

# SIDDHARTH SATYAM

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Looking for Software and Machine Learning Internship roles for Summer'23, Availability from Mid Jun'23 to Mid Sept'23.

## Education

### University of California, San Diego

Sept 2022 - May 2024, GPA - 3.8/4

MS in ECE, Machine Learning and Data Science

La Jolla, California

- Coursework: Statistical Learning (Bayesian Estimation, Gaussian mixture models), Computer Vision (Projective Geometry, Camera Parameter Estimation, Multiple View Geometry), Search and Optimization (Reinforcement Learning), Linear Algebra, Probability and Statistics, Programming for Data Analysis

### IIT Kanpur

July 2018 - May 2022, CPI - 9.4/10

Bachelor of Technology in Mechanical Engineering

Kanpur

- Awarded with Academic Excellence award for outstanding academic performance in the session 2020-21.
- Coursework: Deep Learning in Mechanical Sciences, Data Structures and Algorithms, Cryptology, Numerical Methods

## Technical Skills

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

**Libraries:** NumPy, Pandas, Matplotlib, Keras, Tensorflow, Pytorch, DGL, OpenCV, scikit-image, NLTK

**Cloud Technologies:** SAP Cloud Platform (SAP BTP)

## Work Experience

### Adaptive Computing and Embedded Systems (ACES) Lab

Aug'22 – Nov'22

Research Volunteer

UC San Diego

- Worked on untargeted Backdoor attacks on Physics-guided Deep Learning models in Turbulence modeling.

### 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.

### Larsen and Toubro Infotech

June'21 – Jul'21

Software Engineer Intern

Mumbai

- Created a carbon footprint prediction application for supply chain processes of Chevron using SAP Analytics Cloud.
- Integrated data from HANA in-memory relational database to the web application using OData services.
- Performed a presentation to the Managers for the work carried out during the internship period. [Link](#)

## 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 digits using GANs on MNIST dataset by creating 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

- Performed a transformation of program spectrums as graph networks of test cases and program components.
- Created a GNN model with a custom message traversal order to learn node representations for program components.
- Trained the model to generate bug suspicion probabilities for node representations through feed forward networks.
- Outperformed SOTA metric Ochiai on 96.3% of synthetic spectrums with low bug triggering probability configuration.