

Adhilsha Ansa

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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 [Paper](#) (2023-24)

- 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 (2024)

- 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 (2024)

- 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 [Thesis](#) (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

Technical Projects

Magneto-Hydro Dynamic Simulation	2024
• Study of effect of vertical outflow in mean field dynamo theory by solving induction equation with well-defined boundaries and parameters. • Tools Used: Python, Fortran, astropy	
Implementing Lock-in detection using ExpEYES	2024
• A project on implementing a Lock-in amplifier using the advantages of the ExpEYES-17 hardware and python Programming • Tools Used: ExpEYES-17, Python, Scipy	
Study of Lattice Vibrations using FFT analysis	2024
• Study of Lattice Vibrations using numerical simulation and FFT analysis, we explore the vibrational modes arising from various initial conditions and boundary constraints. • Tools Used: Python, Scipy, scikit-learn	
Chaos in Non-Linear Circuits	2024
• Implementation of non-linear circuits, comparison with their numerically solved differential equation counterpart, and study of the emergence of chaos across a range of parameters using their bifurcation diagram. • Tools Used: Python, Scipy	

Experience

Paper Presentation - NLDL 2024 , UiT Norway	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	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 Aritra Mukhopadhyay [†] , Adhilsha Ansa [†] , Subhankar Mishra Proceedings of the <i>5th Northern Lights Deep Learning Conference (NLDL)</i> , PMLR 233:165-173	2024
[†] Equal contribution	
HetGSMOTE: A Heterogeneous Graph Oversampling Framework [Thesis]	2025

Additional Experience And Awards

INSPIRE Scholarship for Higher Education (SHE)	2020 - 2025
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Skill Summary

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](#)) and TOEFL-iBT ([Score Report](#))