James Tu

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Research Interests

Adversarial robustness for self-driving, learning 3D shape representations, self-driving perception

Education

University of Toronto
BASc with honors, Engineering Science - ECE, minor in robotics *Sept 2013 - June 2018*
Thesis Supervisor: Professor Baochun Li

Master of Science, Computer Science *Sept 2021 - Present*
Supervisor: Professor Raquel Urtasun

Publications

James Tu, Huichen Li, Xinchen Yan, Mengye Ren, Yun Chen, Ming Liang, Eilyan Bitar, Ersin Yumer, Raquel Urtasun. Exploring Adversarial Robustness of Multi-Sensor Perception Systems in Self Driving. In *Arxiv 2021.*

James Tu*, Tsunhsuan Wang*, Jingkang Wang, Siva Manivasagam, Mengye Ren, Raquel Urtasun. Adversarial Attacks On Multi-Agent Communication. In *Arxiv 2021.*

Jingkang Wang, Ava Pun, **James Tu**, Sivabalan Manivasagam, Abbas Sadat, Sergio Casas, Mengye Ren, Raquel Urtasun. AdvSim: Generating Safety-Critical Scenarios for Self-Driving Vehicles. In *Arxiv 2021.*

Abbas Sadat, Sean Segal, Sergio Casas, **James Tu**, Bin Yang, Raquel Urtasun, Ersin Yumer. Diverse Complexity Measures for Dataset Curation in Self-driving. In *Arxiv 2021.*

Davi Frossard, Simon Suo, Sergio Casas, **James Tu**, Rui Hu, Raquel Urtasun. StrObe: Streaming Object Detection from LiDAR Packets. In *CoRL 2020.*

Nicholas Vadivelu, Mengye Ren, **James Tu**, Jingkang Wang, Raquel Urtasun. Learning to Communicate and Correct Pose Errors. In *CoRL 2020.*

Tsun-Hsuan Wang, Sivabalan Manivasagam, Ming Liang, Bin Yang, Wenyuan Zeng, **James Tu**, Raquel Urtasun. V2vnet: Vehicle-to-vehicle communication for joint perception and prediction. In *ECCV2021.*

James Tu, Mengye Ren, Siva Manivasagam, Bin Yang, Ming Liang, Richard Du, Frank Cheng, Raquel Urtasun. Towards Physically Realistic Adversarial Examples for LiDAR Object Detection. In *CVPR 2020.*

Zhiming Hu, **James Tu**, Baochun Li. Spear: Optimized Dependency-Aware Task Scheduling with Deep Reinforcement Learning. In *ICDCS 2019.*

Experience

Uber ATG Toronto, ON
Research Scientist *April 2019 - January 2021*

Supervisor: Raquel Urtasun

Research Topics: Physically realizable adversarial examples in self driving, vehicle-to-vehicle communication, reducing latency in self-driving perception.

University of Toronto Toronto, ON
Undergrad Thesis Student *May 2018 - September 2018*

Supervisor: Baochun Li

Research Topic: Optimizing job scheduling and resource management with learning-guided tree search

ProteinQure Toronto, ON
Machine Learning Engineer *Sept 2018 - April 2019*

Contact Map Prediction: Implemented protein contact map prediction model in Pytorch. Reproduced results from *Accurate De Novo Prediction of Protein Contact Map by Ultra-Deep Learning Model, Wang et al.*

RL Peptide Designer: Created reinforcement learning agent to design de novo peptide binders in toy protein folding environment using proximal policy optimization.

Awards

Canadian Senior Mathematics Contest: 1st place, perfect score
Canadian Mathematical Olympiad: 34th in North America

Technical Skills

Programming Languages: Python, C, C++, LaTeX **Technologies**: Pytorch, Tensorflow, Git