

## 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*  
Built, developed and maintained quadrotor systems with efficient local, reactive collision avoidance with motion primitives based teleoperation. Design, implement and tested safety critical trajectory management framework, including safe transitions. Research focuses are on behavior inference and minimal information, online, real-time intent prediction for assisted operator control of mobile robots.
- 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, Release Engineering*

## Publications

- X. Yang**, N. Michael, “Motion Primitive Trees: Real-Time Trajectory Generation via Biased Incremental Action Sampling”. In *2020 International Conference on Robotics and Automation (ICRA)*, Paris, France. [Submitted]
- 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 IEEE International Conference on Robotics and Automation (ICRA)

2018 IEEE Transactions on Robotics (T-RO)

### Activities

2017, 2018 Teaching Assistant, Introduction to Feedback Control Systems (16-299), CMU

2017– 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