

Jingkang Wang – Curriculum Vitæ

CONTACT INFORMATION	440 Bathurst St, Floor 4 Toronto, ON M5T 2S6, Canada	Tel: +1 (437) 985-0337 Email: wangjk@cs.toronto.edu Website: http://www.cs.toronto.edu/~wangjk/
RESEARCH INTERESTS	Areas: computer vision, robot learning, self-driving vehicles. I am interested in 3D vision and robotics, in particular developing simulation systems to capture the long-tail scenarios that rarely happen in the real world for safe self-driving vehicles. The key research goal is to build <i>realistic, robust</i> and <i>scalable closed-loop</i> simulation systems for robots. Then we leverage them for comprehensive testing or robustness enhancement of full autonomy stack for safe deployment in real world.	
EDUCATION	University of Toronto <i>Department of Computer Science</i> Ph.D., Supervisor: Raquel Urtasun Committee: Florian Shkurti, Sanja Fidler	2019/09 – Present
	Shanghai Jiao Tong University <i>School of Electronic Information and Electrical Engineering</i> BASc, Advisors: Cewu Lu, Gongshen Liu GPA: 3.994/4.3 (91.86/100), Rank: 1/95 Thesis: Reinforcement Learning with Perturbed Rewards Excellent Bachelor Thesis (Top %1, A+), National Scholarships ×3	2015/09 – 2019/06
PROFESSIONAL EXPERIENCE	Waabi Innovation , Toronto, ON, Canada <i>Senior Researcher I</i> <i>Researcher II</i> <i>Researcher</i>	2023/07 – Present 2022/06 – 2023/06 2021/03 – 2022/06
	Uber ATG , Toronto, ON, Canada <i>Research Scientist</i>	2019/09 – 2021/02
	Ant Financial , Hangzhou, Zhejiang, China <i>Research Intern</i> <i>Advisor: Le Song</i>	2019/06 – 2019/08
	University of Illinois at Urbana-Champaign , remote <i>Research Intern in Secure Learning Lab</i> <i>Advisor: Bo Li</i>	2018/09 – 2019/05
	UC Berkeley , remote <i>Research Intern in BAIR</i> <i>Advisor: Bo Li, Dawn Song</i>	2018/06 – 2018/08
TEACHING	University of Toronto <ul style="list-style-type: none">CSC 490: Making Your Self-driving Car Perceive the World Lecturer: Simulation Teaching Assistant: 3D Object Tracking	2021 Winter

(* = equal contribution)

2023

- C1 Ava Pun*, Gary Sun*, **Jingkang Wang***, Yun Chen, Ze Yang, Sivabalan Manivasagam, Wei-Chiu Ma, Raquel Urtasun. Neural Lighting Simulation for Urban Scenes. In *Advances in Neural Information Processing Systems (NeurIPS)*, New Orleans, USA, 2023.
- C2 Jay Sarva, **Jingkang Wang**, James Tu, Yuwen Xiong, Sivabalan Manivasagam, Raquel Urtasun. Adv3D: Generating Safety-Critical 3D Objects through Closed-Loop Simulation. In *Conference on Robot Learning (CoRL)*, Atlanta, USA, 2023.
- C3 Sivabalan Manivasagam*, Ioan Andrei Bârsan*, **Jingkang Wang**, Ze Yang, Raquel Urtasun. Towards Zero Domain Gap: A Comprehensive Study of Realistic LiDAR Simulation for Autonomy Testing. In *International Conference on Computer Vision (ICCV)*, Paris, France, 2023.
- C4 Jeffrey Liu, Yun Chen*, Ze Yang*, **Jingkang Wang**, Sivabalan Manivasagam, Raquel Urtasun. Neural Scene Rasterization for Large Scene Rendering in Real Time. In *International Conference on Computer Vision (ICCV)*, Paris, France, 2023.
- C5 Sivabalan Manivasagam*, Ioan Andrei Bârsan*, **Jingkang Wang**, Ze Yang, Raquel Urtasun. Towards Zero Domain Gap: A Comprehensive Study of Realistic LiDAR Simulation for Autonomy Testing. In *International Conference on Computer Vision (ICCV)*, Paris, France, 2023.
- C6 Jeffrey Liu, Yun Chen*, Ze Yang*, **Jingkang Wang**, Sivabalan Manivasagam, Raquel Urtasun. Neural Scene Rasterization for Large Scene Rendering in Real Time. In *International Conference on Computer Vision (ICCV)*, Paris, France, 2023.
- C7 Ze Yang*, Yun Chen*, **Jingkang Wang***, Sivabalan Manivasagam*, Wei-Chiu Ma, Anqi Joyce Yang, Raquel Urtasun. UniSim: A Neural Closed-Loop Sensor Simulator. In *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, Vancouver, Canada, 2023. **(Highlight)**
- C8 Yuwen Xiong, Wei-Chiu Ma, **Jingkang Wang**, Raquel Urtasun. Learning Compact Representations for LiDAR Completion and Generation. In *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, Vancouver, Canada, 2023.
- C9 Ze Yang, Sivabalan Manivasagam, Yun Chen, **Jingkang Wang**, Rui Hu, Raquel Urtasun. Reconstructing Objects in-the-wild for Realistic Sensor Simulation. In *IEEE International Conference on Robotics and Automation (ICRA)*, London. United Kingdom, 2023.

