

Mengdi Xu

✉ mengdixu@andrew.cmu.edu • 🌐 mxu34.github.io • 📧 mxu34
in mengdixu-bella

Education

Carnegie Mellon University

Ph.D. in SafeAI Lab, Mechanical Engineering

2019–present

MS in Machine Learning, Machine Learning Department

2021–present

Advisor: Ding Zhao

Johns Hopkins University

Robotics MSE, Laboratory of Computational Sensing and Robotics

2017–2019

Advisor: Gregory Chirikjian

Tsinghua University

BS, Automotive Engineering, School of Vehicle and Mobility

2013–2017

Advisor: Jianqiang Wang, Excellent Graduate Award

BS, Management, School of Economics and Management

2013–2017

Work Experience

Toyota Research Institute

Research intern in Machine Learning, Machine Learning Engineering team

2021.6–present

Mentor: Chao Fang

Research Interests

Theories: Reinforcement Learning, Probabilistic Graphical Model, Game Theory, Lie Group Theory

Applications: Robotics, Human-Robot Interaction, Intelligent Mobility

Skills

Programming Languages: Python, C/C++, MATLAB, Mathematica

Technologies: Pytorch, Tensorflow, ROS, Gym, Gazebo, MuJoCo, PyBullet, OpenCV, Arduino, EAG

Publication and Preprints

- **Xu, Mengdi**, Peide Huang, Fengpei Li, Jiacheng Zhu, Xuewei Qi, Kentaro Oguchi, Zhiyuan Huang, Henry Lam, and Ding Zhao. Accelerated Policy Evaluation: Learning Adversarial Environments with Adaptive Importance Sampling. In submission.
- Zhu, Jiacheng, Aritra Guha, **Mengdi Xu**, Yingchen Ma, Rayleigh Lei, Vincenzo Loffredo, XuanLong Nguyen, and Ding Zhao. Functional Optimal Transport: Mapping Estimation and Domain Adaptation for Functional data. In submission.
- Chen, Baiming, Zuxin Liu, Jiacheng Zhu, **Mengdi Xu**, Wenhao Ding, Liang Li, Ding Zhao. Context-Aware Safe Reinforcement Learning for Non-Stationary Environments. In 2021 IEEE International Conference on Robotics and Automation (ICRA). IEEE, 2021.
- **Xu, Mengdi**, Wenhao Ding, Jiacheng Zhu, Zuxin Liu, Baiming Chen, and Ding Zhao. "Task-Agnostic Online Reinforcement Learning with an Infinite Mixture of Gaussian Processes." Thirty-fourth Conference on Neural Information Processing Systems (NeurIPS), 2020.
- Ding, Wenhao, **Mengdi Xu**, and Ding Zhao. "CMTS: A Conditional Multiple Trajectory Synthesizer for Generating Safety-Critical Driving Scenarios." In 2020 IEEE International Conference on Robotics and Automation (ICRA), pp. 4314-4321. IEEE, 2020.

- Chen, Baiming, **Mengdi Xu**, Zuxin Liu, Liang Li, and Ding Zhao. "Delay-Aware Multi-Agent Reinforcement Learning." In submission to Elsevier Neurocomputing, 2020.
- Chen, Baiming, **Mengdi Xu**, Liang Li, and Ding Zhao. "Delay-Aware Model-Based Reinforcement Learning for Continuous Control." In submission to Elsevier Neurocomputing, 2020.
- **Xu, Mengdi**, Shengnan Lyu, Yingtian Xu, Can Kocabalkanli, Brian K. Chirikjian et al. "Mosquito staging apparatus for producing PfSPZ malaria vaccines." In 2019 IEEE 15th International Conference on Automation Science and Engineering (CASE), pp. 443-449. IEEE, 2019.
- Wu, Hongtao, Jiteng Mu, Ting Da, **Mengdi Xu**, Russell H. Taylor, Iulian Iordachita, and Gregory S. Chirikjian. "Multi-mosquito object detection and 2D pose estimation for automation of PfSPZ malaria vaccine production." In 2019 IEEE 15th International Conference on Automation Science and Engineering (CASE), pp. 411-417. IEEE, 2019.
- **Xu, Mengdi**, and Gregory S. Chirikjian. "Recovering a Rotation Matrix From Three Direction Cosines." ASME 2018 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference. American Society of Mechanical Engineers, 2018.
- Zhao, Jieliang*, **Mengdi Xu***, Youjian Liang, Shaoze Yan, and Wendong Niu. "Influence of hydrodynamic pressure and vein strength on the super-elasticity of honeybee wings." Journal of insect physiology 109 (2018): 100-106. (*equal contribution)

Teaching and Professional Services

Teaching Assistant, Johns Hopkins University

EN.530.646 Robot Devices, Kinematics, Dynamics, and Control (Robotics MSE Core)

Spring 2019

EN.530.645 Kinematics

Fall 2018

Assistant to Associate Chief Editor, the Journal of Robotica

2018.09-2019.05

Honors and Awards

Travel Grant of Workshop on Security and Safety in Machine Learning Systems, ICLR	<i>2021</i>
Best Poster Award of Robotics Track in ME PhD Research Symposium, Carnegie Mellon University	<i>2021</i>
Department Fellowship of Mechanical Engineering, Johns Hopkins University	<i>2017-2018</i>
Excellent Bachelor Thesis, Tsinghua University	<i>2017</i>
National Motivational Scholarship, Tsinghua University	<i>2014, 2015, 2016</i>
Qualcomm Scholarship for excellent student researchers, 0.3%, Tsinghua University	<i>2016</i>
Cummins Dr. Lin Scholarship for excellent female students, Tsinghua University	<i>2014, 2015</i>
Sports Excellence Award, Tsinghua University	<i>2015</i>