

# Masha Itkina

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## Academic History

- 2016–pres. Stanford University, Ph.D., Aeronautics and Astronautics  
*GPA: 4.0*
- 2011–2016 University of Toronto, B.A.Sc., Engineering Science, Aerospace  
*Robotics and Mechatronics Minor*  
*High Honors*  
*GPA: 3.9*

## Research Projects

- 2020–pres. Self-Aware Neural Networks for Robust Prediction,  
Prof. Mykel J. Kochenderfer, Stanford University  
*Investigating the problem of epistemic uncertainty encoding in neural network-based behavior prediction in the context of autonomous driving.*
- 2019–2020 Sparsification of Latent Multimodality in Conditional Variational Autoencoders (CVAEs),  
Prof. Mykel J. Kochenderfer and Prof. Marco Pavone, Stanford University  
*Using evidential theory to sparsify the discrete latent space within a CVAE network, while maintaining distributional multimodality and network performance.*
- 2018–pres. Multi-Agent Variational Occlusion Inference Using People as Sensors,  
Prof. Mykel J. 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 J. Kochenderfer, Stanford University  
*Predicting future occupancy state in dynamic urban environments by fusing concepts from computer vision (e.g., video frame prediction) with traditional robotics techniques (e.g. particle filtering, evidential theory).*

## Teaching Experience

- 2021 Student Mentor for AI4ALL
- 2020–2021 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

## Employment Record

- 2017–pres. Research Assistant, Supervisor: Prof. Mykel J. 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

## Publications

### MANUSCRIPTS UNDER REVIEW AND PREPRINTS

1. P. Chen, M. Itkina\*, R. Senanayake, and M. J. Kochenderfer, “Evidential softmax for sparse multimodal distributions in deep generative models,” 2021.
2. M. Itkina\*, Y.-J. Mun, K. Driggs-Campbell, and M. J. Kochenderfer, “Multi-agent variational occlusion inference using people as sensors,” 2021.

### CONFERENCE PAPERS

1. B. Lange, M. Itkina\*, and M. J. Kochenderfer, “Attention augmented ConvLSTM for environment prediction,” in *International Conference on Intelligent Robots and Systems (IROS)*, IEEE, 2021.
2. J. Nitsch, M. Itkina\*, R. Senanayake, J. Nieto, M. Schmidt, R. Siegwart, M. J. Kochenderfer, and C. Cadena, “Out of distribution detection for automotive perception,” in *International Conference on Intelligent Transportation Systems (ITSC)*, IEEE, 2021.
3. M. Toyungyernsub, M. Itkina\*, R. Senanayake, and M. J. Kochenderfer, “Double-prong occupancy ConvLSTM: Spatiotemporal prediction in urban environments,” in *International Conference on Robotics and Automation (ICRA)*, IEEE, 2021.
4. 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.
5. 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.

### 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.

## WORKSHOPS, CONSORTIA, AND SYMPOSIA

1. P. Chen, M. Itkina\*, R. Senanayake, and M. J. Kochenderfer, "Evidential softmax: A sparse multimodal alternative to softmax," in *Bay Area Machine Learning Symposium (BayLearn)*, 2021.
2. M. Itkina\* and M. J. Kochenderfer, "Perception beyond sensors under uncertainty," in *26th AAAI/SIGAI Doctoral Consortium*, 2021.
3. M. Itkina\*, Y.-J. Mun, K. Driggs-Campbell, and M. J. Kochenderfer, "Variational occlusion inference using people as sensors," in *15th Women in Machine Learning Workshop (WiML) co-located with the Conference on Neural Information Processing Systems (NeurIPS)*, 2020.
4. Y.-J. Mun, M. Itkina\*, and K. Driggs-Campbell, "Safe crowd navigation in the presence of occlusions," in *15th Women in Machine Learning Workshop (WiML) co-located with the Conference on Neural Information Processing Systems (NeurIPS)*, 2020.
5. M. Toyungyernsub, M. Itkina\*, R. Senanayake, and M. J. Kochenderfer, "Double-prong occupancy ConvLSTM: Spatiotemporal prediction in urban environments," in *15th Women in Machine Learning Workshop (WiML) co-located with the Conference on Neural Information Processing Systems (NeurIPS)*, 2020.
6. 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 the Conference on Neural Information Processing Systems (NeurIPS)*, 2019.
7. 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 the Conference on Neural Information Processing Systems (NeurIPS)*, 2018.
8. M. Itkina\*, K. Driggs-Campbell, and M. J. Kochenderfer, "Unsupervised occupancy grid prediction in occluded urban environments," in *Bay Area Robotics Symposium*, 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.

## Fellowships and Awards

- 2019–2021 Enhancing Diversity in Graduate Education (EDGE) Fellowship
- 2016–2018 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

- 2021 Student Panel Chair for the department faculty search
- 2020 Co-Organizer for the NeurIPS 2020 3rd Robot Learning Workshop: Grounding Machine Learning Development in the Real World
- 2020–*pres.* Alumnus Mentor, University of Toronto
- 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, Aero/Astro Student Advisory Committee (SAC), 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

- International Conference on Learning Representations (ICLR)
- Advances in Neural Information Processing Systems (NeurIPS)
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
- IEEE Robotics and Automation Letters (RA-L)
- 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