2022

- C10 **Jingkang Wang**, Sivabalan Manivasagam, Yun Chen, Ze Yang, Ioan Andrei Bârsan, Anqi Yang, Wei-Chiu Ma, Raquel Urtasun. CADSim: Robust and Scalable in-the-wild 3D Reconstruction for Controllable Simulation. In *Conference on Robot Learning (CoRL)*, Auckland, New Zealand, 2022.

2021

- C11 **Jingkang Wang**, Ava Pun, James Tu, Abbas Sadat, Sergio Casas, Sivabalan Manivasagam, Mengye Ren, Raquel Urtasun. AdvSim: Generating safety-critical scenarios for self-driving vehicles. In *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2021.
- C12 **Jingkang Wang***, Tianyun Zhang*, Sijia Liu, Pin-Yu Chen, Jiachen Xu, Makan Fardad, Bo Li. Adversarial Attack Generation Empowered by Min-Max Optimization. In *Advances in Neural Information Processing Systems (NeurIPS)*, 2021.
- C13 **Jingkang Wang***, Hongyi Guo*, Zhaowei Zhu*, Yang Liu. Policy Learning Using Weak Supervision. In *Advances in Neural Information Processing Systems (NeurIPS)*, 2021.
- C14 James Tu*, Tsun-Hsuan Wang*, **Jingkang Wang**, Sivabalan Manivasagam, Mengye Ren, Raquel Urtasun. Adversarial attacks on multi-agent communication. In *International Conference on Computer Vision (ICCV)*, 2021.

C15 Sean Segal*, Nishanth Kumar*, Sergio Casas, Wenyuan Zeng, Mengye Ren, **Jingkang Wang**, Raquel Urtasun. Just label what you need: Fine-grained active selection for perception and prediction through partially labeled scenes. In *Conference on Robot Learning (CoRL)*, London, United Kingdom, 2021.

2020

C16 **Jingkang Wang**, Yang Liu, Bo Li. Reinforcement Learning with Perturbed Rewards. In *AAAI Conference on Artificial Intelligence (AAAI)*, New York, New York, USA, 2020. (**Spotlight**)

C17 Nicholas Vadivelu, Mengye Ren, James Tu, **Jingkang Wang**, Raquel Urtasun. Learning to communicate and correct pose errors. In *Conference on Robot Learning (CoRL)*, Cambridge, Massachusetts, USA, 2020.

C18 Gerald Friedland, Ruoxi Jia, **Jingkang Wang**, Bo Li, Nathan Mundhenk. On the Impact of Perceptual Compression on Deep Learning. In *International Conference on Multimedia Information Processing and Retrieval (MIPR)*, Shenzhen, Guangzhou, China, 2020.

2019 and before

C19 **Jingkang Wang***, Jianing Zhou*, Jie Zhou, Gongshen Liu. Multiple Character Embeddings for Chinese Word Segmentation. In *Annual Meeting of the Association for Computational Linguistics (ACL)*, Florence, Italy, 2019.

C20 Yiping Chen*, **Jingkang Wang***, Jonathan Li, Cewu Lu, Zhipeng Luo, Han Xue, Cheng Wang. LiDAR-Video Driving Dataset: Learning Driving Policies Effectively. In *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, Salt Lake City, Utah, USA, 2018.

PEER-REVIEWED 2020

WORKSHOP PAPERS W21 **Jingkang Wang***, Mengye Ren*, Ilija Bogunovic, Yuwen Xiong, Raquel Urtasun. Cost-efficient online hyperparameter optimization. In *ICML RealML Workshop*, Vienna, Austria, 2020.

W22 Tianshi Cao*, **Jingkang Wang***, Annie Zhang and Sivabalan Manivasagam. Zero-Shot Compositional Policy Learning via Language Grounding. In *ICLR Workshop on Beyond "Tabula Rasa" in Reinforcement Learning*, 2020.

