

Yizhou (Philip) Huang

Website: philip-huang.github.io
Email: phu@cs.toronto.edu
LinkedIn: [philip-yizhou-huang](https://www.linkedin.com/in/philip-yizhou-huang)
GitHub: github.com/philip-huang

EDUCATION

University of Toronto

MSc. in Computer Science

Toronto, Canada

Sept 2021 - January 2023

- Thesis: Planning and navigation for autonomous surface vessels
- Supervisors: [Florian Shkurti](#) and [Tim Barfoot](#), cGPA: 4.00/4.00

University of Toronto

BASc. in Engineering Science (Machine Intelligence Major)

Toronto, Canada

Sept 2016 - June 2021

- Thesis: Improving regularization-based continual learning with hypernetworks [\[pdf\]](#)
- Supervisor: [Florian Shkurti](#), cGPA: 3.88/4.00 (90.2%)

PUBLICATIONS

1. **Yizhou Huang**, Hamza Dugmag, Timothy D. Barfoot, and Florian Shkurti, “Stochastic Planning for ASV Navigation Using Satellite Images”, Submitted to *IEEE International Conference on Robotics and Automation (ICRA 2023)* [\[preprint\]](#) [\[video\]](#)
2. **Yizhou Huang**, Kevin Xie, Homanga Bharadhwaj, and Florian Shkurti, “Continual Model-Based Reinforcement Learning with Hypernetworks”, *IEEE International Conference on Robotics and Automation (ICRA 2021)* [\[pdf\]](#) [\[blog\]](#) [\[video\]](#)
3. Keenan Burnett, Jingxing Qian, Xintong Du, Linqiao Liu, David J. Yoon, Tianchang Shen, Susan Sun, Sepehr Samavi, Michael J. Sorocky, Mollie Bianchi, Kaicheng Zhang, Arkady Arkhangorodsky, Quinlan Sykora, Shichen Lu, **Yizhou Huang**, Angela P. Schoellig, Timothy D. Barfoot, “Zeus: A System Description of the Two-Time Winner of the Collegiate SAE AutoDrive Competition”, *Journal of Field Robotics*, 2021 [\[pdf\]](#) [\[video\]](#)
4. Qiyang Li, Xintong Du, **Yizhou Huang**, Quinlan Sykora, Angela P. Schoellig, “Learning of Coordination Policies for Robotic Swarms”, *arXiv preprint arXiv:1709.06620*, 2017 [\[pdf\]](#)

PROFESSIONAL EXPERIENCE

Robot Learning and Vision Lab, University of Toronto

Robotics Researcher

Toronto, Canada

Jan 2020 - Present

- Conducted **field tests of an autonomous surface vessel (ASV)** on a **3.7km** route in Northern Ontario; proposed, implemented, and validated a robust route-planning algorithm in the presence of environmental disturbances and unexpected obstacles
- Developed a hypernetwork-based, **continual learning** algorithm for model-based reinforcement learning; demonstrated state-of-the-art performance in multiple robotic simulations, including a door opening experiment
- Proposed the use of self-tuning network as a scalable hypernetwork architecture; reduced memory use by **98%**; verified its efficacy for continual image classification on many benchmarks, including MNIST and Tiny ImageNet

Qualcomm Inc.

Machine Learning Engineering Intern

Toronto, Canada

May 2019 - May 2020

- Developed and streamlined C++ test apps for Qualcomm’s HTA neural networks (NN) compiler on Snapdragon devices; reduced test time by **20% for a team of 15+** engineers

- Created a compiler profiling tool capable of reducing NN inference latency by **>15%**
- Developed a GUI application with Electron.js for visualizing neural networks in custom representation and running different test apps, which significantly improved the efficiency of day-to-day development

Civil, Environmental, Agricultural and Learning Lab, Technion

Haifa, Israel

Undergraduate Research Assistant

May 2018 - Aug 2018

- Designed a depth-camera based quadcopter localization and tracking pipeline in C++ running at 30Hz
- Re-trained a Mask-RCNN network in Keras to detect sunflowers using a custom dataset of 75 images
- Developed a demo in ROS featuring a **Crazyflie** nano-quadcopter autonomously navigating between 2-4 sunflowers for artificially pollinating sunflowers. [\[video\]](#)

