

## Education

- 2017– **Robotics Institute, Carnegie Mellon University** Ph.D. in Robotics  
Advisor: Dr. Nathan Michael
- 2015–2017 **Robotics Institute, Carnegie Mellon University** M.S. in Robotics  
Advisor: Dr. Nathan Michael, Dr. Koushil Sreenath
- 2010–2015 **University of Toronto** B.A.Sc. in Engineering Science with Honours  
Major in Aerospace Engineering, Minor in Robotics and Mechatronics  
Thesis: Control with Complex Specifications for a Flip Maneuver of a Quadrotor Helicopter  
Advisor: Dr. Mireille Broucke

## Experience

- 2018 **Toyota Research Institute** Ann Arbor MI, USA  
*Research Intern, Risk Aware Trajectory Planning and Control*  
Developed FLUID planner, a planner that generates dynamically feasible trajectories given previous trajectories segments by learning a local flow field of directional intent.
- 2017– **Resilient Intelligent Systems Lab, Robotics Institute, Carnegie Mellon University** Pittsburgh PA, USA  
*Graduate Research Assistant*  
Designed, built and maintained quadrotor/hexarotor hardware and software systems with focus on novel planning frameworks for trajectory-based teleoperation. Developed, implemented and tested safety critical trajectory management frameworks. Primary research focuses on intent representation, inference and prediction for imperceptible operator control of mobile robots using trajectory-based teleoperation.
- 2015–2017 **Resilient Intelligent Systems Lab, Robotics Institute, Carnegie Mellon University** Pittsburgh PA, USA  
*Graduate Research Assistant*  
Developed long-duration locally adaptive motion-primitives based teleoperation for ground robots and quadrotors using online regression over feature-based operator intent.
- 2015 **Rapyuta Robotics Ltd.** Zürich, Switzerland; Tokyo, Japan  
*Control Engineering Intern*  
Simulated, implemented and tested an aggressive quadrotor hover-to-hover flip maneuver using a parameterized open-loop trajectory, improved using iterative learning scheme for real-time flip performance.
- 2014 **Autonomous Systems and Biomechatronics Lab, University of Toronto** Toronto ON, Canada  
*Research Assistant*  
Implemented OctoMap for 3D mapping with Microsoft Kinect and developed constraints and parameters for classification of traversable terrains in an intelligent robot learning system for realtime terrain categorization.
- 2013–2014 **IBM Canada Ltd.** Markham ON, Canada  
*Software Developer Intern, Release Engineering*

## Publications

- X. Yang**, N. Michael, “Assisted Mobile Robot Teleoperation with Intent-aligned Trajectories via Biased Incremental Action Sampling”. In *2020 International Conference on Intelligent Robots and Systems (IROS)*, Las Vegas, Nevada. pp. 2020 [pdf]
- A. E. Spitzer\*, **X. Yang\***, J. Yao, A. Dhawale, K. Goel, M. Dabhi, M. Collins, C. Boirum, N. Michael, “Fast and Agile Vision-Based Flight with Teleoperation and Collision Avoidance on a Multirotor”. In *2018 International Symposium on Experimental Robotics (ISER)*, Buenos Aires, Argentina. pp. 2018 [pdf]
- A. Dhawale, **X. Yang**, N. Michael, “Reactive Collision Avoidance using Real-Time Local Gaussian Mixture Model Maps”. In *2018 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Madrid, Spain. pp. 2018 [pdf]

**X. Yang**, A. Agrawal, K. Sreenath, N. Michael, “Online Adaptive Teleoperation via Motion Primitives for Mobile Robots”. In *Special Issue on Learning for Human-Robot Collaboration, Autonomous Robots*, April 2018. [pdf]

**X. Yang**, K. Sreenath, N. Michael, “A Framework for Efficient Teleoperation via Online Adaptation”. In *Proceedings of 2017 IEEE International Conference on Robotics and Automation (ICRA)*, Singapore. May 2017. pp. 5948–5953 [pdf]

**X. Yang**, K. Sreenath, N. Michael, “Online Adaptive Teleoperation via Incremental Intent Modeling”. In *Proceedings of the Companion of the 2017 ACM/IEEE International Conference on Human-Robot Interaction (HRI’17)*, Vienna, Austria. Mar. 2017. pp. 329–330 [pdf]

S.C.C. Shih, I. Barbulovic-Nad, **X. Yang**, R. Fobel, and A.R. Wheeler, “Digital microfluidics with impedance sensing for integrated cell culture and analysis”. In *Biosensors and Bioelectronics*. Oct. 2013, vol. 42, pp. 314–320. [pdf]

## Talks

Oct 2018 “Toward intuitive human controlled MAVs: motion primitives based teleoperation”. Invited talk, IROS 2018 workshop on Vision based Drones: What’s Next?

## Peer Review Activities

2018,19,20 IEEE International Conference on Robotics and Automation (ICRA)  
 2018 IEEE Transactions on Robotics (T-RO)  
 2020 IEEE Access

## Activities

2017, 2018, 2019 Teaching Assistant, Introduction to Feedback Control Systems (16-299), CMU  
 2017–2019 RoboCzar (Chair), RoboOrg (Robotics Institute graduate student organization), CMU  
 2016–2017 Class Rep, RoboOrg, CMU  
 2013–2015 Executive Chair, Galbraith Society, University of Toronto

## Systems

Linux/Unix

## Languages

C++, MATLAB, Python

## Software

ROS, Git, L<sup>A</sup>T<sub>E</sub>X