, CA, December 2017.

[W11] Max Pflueger, Ali-akbar Agha-mohammadi, Gaurav S. Sukhatme, "**Long-Range Path Planning for Planetary Rovers via Imitation Learning and Value Iteration Networks**" in *Southern California Machine Learning Symposium*, Los Angeles, CA, October 2017. **Honorable Mention for the Best Paper Award.**

[W12] Ali-akbar Agha-mohammadi, Eric Heiden, Karol Hausman, Gaurav S. Sukhatme, "**Confidence-aware Occupancy Grids**", in International Conference on Intelligent Robots and Systems (IROS), Workshop on Vision-based Agile Autonomous Navigation of UAVs, Vancouver, Canada, September 2017.

[W13] Eric Heiden, Karol Hausman, Gaurav S. Sukhatme, Ali-akbar Agha-mohammadi, "**High-speed Safe Trajectory Planning in Confidence-rich Maps**", in International Conference on Intelligent Robots and Systems (IROS), Workshop on Vision-based Agile Autonomous Navigation of UAVs, Vancouver, Canada, September 2017.

[W14] Eric Heiden, Karol Hausman, Guarav Sukhatme, Ali-akbar Agha-mohammadi, "**Safe Trajectory Generation using Confidence-rich Maps,**" in *Southern California Robotics Symposium (SCR)*, Los Angeles, CA, April 2017.

[W15] Ali-akbar Agha-mohammadi, "**SMAP: Simultaneous Mapping and Planning on Occupancy Grids,**" in International Conference on Intelligent Robots and Systems (IROS), Workshop on Vision-based High Speed Autonomous Navigation of UAVs, Daejeon, South Korea, October 2016.

[W16] Christopher Amato, George Konidaris, Shayegan Omidshafiei, Ali-akbar Agha-mohammadi, Jonathan P. How, Leslie P. Kaelbling, "**Probabilistic Planning for Decentralized Multi-Robot Systems**", in *Sequential Decision Making for Intelligent Agents, AAAI fall symposium*, Arlington, VA, November 2015.

[W17] Ali-akbar Agha-mohammadi, Shayegan Omidshafiei, Christopher Amato, Jonathan P. How, "**Graph-based Planning to Solve Multi-agent POMDPs**", In *Robotics: Science and Systems 2014 Workshop on Distributed Control and Estimation for Robotic Vehicle Networks*, Berkeley, CA, July 2014.

[W18] Ali-akbar Agha-mohammadi, Saurav Agarwal, Suman Chakravorty, Nancy M. Amato, "**Dynamic Closed-loop Replanning in Belief Space: Toward Handling Dynamically Changing Environments**", in *Robotics: Science and Systems 2014 Workshop on Information-based Grasp and Manipulation Planning*, Berkeley, CA, July 2014.

[W19] Ali-akbar Agha-mohammadi, Suman Chakravorty, Nancy M. Amato, "**Online Replanning in Belief Space for Dynamical Systems: Towards Handling Discrete Changes of Goal Location**", in *IEEE International Conference On Robotics and Automation (ICRA), Workshop on Combining Task and Motion Planning,* Karlsruhe, Germany, May 2013.

[W20] Ali-akbar Agha-mohammadi, Suman Chakravorty, Nancy M. Amato, "**Medical Needle Steering under Motion and Sensor Noise using Feedback-based Information Roadmaps**", in *IEEE International Conference On Robotics and Automation (ICRA), Workshop on Medical Needle Steering*, Saint Paul, Minnesota, May 2012.

[W21] Arash Kalantari, Ehsan Mihankhah, Ali-akbar Agha-mohammadi, "**Resquake, A Tracked Mobile Rescue Robot**", in *Rescue Robotics Camp, IEEE International Workshop on Safety Security and Rescue Robotics (SSRR)*, Rome, Italy, September 2007.

[W22] Amirhossein Tamjidi, Ali-akbar Agha-mohammadi and Hamid D. Taghirad, "Augmenting Vision and LRF Information: Towards Encoder-free SLAM in Unstructured Environments," Machine Vision and Image Processing Conference, Tabriz, Iran, 2008.

[W23] Ali-akbar Agha-mohammadi, Majid Nili Ahmadabadi and Taher S. Mirzahasanloo, "Behavior Learning in Behavior-Based Architectures Using Reinforcement Learning," 12th International CSI Computer Conference (CSICC), Tehran, Iran, pp.171-174, 2007.

