




# Nathaniel Todd

**Objective:** Seeking Position as Software Engineer Starting Summer 2020

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 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,

OpenCV, Git, Tensorflow

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

Arduino/Microcontrollers, Jetson

TX2/Xavier

## Extra-Curricular

### Georgia Tech Salsa Club

#### Vice President

- Increased club size through

- advertising and outreach

- Secured additional funding avenues

- for future stability

- Produced easier turn-over by

- reviewing all club officer

- responsibilities

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

#### Volunteer Instructor

- Helped middle schoolers build

- working circuits and software

### BIG Idea Competition

#### Team Cashout

- Pitched Cashout to investors

- Collaborated with industry mentors

- to refine our product

### Pitt Robotics Club

#### Team IARC

- Developed logging and image

- processing ROS nodes

- Designed prop thrust test bench

## Experience

### Computer Vision Engineer, Software Automation

Jan 2020 - Present

- Eliminated fabric placement error with the development of reliable fabric localization and fabric face detection

- Produced 30% speed up and eliminated dropped frames in vision feedback with implementation of counter based image synchronization

- Performed various camera tuning such as calibration and sharpness tests

### Software Engineer, Georgia Tech Research Institute

Aug-Dec 2019

- Created reliable USB and UDP communication enabling real time updates

- Eliminated repeat engineering effort with self-populating license section

### Machine Learning Intern, Bloomfield Robotics

May-Aug 2019

- Enabled real time stereo depth by applying GPU acceleration

- 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

- Led new product design replacing 3 legacy products with single new design

- Tasks included circuit design, 10 layer PCB layout, C and VHDL development

- Finalized prototype with testing, sourcing, and placing manufacturing orders

### Owner, Mow'n'Go

Apr'13-Aug'15

- Started from scratch and grew to 40 weekly customers

- Lead 2 regular employees and contracted others as needed

## 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 in 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, Mobile Computer & IoT