

# 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

*MS in ECE, Machine Learning and Data Science*

*La Jolla, California*

- Coursework: Statistical Learning (Includes topics: Generative Learning, Bayesian Learning, Parameter Estimation), Probability and Statistics for Data Science, 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 – ongoing

*Research Volunteer*

*UC San Diego*

- Working on untargeted Backdoor attacks on Physics-guided Deep Learning models in Turbulence modelling.

### 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.