

# Nathaniel Todd

Student - Master of Science  
in Computer Science



nathanieltodd48@gmail.com



nathanieltodd.com/cv

## Education

### Georgia Institute of Technology

#### M.S. Computer Science

Specialization: Machine Learning

Specialization: Perception & Robotics

Graduation: May 2020 | GPA: 3.9

### University of Pittsburgh

#### B.S. Electrical Engineering

Specialization: Signals & Systems

Minor: Computer Science

Class of 2018 | GPA: 3.6

## Skills

**Programming Languages:** Python, C,

C++, Java, Matlab/Octave, SQL

**Engineering Tools:** ROS, PyTorch,

Tensorflow, OpenCV, Git

**Iot/Developer Tools:** Raspberry Pi,

Arduino/Microcontrollers, Jetson

TX2/Xavier

## Extra-Curricular

### Georgia Tech Salsa Club

#### Vice President | Instructor

- Organized classes and hired instructors

- Engaged club in Georgia Tech community with various networking events

### K.I.D.S. Workshop

#### Volunteer Instructor

- Taught children basic programming

### BIG Idea Competition

#### Team Cashout

- Pitched Cashout to investors
- Collaborated with mentors to refine our product
- Developed basic web and android app to expedite store checkout

### Pitt Robotics Club

#### Team IARC

- Developed logging and image processing ROS nodes
- Designed prop thrust testing software and rig

## Experience

### Software Engineer, Georgia Tech Research Institute

Aug-Dec 2019

- Developed production code for android app
- Handled tasks related to USB and UDP communication and GUI development

### CV/ML Intern, Bloomfield Robotics

May-Aug 2019

- Applied GPU acceleration classical stereo vision
- Experimented with deep network architectures for object detection
- Fine-tuned existing networks with proprietary training data
- Integrated vision systems with ROS on Nvidia TX2 and Xavier

### R&D Engineering Co-op, ABB Inc.

Jan-Dec 2017

- Lead engineer on an end to end design upgrade of a legacy board
- Performed circuit design and 10 layer PCB design/layout
- Programmed in C and VHDL for software redesign
- Finalized development with prototype testing, sourcing, and placing manufacturing orders

### Electrical Engineering Co-op, General Electric

May-Aug 2016

- Worked on design and configuration of drive control software
- Assisted with on site motor drive installation and commissioning

### Owner, Mow'n'Go

Apr'13-Aug'15

- Grew through canvassing and advertisement
- Personally managed customer relations and work schedule
- Managed 2 employees and contracted others as needed
- Performed all mechanical maintenance and repairs

## Projects

### Weighted Jacobian Regularization for Robust Classification

Nov-Dec 2019

- Built on Jacobian regularization techniques by weighting the each element of the Jacobian by its distance to ground truth label
- Initial experiments showed modest improvement smoothness decision boundaries and robustness to attacks

### Automatic Star Trail Generation Application

Apr 2019

- Produced novel javascript application to generate star trails of starry sky picture.
- Final product accomplished using graph cut, homographies, and maximal blending

### Panoramic Stitching Application

February 2019

- Created javascript panorama stitching application to stitch 3 images together using manually selected features

### Camera Calibration and Fundamental Matrix Estimation with RANSAC

Oct 2018

- Developed a method for improving the local feature matching application.
- Calculated fundamental matrix to relate points along epipolar lines and eliminate feature matches not satisfying the epipolar line relation.

### Local Feature Matching Application

Sept 2018

- Created local feature matching algorithm by recreating a version of Harris' Corner detector, a SIFT descriptor, and a feature matching function.

## Relevant Coursework

MS Electives    Computer Vision, Computational Photography  
Machine Learning, Machine Learning Theory, Deep Learning  
Robotic Intelligence: Planning, Big Data Ethics

CS Core        Graduate Algorithms, Introduction to Database Systems, Algorithm  
Implementation, Data Structures, Discrete Math Structures, Formal  
Methods, Systems Software, Computer Organization

Engineering    Digital Logic, Embedded Systems & Microcontrollers, Microelectronic  
Circuits, Signals & Systems Analysis