

Vaibhav Sahu

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EDUCATION

University of Pennsylvania

Master of Science in Scientific Computing - GPA: 3.72/4

Philadelphia, PA

Aug. 2022 – May 2024

Indian Institute of Science

Bachelor of Science in Physics - GPA: 8.2/10

Bangalore, India

Aug. 2016 – June 2020

EXPERIENCE

Graduate Research Assistant

University of Pennsylvania

May 2023 – Present

Philadelphia, PA

- Worked on measuring the performance of Neural Network Potentials at predicting the Energy Landscape of Materials
- Trained Neural Network Potentials on the DeePMD framework for Copper
- Estimated and Analysed the performance of DeePMD compared to efficient EAM potentials at predicting the Thermal expansion coefficient of Copper and Melting Point of Copper Nanoparticles

Research Engineer

Simyog Technology Pvt. Ltd.

April 2021 – July 2022

Bangalore, India

- Conducted Performance Profiling of computational solver implemented in C++ for bottleneck identification
- Achieved a 22% speedup by optimizing the Matrix-Vector Product (detected bottleneck) function using OpenMP
- Implemented a concurrent GMRES algorithm for the computational solver, resulting in a 40% speed improvement using contiguous memory operations
- Established a pipeline for simulating Black-box measurement-based Integrated Circuit models using Neural Networks within TensorFlow
- Trained the pipelines on diverse IC data, with achieved R-squared values of 0.9+, demonstrating the generation of accurate EMI/EMC correlation graphs

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

PROJECTS

Masked Face identification using One-Shot Learning | Python, PyTorch, OpenCV

- Deployed Inception-ResnetV1 as a Siamese Network for one-shot face identification
- Used transfer learning to achieve 91% accuracy of the LFW Dataset
- Used Image Editing to mask the faces in LFW Dataset and retrained the models to achieve 82% accuracy on masked faces

Generating Adversarial Attack Examples using GANs | Python, PyTorch

- Implemented the Adv-GAN model for performing semi-white-box attacks on Deep Nets
- Achieved attack success rates on training and validation sets of 95% and 87% respectively on a trained All-CNN on CIFAR-10

Extracting Lexical Stylistic Notions From Words Using LLMs | PyTorch, Hugging Face, Scikit-learn

- Performed Literature Review on Extracting Directions attributing to features, such as Complexity and Formality of Text
- Improved the performance of LLM-based Contextual Word Embeddings on extracting lexical features and using them to classify phrases using cluster-based Anisotropy removing - accuracy improved from 64% to 83%
- Fine-tuned LLMs to do document-level classification for these features
- Used ML models to make new similarity measures that performed better than cosine similarity

TECHNICAL SKILLS

Languages: Python, C/C++, SQL, MATLAB

ML Frameworks: PyTorch, Tensorflow, Spark, PyTorch, Scikit-learn, Hugging Face

Other Frameworks: pandas, NumPy, Matplotlib, Seaborn, OpenMP

CERTIFICATIONS

DeepLearning.AI: Deep Learning Specialisation

[Certificate](#)

IBM: Machine Learning with Python: A Practical Introduction

[Certificate](#)

Fundamentals of Parallelism on Intel Architecture

[Certificate](#)