[W24] Ali-akbar Agha-mohammadi, "Mobile Robot Localization Using Single Camera," 10th Iranian Student Conference on Electrical Engineering, (ISCEE), Esfahan, Iran, 2007.

[W25] Ali-akbar Agha-mohammadi and Taher S. Mirzahasanloo, "Path Planning Using Hopfield Neural Network," 10th Iranian Student Conference on Electrical Engineering, (ISCEE), Esfahan, Iran, 2007.

[W26] Ali-akbar Agha-mohammadi and Amirhossein Tamjidi, "An Introduction to Modified Methods in Ant Colony Systems Optimization and Proposing a New Local Optimizer," 10th Intelligent Systems Conference, Esfahan, Iran, pp.460-463, 2005.

Patents

[P1] Ali-akbar Agha-mohammadi, "**Rollocopter: Novel Hybrid Aerial-Ground Vehicle for Failure-Resilient, Energy-Efficient, and Agile Mobility,**" *Submitted to The United States Patent and Trademark Office*.

[P2] Ali-akbar Agha-mohammadi, "**Cobots: Autonomous Cooperatives Robots for Resilient Mobility on Titan and Beyond,**" *Submitted to The United States Patent and Trademark Office*.

[P3] Zhaoyang Lv and Aliakbar Aghamohammadi, "**Holistic planning with multiple intentions for self-driving cars,**" *US Patent App. 15/604,437*, November 29 2018.

[P4] Zhaoyang Lv, Ali-akbar Agha-mohammadi and Amirhossein Tamjidi, "**Motion Planning and Intention Prediction for Autonomous Driving in Highway Scenarios via Graphical Model-based Factorization**," *US Patent App. 15/601,047*, March 15 2018.

[P5] Ali-akbar Agha-mohammadi and Kiran Somasundaram, "**Systems and methods for mapping an environment**," *US Patent 9,996,944*, June 12 2018.

[P6] Ali-akbar Agha-mohammadi et al., "**Autonomous visual navigation,**" *US Patent App. 15/249,250*, June 15 2017.

[P7] Ali-akbar Agha-mohammadi, et al., "**Simultaneous mapping and planning by a robot,**" *US Patent App. 15/192,719*, June 8 2017.

[P8] Ali-akbar Agha-mohammadi, et al., "**Parallel belief space motion planner,**" *US Patent App. 14/941,465*, January 5 2017.

[P9] Ali-akbar Agha-mohammadi, et al., "**Map generation based on raw stereo vision-based measurements,**" *US Patent App. 15/192,874*, June 8 2017.

[P10] Saurav Agarwal, Ali-akbar Agha-mohammadi and Kiran Somasundaram, "**Rapidly-exploring randomizing feedback-based motion planning,**" *US Patent App. 15/192,881*, June 15 2017.

[P11] Ali-akbar Agha-mohammadi et al., "**Stochastic map-aware stereo vision sensor model,**" *US Patent App. 15/192,603*, June 8 2017.

[P12] Ali-akbar Agha-mohammadi et al., "**Stochastic map generation and bayesian update based on stereo vision,**" *US Patent App. 15/192,944*, June 8 2017.

[P13] Ali-akbar Agha-mohammadi, Seyed Hesameddin Najafi Shoushtari and Regan Blythe Towal, "**Object-focused active three-dimensional reconstruction**," *US Patent App. 15/192,857*, July 27 2017.

[P14] Regan Blythe Towal, Shayegan Omidshafiei and Ali-akbar Agha-mohammadi, "**Active camera movement determination for object position and extent in three-dimensional space,**" *US Patent App. 15/069,834*, June 8 2017.

Technical Reports

[T1] Ali-akbar Agha-mohammadi, Andrea Tagliabue, Stephanie Schneider, Benjamin Morrell, Marco Pavone, Jason Hofgartner, Issa A. D. Nesnas, Kalind Carpenter, Rashied B. Amini, Arash Kalantari, Alessandra Babuscia, Javid Bayandor and Jonathan Lunine, "**The Shapeshifter: A Morphing, Multi-Agent, Multi-Modal Robotic Platform for the Exploration of Titan,**" *NASA Innovative Advanced Concepts (NIAC)*, Phase I, Final Report, 2019.

