Ruoyang 'Alex' Xu

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Education

Carnegie Mellon University **Pittsburgh, PA**
Master of Science in Robotics *August 2020 - August 2020 (expected)*
- {ROBOField} in {LabName} advised by Dr. {ProfName}.

Georgia Institute of Technology **Atlanta, GA**
Bachelor of Science in Computer Engineering, GPA 3.88/4.0 *August 2016 - May 2020*
- Minor in Robotics, and Computing and Intelligence
- Graduate Level Courses in Machine Learning, Robot Intelligent Planning, and Computer Architecture.

Skills

Concepts: Motion Planning, Navigation, Computer Vision, Machine Learning, Computer Architecture
Programming: Wrote a lot: Python, C++, MATLAB; Knows: C, Julia; Coursework: VHDL, Java
Frameworks: Linux/Unix, Git, ROS, PyTorch, Keras, CMake, Eigen.
Hardware: Raspberry Pi, ARM mbed, ATMega, Intel DE10 SoC
Publication: J. S. Smith, **R. Xu**, P. Vela., egoTEB: Ego-centric, Perception Space Navigation Using Timed-Elastic-Bands, 2019, ICRA 2020.

Teaching and Volunteering

Georgia Institute of Technology **Atlanta, GA**
Undergraduate Teaching Assistant | Digital Design Laboratory *August 2017 - December 2018*
- Helped students understand digital design and VHDL programming on Terasic DE2 FPGA Dev board.
- Helped student understand and implement a simplified single cycle processor.
- Hold lab hours, 30 students per semester.

Georgia Institute of Technology **Atlanta, GA**
Electrical Training Lead | RoboJackets - Competitive Robotics at Georgia Tech *August 2017 - May 2018*
- Led the design and teaching of freshman training program to robotics club, received by ~80 students.
- Program covers basic electrical concept from resistance, PCB design to firmware and communication protocols.

Georgia Institute of Technology **Atlanta, GA**
Volunteer | Georgia FIRST *August 2016 - May 2017*
- Mentored FRC team #5332 Toaster Tech in season 2016-2017. Volunteered for local FTC competitions as referee.

Honors and Awards

Faculty Honors - Georgia Tech Spring 2018 - Fall 2019
Academic average of 4.0/4.0 in proceeding term with no withdraw grades, at least 12 credit hours.
1st Design Award, 3rd Overall - 28th Intelligent Ground Vehicle Challenge July 2019
Comprehensive evaluation of vehicle design strategy and capability in completing navigation course
2nd Research Award - Georgia Tech May 2018
ECE Opportunity Research Scholar Program

Relevant Coursework

Introduction to Automation and Robotics: Fundamentals in robotics from representation through manipulator kinematics, and control; End-effector planning through jacobian.
Machine Learning: Introduction to ML that covers **randomized optimization, supervised, unsupervised, and reinforcement learning.** Open ended projects for each topic for comparative algorithmic performance analysis and characteristic evaluation.
Intro to Computer Vision: Foundation of **classical computer vision**, Harris feature detector, SIFT feature descriptor, bag of words classification; stereo pose estimation; deep learning for classification in computer vision.
Percpetion and Robotics: Mobile robots **navigation stack** from perception (label recognition and classification) to execution (probabilistic localization and planning)