

Ali Reza Pedram

CONTACT INFORMATION	Walker Department of Mechanical Engineering University of Texas at Austin, Austin TX 78712 Linkedin: Ali Reza Pedram	Phone: +1 240-302-0809 Email: apedram@utexas.edu Google Scholar: Ali Reza Pedarm
EDUCATION	PhD, Dynamic Systems and Control, Mechanical Engineering , in progress Graduate Portfolio in Robotics The University of Texas at Austin GPA: 3.96/4.0 MSc, Mechanical Engineering , July 2017 Sharif University of Technology , Tehran, Iran GPA: 3.96/4.0 BSc, Mechanical Engineering and Applied Physics (dual degree), July 2015 Sharif University of Technology , Tehran, Iran GPA: 3.93/4.00	
RESEARCH INTERESTS	<ul style="list-style-type: none">• Robotics and Motion Planning• Optimal Stochastic Control and Networked Control Systems• Information Theory, Estimation Theory, and Privacy in Dynamic Systems• Optimization and Machine Learning• Reinforcement Learning• Game Theory and Team Theory	
DOCTORAL DISSERTATION	Information-Theoretic Control, Path Planning, and Learning Advisors: Prof. Takashi Tanaka and Prof. Luis Sentis (June 2018 - Present) <ul style="list-style-type: none">• Rationally Inattentive (RI) Path Planning: I introduced a platform to incorporate the expected perception cost in the path planning algorithm and proposed a new algorithm called RI-RRT*.• Visual Attention for Vision-based Autonomous Navigation: I design an algorithm for task-dependent (top-down) attention allocation for vision-based autonomous navigation.• Privacy in Cloud-based Control of Dynamic Systems: I devise a tractable algorithm for imposing privacy, both differential privacy and information-theoretic privacy, in cloud-based control schemes.• System Identification and Learning: I proposed a new information-theoretic method to analyze the identification of linear systems and provide the fundamental bounds for the achievable learning rate.• Mean-Field Traffic Routing Games: I devised a tax mechanism for multi-team road traffic games which mitigates the congestion and eliminates the necessity of commutations between vehicles.• Optimal Control of Communication Channels: I derived a convex formulation for the control of the communication channels with memory.	
MASTER'S THESIS	Batch Fabrication, Test, and Control of Neutrally-buoyant Magnetic Microrobots Advisors: Prof. Metin Sitti and Prof. Hossein Nejat (September 2016 - June 2017) <ul style="list-style-type: none">• I proposed and implemented a method for batch fabrication of buoyant magnetic microrobots. I developed an LQR-based optimal controller for buoyant magnetic microrobots in coil excitation setup.	
RELEVANT COURSES	<ul style="list-style-type: none">• Control/Systems: Digital Control, Estimation Theory, Stochastic Estimation/Control, Nonlinear and Optimal Control, Multi-variable and Robust Control, Networked Control Systems and Information Theory, Fuzzy Control, Linear System Theory and Control• Optimization/Machine Learning: Convex Optimization, Large Scale Optimization for Learning, Stochastic Process I, Reinforcement Learning, Cyber-Physical Intelligent Systems• Mechatronics/Robotics: Robot Mechanism Design, Advanced Mechatronics and Lab, Advanced Robotics and Lab, Algorithms for Sensor-Based Robotics, Advanced Dynamics	

PROFESSIONAL POSITIONS	<ul style="list-style-type: none"> • Graduate Research Assistant, UT Austin (2018 – Present) • Teaching Assistant, Mechatronics Lab, UT Austin (2017 – 2018) • Guest Researcher, Max Plank Institute of Physical Intelligence, Stuttgart, Germany (2016 – 2017) • Teaching Assistant, Automatic Control, Sharif University of Technology (2015 – 2016) • Journal Reviewer, IEEE Transaction on Automatic Control, Automatica (2019 – Present) • Conference Reviewer, CDC 19, ACC 20, ECC 20, IROS 20, ACC 21, ECC21 (2019 – Present)
AWARDS AND ACHIEVEMENTS	<ul style="list-style-type: none"> • Iranian National Elite Foundation Scholarship (2015 – 2016) • Merit-based admission to the MSc program as an outstanding undergraduate student, Sharif University of Technology (2014) • Ranked 169th out of 150,000 applicants, Nation-wide University Entrance Exam, Iran (2010)
SOFTWARE	C++, Python, MATLAB/Simulink, ROS, SolidWorks, Comsol Multiphysics
PEER-REVIEWED JOURNAL PUBLICATIONS	<ul style="list-style-type: none"> • AR. Pedram, R. Funada, T. Tanaka, “Gaussian Belief Space Path Planning for Minimum Sensing Navigation”, to appear in IEEE Transactions on Robotics • H. Jung, AR. Pedram, T. Cuvelier, T. Tanaka, “Optimized Data Rate Allocation for Dynamic Sensor Fusion over Resource Constrained Communication Networks”, International Journal of Robust and Nonlinear Control(2022) • T. Tanaka, E. Nekouei, AR. Pedram, KH. Johansson, “Linearly Solvable Mean-Field Traffic Routing Games”, IEEE Transactions on Automatic Control (2020) • AR. Pedram, H. Nejat Pishkenari, M. Sitti, “Optimal Controller Design for 3D Manipulation of Buoyant Magnetic Microrobots via Constrained LQR Approach”, Journal of Micro-Bio Robotics, 15(2): 105-117 • AR. Pedram, H. Nejat Pishkenari, “Smart Micro/Nano-robotic Systems for Gene Delivery”, Current Gene Therapy, 17(2): 73-79
PEER-REVIEWED CONFERENCE PROCEEDINGS	<ul style="list-style-type: none"> • AR. Pedram, T. Tanaka, “Smoothing Algorithm for Minimum Sensing Path Plans in Gaussian Belief Space”, submitted to 2023 Annual American Control Conference (ACC) • AR. Pedram, R. Funada, T. Tanaka, “Dynamic Allocation of Visual Attention for Vision-based Autonomous Navigation under Data Rate Constraints”, 2021 IEEE Conference on Decision and Control (CDC) • AR. Pedram, J. Stefan, R. Funada, T. Tanaka, “Rationally Inattentive Path-Planning via RRT*”, 2021 Annual American Control Conference (ACC) • AR. Pedram, T. Tanaka, “Online Parameter Identification of Linear Dynamical Systems through the Lens of Feedback Channel Coding Theory”, 2020 Annual American Control Conference (ACC) • AR. Pedram, T. Tanaka, “Linearly-Solvable Mean-Field Approximation for Multi-Team Road Traffic Games”, 2019 IEEE Conference on Decision and Control (CDC) • AR. Pedram, T. Tanaka, M. Hale, “Bidirectional Information Flow and the Roles of Privacy Masks in Cloud-Based Control”, 2019 IEEE Information Theory Workshop (ITW) • AR. Pedram, T. Tanaka, “Some Results on the Computation of Feedback Capacity of Gaussian Channels with Memory”, 2018 56th Annual Allerton Conference on Communication, Control, and Computing (Allerton), pp. 919-926. IEEE, 2018
WORKSHOPS, SYMPOSIA, AND POSTER SESSIONS	<ul style="list-style-type: none"> • 8th Midwest Workshop on Control and Game Theory (MWCGT), April 2019 at Washington University in St. Louis, MO, USA • 3rd Summer School on Cognitive Robotics, July 2019 at University of Southern California (USC), CA, USA