

Aravind Krishnan

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EXPERIENCE

- Senior Software Engineer - Autonomous Driving**, KPIT Technologies GmbH, Germany *Feb '19 - Present*
Worked on feature implementation of Camera, LiDAR by following TDD with strict software quality using C++14. Working on a tech stack with and without ROS for BMW autonomous driving project. Adaptive AUTOSAR & Bazel experience. Worked on maturity level 2 of *Automatic Sensor Cleaning Mechanism* algorithm
- Software Engineer - Perception**, Dabit Industries LLC, USA *Aug '17 - Feb '19*
Worked on TurtleBot3, Google Blockly and interfaced sensors like - 2D LiDAR, IMU and Camera, to create experimental platform, compare Gmapping and Hector SLAM. Worked on Audio and Feature Extraction using Neural networks for emergency vehicles. Explored AUTOWARE and ROS2
- Software Intern** - Nippon Seiki Europe, Munich, Germany *Apr - Nov '15*
Software debugging of 'blackscreen' issue and white box testing on Head-Up Displays for BMW, Audi and Daimler
- Embedded Software Engineer** - Forus Health, Bengaluru, India *Jan - Sep '14*
Handheld retinal camera with foot-switch activated focus mechanism using Haydon's linear actuator stepper motor, Microchip 16bit microcontroller application development. EMF protection under IEC 60601-1 standard
- Robotics Engineer**, Li2 Innovations, Bengaluru, India *Jun '11 - Jul '13*
Self Balancing Robot's PID control with Kalman filtering using Gyro & Accelerometer sensors in Arduino/C++
Real-time multiple sensor integration and data acquisition with 3 tier architecture. Sphinx 3 speech engine for a voice controlled robot

SKILLS

Github: <https://github.com/aravindk2604>

Programming Languages: C++(11, 14), Python, C
Packages: ROS, Gazebo, Matlab, OpenCV, PCL, Arduino, TensorFlow, Keras, Caffe
Platforms: NVIDIA TX2, TK1, STM32Fxx, Atmel, MSP430, Beagle Bone, Rasp Pi, Intel Edison
Aware of: FuSa ISO26262, SOLID principles, Klocwork, Adaptive AUTOSAR, CleanCode

EDUCATION

Worcester Polytechnic Institute Master of Science in Robotics Engineering *May'17*
Visvesvaraya Tech University Bachelor of Engineering in Telecommunications *Jul'11*

PROJECTS

Computer Vision and Deep Learning Module Projects, Udacity

- Lane Detection - simple identification of left and right lines for a lane on a highway. Detection was performed on a video using CV techniques and simple math.

Ongoing:

- LiDAR Obstacle Detection
- Collision Detection Systems (Camera based)
- Radar Target Generation and Detection
- Sensor Fusion - LiDAR and RADAR with Kalman Filtering
- Unscented Kalman Filtering

RC Car autonomous driving in unstructured environments based on MIT Racecar

Using NVIDIA Redtail project to implement TrailNet NN to navigate in unstructured environments. Working on the perception and sensing part of the project -- ZED camera, Sweep LiDAR, razor m0 IMU, NVIDIA Jetson TX2

ROS Bridge for Microsoft Airsim and Rviz

Worked on a ROS bridge to display Microsoft Airsim's Camera Feed into Rviz with reduced frame rate and the ego vehicle motion controlled through simple geometry_msgs.

LiDAR-Camera Calibration and processing using ROS

Calibrated narrow-stereo camera using ROS and cross calibrated a Velodyne LiDAR using camera data and visualized using RGB point cloud (PCL). Worked on plane segmentation and cluster extraction of the rosbag data.

Porting of TurtleBot3 control using Google Blockly, Dabit Industries

Developed API for drag-n-drop based sensor features on Google Blockly to control TurtleBot3 with ROS as middleware. *doc:* <http://turtlebot-3-blockly-wiki.readthedocs.io/en/latest/>

Evaluation of CNN's Prediction Time in Classifying Traffic Signs, WPI

Implemented an algorithm for successful identification and classification of Traffic signs for Self-Driving Car with 99.34% accuracy using deep learning techniques and evaluated time complexity for the same & published paper

Autonomous Mobile Robot for Object Relocation, WPI

A prototype to relocate objects using 9-axis IMU, encoded DC motors, Orb SLAM2, Deep Q-learning motion planning using ultrasonic sensors, Caffe object detection, processing on NVIDIA Jetson TX1 with ROS

PUBLICATIONS

Fulco J., Devkar A., Krishnan A., Slavin G. and Morato C. (2017), **Empirical Evaluation of Convolutional Neural Networks Prediction Time in Classifying German Traffic Signs** in Proceedings of the 3rd International Conference on Vehicle Technology and Intelligent Transport Systems - Volume 1: VEHITS, DOI: 10.5220/0006307402600267