Adhilsha Ansad

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Introduction

I am a final-year student in the Integrated Master of Science program at the National Institute of Science Education and Research (NISER), Bhubaneswar. Currently, I am a part of SMLab at NISER, expanding my expertise in Deep Learning, focused on Graph Learning and an interest in exploring Multi-modal applications.
Research interests: Graph Learning, Sequence Learning, Computer Vision, Lottery Ticket Hypothesis

Education

National Institute of Science Education and Research, Bhubaneswar, IN 2020 – 2025
Integrated M.Sc. in Physical Science (major) and Computer Science (minor)

- CGPA: 8.03/10.0 (Provisional Transcript, CS Transcript excerpt, Bonafide Certificate)
- **CS Coursework:** Programming and Data Structures, Theory of Computation, Discrete Structures and Computation, Design and Analysis of Algorithms, Machine Learning, Advanced Machine Learning, Parameterized Algorithms

Coursera education Online

- Machine Learning Specialization (certificate)
  - Supervised Machine Learning: Regression and Classification (certificate)
  - Advanced Learning Algorithms (certificate)
  - Unsupervised Learning, Recommenders, Reinforcement Learning (certificate)
- Deep Learning Specialization (ongoing)
  - Neural Networks and Deep Learning (certificate)
  - Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization (certificate)
  - Structuring Machine Learning Projects (certificate)
  - Convolutional Neural Networks (ongoing)

Projects

Large Neural Networks at a fraction 2023

- A project on reducing and testing the Lottery Ticket Hypothesis on a Large Neural Network using a combination of Pruning and Quaternion architecture. Publishing a conference paper in NLDL 2024.
- Tools Used: Deep Learning, PyTorch, Image processing, Python

Long context LLM support Experimental

- Experimented developing a memory architecture for Large Language Models (LLMs) to support long context.
- Tools Used: Natural Language Processing (NLP), Large Language Models (LLMs), PyTorch, Python

Representation Learning in Graph using modified Mamba Experimental

- Developing a new methodology for modified Mamba sequence Learning on Graphs. Ongoing work.
- Tools Used: Sequence Learning, Graph Neural Networks, PyTorch, Python

Oversampling in Heterogeneous graphs 2024-25

- Extending SMOTE to heterogeneous graph networks to overcome class imbalance issues. *Paper in progress.*
- Tools Used: Deep Learning, Graph Neural Networks, Data Processing, PyTorch, Python

Understanding Oversmoothing in Message Passing Neural Networks Current

- Trying to understand and generalize Oversmoothing in MPNNs and other architectures. Ongoing project.
- Tools Used: Graph Neural Networks, PyTorch, Python

Experience

Paper Presentation - NLDL 2024, UiT Norway — Jan 2024

- Presented the paper "Large Neural Networks at a Fraction" at the Northern Lights Deep Learning (NLDL) conference 2024 as both a presentation and as a poster. (invite, slides, poster)

SMLab Talks, NISER Bhubaneswar, India — 2024 - 2025

- Gave some Lab talks on 1-bit LLMs, Vision-Mamba, LLM self-correction via RL, and Large Concept Models.

Mentoring Students, NISER Bhubaneswar, India — 2023 - 2024

- Mentored two Machine Learning Projects in the CS460 (2024) course under Dr. Subhankar Mishra.
- Assisted in the First Year of CS Labs (2023) as TA under Dr. Anup Kumar Bhattacharya.

ACM India Winter School, IIT Patna, India — Dec 2023

- Participated in the ACM India Winter School on "Recent Trends in AI/ML for Industry 4.0" hosted by the Indian Institute of Technology Patna and partly sponsored by Google Research India. (certificate)

Publications

Large Neural Networks at a Fraction — Jan 2024

Aritra Mukhopadhyay[†], ***Adhilsha Ansad***[†], Subhankar Mishra

[†]Equal contribution

Proceedings of the *5th Northern Lights Deep Learning Conference (NLDL)*, PMLR 233:165-173

Additional Experience And Awards

INSPIRE Scholarship for Higher Education (SHE) — 2020 - 2025

Technologies

Programming Languages: C, Python, Fortran

Skills: Deep Learning, Supervised Learning, PyTorch, Natural Language Processing (NLP), Large Language Models (LLM), Data Processing, Graph Networks, Synthetic Data Generation, Numerical simulations

Language skills

- English - Fluent
  - Proof of English Medium of Instruction (certificate)
  - TOEFL Score (Score Report)