Ashish Arun Farande

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Education

University of California, San Diego (UCSD) **Expected Graduation: June 2023**
Master of Science in Electrical and Computer Engineering *GPA: 3.96/4*

Sri Jayachamarajendra College of Engineering (SJCE), Mysuru **2014 – 2018**
Bachelor of Engineering in Electrical and Computer Engineering *GPA: 3.96/4*

Relevant Coursework

- Advanced Computer Vision
- Linear Algebra
- Multiview Geometry
- Deep Learning for 3D Geormetry
- Statistical Learning
- Motion Planning and Learning
- Deep Learning
- Data Structures and Algorithms
- Sensing and Estimation

Technical Skills

Programming Languages: C++ Python C JavaScript Matlab
Python Libraries: Numpy OpenCV Matplotlib Pytorch
Developer Tools: Linux Git ROS NodeJS Eclipse Jupyter

Experience

Brain Corp **Jan 2023 – Present**
Software Engineering Robotics Intern *San Diego, USA*

- Tasked with the development of features in python and C++ for artificial intelligence software platform that powers the world's largest fleet of autonomous mobile robots operating in indoor public spaces.

Robert Bosch Engineering & Business Solutions **Sept 2018 – July 2021**
Senior Software Engineer *Bangalore, India*

- Tasked with development of Telematics and Personalization features for car infotainment devices on a Linux platform using C++
- Developed a User Authentication feature by incorporating advanced networking protocols like OAuth 2, which improved the security of the data traffic.
- Accelerated the testing process by developing TServer — a testing server built using NodeJS, MQTT and ElectronJS, improving the number of test cases count by 10x
- Redesigned a Middleware component with an emphasis on OOPs, which reduced the bugs by 80%.
- Collaborated closely with Business Analysts, and product partners to identify the business requirements for technical architecture plans and analytical solutions to ensure 0.0 defects.

Vision-based Research & Projects

Pose Estimation | *ICP, Pytorch* **Nov 2022 - Dec 2022**
Prof. Hao Su *San Diego, USA*

- Developed an ICP and Neural Network (PVN3D) based model to predict 6D Pose with an accuracy of 92.8% for a 5 deg and 1 cm rotational and translation threshold respectively.

3D Object detection from Monocular Images | *Pytorch* **Jun 2022 - Sep 2022**
Prof. Nuno Vasconcelos *San Diego, USA*

- Explored several research work in 3D object detection based on geometric priors and deep learning, and engineered a solution with a fusion of DD3D and transformer.

Semantic Segmentation using Inception | *Pytorch* **Feb 2022**
Prof. Garrison Cottrel *San Diego, USA*

- Developed an architecture inspired from UNet and Inception to segment images for **Unstructured Driving Scenarios** from TAS500 Dataset. The model was able to perform approx 5% better than the UNet, with 50% lesser parameters

Image Captioning | *Pytorch, Python* **Mar 2022 – Mar 2022**
Prof.Garrison Cottrel *San Diego, USA*

- A neural network architecture was trained to predict the captions from image, which consisted of pre-trained ResNet50 as encoder and LSTM/RNN as decoder.

Robotics-based Research & Projects

SLAM using Particle Filter | *Python* **Feb 2022**

- Built a 2D Occupancy grid of the environment and trajectory of the car using particle filter, based IMU for the prediction and LIDAR data for update.

Visual Inertial SLAM using EKF | *Python* **Mar 2022**

- Built a 2D map of the environment and trajectory of the car using EKF prediction based on SE(3) kinematics with IMU data and EKF update based on stereo camera measurements from an autonomous car.

Robotic System to collect Farm Produce | *OpenCV, Python* **Jan 2018 – Mar 2018**

- A real-time system with overhead camera that could detect and distinguish Aruco markers (fruits) in the field.
- In addition, autonomously plan a path, using VREP Emulator, in order to collect good fruits and place it in the truck.
- Designed a PID Controller for the robot and the truck. Also, worked on the hardware design of the robot.

Gesture Controlled Robotic Arm in 3D Space | *C#, Visual Studio* **Jan 2017 – Apr 2017**

- An intuitive system that imitates the human hand in 3D space.
- Worked on Skeleton extraction from a RGB-D camera & angle determination between joints of hand using direction cosines.

Autonomous Robot for 3D Mapping and Object Detection | *Python, ROS, TensorFlow* **Aug 2017 – May 2018**

- A self-docking robot – traverse and build a map in an unknown environment & successfully dock at a point for charging.
- Used ROS to build a 3D map and worked on object detection using Faster R-CNN.

Leadership / Extracurricular

- **Graduate Teaching Assistant** - ECE Department (Linear System Fundamentals) and Physics Department
- Served as a **Placement Secretary** of SJCE, Mysuru, 2017-18.
- **Student Association Coordinator**, IEEE-SJCE Student Branch, 2016-18.