

Ekaterina Tolstaya

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(240) 449 5602

programming

Python, C++, Java

coursework

Machine Learning,
Advanced Robotics,
Learning in Robotics,
Convex Optimization,
Probability Theory

languages

English fluency
Russian fluency

education

2016–	Ph.D. in Electrical Engineering	University of Pennsylvania
2016–2017	M.Sc. in Robotics	University of Pennsylvania
2012–2016	B.Sc. in Electrical Engineering, Magna Cum Laude	University of Maryland
2012–2016	B.Sc. in Computer Science	University of Maryland

research

2016–	GRASP Laboratory , Dr. Alejandro Ribeiro, Dr. Vijay Kumar <i>Research Assistant</i>	University of Pennsylvania
	<ul style="list-style-type: none"> Developed an algorithm for decentralized control of robot teams using graph neural networks with PyTorch Tested and developed an algorithm for composable learning for obstacle avoidance in teams of ground robots Implemented Q function approximation algorithms for reinforcement learning in continuous spaces using kernel methods Integrated OpenAI Gym with the ROS, Gazebo and MAVROS-based OpenUAV simulation stack for modular reinforcement learning experiments 	
2015–2016	Intelligent Servosystems Laboratory , Dr. P.S. Krishnaprasad <i>Women in Engineering Research Fellow</i> Mobile robot navigation using sound source localization and human body tracking	University of Maryland
2013–2015	MEMS, Sensors and Actuators Laboratory , Dr. Reza Ghodssi <i>Women in Engineering Research Fellow, RISE Honors Program Fellow</i> Real time biofilm sensing using electrochemical methods	University of Maryland

industry

2019	DeepMind <i>Intern, Robotics</i>	London, UK
2018	Microsoft Research <i>Research Intern, Adaptive Systems and Interaction Group</i>	Redmond, WA
	<ul style="list-style-type: none"> Implemented an inverse optimal control algorithm to learn from air traffic data Developed motion planning applications for the AirSim autonomous vehicle simulator and worked to enable Linux support 	
2016	Microsoft <i>Electrical Engineering Intern, Hololens Hardware</i>	Mountain View, CA
	<ul style="list-style-type: none"> Designed test tools for signal integrity and DC resistance measurements Implemented a software-defined power supply, including a DC/DC converter, embedded system design, and C-based software 	
2015	Microsoft <i>Electrical Engineering Intern, New Product Introduction</i>	Redmond, WA
	<ul style="list-style-type: none"> Conducted failure analysis on next-generation hardware Performed statistical analysis of data from the hardware assembly line to enable a factory process change and increase the return on investment 	
2014	Texas Instruments <i>Semiconductor Engineering Intern, Process Integration and Parametric Test</i>	Richardson, TX
	<ul style="list-style-type: none"> Developed an online system for notifying engineers about trends in the factory's parametric test results using R Analyzed data from passive and active experiments to enable a test process change and reduce factory costs 	

publications

- 2019 **E. Tolstaya**, F. Gama, J. Paulos, G. Pappas, V. Kumar, A. Ribeiro, "Learning Decentralized Controllers for Robot Swarms with Graph Neural Networks," Conference on Robot Learning (CoRL), Oct. 29-31, 2019.
- 2019 A. Khan, **E. Tolstaya**, A. Ribeiro, V. Kumar, "Graph Policy Gradients for Large Scale Robot Control," Conference on Robot Learning (CoRL), Oct. 29-31, 2019.
- 2019 **E. Tolstaya**, A. Ribeiro, V. Kumar, and A. Kapoor, Inverse Optimal Planning for Air Traffic Control," International Conference on Intelligent Robots and Systems (IROS), Nov. 4-8, 2019.
- 2018 **E. Tolstaya**, E. Stump, A. Koppel, and A. Ribeiro, "Composable Learning with Sparse Kernel Representations," International Conference on Intelligent Robots and Systems (IROS), Oct. 1-5, 2018.
- 2018 **E. Tolstaya**, A. Koppel, E. Stump, and A. Ribeiro, "Nonparametric Stochastic Compositional Gradient Descent for Q-Learning in Continuous Markov Decision Problems," American Control Conference, June 27-29, 2018.
- 2017 S. Subramanian, **E. Tolstaya**, T. Winkler, W. E. Bentley, and R. Ghodssi, "An Integrated Microsystem for Real-Time Detection and Threshold-Activated Treatment of Bacterial Biofilms," ACS Appl. Mater. Interfaces, 2017, 9 (37), pp 31362–31371.
- 2016 S. Subramanian, **E. Tolstaya**, W. E. Bentley, and R. Ghodssi, "Real-time impedimetric sensing of bacterial biofilms in microfluidics," 26th Anniversary World Congress on Biosensors, May 25-27, 2016.
- 2014 **E. Tolstaya**, Y. Kim, S. Chu, K. Gerasopoulos, W. E. Bentley, and R. Ghodssi, "An Inductive-Capacitive Sensor for Real-time Biofilm Growth Monitoring," American Vacuum Society 61st International Symposium, November 9-14, 2014.
- 2014 M. Gnerlich, **E. Tolstaya**, J. N. Culver, D. Ketchum, and R. Ghodssi, "Solid Micro-supercapacitor using Directed Self-Assembly of Tobacco Mosaic Virus and RuO₂," American Vacuum Society 61st International Symposium, November 9-14, 2014.

teaching

- 2019 **Reinforcement Learning** University of Pennsylvania
Graduate Teaching Assistant
- 2018 **Signal and Information Processing** University of Pennsylvania
Graduate Teaching Assistant
- 2017 **Stochastic Systems Analysis and Simulation** University of Pennsylvania
Graduate Teaching Assistant
- 2016 **Introduction to Electrical and Computer Engineering** University of Maryland
Undergraduate Teaching Fellow
- 2015 **Introduction to Electrical and Computer Engineering** University of Maryland
Undergraduate Teaching Fellow
- 2014 **Introduction to Engineering Design** University of Maryland
Laboratory Teaching Fellow

awards

- 2018 **ESE Best Doctoral Citizen Award** University of Pennsylvania
- 2016 **National Science Foundation Graduate Research Fellowship** University of Pennsylvania
- 2016 **Omicron Delta Kappa Leadership Honor Society** University of Maryland

interests

professional: aerial robotics, reinforcement learning, planning, simulation, sensing
personal: weightlifting, snowboarding, travel