

Masha Itkina

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Academic History

- 2018–pres. Stanford University, Ph.D., Aeronautics and Astronautics
Computer Science Minor
- 2016–2019 Stanford University, M.S., Aeronautics and Astronautics
- 2011–2016 University of Toronto, B.A.Sc., Engineering Science, Aerospace
Robotics and Mechatronics Minor
High Honors

Research Projects

- 2020–pres. Self-Aware Neural Networks for Robust Prediction,
Prof. Mykel Kochenderfer, Stanford University
Investigate the problem of epistemic uncertainty encoding in neural network-based behavior prediction in the context of autonomous driving.
- 2019–pres. Sparsification of Latent Multimodality in Conditional Variational Autoencoders (CVAEs),
Prof. Mykel Kochenderfer and Prof. Marco Pavone, Stanford University
Using evidential theory to identify the subset of the latent space within a CVAE that is maximally conflicting or, equivalently, maximally multimodal.
- 2018–pres. Occlusion Inference using People as Sensors,
Prof. Mykel Kochenderfer, Stanford University
Inferring occluded obstacles by treating observed human driver behaviors on the road as additional sensor input into the perception system.
- 2017–pres. Occupancy Grid Prediction in Cluttered, Urban Environments,
Prof. Mykel Kochenderfer, Stanford University
Predicting future occupancy state in dynamic urban environments by fusing concepts from image-based deep-learning methods with traditional robotics techniques (e.g. particle filtering, Dempster-Shafer Theory).

Employment Record

- 2017–pres. Research Assistant, Supervisor: Prof. Mykel Kochenderfer,
Stanford Intelligent Systems Laboratory (SISL), Stanford University
- 2019 Applied Research Intern, Waymo
- 2017 Research and Development Intern, Autonomous Driving Team,
Renault Innovation Silicon Valley
- 2014–2015 Design Research Intern, Digital Channels, TD Canada Trust
- 2014 Summer Research Student, Supervisors: Dr. Leonard Tse and Dean Cristina Amon, ATOMS
Laboratory, University of Toronto
- 2013 Summer Research Student, Supervisor: Prof. Ofer Levi, Biophotonics Laboratory,
University of Toronto

Teaching Experience

- 2020 Head Teaching Assistant, Engineering Design Optimization, Stanford University
- 2015 Teaching Assistant, Engineering Mathematics and Computation, University of Toronto
- 2012–2014 Calculus Tutor, University of Toronto

Publications

MANUSCRIPTS UNDER REVIEW

1. M. Itkina*, B. Ivanovic, R. Senanayake, M. J. Kochenderfer, and M. Pavone, “Evidential sparsification of multimodal latent spaces in conditional variational autoencoders,” in *Advances in Neural Information Processing Systems (NeurIPS)*, 2020.
2. B. Lange, M. Itkina*, and M. J. Kochenderfer, “Attention augmented ConvLSTM for environment prediction,” in *Conference on Robot Learning (CoRL)*, 2020.

CONFERENCE PAPERS

1. M. Itkina*, K. Driggs-Campbell, and M. J. Kochenderfer, “Dynamic environment prediction in urban scenes using recurrent representation learning,” in *International Conference on Intelligent Transportation Systems (ITSC)*, IEEE, 2019, Available at: <https://ieeexplore.ieee.org/document/8917271>.

THESES

1. M. Itkina, “Towards multi-agent learning,” Supervised by Prof. Angela Schoellig, B.A.Sc. Thesis, University of Toronto, 2016.

JOURNAL ARTICLES

1. S. A. Crawford, M. Itkina*, M. G. Doyle, L. W. Tse, C. H. Amon, and G. Roche-Nagle, "Structural implications of fenestrated stent graft misalignment," *Surgeon*, vol. 16, no. 2, pp. 89–93, 2016, Available at: <https://www.sciencedirect.com/science/article/abs/pii/S1479666X1630052X>.

