Sundar Sripada V S

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Website GitHub LinkedIn

Education

- **The University of Texas at Austin** — *Austin, Texas, USA*
  Master of Science in Engineering, Electrical and Computer Engineering — *Aug 2022 - Aug 2024*
  - Academic Track: Decision, Information and Communication Engineering — GPA: N/A
  - Relevant Courses: Convex Optimization*, Machine Learning for Real-World Networks*, Learning-based Optimal Control*
- **Anna University** — *Chennai, India*
  Bachelor of Engineering, Electronics and Communication Engineering — *Jul 2016 - Sept 2020*
  - Relevant Courses: Object-Oriented Programming & Data Structures, Computer Architecture, Robotics, Computer Networks — GPA: 8.54/10

Skills

- **Languages** Python, C++, C, MATLAB, Julia, Bash
- **Frameworks** PyTorch, TensorFlow, Keras, Robot Operating System (ROS), CARLA, Gazebo
- **Libraries** numpy, pandas, matplotlib, seaborn, OpenCV, Pillow, scikit-learn, plotly, networkx
- **Version Control & OS** git, GitHub, Linux (Pop!OS_20.04), Windows 10

Publications

- **Drift Reduced Navigation using Deep Explainable Features**, IROS 2022, Paper — *Jun 2022*
- **LADFN: Learning Actions for Drift-Free Navigation in Highly Dynamic Scenes**, ACC 2022, Paper — *Jan 2022*

Work Experience

- **Research Intern, Robotics Research Center** — *Oct 2020 - Jun 2022*
  The International Institute of Information Technology - Hyderabad, India
  - Tuned classification and regression models to predict the presence and amount of drift accumulated by a self-driving car up to 92% accuracy, given input pose and velocity using CARLA simulator
  - Formulated a Reinforcement Learning (RL) model using Proximal Policy Optimization (PPO) that clearly outperformed a vanilla Stanley controller in reducing drift over 1.63 times in autonomous driving (ACC 2022)
  - Designed a ranking loss function to train a Convolutional Neural Network (CNN) to minimize drift in a variety of autonomous driving scenes, beating previous state-of-the-art by up to 76.76% (IROS 2022)
  - Developed API-level functions and automation scripts in Python to collect contrived scenes containing more than 100,000 data points using CARLA simulator for prototyping and testing various parts of our work
  - Ported the Lidar Odometry And Mapping (LOAM) SLAM package from C++11 to C++14 to conduct necessary research in the new ROS version (ROS Noetic)

- **Summer Research Fellow, Medical Image Guidance Lab** — *May 2019 - Jul 2019*
  Indian Institute of Technology - Madras, India
  - Tracked the pose of a tooltip found in a drill bit used in Surgical Navigation Systems (SNS) with the aid of fiducial markers, by experimenting on around 500 data points obtained from a stereo camera
  - Developed MATLAB functions for the transformation of the tooltip from world to image coordinate frames-of-reference using Homogeneous Transformation Matrices and the pseudoinverse function

Select Projects

- **Drift Heatmap Generation** — *Nov 2021*
  - Generated drift heatmaps around a self-driving car using a multimodal CNN with range images and poses as inputs, showing regions of high and low probability of drift accumulation around the car
- **Monocular SLAM**, Project Link — *Sept 2018 - Feb 2019*
  - Received a grant of Rs. 20,000 (around $250) to simulate, test and deploy monocular ORB-SLAM2 on a mobile robot as a part of the SSN Internally Funded Research Project 2018