[T2] E. Natasha Stavros, Ali-akbar Agha-mohammadi, Allen Sirota, Marco Quadrelli, Kamak Ebadi and Kyongsik Yun, "**Smoke Sky--Exploring New Frontiers of Unmanned Aerial Systems for Wildland Fire Science and Applications**," Technical Report, JPL, Pasadena, CA, 2019, *arXiv preprint arXiv:1911.08288.*

[T3] Ali-akbar Agha-mohammadi, Nazim Kemal Ure, Jonathan P. How, John Vian, "**Health-aware Stochastic Planning for Persistent Package Delivery Missions using Quadrotors**", Technical Report, Aerospace Controls Laboratory, Department of Aero/Astro, MIT, Dec 2013.

[T4] Ali-akbar Agha-mohammadi, Saurav Agarwal, Suman Chakravorty, "**Periodic-node Graph-based Framework for Stochastic Control of Small Aerial Vehicles**", Technical Report, TAMU-EDPL-TR-2014-001, Department of Aerospace Engineering, Texas A&M University, 2014.

[T5] Ali-akbar Agha-mohammadi, Saurav Agarwal, Aditya Mahadevan, Suman Chakravorty, Daniel Tomkins, Jory Denny, Nancy M. Amato, "**Dynamic Real-time Replanning in Belief Space: An Experimental Study on Physical Mobile Robots**", Technical Report, TR13-007, Department of Computer Science, Texas A&M University, Jul 2013.

[T6] Ali-akbar Agha-mohammadi, Suman Chakravorty, Nancy M. Amato, "**Sampling-based Nonholonomic Motion Planning in Belief Space via Dynamic Feedback Linearization-based FIRM**", Technical Report, TR12-004, Department of Computer Science and Engineering, Texas A&M University, Mar 2012.

[T7] Ali-akbar Agha-mohammadi, Suman Chakravorty, Nancy M. Amato, "**Periodic-Feedback Motion Planning in Belief Space for Nonholonomic and/or Nonstoppable Robots**", Technical Report, TR12-003, Department of Computer Science and Engineering, Texas A&M University, Feb 2012.

[T8] Ali-akbar Agha-mohammadi, Suman Chakravorty, Nancy M. Amato, "**Sampling-based Feedback Motion Planning under Motion Uncertainty and Imperfect Measurements**", Technical Report, TR11-007, Department of Computer Science and Engineering, Texas A&M University, Dec 2011.

[T9] Ali-akbar Agha-mohammadi, Suman Chakravorty, Nancy Amato, "**Probabilistic Completeness of the Belief Space Motion Planners**", Technical Report, TR11-006, Department of Computer Science and Engineering, Texas A&M University, Nov 2011.

[T10] Ali-akbar Agha-mohammadi, Suman Chakravorty, Nancy Amato, "**FIRM: Feedback Controller-Based Information-State Roadmap, A Framework for Motion Planning Under Uncertainty**", Technical Report, TR11-001, Department of Computer Science and Engineering, Texas A&M University, Jan 2011

Dissertations and Book Chapters

[D1] Ali-akbar Agha-mohammadi, Eric Heiden, Karol Hausman and Gaurav Sukhatme, "**Confidence-rich grid mapping**," Robotics Research, Springer, 2020.

[D2] "**Sampling-based State Estimation and Stochastic Control for Robot Motion Planning under Motion Uncertainty and Noisy Sensor Measurements**", PhD Dissertation, Department of Computer Science and Engineering, Texas A&M University, Oct 2013.

[D3] Ali-akbar Agha-mohammadi, Sandip Kumar, Suman Chakravorty, "**Motion Planning under Uncertainty**", Book Chapter, J. Valasek (Ed.), Advances in Intelligent and Autonomous Aerospace Systems, Progress in Astronautics and Aeronautics, *American Institute of Aeronautics and Astronautics (AIAA)*, Reston, VA, 2012.

[D4] "**Design and Implementation of Multi-sensor Fusion methods for Solving Simultaneous Localization And Mapping (SLAM) Problem**", M.Sc. Thesis, Department of Electrical and Computer Engineering, Khaje Nasir Toosi University of Technology, July 2008.

