Nathaniel Todd

Student - Master of Science in Computer Science

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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 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 test bench

Experience

Computer Vision Engineer, Softwear 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

CV/ML 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