

VAIBHAV SAHU

Philadelphia, PA

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EDUCATION

Master's in Scientific Computing, University of Pennsylvania Expected 2024

Courses: Big Data Analytics, Computer Vision, Deep Learning, Numerical Methods
Scientific Machine Learning, Quantum Circuits and Systems

Bachelor of Science (Physics), Indian Institute of Science 2016 - 2020

Courses: Pattern Recognition and Neural Networks, Data Analytics, Linear Algebra
Probability and Statistics, Real Analysis, Computational Physics

SKILLS

Data Science & Machine Learning	TensorFlow, PyTorch, Jax, Scikit-learn, Pandas, SQL, Spark, spaCy
Computer Languages & Parallel Computing	Python, MATLAB, C++, OpenMP, Intel Vtune
Computational Math and Plotting	NumPy, SciPy, Intel MKL, Matplotlib, Seaborn
Version Control & Debugging	Git, Visual Studio

EXPERIENCE

Graduate Online Teaching Assistant Jan 2023 - May 2023
MCIT-5450: Big Data Analytics, University of Pennsylvania *Philadelphia, PA*

Research and Development Engineer July 2021 - June 2022
Simyog Technology Pvt. Ltd. *Bangalore, India*

- Profiling computational solvers used in CompScope (product software); Test cases with **MKL-BLAS** using **OpenMP** on C++
- Matrix-vector product function optimisation in using **OpenMP**; 22% improvement in the solve-time; 11% improvement in the overall time
- Concurrent-GMRES algorithm implementation for the linear solver using block matrix-vector multiplication and contiguous memory allocations
- Also implemented and debugged automated testing routines written in **Python**, which included parsing JSON files and writing unit test cases to provide more control and efficiency in testing and regression

Research Intern April 2021 - June 2021
Simyog Technology Pvt. Ltd. *Bangalore, India*

- Setup the Pipeline for simulating Black-box measurement-based IC models using **Neural Networks** in **TensorFlow**
- Translated legacy **MATLAB** code for reconstructing waveforms for IC Models to **Python**
- Training Neural Network models on data for different ICs (R^2 values for predicted attributes of the waveforms: around 0.7-0.9 on noisy data, but accurate correlation graphs for EMI-EMC tests)

PROJECTS

Masked Face identification using One-Shot Learning on Deep Networks - Inception-ResnetV1 as a Siamese Network for face identification - Generation of Masked Images using Image editing and implementing face identification with masks - 90% accuracy on unmasked images, 82% accuracy on masked images - PyTorch, OpenCV, NumPy

Generating Adversarial Attack Examples using GANs - AdvGANs to generate semi-white box adversarial attack examples for any model trained on the CIFAR-10 dataset, the Attack success rate for training and validation sets were 95% and 87% respectively - PyTorch

Efficacy of Neural Network Potentials in Molecular Dynamics - DeePMD is at the cutting edge of NNPs. This is an ongoing project where we are looking at the performance of NNPs on how well they explain phenomena - **Python, DeePMD, LAMMPS**

Analysing Neural Networks using Sloppy Models and Information Geometry - Deep Learning borrows a lot of concepts from Information theory and Differential Geometry (Information Geometry) - These, along with Statistical Physics, give us exciting ways to study Neural Networks like never before - **Python, PyTorch**

PUBLICATIONS

Co-Author: "Black-Box Behavioral DC-DC Converter IC Emission Model," 2022 IEEE International Symposium on Electromagnetic Compatibility & Signal/Power Integrity (EMCSI), 2022, pp. 570-574, doi:10.1109/EMCSI39492.2022.9889598.

ACADEMIC ACHIEVEMENTS

- KVPY-SA 2014 Scholar (All India Rank - 258 amongst 40k participants)
- National Talent Search Examination (NTSE) 2012 Scholar