

# Ekaterina Tolstaya

Last Updated on 11th August 2019

## contact

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

## research

2016–	<b>GRASP Laboratory</b> , Dr. Alejandro Ribeiro, Dr. Vijay Kumar <i>Research Assistant</i> <ul style="list-style-type: none"><li>Developed an algorithm for decentralized control of robot teams using graph neural networks with PyTorch</li><li>Tested and developed an algorithm for composable learning for obstacle avoidance in teams of ground robots</li><li>Implemented Q function approximation algorithms for reinforcement learning in continuous spaces using kernel methods</li><li>Integrated OpenAI Gym with the ROS, Gazebo and MAVROS-based OpenUAV simulation stack for modular reinforcement learning experiments</li></ul>	University of Pennsylvania
2015–2016	<b>Intelligent Servosystems Laboratory</b> , 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	<b>MEMS, Sensors and Actuators Laboratory</b> , 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	<b>DeepMind</b> <i>Intern, Robotics</i>	London, UK
2018	<b>Microsoft Research</b> <i>Research Intern, Adaptive Systems and Interaction Group</i> <ul style="list-style-type: none"><li>Implemented an inverse optimal control algorithm to learn from air traffic data</li><li>Developed motion planning applications for the AirSim autonomous vehicle simulator and worked to enable Linux support</li></ul>	Redmond, WA
2016	<b>Microsoft</b> <i>Electrical Engineering Intern, HoloLens Hardware</i> <ul style="list-style-type: none"><li>Designed test tools for signal integrity and DC resistance measurements</li><li>Implemented a software-defined power supply, including a DC/DC converter, embedded system design, and C-based software</li></ul>	Mountain View, CA
2015	<b>Microsoft</b> <i>Electrical Engineering Intern, New Product Introduction</i> <ul style="list-style-type: none"><li>Conducted failure analysis on next-generation hardware</li><li>Performed statistical analysis of data from the hardware assembly line to enable a factory process change and increase the return on investment</li></ul>	Redmond, WA
2014	<b>Texas Instruments</b> <i>Semiconductor Engineering Intern, Process Integration and Parametric Test</i> <ul style="list-style-type: none"><li>Developed an online system for notifying engineers about trends in the factory's parametric test results using R</li><li>Analyzed data from passive and active experiments to enable a test process change and reduce factory costs</li></ul>	Richardson, TX

## publications

- 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 RuO<sub>2</sub>," American Vacuum Society 61st International Symposium, November 9-14, 2014.

## teaching

- 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, manipulation, reinforcement learning, planning, simulation, sensing  
**personal:** weightlifting, snowboarding, travel