Purna Dutta

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Education

Indian Institute of Science Education and Research (IISER) **Berhampur, India**
BS-MS Dual Degree *2019 – 2024*
Major in Mathematics, Minor in Computer Science
Cumulative Performance Index - 9.30/10.00

Projects

The Institute of Mathematical Sciences (IMSc) **Chennai, India**
MS Thesis Project *May 2023 - April 2024*
Thesis: Expander Decomposition and Applications [supervisor: Prof. Saket Saurabh]:
- Reviewed efficient algorithms for expander decomposition, and some applications including computing global mincut and construction of cut-sparsifiers
- Attended graduate-level coursework on algorithms design and analysis, discrete mathematics, logic, randomized algorithms, parameterized algorithms, and linear programming and combinatorial optimization

Technische Universität (TU) **Berlin, Germany**
DAAD-WISE Fellow *May 2022 – July 2022*
Data analysis with neural networks [supervisor: Robert Spang, under Prof. Sebastian Möller]:
- Collaborated with supervisor in processing of datasets for two publications
- Collected self heartbeat data and constructed a feedforward neural network model to predict rest or motion that achieved an accuracy of 85%

Indian Statistical Institute (ISI) **Delhi, India**
Summer Intern *May 2021 – September 2021*
Statistical analysis [supervisor: Prof. S. K. Neyogi]:
- Collected real-time data
- Performed tests of hypotheses for statistical inferences on the data using Python

National Institute of Science Education and Research (NISER) **Bhubaneswar, India**
IASc Summer Fellow *May 2021 – June 2021*
Study on transcendental numbers [supervisor: Prof. Brundaban Sahu]:
- Studied and presented construction of transcendental numbers and proofs of transcendence
- Studied proofs of irrationality of $\zeta(2)$ and $\zeta(3)$

Relevant Coursework

Computer Science: Algorithms design and analysis, Theory of Computation, Discrete Math, Logic, Randomized Algorithms, Parameterized Algorithms, Linear Programming and Combinatorial Optimization, Programming and Data Structures, Introduction to Data Science, Error Analysis

Mathematics: Combinatorics and Graph Theory, Optimization Techniques, Calculus, Group Theory, Probability, Linear Algebra, Numerical Analysis, Elementary Number Theory

Skills

LaTeX: Proficient

Python: Proficient

MATLAB: Basic

C: Intermediate

Achievements

2024: All India rank 55 in JEST examination Part A, among 16 applicants across India to qualify Part B

2022: DAAD-WISE Scholarship: 3-month research fellowship awarded to less than 12% of applicants by German Academic Exchange Service

2021: IASc-INSA-NASI Summer Research Fellowship: 2-month research fellowship awarded to less than 10% of applicants by the three Indian science academies

2019-2024: INSPIRE - SHE (Scholarship for Higher Education): 5-year scholarship awarded to top 1 percentile (across India) candidates in school-leaving exam by the Government of India

2019-2023: Secured O grade for exceptional performance in 10 courses in undergraduate curriculum

Workshops attended

Advanced Instructional School on Algorithmic Graph Theory

Indian Institute of Technology (IIT), Indore *2023*

21-day lecture series on current research trends in graph theory

Vijyoshi Camp for INSPIRE-SHE scholars

Indian Institute of Science Education and Research (IISER), Kolkata *2019*

3-day workshop on applications of STEM

Leadership experience

Project Spiral, Math club of IISER Berhampur

Core Committee Member *2020-2023*

- Co-organised Mathematics Online Seminar Series 2023 where faculty from around the world contributed
- Co-organised special lecture by Prof. Ram Murty from Queen's University on π-day
- Co-organised student seminar series on applications of mathematics in other disciplines
- Co-organised an institute-wide mathematics quiz competition
- Presented Goldbach's Conjecture to school students during an outreach event
- Managed budget and resources for events

References

Available upon request