[D5] "**Robosoccer: Small-size Soccer Robots for Robocup Competitions**", B.Sc. Thesis, Department of Electrical and Computer Engineering, Tabriz University, June 2005

Advising and Research Mentoring

Postdocs
[1] Dr. Brett Lopez, JPL, 2019-Present (PhD from MIT)
[2] Dr. Mohammadreza Radmanesh, JPL, 2019-Present (PhD from U of Cincinnati)
[3] Dr. Jeffrey Edlund, JPL, 2018-2019 (PhD from Caltech)
[4] Dr. Angel Santamaria Navarro, JPL, 2018-2019 (PhD from Uni. Politècnica de Catalunya)
[5] Dr. Benjamin Morrell, JPL, 2018-2019 (PhD from University of Sydney)
[6] Dr. Matthew Anderson, JPL, 2018-2019 (PhD from University of Sydney)

Graduate Students
[1] Yasin Almalioghlu (PhD, Imperial College London), JPL visiting researcher, 2020-Present
[2] Marcel Kaufmann (PhD, Polytechnique Montréal), JPL visiting researcher, 2020-Present
[3] David Fan (PhD, Georgia Tech), JPL visiting researcher, 2018-Present
[4] Inhwan Wee (PhD, KAIST), JPL visiting researcher, 2020-Present
[5] Matteo Palieri (PhD, Polytechnic University of Bari), JPL summer Intern, 2019-2020
[6] Nobuhiro Funabiki (PhD, The University of Tokyo), JPL visiting researcher, 2019-2020

[7] Kamak Ebadi (PhD, Santa Clara University), JPL Intern, 2018-2019
[8] Jesús Tordesillas Torres (PhD, MIT), JPL Intern, 2019
[9] Abhishek Cauligi (PhD, Stanford), JPL Intern, NASA Mentor for NASA NSTRF fellow, 2018-2019
[10] Andrew Kramer (PhD, Uni. of Colorado, Boulder), JPL Intern, 2019
[11] Mohammadreza Radmanesh (PhD, University of Cincinnati), JPL Intern, 2019
[12] Hanseob Lee (PhD, KAIST), JPL visiting researcher, 2019
[13] Sunggoo Jung (PhD, KAIST), JPL visiting researcher, 2019
[14] Tomoki Emmei (PhD, University of Tokyo), JPL visiting researcher, 2019
[15] Andrea Tagliabue (Master, ETH), JPL Intern, 2018-2019
[16] Brett Lopez (PhD, MIT), JPL summer Intern, 2018
[17] David Chan (PhD, Berkeley), JPL summer Intern, 2018
[18] SooJean Han (PhD, Caltech), JPL summer Intern, 2018
[19] Jared Strader (PhD, West Virginia University), JPL visiting researcher, 2018
[20] Eric Heiden (PhD, USC), JPL Intern, 2018
[21] Gabrielle Hetrick (PhD, West Virginia University), JPL Intern, 2018
[22] Sahand Sabet (PhD, University of Arizona), JPL Intern, 2018
[23] Takahiro Sasaki (PhD, Kyoto University), JPL Intern, 2017
[24] Sung Kim (PhD, CMU), JPL Intern, 2017
[25] Max Pflueger (PhD, USC), JPL Intern, 2017
[26] Vincezno Pesce (PhD, Politecnico di Milano), JPL Intern, 2017
[27] Zhaoyang Lv (PhD, GeorgiaTech), Qualcomm Research Intern, 2016
[28] Lucas Janson, (PhD, Stanford), Qualcomm innovation fellowship program, 2016
[29] Edward Schmerling, (PhD., Stanford), Qualcomm innovation fellowship program, 2016
[30] Beipeng Mu, (PhD, MIT), Research Mentoring, 2014-2015
[31] Shayegan Omidshafiei, (PhD, MIT), Research Mentoring, 2013-2015
[32] Brett Lopez, (PhD, MIT), MIT-Boeing alliance on multi-robot systems, 2014
[33] Yu Fan/Steven Chen, (PhD, MIT), MIT-Boeing alliance on multi-robot systems, 2014
[34] Saurav Agarwal, (PhD, Texas A&M), Research Mentoring, 2013
[35] Mohammad Rafiei, (PhD, Texas A&M), Research Mentoring. 2013

