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: Autonomous Field Robotics (Grad), Mobile Robotics (Grad), Robotics Sensing and Navigation (Grad), Computer Vision (Grad), High Performance Computing (Grad), Object Oriented Design
- Involvement: MIT Ballroom Dance Team, Undergraduate Research, numerous hackathons, IEEE, Toastmasters, SASE

Skills

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

Technologies ROS , OpenMP , OpenCV , MATLAB , Git , GDB , Linux , LCM , LaTeX

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*

- Primary software architect and developer of ROS based mobile robot in team of seven software and test engineers; project utilized six different languages, for seven unique pieces of hardware and ten different I/O peripherals. Worked in close collaboration with electrical, mechanical, project management, and design teams .
- Integrated commercial SLAM system, fusing data from LIDAR, sonar, wheel encoders, and IMU. PoC for sensing and navigation software.
- Performed extensive literature and code reviews to identify and implement best practices for project design, workflow, and to gain technical understanding of system limitations. Distilled findings and project reflection in internal paper.
- Implemented several basic machine learning and deep neural net algorithms in Matlab to further technical understanding.

MIT Lincoln Laboratory — *Lexington, MA*

CO-OP TECHNICAL ASSISTANT, INTERIM SECRET CLEARANCE | GROUP 102 - OPEN AND EMBEDDED SYSTEMS — *Jan. 2017—Aug. 2017*

- Independently parallelized radar signal processing chain in C++ using OpenMP and MPI to run in distributed multi-core Linux environments. Optimizations resulted in a 1700% speedup and demonstrated hybridized MPI and OpenMP parallelizations met stringent performance 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)

Technical 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.