WORKSHOPS

1. M. Itkina*, B. Ivanovic, R. Senanayake, M. J. Kochenderfer, and M. Pavone, "Evidential disambiguation of latent multimodality in conditional variational autoencoders," in *Workshop on Bayesian Deep Learning at Neural Information Processing Systems (NeurIPS)*, 2019, Available at: <http://bayesiandeeplearning.org/2019/papers/34.pdf>.
2. M. Itkina*, K. Driggs-Campbell, and M. J. Kochenderfer, "Occupancy grid prediction in cluttered, dynamic environments," in *13th Women in Machine Learning Workshop (WiML) co-located with Advances in Neural Information Processing Systems (NeurIPS)*, Montréal, Canada, 2018.

SYMPOSIUMS

1. M. Itkina*, K. Driggs-Campbell, and M. J. Kochenderfer, "Unsupervised occupancy grid prediction in occluded urban environments," in *Bay Area Robotics Symposium*, Berkeley, California, 2017.

COURSE PROJECT REPORTS

1. M. Itkina*, "A generative approach to urban environment prediction," Stanford University, Deep Generative Models (CS236), 2018.
2. M. Itkina*, M. Bouton, and M. Kelly, "Incorporating behavior prediction into MPC for autonomous driving scenarios," Stanford University, Optimal and Learning-based Control (AA203), 2018.
3. S. Anderson and M. Itkina*, "Controlling soft robots with POMCP," Stanford University, Decision Making Under Uncertainty (AA228), 2016.
4. M. Itkina*, Y. Wu, and B. Bahmani, "Adversarial attacks on image recognition," Stanford University, Machine Learning (CS229), 2016, Available at: <http://cs229.stanford.edu/proj2016/report/ItkinaWu-AdversarialAttacksonImageRecognition-report.pdf>.

Fellowships and Awards

2019–2021	Enhancing Diversity in Graduate Education (EDGE) Fellowship
2016–2018	s Five-Quarter Graduate Engineering Fellowship
2014–2015	Trenwith and Galipeau Aerospace Science Award
2011–2015	Queen Elizabeth II Aiming for the Top Scholarship
2013, 2014	Natural Sciences and Engineering Research Council of Canada's Undergraduate Research

Award (NSERC USRA)

2013-2014 J. Frank Guenther Scholarship

2011 University of Toronto Scholar Award

2011 Faculty of Applied Science and Engineering Admission Scholarship

Volunteer and Outreach Experience

- 2020 Co-Organizer for the NeurIPS 2020 3rd Robot Learning Workshop: Grounding Machine Learning Development in the Real World
- 2019–2020 Technical Development Co-Chair, Women of Aeronautics and Astronautics (WoAA), American Institute of Aeronautics and Astronautics (AIAA)
- 2019 Judge, Stanford Research Conference, Stanford Undergraduate Research Association
- 2018–2019 Co-President, Women in Aeronautics and Astronautics (WIAA), Stanford University
- 2018–*pres.* Mentor, Women in Aeronautics and Astronautics (WIAA), Stanford University
- 2017–*pres.* Member, AI Women, Stanford University
- 2011–2016 Co-President, Club for Undergraduate Biomedical Engineers (CUBE), University of Toronto
- 2012–2016 Engineering Science Ambassador, University of Toronto
- 2013–2015 Science Director, Robotics for Space Exploration (RSX), University of Toronto
- 2013–2014 Member, Engineers Without Borders (EWB), University of Toronto

Invited Reviewer

- IEEE International Conference on Intelligent Transportation Systems (ITSC)
- IEEE Intelligent Vehicles Symposium (IV)
- Women in Machine Learning (WiML) Workshop

Technical Skills

- Programming languages: Python, C++, MATLAB, Julia
- Frameworks: Robot Operating System (ROS), TensorFlow, PyTorch
- Operating Systems: Linux, Windows