# Nathaniel Todd

**Objective:** Seeking Position as Machine Learning Engineer Starting Summer 2020


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## 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 mentorsto 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

**Machine Learning 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 canvasing 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

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|---|---|
| MS Electives | Computer Vision, Computational Photography<br>Machine Learning, Machine Learning Theory, Deep Learning<br>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 |