

EDUCATION

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**Stanford University** 2021–Present**Doctor of Philosophy in Computer Science**

Advisors (rotational): Prof. Jiajun Wu; (next) Prof. Fei-Fei Li and Prof. Jeannette Bohg

*Coursework: interactive and embodied learning, multi-task and meta-learning, differentiable graphics***University of Toronto** 2016–2019, 2020–2021**Bachelor of Applied Science in Engineering Science, Robotics**

Advisor: Prof. Florian Shkurti. Graduation with Honours, Dean's Honour List 2018–2021

*Coursework: robot perception, planning and control, geometric deep learning, reinforcement learning, statistical ML*RESEARCH EXPERIENCES

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**Stanford Vision and Learning Lab**, Stanford University Stanford, CA, USA

Graduate Researcher advised by Prof. Jiajun Wu

2021-09 – Present

*Topics: deep multi-task planning for mobile manipulation in long-horizon task settings***Robot Vision and Learning Lab**, Vector Institute & University of Toronto Toronto, Canada

Undergraduate Researcher advised by Prof. Florian Shkurti

2020-05 – 2021-05

*Topics: learning to plan in symbolic 3D scene graphs with graph neural networks***Mobile Robotics Lab**, MILA & McGill University Montreal, Canada

Research Intern co-supervised by Prof. Gregory Dudek and Prof. David Meger

2020-01 – 2020-05

*Topics: depth prediction for direct visual SLAM, visual representation learning for self-driving control***Noah's Ark Lab**, Huawei Research Canada Markham, Canada

Deep Learning Research Intern, perception and localization with Dr. Bingbing Liu

2019-05 – 2020-05

*Topics: 3D semantic understanding for scene reconstruction, road estimation and SLAM***Autonomous Systems and Biomech. Lab**, University of Toronto Toronto, Canada

Research Intern supervised by Prof. Goldie Nejat

2018-05 – 2018-08

*Topics: sim2real transfer of deep reinforcement learning based autonomous navigation policies*INDUSTRY EXPERIENCES

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**Mixed Reality and Robotics, Microsoft** Redmond, WA, USA

Software Engineering Intern on the Scene Understanding and Data Teams (HoloLens)

2021-05 – 2021-08

*Topics: bridging multi-agent reinforcement learning scenarios into mixed reality environments***Cloud, Google** San Francisco, CA, USA

Software Engineering Intern building ABI simulators with the Istio Networking Team

2020-05 – 2020-08

**aUToronto, UofT Autodrive Group** Toronto, Canada

Autonomy Engineer developing deep learning pipelines with the Object Detection Team

2019-08 – 2020-05

HONORS AND AWARDS

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**Stanford Graduate Fellowship, School of Engineering** 2021

Awarded to outstanding students pursuing doctoral degrees in computer science and engineering

**Ontario Engineering Competition** 2019

Awarded first prize at Toronto's district and Ontario's provincial programming competitions

**NSERC Undergraduate Student Research Award** 2018

Awarded to undergraduate science and engineering students on the basis of research aptitude

**President's Scholarship Program** 2016

Awarded to top engineering candidates pursuing studies at the University of Toronto

## PUBLICATIONS

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### REFEREED CONFERENCE PAPERS

- [4] Ran Cheng, Christopher Agia, Florian Shkurti, David Meger, and Gregory Dudek, “Latent attention augmentation for robust autonomous driving policies,”
- [3] Christopher Agia, Krishna Murthy Jatavallabhula, Mohamed Khodeir, Ondrej Miksik, Vibhav Vineet, Mustafa Mukadam, Liam Paull, and Florian Shkurti, “Taskography: Evaluating robot task planning over large 3d scene graphs,” in *5th Annual Conference on Robot Learning*, 2021.
- [2] Ran Cheng, Christopher Agia, David Meger, and Gregory Dudek, “Depth prediction for monocular direct visual odometry,” in *2020 17th Conference on Computer and Robot Vision (CRV)*, IEEE Computer Society, 2020, pp. 70–77.
- [1] Ran Cheng, Christopher Agia, Yuan Ren, Xinhai Li, and Liu Bingbing, “S3cnet: A sparse semantic scene completion network for lidar point clouds,” *arXiv preprint arXiv:2012.09242*, 2020.

### REFEREED JOURNAL PAPERS

- [2] Han Hu, Kaicheng Zhang, Aaron Hao Tan, Michael Ruan, Christopher Agia, and Goldie Nejat, “A sim-to-real pipeline for deep reinforcement learning for autonomous robot navigation in cluttered rough terrain,” *IEEE Robotics and Automation Letters*, vol. 6, no. 4, pp. 6569–6576, 2021.
- [1] Yuan Ren, Bingbing Liu, Ran Cheng, and Christopher Agia, “Lightweight semantic-aided localization with spinning lidar sensor,” *IEEE Transactions on Intelligent Vehicles*, 2021.

### INVITED TALKS

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<b>Facebook AI Research.</b> Taskography: Evaluating robot task planning over large 3d scene graphs	2021-07
<b>Microsoft Research.</b> Robot task planning in structured world models	2021-07
<b>Embodied AI Lab, MILA.</b> Contextual graph representations for task-driven 3d planning	2021-06

### COMMUNITY SERVICE AND LEADERSHIP

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<b>Stanford AI Salon</b> , Stanford University Organizer of Stanford’s AI Salon, a platform facilitating open-ended discussion between graduate students, industry, and academic leaders on contemporary ML & AI topics and their societal implications	2021-10 – Present
<b>Frosh Scholars Mentorship Program</b> , Stanford University Mentoring first generation college students through their developmental journey in academics, career, and well-being	2021-10 – Present
<b>Pro Bono Research Mentoring</b> Guided three driven undergraduate research students through to applications at top graduate engineering schools	2021-01 – Present
<b>NSight Student Mentorship Program</b> , University of Toronto Provided academic, social and personal support to first and second year Engineering Science students	2018-09 – 2019-05

### SKILLS

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Languages: (*Proficient*) Python, C/C#/C++, MATLAB, Rust, L<sup>A</sup>T<sub>E</sub>X, Bash - (*Working*) Java, Assembly  
Tools: Git, Linux/Unix, Unity, Docker, Wasmtime (WebAssembly), Kubernetes  
Libraries: PyTorch, TensorFlow, ROS, NumPy, ml-agents, PCL, OpenCV, SciPy, scikit-learn, Pandas, Jupyter