Master Students
[1] Benjamin Ramtoula (MS, EPFL), JPL visiting researcher, 2020-Present
[2] Muhammad Fadhil Ginting (MS, ETH), JPL visiting researcher, 2019-Present
[3] Xianmei Lei (MS, Cal Poly Pomona), JPL Intern, 2018-Present
[4] Edward Terry (MS, CMU), JPL research engineer, 2018-2020
[5] Thomas Touma (MS, RMIT University), JPL visiting researcher, 2019-2020
[6] Alatur Nikhilesh (MS, ETH), JPL visiting researcher, 2019-2020
[7] Nobuhiro Funabiki (MS, The University of Tokyo), JPL visiting researcher, 2019
[8] Thomas Lew (MS, ETH), JPL visiting researcher, 2019
[9] Alexander Haugland, Hatteland (MS, ETH), JPL visiting researcher, 2019
[10] Meriem Ben Miled (MS, ETH), JPL visiting researcher, 2018
[11] Sandro Berchier (MS, ETH), JPL visiting researcher, 2018
[12] Giulio Autelitano (MS, Università di Pisa), JPL visiting researcher, 2018
[13] Jacopo Villa (MS, KTH), JPL visiting researcher, 2018
[14] Scott Harper (MS, West Virginia University), JPL Intern, 2018
[15] Pradyumna Vyshnav (MS, Aalto University), JPL Intern, 2018
[16] Amir Tamjidi, (MS, Texas A&M), Research Mentoring, 2013

Undergraduate Students
[1] Hyungho (Chris) Choi, JPL Intern, 2019-Present
[2] Fernando Chavez, JPL Intern, 2017-Present
[3] Ravi Alex Stephens, JPL Intern, 2019-2020
[4] Gustavo Correa, JPL Intern, 2019
[5] Tristan Buick Heywood, JPL Intern, 2018-2019
[6] Leon Kim, JPL Intern, 2018-2019
[7] Tara Bartlett, JPL Intern, 2018-2019
[8] Jairo Contreras, JPL Intern, 2018-2019
[9] Micah Elinor Feras, JPL Intern, 2018-2019
[10] Gita Temelkova, JPL Intern, 2018-2019

[11] Kyle Strickland, JPL Intern, 2018-2019
[12] Navid Nassiri, JPL Intern, 2018-2019
[13] Daniel Tikhomirov, JPL Intern, 2017-2018
[14] Braddley Carey, JPL Intern, 2017
[15] Emilie Naples, JPL Intern, 2017
[16] Jose Mendez, JPL Intern, 2017-2018
[17] Roberto Mendez, JPL Intern, 2017
[18] Christopher Maynor, Research Mentoring at MIT, 2014
[19] Mycal Tucker, Research Mentoring at MIT, 2014
[20] Jesse Alder, Research Mentoring at MIT, 2014
[21] Ajinkya Jain, Research Mentoring at Texas A&M, 2013
[22] Fernando Pastor, Research Mentoring at Texas A&M, 2013
[23] Karan Bagadiya, Research Mentoring at Texas A&M, 2012-2013
[24] Ammar M. Abbas, Research Mentoring at Texas A&M, 2012
[25] Cole Jones, Research Mentoring at Texas A&M, 2010
[26] Kasra Khosousi, Research Mentoring at KN Toosi, 2008

Visiting faculty member
[1] Dr. Evangelos Theodorou, JPL visiting faculty member, 2019
[2] Dr. Jong Tai Jang, JPL visiting faculty member, 2018
[3] Dr. Paul Akangah, JPL visiting faculty member, 2017

Teaching Experience

Texas A&M University
CSE Dept., **Artificial Intelligence**, undergraduate course, Teaching Assistant. (Summer 2009 and Spring 2009)
CSE Dept., **C++ Programming**, undergraduate course, Teaching Assistant (Spring 2010), Instructor: Dr. Stroustrup (Creator of C++)
CSE Dept., **Intro to Robotics** (coding **Lego Mindstorms Robots)**, undergrad course, Teaching Assistant (Fall 2009)

K.N. Toosi University of Tech
ECE Dept., **Robotics**, graduate course, Teaching Assistant. (Spring 2008)
ECE Dept., **Introduction to Intelligent Systems**, graduate course, Teaching Assistant. (Spring 2008)
ECE Dept., **Fuzzy Control Systems**, graduate course, Teaching Assistant. (Spring 2007)