Dynamic Systems Lab, University of Toronto

Toronto, Canada

Undergraduate Research Assistant

May 2017 - Aug 2017

- Designed and implemented a software framework (with ROS, C++ and Python) capable of flying **a swarm of 9 Crazyflie nano-quadcopters indoors**
- Built a simulation environment in Gazebo to debug controller and planning modules in ROS
- Developed an interactive demo with 6 quadcopters flying a synchronized “wave” motion. [\[video\]](#)

TEACHING AND SERVICES

- **Teaching Assistant** for CSC317 Fall 2022
Computer Graphics (University of Toronto)
- **Teaching Assistant** for CSC477 Fall 2021
Introduction to Mobile Robotics (University of Toronto)
- **Mentor** for PRISM Workshop Spring 2022
Preparation for Research through Immersion, Skills, and Mentorship (University of Toronto)
- **Reviewer** for IEEE International Conference on Robotics and Automation, *ICRA 2023* 2022
- **Reviewer** for IEEE/RSJ International Conference on Intelligent Robots and Systems, *IROS 2022* 2022
- **Reviewer** for Workshop on Meta Learning, *NeurIPS 2020* 2020

EXTRACURRICULAR ACTIVITIES

You're Next Career Network

Toronto, Canada

Marketing Associate

May 2020 - March 2021

- Worked for a student club that hosts the largest student-run career fair at University of Toronto, connecting over **3000 students** and **100 companies** a year
- Designed event graphics for different social media platforms
- Analyzed event participant data and created a dashboard with Google Data Studio

University of Toronto Self-Driving Car Team

Toronto, Canada

Object Detection Sub-Team Co-Lead and Member

Feb 2018 - Aug 2020

- Finished **1st place in three consecutive years** of SAE AutoDrive Challenge
- Led the object detection sub-team of 5+ students in reproducing a 3D object detection network (PointPillar) and developed custom software for accelerating inference on the Intel OpenVINO platform
- Improved the performance of our squeezeDet pedestrian detector from **41% to 85%** average precision while maintaining runtime at 40ms
- Reproduced a lidar-based, birds-eye-view object detection algorithm (PIXOR) on the KITTI self-driving dataset; PyTorch code (**>260 stars**) is available on [GitHub](#)

SCHOLARSHIPS AND AWARDS

- 3rd place, UofT Robotics Institute Three Minute Thesis Competition 2022
- Canada Graduate Scholarships-Master's (CGS-M) award - CAD \$17000 2021
- Vector Scholarship in Artificial Intelligence - CAD \$17000 2021
- 2nd place, Engineering Science Select Equity Den - CAD \$1000 2020
- University of Toronto Excellence Award - CAD \$6,000 2020
- William V. Hull Scholarship - CAD \$ 520 2019
- 1st place, Engineering Science Roshambo In-class Tournament 2019
- 2nd place, University of Toronto Engineering Kompetitions (UTEK), Programming Section 2019
- 3rd place, University of Toronto Engineering Kompetitions (UTEK), Programming Section 2018
- Sullivan Memorial Scholarship - CAD \$ 3,415 2017
- The Wallberg Undergraduate Scholarships - CAD \$ 1,500 2017
- Engineering Science Research Opportunities Program - CAD \$ 6,000 2017
- President's Entrance Scholarships - CAD \$ 2000 2016
- 1st place, Engineering Science Matboard Bridge Design and Build Challenge 2016
- 2nd place, Engineering Science Pong AI vs AI Competition 2016

SKILLS

- **Programming Languages:** Python, C++, MATLAB, Javascript/HTML, Bash, Latex, Java, Verilog
- **Libraries:** PyTorch, ROS, Tensorflow, OpenCV, PCL, Pyro, Electron.js, Pandas, NumPy, SciPy, Jupyter
- **Tools:** Git/Gerrit, Docker, Slurm, Linux, Illustrator, OpenVINO, AWS