Akash Sharma

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Education

- **Carnegie Mellon University** — Pittsburgh, USA
  Master of Science in Robotics (Cumulative GPA: 4.25) — *2019 - Present*
- **Sri Jayachamarajendra College of Engineering** — Mysore, India
  B.E in Electronics and Communication (GPA 9.61/10) - Rank 7/160 — *2013 - 2017*

Research Experience

- **Carnegie Mellon (Robotics Institute)** — Pittsburgh, USA
  Research Assistant — *October 2019 - Present*
  - Working on Object level semantic SLAM for Indoor environments
  - Research on algorithms to improve map reconstructions using objects as landmarks for pose graph SLAM
- **PES University (Indvent Labs)** — Bangalore, India
  IAS Summer Research Fellow — *June 2016 - July 2016*
  - Worked with the TI F28335 peripheral explorer kit Digital Signal Controller (DSC), using Simulink
- **Indian Institute of Science (CeNSE, IISc)** — Bangalore, India
  Summer Research Intern — *June 2015 - August 2015*
  - Worked on a hardware accelerator for RSA encryption using Verilog HDL. Implemented and simulated results on the ZedBoard FPGA(Zynq 7020).

Industrial Experience

- **OpenCV** — Virtual/Pittsburgh, USA
  Student Developer — *May 2020 - Present*
  - Working as part of **Google Summer of Code**
  - Improving RGBD fusion methods for large scale environments via algorithms (such as spatial hashing, pose graph optimization) that improve map building accuracy and storage, to make the system feasible on CPU.
- **Infinera India** — Bangalore, India
  Software Developer — *July 2017 - July 2019*
  - Built system level abstract infrastucture software for Fault, Configuration and Performance management of Infinera devices.
  - Developed and supported Input Power Control for Add Drop Multiplexers (ROADMs) and amplifiers in the Infinera Line System, to increase capacity/degree of traffic turn up
  - Developed the Bypass Auto-Discovery (AD) feature, which enables faster turn up of optical traffic on the network through point and click provisioning of devices.

Projects

- **Visual SLAM for Quadrotors in Indoor Outdoor environments** — *December 2016 - May 2017*
  - Built an autonomous quadrotor which can map and localize itself online in a static GPS-denied environment. The robot primarily used RTAB mapping in ROS for localization
  - Quadrotor used an Arduino based controller, an onboard Odroid XU4 and Kinect
- **Robot to Navigate a Terrain** — November 2016 - Jan 2017
  - Selected for the pre-finals round of E-Yantra Robotics Competition eYRC-2016, held by IIT Bombay
  - Designed and built a robot to follow a laser. An orchestrated laser pointer led the robot down a map with obstacles to reach a certain goal. Communication between devices was over WiFi
- **Self Balancing Robot with Intelligent Computer Vision** — *January 2016 - April 2016*
  - Built a mobile inverted pendulum robot. The robot used a cascaded PI-PD controller and used hardware timers to control the stepper motors
  - Implemented SURF feature based obstacle detection, and a path following algorithm using OpenCV.

- **Hybrid Intelligent Gear Shifter and Vehicle Control System** *September 2015 - July 2016*
  - Won 4$^{\text{th}}$ Place in the Partners for the Advancement of Collaborative Engineering Education (PACE) Collaborative Innovation Challenge (CIC) presented at Cincinnati, Ohio, USA
  - Designed and conceptualized a hybrid gear actuator system based on capacitive touch panels attached to the steering wheel

Technical Skills

Programming Languages: C/C++, Python

Experience in working with **OpenCV, Open3D, Pytorch, ROS**

Awards and Achievements

- Won the Most Promising Project Award (Cash prize) in the **Infinera India Hackathon 2018**. 2$^{\text{nd}}$ among over 50 participating teams
- Won 1^{st} place in the C Night-Out coding competition conducted jointly by **Hackerearth and IEEE-SJCE**
- Won 2^{nd} Place in State level line following robot competition in the 2^{nd} at SJCE