Adiban University of Garmsar; Azad University of Behbahan; Tabriz University
ECE Dept., **Programming Languages (C++)**, undergraduate course, Lecturer (Fall 2008)
ECE Dept., **Operating Systems**, undergraduate course, Lecturer (Fall 2008)
ECE Dept., **Data Structures**, undergraduate course, Lecturer (Fall 2008)
ECE Dept., **Programming Languages (C++)**, undergraduate course, Lecturer (Spring 2008)
ECE Dept., **Operating Systems**, undergraduate course, Lecturer (Spring 2008)
ECE Dept., **Data Structures**, undergraduate course, Lecturer (Spring 2008)
EE Dept., **Electronic Circuits**, undergraduate course, Lecturer (Fall 2006)
EE Dept., **Electrical Circuits**, undergraduate course, Lecturer (Fall 2006)
EE Dept., **Electrical Machines**, undergraduate course, Lecturer (Fall 2006)
ECE Dept., **Microcontrollers Programming (8051 & AVR)**, Teaching Assistant (2002-2004)

Selected Research Highlighted in Media
- Article: "All of the Winners in the DARPA Subterranean Challenge Tunnel Circuit" by Evan Ackerman, IEEE Spectrum news, 2019
- Article: "How Robotics Teams Are Solving the Biggest Problem at DARPA's Subterranean Challenge" by Evan Ackerman, IEEE Spectrum news, 2019
- Article: "NASA Robots Compete Underground in DARPA Challenge" by JPL, NASA, 2019
- Article: "NASA Designing Shapeshifting Robots for Saturn's Moons" by JPL, NASA, 2019
- Article: "This shapeshifting robot could explore other planets" by Ashley Strickland, CNN, 2019
- Article: "Helping robots handle uncertainty algorithm for planning multirobot collaborations makes complex models practical" by Larry Hardesty, MIT news, 2015.

- Article: "[Augmented Reality Room Shows What Robots Are Thinking](#)" By Evan Ackerman, IEEE spectrum, 2014.
- Article: Measurable Augmented Reality system; featured on <u>the cover page of MIT</u>: http://news.mit.edu/2014/system-shows-robot-intentions-1029
- Article: "[Projecting a robot's intentions: A new spin on virtual reality helps engineers read robots' minds](#)" by Jennifer Chu, MIT news, 2014.
- Article: Planning method for package delivery under uncertainty; featured on <u>the cover page of MIT</u>: http://web.mit.edu/site/spotlight/4123
- Article: "Delivery by drone" by Jennifer Chu, MIT news, 2014
- Article: "MIT Researchers Are Now Able To Watch Robots Think", by Eric Hopton, RedOrbit, 2014.
- Article: "Delivery drones will monitor their own health" by Katie Collins, Wired, 2014

Professional Activities

Workshop organizing committee:

- Southern California Robotics Symposium (SCR), Caltech, Pasadena, CA, 27th Apr 2019, http://scr2019.caltech.edu/
- Robotics Science and Systems (RSS) workshop on "[POMDPs in Robotics: State of The Art, Challenges, and Opportunities](#)", MIT, Cambridge, MA, 15th Jul 2017.
- Southern California Robotics Symposium (SCR), USC, Los Angeles, CA, 14th Apr 2017, http://socal-robotics.org/
- Southern California Robotics Symposium (SCR), UCSD, San Diego, CA, 22nd Apr 2016, http://socal-robotics.org/
- MURI workshop on "Nonparametric Bayesian Models to Represent Knowledge and Uncertainty for Decentralized Planning", MIT, Cambridge, MA, 23rd Jan 2014.
- MURI workshop on "Nonparametric Bayesian Models to Represent Knowledge and Uncertainty for Decentralized Planning", MIT, Cambridge, MA, 30th Sep 2014.

Reviewer for the Following Journals and Conferences:

[J1] International Journal of Robotics Research (IJRR)
[J2] IEEE Transaction on Robotics (TRO)
[J3] Autonomous Robots
[J4] IEEE Robotics and Automation Letters (RAL)
[J5] ASME Journal of Dynamic Systems, Measurement and Control
[J6] Journal of Aerospace Information Systems (JAIS)
[J7] Computer Animation and Virtual Worlds (CAVW)
[C1] Robotics: Science and Systems (RSS)
[C2] IEEE International Conference on Robotics and Automation (ICRA)
[C3] Workshop on the Algorithmic Foundations of Robotics (WAFR)
[C4] IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
[C5] American Control Conference (ACC)
[C6] International Federation of Automatic Control World Congress (IFAC)
[C7] AAAI Conference on Artificial Intelligence (AAAI)
[C8] IEEE International Symposium on Mixed and Augmented Reality (ISMAR)
[C9] Computer Animation and Virtual Worlds (CAVW)
[C10] International Conference on Motion in Games (MIG)
[C11] Conference on Computer Animation and Social Agents (CASA)
[C12] IEEE International Conference on Mechatronics and Automation (ICMA)
[C13] Advanced Intelligent Mechatronics (AIM)
[C14] International Conference on Intelligent Autonomous Systems (IAS)
[C15] International Symposium on Multi-Robot and Multi-Agent Systems (MRS)
[C16] IEEE Aerospace Conference

