

SIDDHARTH SATYAM

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Education

University of California, San Diego

Sept 2022 - Dec 2023, GPA - 3.8/4

MS in Machine Learning and Data Science (ECE)

La Jolla, California

- Coursework: Statistical Learning (Bayesian Estimation, Gaussian mixture models), Computer Vision (Photogrammetry, Pose Estimation and Calibration, Multiple View Geometry), 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

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%.

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.
- Worked on using Swin Transformers, a Vision Transformer architecture, to denoise cardiac ultrasound images.

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.
- Simulated Vector Matrix Multiplication and in-situ training, and demonstrated robustness to RRAM device variations.
- 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

Under Review: IEEE Transactions on Neural Networks and Learning Systems [arXiv]

Prof. Shubham Sahay

- Generated hand-written digit images using GANs and devised a novel weight-conductance mapping scheme.
- Performed a simulation of efficient fixed amplitude training by in-situ computations on passive RRAM crossbar arrays.
- Generated a true-random noise input for generator, achieving 7.14% drop in energy consumption and greater accuracy

Research Projects

Spectrum Based Fault Localization using GNNs | Prof. Subhajit Roy, IIT Kanpur [report]

Sep'21 - Apr'22

- Devised a representation of program spectrums as a graph network of test cases and program components.
- Trained a GNN-based model to generate bug suspicion probabilities for node representations of program components.
- Outperformed SOTA metric Ochiai on 96.3% of synthetic spectrums with low bug triggering probability configuration.

Technical Skills

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

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

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