Keshav Rungta

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First year MS student with a passion for Robotics and Machine Learning that assists in developing society with 3 years experience in Data Engineering, Deep Learning and SLAM.

EDUCATION

UC, SAN DIEGO

MS in Intelligent Systems, Robotics and Controls
Dec 2021 | San Diego, CA

BS in Electrical Engineering
Jun 2020 | San Diego, CA
ECE Honours Student
GPA: 3.85, Cum Laude

ACHIEVEMENTS

2020 ECE Student of the Year
2020 Award for Excellence in ECE
2020 Henry Booker Award
2020 Caledonian Scholar
2020 Honor Societies: Eta Kappa Nu Phi Beta Kappa, Tau Beta Pi

TUTORING

ECE 100 - Linear Systems
ECE 5 - Intro to ECE

COURSEWORK

Neural Networks/ Deep Learning
Pattern Recognition
Sensing & Estimation
Advanced Computer Vision

SKILLS

Concepts
Perception • SLAM • Bayesian Filters
NLP • Path Planning

Programming
Python • MATLAB • Unity
Java • C, C++, C#

Frameworks
Numpy • Pandas • Matplotlib
Open3D • PyTorch • Scikit
Comet.ml • OpenCV • NuScenes
Astyx • KITTI • HuggingFace

Hardware
Raspberry Pi • Arduino • Jetson Nano
Intel Realsense • TI Radar • ROS
Ouster LiDAR • Soldering

Miscellaneous
Git • Unix • Rapid Prototyping
Kubernetes • Docker

WORK EXPERIENCE

DETECTION IN AUTONOMOUS DRIVING | WCSNG at UC, San Diego
Mar 2019 - Present | San Diego, CA

Sensor Fusion

- Designed multi-stage network to detect cars from fused radar birds eye view (BEV) and RGB images in PyTorch with **mAP of 0.55**
- Blueprinted algorithm to augment dataset leading to **43.1% improved** detections over SOTA

Pointillism: accurate 3D bounding box estimation with multi-radars

- Architected hardware to collect data from camera, LiDAR and radar at **30 fps** using ROS, Arduino, C++, **fps improved by 100%**
- Curated two real-world datasets of **8000+** and **1700+** samples
- Devised algorithm called Cross Potential Point Clouds to de-noise and segment objects, **improving network's performance by 10%**

3D SCENE RECONSTRUCTION | Video Processing Lab, UC San Diego
Mar 2018 – Mar 2019 | San Diego, CA

- Developed scripts to organise point clouds in octree structure to render VR scenes in Unity and C# at **100fps, improved by 240%**
- Implemented UI system to manipulate and navigate around VR scene

LEADERSHIP

IEEE ETA KAPPA NU (HKN) | Vice President of Events
Apr 2018 - Present | San Diego, CA

- Managed and led **25+ officers** to create **100+** events that facilitate academic, technical, professional development for engineering community
- Directed **H.A.R.D. Hack**, 24-hour hardware-based hackathon, for **250+ participants** and **10 companies**

PROJECTS

SLAM WITH KALMAN AND PARTICLE FILTERS | Class Project

- Synchornised data across multiple sensors - IMU, Stereo Cam, LiDAR
- Performed SLAM with both Particle Filters and Extended Kalman Filters
- Mapped camera RGB features to generated map

MULTI-AGENT MULTIPATH | Research Project

- Architected network to predict plausible trajectory of multiple agents
- Developed data-loader to extract data from simulations of real world trajectories and NuScenes Dataset

ALL TERRAIN AUTONOMOUS VEHICLE | ECE Honors Project

- Architected car to navigate itself on land and water
- Designed chassis, wheels and built Donkey Car framework on Jetson

PUBLICATIONS

[1] Bansal, K., Rungta, K., Zhu, S., and Bharadia, D. Pointillism: Accurate 3d bounding box estimation with multi-radars. In *Proceedings of the 18th Conference on Embedded Networked Sensor Systems* (New York, NY, USA, 2020), SenSys '20, Association for Computing Machinery, p. 340–353.