

SIDDHARTH SATYAM

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Education

University of California, San Diego

Sept 2022 - May 2024, GPA - 3.8/4

MS in Machine Learning and Data Science (ECE)

La Jolla, California

- **Coursework:** Statistical Learning (Bayesian Estimation, Gaussian mixture models), Linear Algebra, Probability and Statistics, Operating Systems, Statistical Natural Language Processing, Deep Generative Models

Indian Institute of Technology, Kanpur

July 2018 - May 2022, CPI - 9.4/10

Bachelor of Technology in Mechanical Engineering

Kanpur, India

- Coursework: Numerical Methods, Deep Learning in Mechanical Sciences, Data Structures and Algorithms, Cryptology
- Part of vehicle dynamics subteam at the university SAE team, participated in Virtual BAJA SAEINDIA 2019.

Work Experience

Valeo

June'23 – Sep'23

Machine Learning Software Engineer Intern - Autonomous driving

San Mateo, CA

Project 1: Pothole Detection using LiDAR Point Cloud data

- Performed efficient semantic annotation through point cloud registration utilizing KISS-ICP for pose generation.
- Achieved 60% mIoU on semantic segmentation task on Scala3 LiDAR data for ground classes using SalsaNext model.

Project 2: Lost Cargo object detection and LiDAR Point Cloud Density Optimization

- Performed bounding box annotation on Scala3 LiDAR data and trained on PointPillars model for lost cargo detection.
- Optimized the LiDAR point cloud density using MCMC iterations and Deterministic-grid based resampling to increase the object detection performance on PointPillars by 2%.
- Implemented state-of-the-art data augmentation techniques to prevent imbalance in the data by inserting objects at apt positions in the LiDAR range projection.

Lenek Technologies

May'22 – Aug'22

Data Science Intern

Remote

- Performed the semantic segmentation of Left Ventricle in cardiac ultrasound images with fIoU of 95%.
- Created an Ejection Fraction prediction model with 5.91 test MAE using a R2+1D pytorch architecture.
- Applied Swin Transformers, a Vision Transformer architecture, to effectively denoise cardiac ultrasound images.

CSE Department

Jan'24 – Mar'24

Teaching Assistant - Computer Vision 2 (CSE 252B)

UC San Diego

- Devised assignments aimed at extracting and matching image features, estimating Essential and Fundamental matrices utilizing stereo image geometry from scratch in Python. This facilitated 3D scene reconstruction through optimal triangulation and involved optimization using the Levenberg-Marquardt technique.

Projects

Visual-Inertial SLAM using Extended Kalman Filter | Course project | ECE 276A

Feb' 24

- Developed an EKF prediction framework leveraging IMU measurements for accurate estimation of vehicle pose dynamics.
- Utilized visual features from a stereo camera observation model to estimate and map landmarks effectively.

Publications

Long Short-Term Memory Implementation Exploiting Passive RRAM Crossbar Array

IIT Kanpur

IEEE Transactions on Electron Devices, doi: 10.1109/TED.2021.3133197 [arXiv]

Prof. Shubham Sahay

- Performed a time series prediction using LSTMs, mapping weights to conductance values on passive crossbar arrays.
- Achieved a reduced energy dissipation of 51.7 times and area efficiency of 6500 times compared to active crossbar arrays.

Energy-Efficient Implementation of GANs on Passive RRAM Crossbar Arrays

IIT Kanpur

Accepted at IEEE Design Automation Conference 2024, San Francisco [arXiv]

Prof. Shubham Sahay

- Generated hand-written digit images using GANs and devised a novel weight-conductance mapping scheme.
- Generated a true-random noise input for generator, achieving 7.14% drop in energy consumption and greater accuracy

Technical Skills

Languages: Python, C, C++, MATLAB, FORTRAN, SQL, Java

Libraries: NumPy, Pandas, Matplotlib, Keras, Tensorflow, Pytorch, DGL, OpenCV, scikit-image, PCL, Open3D, ROS

Cloud Technologies: Docker, Kubernetes, SAP Cloud Platform (SAP BTP)

Development: Qt, Cmake, C++ Eigen