# Andrew **Tu**

Computer Engineer

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*Available for Co-Op July – December 2019*

## Education

**Northeastern University** | *Boston, MA* *May 2020*

Bachelor of Science in Computer Engineering and Computer Science ***GPA: 3.9/4.0***

- Coursework: Robotics Sensing and Navigation (Grad), Computer Vision (Grad), Algorithms, Object Oriented Design, Computer Systems, Linear Systems, Circuits and Signals, Embedded Design
- Involvement: MIT Ballroom Dance Team, Undergraduate Research, numerous hackathons, IEEE, Toastmasters, SASE

## Skills

**Programming** Python , C++ , C , Javascript|HTML|CSS , Java

**Technologies** ROS , OpenMP , OpenCV , MATLAB , Git , GNU Make , GDB , Linux , LCM

**Hardware** IMUs , GPS , XBee Radio Modules , Teledyne Benthos Acoustic Smart Modems , Ethereum Miners

**Upcoming** **Spring 2019 coursework will consist heavily of grad level robotics and high performance computing classes**

## Technical Experience

### Flex Innovation and Design Labs

*Milpitas, CA*

Robotics Software Co-op *July 2018 - Present*

- Designing and implementing entire software system with ROS; working closely with electrical and mechanical sub teams.
- Integrating SLAM functionality into mobile robot system, fusing data from LIDAR, sonar, wheel encoders, and IMU.

### MIT Lincoln Laboratory

*Lexington, MA*

Co-Op Technical Assistant | Group 102 - Open and Embedded Systems *Jan. 2017—Aug. 2017*

- Parallelized radar signal processing chain in C++ using OpenMP and MPI resulting in $1700\%$ speedup. Work demonstrated hybridized MPI and OpenMP parallelizations met project requirements and reduced development costs.
- Automated benchmarking efforts through python and bash scripts to rapidly test and compare over $350$ configurations.
- Leveraged analysis tools from the Intel Parallel Studio Suite and Allinea Forge for debugging and optimization

### Northeastern University Marine Observatory Network

*Boston, MA*

Undergraduate Research Assistant **(NSF REU)** *Oct. 2015 - Jan. 2017*

- Designed and implemented smart buoy and GUI control system using C++, QT framework, and XBee Radio modules to bridge above water radio network with subsea acoustic network.
- Implemented MAC protocols in MATLAB on Teledyne Benthos SM-975 Acoustic Smart Modems to advance understanding of modem interactions and compare efficacy of MAC protocols over acoustic channel.
- Co-authored two papers and gave two major presentations (see personal website for links)

## Selected Side Projects

### Human Tracking TurtleBot

*Boston, MA*

Robotics Sensing and Navigation Project *Spring. 2018*

- Combined LIDAR and camera data through ROS to detect and follow humans around a room on TurtleBot3 platform
- Designed and implemented image processing pipeline through ROS to stream, process, and react to camera sensor data.
- Utilized OpenCV Hog Detection and MobileNet SSD for person detection

### Performance Comparison of Dead Reckoning against GPS

*Boston, MA*

Robotics Sensing and Navigation Project *Spring. 2018*

- Implemented data collection drivers through LCM to collect data from GPS and 9 DOF IMU in autonomous car while driving in Boston.
- Compared estimate of estimated path based on IMU data to GPS ground truth - one of few students to get partial alignment between dead reckoning and GPS data.

### NuVision: Augmented-Reality Heads Up Display Simulation

*Cambridge, MA*

2017 MIT Connected Care Design Hackathon | Top 5 of Hackathon *Apr. 2017*

- Implemented a heads up display by overlaying data modules on live camera feed using HTML frontend and Flask backend
- Constructed heat map of crime in Boston using public data and Google Maps APIs with geolocations based alerts
- Implemented facial recognition for POI alerts using Kairos Facial recognition API