

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, LCM, OpenMP, OpenCV, Git, GNU Make, GDB, MATLAB, Linux

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

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.
- Complete ownership over navigation and control systems.

MIT Lincoln Laboratory

Lexington, MA

CO-OP TECHNICAL ASSISTANT

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