Trevor M. Decker

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Employment History

Robotics Engineer, Apple Special Projects Group (2016 - Present)
- Created bundle adjustment and SLAM pipelines for high definition map creation
- Developed a patent pending high fidelity rolling shutter LiDAR simulation
- Created low cost multimodal modular distributed embedded traffic monitoring system
- Mentored team intern on reinforcement learning project

Research Assistant, CMU Field Robotics Center (2011 - 2016)
- Assisted with software and hardware maintenance/development of 10+ robots
- Built multi-robot co-localization algorithms in low infrastructure environment
- Developed Kalman filter and EKF for sensor fusion
- Added vision system to robot to allow for automated initialization

Intern, Amazon Prime Air (Summer 2015)
- Worked on computer vision and a real time embedded system for sensors team
- Team is applying for multiple patents based on my work on the project
- Completed internship project early, helped another intern finish a second project

Intern, Volkswagen Electronics Research Laboratory (Summer 2014)
- Developed scalable architecture for sensor extrinsic calibration verification
- Upgraded legacy code to work with new system interface
- Participated in and helped organize computer vision reading group

Introduction to robotics TA (Spring 2013 - 2016)
- 2016 lead teaching assistant, managed team of 12 TAs, wrote exams
- Designed new Bayes filter localization lab, robots solve the lost robot problem
- Taught localization/state estimation lecture for professor

Programming
Matlab ★★★★☆
C ★★★★☆
C++ ★★★★☆
Java ★★★★☆
Python ★★★☆☆
HTML ★★★☆☆
PHP ★★☆☆☆
JavaScript ★★☆☆☆
SML ★★☆☆☆
LaTex ★★★☆☆

Libraries
ROS ★★★☆☆
Free RTOS ★★☆☆☆
OpenCV ★★☆☆☆
PCL ★★★☆☆
TensorFlow ★★★☆☆
G2o ★★★★☆

Software
linux ★★★☆☆
Adobe Premiere ★★☆☆☆
SolidWorks ★★★☆☆

Mechanical
Mill ★★★☆☆
Lathe ★★☆☆☆
3d printer ★★★★☆
Laser cutter ★★★☆☆
Carbon Fiber ★★☆☆☆

Education and Relevant Classes

Carnegie Mellon University (CMU), Pittsburgh, PA
- Masters of Science in Electrical Computer Engineering (ECE) (May 2016)
- Bachelors of Science in ECE with minors in Computer Science, Robotics, and Business Administration (2015)

Robot Kinematics Dynamics and Controls
- Created Kalman filter for vision system parameter estimation

Mecatronic Design
- Won "Coolest Robot" award for skyscrapper window cleaner

Statistical Techniques in Robotics
- Used Reinforcement learning for AI to play Mario Kart clone

Parallel Computer Architecture and Programming
- Developed Vision system for GPU based road segmentation

Real Time Embedded Systems
- Designed working RTOS with priority inversion

Computer Vision
- Designed optical text recognition system

Embedded Controls
- Programmed stable inverted pendulum

Distributed Embedded Systems
- Developed safety critical elevator control system

Activities

Robotic Buggy (2013 - 2016)
- Creating a robot which can autonomously compete in a gravity race at CMU
- Lead Software Team (manage 8+ people) Responsible for all software and firmware
- Developed a scalable real time architecture for mapping, path planning, and localization
- Wrote motion model and observation model for GPS, IMU, encoders, cameras, ...
- Built computer vision road lane and building feature detectors to help extract robot's state

Mentor, Girls Of Steel FIRST Robotics Team 3504 (2011 - 2013)
- Mentored CMU sponsored robotics team of 40+ high school girls
- Co-taught Java programming course for students
- Acted as a Resident Assistant for 30 visiting Chinese students during a 2 week camp (2013)

Apex Buggy Team (2011 - 2016)
- Relay race at CMU with human driven carbon fiber carts built by students
- Co-founded team as a freshman (now has 40+ members), was an active member for 5 years

Distinctions

- 1st place Apple maps emerging technology reinforcement learning challenge 2017
- Computer technician: diagnosed and repaired computers for 650+ students (2009 - 2011)
- Black Belt,Tang Soo Do Karate