Associate Editor/ Program Committee/ session chair for the Following Conferences:

- AE for IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2015
- PC for Robotics: Science and Systems (RSS), 2017
- PC for Autonomous Agents and Multi-Agent Systems (AAMAS), 2017
- Workshop on "Robot Learning and Planning" at Robotics: Science and Systems (RSS) conference, University of Michigan, Ann Arbor, MI, June 18-22, 2016.

- Session chair, Regular Session: "**Machine Learning and Probabilistic Reasoning for Intelligent UAS**", *AIAA Infotech @ Aerospace, AIAA Science and Technology*, San Diego, California, Jan 2016.
- IROS (IEEE/RSJ International Conference on Intelligent Robots and Systems), 2011
- Session chair, Regular Session MolVT16: "**SLAM: Theory**", IEEE/RSJ International Conference on Intelligent RObots and Systems (IROS'09), St. Louis, US, Oct 2009.

Serving as a Thesis Advisor or Committee Member:

-- PhD Committee member, Andrew Kramer, U of Colorado Boulder, 2021
-- PhD Committee member, Sahand Sabet, U of Arizona, 2021
-- PhD Committee member, Max Pflueger, USC, 2020
-- PhD Co-advisor, David D. Fan, Dept. of Robotics, Georgia Institute of Technology, 2020
-- PhD Co-advisor, Björn Täljsten, Luleå University of Technology, 2020
-- PhD Committee member, Kamak Ebadi, Santa Clara University, 2020
-- PhD Co-advisor, Christoforos Kanellakis, Luleå University of Technology, 2020
-- PhD Committee member, Sung Kyun Kim, The Robotics Institute, CMU, May 2019
-- PhD Committee member, Prince Singh, Dept of Aero/Astro, MIT, 2018

-- MS Co-advisor, Fadhil Ginting, ETH, 2020
-- MS Committee member, Maria Tsiourva, Computer Science, UNR, 2020
-- MS Co-advisor, Nikhilesh Alatur, ETH, Jan 2020
-- MS Co-advisor, Sandro Berchier, ETH, June 2019
-- MS Co-advisor, Meriem Ben Miled, Dept. of Mech. Eng., ETH, June 2019

-- Reader member, PhD dissertation committee, Nazim Kemal Ure, Dept. of Aero/Astro at MIT, May 2015
-- Reader member, PhD dissertation committee, Brandon Luders, Dept. of Aero/Astro at MIT, May 2014

Awards in Robotic Contests

-- First Place – DARPA SubTerranean Challenge, Urban Competition. (August 2019)
-- Second Place – DARPA SubTerranean Challenge, Tunnel Competition. (August 2019)
-- Second Place - Advanced Autonomy, International Robotics Contest, Robocup 2007, IR-Open, Rescue Robots, real league. (2007)
-- First Place - Advanced Mobility, International Robotics Contest, Robocup 2007, IR-Open, Rescue Robots, real league. (2007)
-- Participated in International Robotics Contest, Robocup'07, Atlanta, GA, Rescue real league. (2007)
-- Second Place in Intelligent Mice Robotics Contest, Tabriz University (2002)

Outreach and open robotics demos for public

-- MIT Aeronautics and Astronautics centennial symposium, Oct 22nd-24th 2014
-- Robotics demo for the students in the Discover Aerospace Freshman Pre-Orientation Program, Aug 22nd, 2014
-- Robotics demo for Boeing company after MIT received Boeing's Supplier of the Year" Award in the university/innovation category, May 6th 2014
-- Public open house for Aero/Astro 100-year anniversary (MIT), April 23rd-24th 2014
-- Open-house demo for prospective graduate students of the department of Aero-Astro at MIT, Mar 14th, 2014.