W23 **Jingkang Wang***, Gaoyuan Zhang*, Sijia Liu. Is Robust Neurons' Activation Sufficient to Robustify CNNs against Adversarial Attacks? In *KDD Workshop on Adversarial Machine Learning*, 2020.

PATENTS

P1 **Jingkang Wang**, Sivabalan Manivasagam, Yun Chen, Ze Yang, Ioan Andrei Bârsan, Wei-Chiu Ma, Raquel Urtasun. Three Dimensional Object Reconstruction for Sensor Simulation, US Patent, 2023.

P2 **Jingkang Wang**, Ava Alison Pun, Xuanyuan Tu, Mengye Ren, Abbas Sadat, Sergio Casas, Sivabalan Manivasagam, Raquel Urtasun. Generating Motion Scenarios for Self-Driving Vehicles, US 20220153298 A1, US Patent, 2022.

P3 Nicholas Baskar Vadivelu, Mengye Ren, Xuanyuan Tu, Raquel Urtasun, **Jingkang Wang**. Systems and Methods for Mitigating Vehicle Pose Error Across an Aggregated Feature Map, US 20220032970 A1, US Patent, 2022.

P4 Xuanyuan Tu, Raquel Urtasun, Tsu-shuan Wang, Sivabalan Manivasagam, **Jingkang Wang**, Mengye Ren. Systems and Methods for Training Machine-Learned Models with Deviating Intermediate Representations, US 20210279640 A1, US Patent, 2021.

AWARDS & HONORS	• Baidu Fellowship Finalist (Top 20 worldwide)	2021
	• CVPR Outstanding Reviewer	2020
	• Excellent Bachelor Thesis (Top %1) of SJTU	2019
	• Outstanding Undergraduate in Shanghai	2019
	• National Scholarships in China (1%)	2018, 2017, 2016
	• Level-A SJTU Outstanding Scholarships (1%)	2018, 2017, 2016
	• SenseTime Scholarship ¥20,000 CNY	2018
	• First Prize in National College Student Information Security Contest	2018
	• Meritorious Award in Mathematical Contest of Modeling (MCM)	2018
	• Yitu Scholarship ¥10,000 CNY	2017
	• Second Prize in National College Student Information Security Contest	2017
	• Second Prize in The Chinese Mathematics Competition (CMC, Shanghai)	2017
	• Second Prize in National College Students Information Security Contest	2017
	• First Prize in Chinese Mathematical Olympiad (CMO, 10th in Shanxi)	2014

PROFESSIONAL SERVICE

Journal Reviewer:

- IEEE Transactions on Image Processing (TIP)
- IEEE Transactions on Neural Networks and Learning Systems (TNNLS)
- Computer Vision and Image Understanding (CVIU)
- IEEE Transactions on Signal Processing (TSP)
- IEEE Robotics and Automation Letters (RA-L)

Conference Reviewer:

- Conference on Neural Information Processing Systems (NeurIPS) 2022 – 2023
- Conference on Computer Vision and Pattern Recognition (CVPR) 2021 – 2024
- International Conference on Computer Vision (ICCV) 2021 – 2023
- European Conference on Computer Vision (ECCV) 2022 – 2024
- International Conference on Machine Learning (ICML) 2024
- International Conference on Learning Representations (ICLR) 2024
- IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) 2024
- International Conference on Robotics and Automation (ICRA) 2023
- International Conference on Automated Machine Learning (AutoML) 2023
- International Conference on Intelligent Robots and Systems (IROS) 2023
- European Conference on Computer Vision (CoRL) 2022
- Annual Meeting of the Association for Computational Linguistics (ACL) 2021 – 2022
- Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL) 2022
- Empirical Methods in Natural Language Processing (EMNLP) 2021
- ACM SIGKDD Conference on Knowledge Discovery & Data Mining (KDD) 2020

INVITED TALKS

- T1 Data-Driven Sensor Simulation for Self-Driving Vehicles. UBC, Vancouver, Canada, June 2023.
- T2 AdvSim: Generating Safety-Critical Scenario for Self Driving Vehicles. Shanghai Jiao Tong University & SenseTime, Oct 2021.
- T3 Safety-Critical Scenario Generation for Autonomy Testing. CVPR21 Tutorial: All about Self Driving, June 2021.
- T4 Towards Secure and Interpretable Learning in Deep Neural Networks. Uber-ATG, Toronto, Canada, July 2019.

STUDENT SUPERVISION

Interns (Uber ATG & Waabi):

- Ava Pun

- Gary Sun
- Jay Sarva
- Rishi Menon
- Matthew Haines
- Jeffrey Liu