AGNEY K RAJEEV

Integrated MSc. Fourth Year

Bhubaneswar, India
+91 8078160515
agneyk.rajeev@niser.ac.in
AKR211

EDUCATION

National Institute of Science Education and Research *Bhubaneswar, India*
INT MSC *2026* *10/2021 - present*

- Major in **Physics**
- Minor in **Computer Science**
  - Current CGPA: **9.03**

Chinmaya Vidyalaya Kolazhy *Thrissur,India*
HIGHER SECONDARY SCHOOL *2021* *2009-2021*

- Class XII CBSE 2021: *97.0 percent*
- Class X CBSE 2019: *95.0 percent*

INTERNSHIPS/PROJECTS

Computational Studies of The Ising Model *NISER,Bhubaneswar*
SUMMER INTERNSHIP *2/6/2023 - 31/7/2023*

- Monte Carlo Simulation
- Ising Model
- Numpy
- Matplotlib

‘

The Internship was carried out under the guidance of Dr. A. V. Anil Kumar of NISER. We conducted a study of the 2D Ising model implemented using the Metropolis Algorithm to observe parameters such as Energy, Net Magnetization, Specific Heat Capacity, Magnetic Susceptibility etc. and determined the existence of a phase transition in the model. Using results from above we attempted to incorporate non reciprocal interactions and random fields to the model and observe any change in results.

Source Code Project Report Certification

Physics Informed Neural Networks with PyTorch *NISER,Bhubaneswar*
SEMESTER PROJECT *1/7/2023 - 27/11/2023*

- Machine learning
- Physics Informed Neural Networks
- PyTorch

‘

The project was carried out as part of the Computational Physics Lab Course. We aimed to develop a Physics Informed Neural Network (PINN) to solve Differential Equations (DEs) using Machine Learning.

Source Code Project Report Presentation

Predicting Protein Oligomericity from Amino Acid Sequence *NISER,Bhubaneswar*
SEMESTER PROJECT *2/1/2024 - 7/9/2024*

- Machine Learning
- Dataset Curation
- kNN, Random Forest, Transformers
- sklearn, PyTorch, Pandas

‘

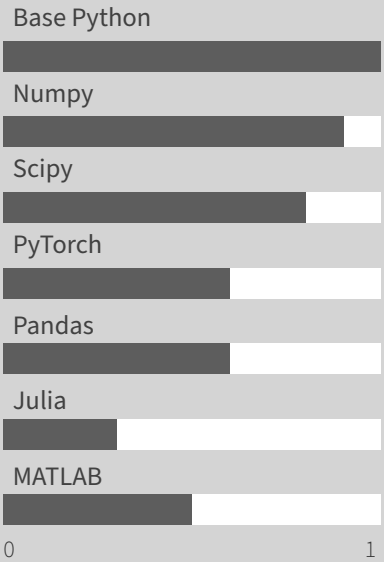
This project was carried out under the supervision of Dr. Subhankar Mishra in connection with the Machine Learning course. We aimed to create a machine learning model for predicting the oligomerization states possible for the amino

ABOUT ME

NISERite, Aspiring Computational Physicist, Hobbyist Coder, Amateur Keyboardist

Research Interests: Molecular simulations, Machine Learning, Biological systems, Active matter, Non-reciprocal interactions

PROGRAMMING



LANGUAGES

Malayalam • Mother tongue
English • Fluent
Hindi • Fluent

HOBBIES

- Table Tennis, Chess
- Playing Keyboard
- Coding, Cryptograhic puzzle solving

acid sequence of a protein. We achieved near state-of-the-art results in classifying fluorescent proteins into monomers and oligomers. The results are currently under review for the NLDL conference 2025.
Proposal Presentation OpenReview

Predicting the Stress Tensor for a simulated molecular system *IISER, Kolkata*
Summer Internship *14/5/2024 - 14/7/2024*

- Machine Learning
- Graph Neural Networks
- Dataset Generation
- Pytorch, PyG

‘

The project was conducted under the supervision of Dr. Neelanjana Sengupta in her lab at IISER Kolkata. Our goal was to predict the Cauchy stress tensor of a molecular system using deep learning techniques as a more efficient alternative to the traditional computation method based on pairwise atomic interactions, which is inherently time-consuming. We successfully obtained novel preliminary results for the atomic stress tensor of a water box by applying node regression learning in graph neural networks.
Project Report Certification

HIGHLIGHTS

- **Published Preprint**
  Published preprint on Ising model with non-reciprocal interactions with Dr. A. V. Anil Kumar based on the results obtained during my first summer internship
- **Submitted paper to conference**
  Submitted paper titled Predicting Oligomeric states of Fluorescent Proteins using Mamba with Joel Joseph K B and Dr. Subhankar Mishra to Northern Lights Deep Learning Conference 2025 (currently under review)

HONOURS

2023	**Topper,** Semester IV, School of Physical Sciences	*NISER,Bhubaneswar*
2021	**Scholar,** Innovation in Science Pursuit for Inspired Research (INSPIRE)	
2021	**Top 6,** Indian Olympiad Qualifier in Mathematics(Kerala Region)	
2021	**99.16 percentile,** JEE Main	
2021	**Rank 186,** IISER Aptitude Test(IAT)	
2021	**Rank 174,** National Entrance Screening Test(NEST)	
2021	**Among 1 percent of successful candidates,** CBSE XII	*Delhi,India*
2019	**Cleared the Aptitude Test,** KVPY SA	

COURSES

‘

The relevant courses I undertook are given below

Physics : Classical Mechanics I, Mathematical Methods I & II, Quantum Mechanics I & II, Statistical Mechanics, Introduction to Condensed Matter Physics, Classical Mechanics II(ongoing), Non-equilibrium Statistical Mechanics(ongoing)

Computer Science : Introductory Python Programming I & II, Theory of Computation, Discrete Structures and Computation, Design and Analysis of Algorithms, Machine Learning, Complexity Theory(ongoing)

I have also completed Introductory courses in Chemistry, Biology, Maths and Humanities