SREEHARSHA PARUCHURI

Software Engineering | Deep Learning | Robotics

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EXPERIENCE

Research Assistant

Advised by Dr. Madhava Krishna

January 2020 – June 2022 Robotics Research Center, IIIT-H

- Working to jointly learn pose, depth and free-space in a self-supervised manner on indoor environments collected from Gibson using stereo vision and deep learning.
- Integrated laser depth data and monocular images to solve the absolute orientation problem between the laser and the camera using SLAM methods and Neural Networks with the KITTI dataset.
- Led the Vision and Navigation team for the ARTPARK robotics challenge along with building and testing a prototype robot for the final stage.

Research Assistant

Advised by Dr. Vinoo Alluri and Dr. Ponnurangam Kumaraguru

Dec 2020 – June 2022 Cognitive Science Lab, IIIT-H

- Worked on analysing the impact of lyrical regularities as an indicator of depressive music listening tendencies.
- Working on a multi-modal network to aid in early diagnosis of depression using online music listening habits.
- Using a data-driven approach to finding a correlation between the music listening habits and the social media engagements of an individual.

Computer Vision Intern

Advised by Dr. Amit Kale and Dr. Tejaswi Kasarla

May 2021 – Aug 2021 Bosch Research Center, Remote

- Worked on a Research Project in collaboration with Diamler that dealt with Autonomous Driving using Laser, Image and Odometry data.
- Developed and tested online and offline algorithms for Multi-Object Tracking using laser data from the NuScenes dataset.

Teaching Assistant

Jan 2021 - June 2022 IIIT-H

- **EC5.205.S21** *Introduction to Coding Theory*: Taught a class of 100+ students the fundamentals of applied Linear Algebra and Abstract Algebra with applications in signal processing.
- **CS7.503.M21** *Mobile Robotics*: Taught a class of 65+ graduate and undergraduate students the fundamentals of SLAM and Computer Vision. Taught Deep Learning basics in the Lab's summer school to 40 students.
- **CS9.434.S22** *Music, Mind and Technology*: **Head Teaching Assistant** for a class of 100+ graduate and undergraduate students and developed assignments on music information retrieval.

RELEVANT COURSES

Core: Data Structures and Algorithms, Compilers, Robotics: Planning and Navigation, Processor Architecture, Signal Processing
Artificial Intelligence: Computer Vision, Statistical Methods in AI, Mobile Robotics, Topics in Applied Optimization
Mathematics: Probability and Random Processes, Linear Algebra, Introduction To Coding Theory, Introduction to Game Theory

EDUCATION

B.Tech (with honours) in ECE

IIIT-H

Aug 2018 – May 2022

- Honours in Computer Vision and Robotics
- Deans list (Monsoon 2020, Spring 2021)

PROJECTS

ARTPARK Robotics Challenge

- Represented the university and finished **runners up** in this **national** robotics competition by creating and deploying a full-stack software solution in ROS and Gazebo in C++ / Python.
- Developed the vision algorithms used to detect regions of interest via image processing and point cloud filtering techniques.

Mini SQL Engine

- A Mini SQL engine using python, which can parse and run a subset of SQL queries using command line interface.
- Supports Select, aggregate functions, where conditions, group by, order by, distinct, limit with appropriate error handling.

Linux Shell

- Implemented a Linux Bash shell, a command line interpreter in C. Supports numerous bash commands along with piping, redirection, foreground and background processing.

3D interactive flying game

- Built a 2D arcade game and a 3D flight simulator game in OpenGL 3.0 using graphics concepts such as texture mappings, rasterisation and lighting, with support for multiple camera views for resplendent gameplay.

Paper Implementations

- Classical: GrabCut, Viola-Jones, Lane Detector, Gauss-Newton optimization, Seam-Carving.
- Learning: Context Encoders, Reflection removal, Pose-Graph Optimization.
- Please visit my GitHub for more projects.

SKILLS

Languages: Python, C++, C, MATLAB, Java, Racket, GoLang, JavaScript, HTML/CSS
Libraries: PyTorch, Tensorflow, Keras, Scikit-Learn, OpenCV, Open3d, Jax
Frameworks: Flask, Django, Node
Other: ROS, MongoDB, SQL, Git, Docker