Shastri Ram

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EDUCATION

Carnegie Mellon University, Pittsburgh PA

- MSc Robotics — Aug 2016 – July 2018
- BS Electrical and Computer Engineering, Additional Major in Robotics (Hons) — Aug 2012 – May 2016

RELEVANT SKILLS

- Programming Languages: C, C++, Python, MATLAB, Arduino C, Stateflow, Simulink
- Deep learning and Robotics: ROS, Tensorflow, Keras, Caffe, TensorRT, DeepStream, Docker, PCL
- Project Management: Jira, DevOps, GIT

WORK EXPERIENCE

Automation Engineer — June 2019 – Present
CAT Robotics/Pittsburgh Automation Center, Caterpillar Inc.

- Progressively developing features to improve performance of the 2D object tracking system
- Created visualization tools to perform qualitative analysis of 2D object tracking system
- Wrote the safety lights driver to indicate the status of the machine during operations
- Performed thorough analysis of multiple data annotation companies to provide a recommendation to CAT
- Benchmarked performance of different types of deep learning networks to understand resource requirements

Automation Engineer — Oct 2019 – May 2019
Pittsburgh Automation Center, Caterpillar Inc.

- Trained and benchmarked deep learning networks for object detection and classification, achieving greater than 0.9 MAP scores on the test set
- Led deployment of the trained networks on embedded platforms
- Created dataset analysis tools for deep learning applications
- Analysed the performance of different types of deep learning networks on various GPUs which lead to the purchase of a local high compute platform at the Pittsburgh Automation Center
- Developed probabilistic update feature for the 3D space representation library
- Standardized performance metrics for algorithms, software and systems. Additionally standardized requirements for data collection and annotation activities
- Joined CAT CMU Recruiting team, and annually attended conferences such as Nvidia GTC and CVPR

Senior Associate Engineer Product Development — Sept 2018 – Sept 2019
Pittsburgh Automation Center/Peoria Proving Grounds, Caterpillar Inc.

- Implemented an algorithm for ground surface estimation using GPU accelerated code and worked with the terrain mapping team to deploy it on embedded computing platforms
- Integrated a fiducial marker detection system using Docker containers to run on x86 and arm64 platforms
- Developed a watchdog system to perform critical safety audits for the GPS Pose and Remote Control systems for medium dozers. The watchdog system was deployed on-machine for testing and will be put into production for the next generation of dozers
- Created simulators for each of these watchdog systems, as well as a data injector to test performance
- Gained extensive systems integration and on-machine experience designing and executing test plans, data collection and analysis, installation, testing and troubleshooting of hardware components
- Tuned PID gains for implement controls on medium dozers

Research Assistant and Systems Engineering Intern — May 2015 – July 2018
Field Robotics Center, Carnegie Mellon University

- Worked in collaboration with Yamaha to build and design a self-driving all terrain vehicle
- Integrated sensors such as GPS, IMU, Velodyne 64 and Multisense S21 with vehicle
- Built a ROS-CAN driver, using C++, that listened to ROS messages and published them to the CAN network and vice versa
- Conducted system characterization tests to develop the open loop model of the vehicle, then modified and tuned the control architecture of the vehicle, via Simulink to have a better response
- Debugged and tested the system extensively to identify and fix bugs especially with the drive by wire system
- Designed a system for terrain recognition using computer vision and deep learning

LEADERSHIP

- FIRST Global Robotics- Global STEM Corps Mentor and Leader of Team Trinidad and Tobago — Jan 2017 – July 2018
- Eta Kappa Nu- Electrical and Computer Engineering Honor Society- VP — May 2015 – May 2016
- Tau Beta Pi- Engineering Honor Society — May 2015 – May 2016
- Formula Society of Automotive Engineers- Director of Safety Systems — Jan 2013 – Jul 2014