Arjun S Kumar

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Work Experience

- **Ignitarium Technologies** — Kerala, India
  Senior Engineer (Machine Learning and Robotics)(Full-time) — *April 2019 - Present*
  - Working on the ROS integration of Texas Instruments Jacinto J7 automotive processor platform with Turtlebot 2 for simuletenous localization and mapping applications.
  - Worked on TIDL (Texas Instruments Deep Learning) libraries for Jacinto J7 Automotive platform on custom object detection and semantic segmentation.
  - Worked on the evaluation of vSLAM and Visual Odometry algorithms targeted for Nvidia Jetson platforms based F1/10 size autonomous car.
  - Worked on the training and evaluation of DNN models using Keras, TensorFlow in Carla Simulator.
  - Developed object classification, object detection, semantic segmentation neural networks using Transfer Learning targeted for ARM & x86 devices.
- **Nanyang Technological University** — Nanyang Eve, Singapore
  Research Associate (Aerial Robotics) (Full-time) — *Aug 2018 - Apr 2019*
  - Gained hands-on experience with real-world deployment of Visual Inertial Odometry (VIO) and SLAM algorithms and benchmarked their performances on Nvidia Jetson TX2.
  - Worked on the navigation of autonomous Micro Aerial Vehicles (MAV) in a GPS denied environment using only On-board Camera and IMU and achieved an average absolute trajectory error of 0.025m.
  - Built custom Micro Aerial Vehicle with Stereo Camera, Nvidia Jetson TX2 and Pixhawk under ROS platform.
  - Implemented VIO algorithms with Double Input Type-I and Type- II fuzzy logic controllers and simulated their performances under various flight speeds in Gazebo.
- **Addverb Technologies** — Noida, India
  Engineer (Robotics) (Full-time) — *Jan 2018 - July 2018*
  - Developed and deployed perception algorithms for Robotic 3D Bin picking for an E-commerce client using Point Cloud Library (PCL), OpenCV, ROS and TensorFlow with ABB, KUKA, Universal Robots manipulators.
  - Implemented a perception based solution for pallet detection using 2D Laser scanners.
- **Ernst and Young** — Kerala, India
  Consultant (Artificial Intelligence and Robotics) (Full-time) — *Jan 2017 - Dec 2017*
  - Developed and Demonstrated various Proof of Concepts (POCs) using Microsoft stack of technologies including Cognitive Services, Microsoft HoloLens (v1), Kinect Sensor and CNTK framework.
  - Developed a computer vision algorithm for crack detection and rust classification occurred in mobile towers using CNN and ROS for a US-based Aerial company.
  - Worked on the integration of PTAM-SLAM with Parrot Ardrone 2.0 and Parrot Bebop drones and developed warehouse inventory management POCs.
- **Ingeniarius Lda** — Coimbra, Portugal
  Intern Engineer (Robotics)(Full-time) — *Jun 2016 - Dec 2016*
  - Worked across the entire development of a differential drive ROS mobile robot.
  - Implemented an Evolutionary swarm robotics algorithm using C++, ROS in Gazebo.

Education

- **Udacity**
  The School of Autonomous Systems - Self Driving Car Nanodegree — *Aug 2020*
- **Amrita School of Engineering** — Kerala, India
  Master of Technology - Robotics and Engineering; GPA: 6.91 — *July 2015 - Jun 2017*
- **Amrita School of Engineering** — Kerala, India
  Bachelor of Technology - Computer Science and Engineering; GPA: 6.61 — *July 2011 - Jun 2015*

Skills

- **Programming Languages**: Python, C++
- **Software Libraries/Tools**: TensorFlow, Keras, PyTorch ROS, OpenCV, PCL, Git, Docker
- **Computer Vision**: Object Detection, Scene Segmentation, Object Classification

Publications

- **Search and Rescue Operations Using Robotic Darwinian Particle Swarm Optimization**: ICACCI (2017), India.
- **Automated Inspection of Monopole Tower using Drones and Computer Vision**: ICoIAS (2019), Sinagpore.