

Priya Mishra

Fourth Year Undergraduate · Department of Electrical Engineering · Indian Institute of Technology Kanpur

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Education

Indian Institute of Technology Kanpur

Bachelor of Technology (B.Tech) in Electrical Engineering, Minor in Linguistic Theory

GPA: 9.8/10.0

Kanpur, India

Jul 2017 - Jul 2021 (Ongoing)

Dayanand Dinanath Education Centre Kanpur

All India Senior School Certificate Examination, CBSE

94.2%

Kanpur, India

May 2017

Publications

Communication-aware Job Scheduling using SLURM | **Priya Mishra**, Tushar Agrawal, Preeti Malakar

Aug 2020

In 49th International Conference on Parallel Processing - ICPP : Workshops

[PDF](#) | [Slides](#) | [Talk on Youtube](#)

Research Experience

Energy Disaggregation using Optimization Problem

Research Intern, INRIA

Jun 2020 - Aug 2020

Advisor: Prof. Denis Trystram, DATAMOVE Team

- Surveyed the current non-intrusive load monitoring methods for energy disaggregation
- Developed an integer linear programming approach to detect appliances from aggregate power consumption data
- Implemented constraints based on device features such as power rating, expected time of operation, and precedence order
- Evaluated the proposed algorithm using power consumption data from Qarnot Computing platform

Improving Scheduling using Job Runtime Predictions

Research Intern, INRIA

May 2020 - Jun 2020

Advisor: Prof. Denis Trystram, DATAMOVE Team

- Studied the problem of scheduling a set of non-clairvoyant independent jobs on identical parallel machines
- Studied the impact of profiling and classifying jobs into short and long tasks on scheduling performance
- Developed multiple classification models to predict the class of submitted jobs based on user history and job characteristics
- Evaluated the performance of the proposed classifiers using five full workload traces from HPC platforms

Communication-aware Job Scheduling using SLURM

Indian Institute of Technology Kanpur

Jan 2020 - Apr 2020

Advisor: Prof. Preeti Malakar, Department of Computer Science and Engineering, IIT Kanpur

[Code]

- Proposed a novel way of optimizing node-allocation based on underlying algorithms of MPI collectives
- Developed two new node-allocation algorithms – balanced and adaptive that minimize inter-switch communication in jobs
- Displayed the improvements obtained over the default algorithm by emulating three supercomputer job logs
- Proposed algorithms reduce execution time by 12% and wait times by 53% on average as compared to the default SLURM algorithm

Optimizing Resource Allocation on Fat-Tree Networks

Indian Institute of Technology Kanpur

May 2019 - Dec 2019

Advisor: Prof. Preeti Malakar, Department of Computer Science and Engineering, IIT Kanpur

[Code]

- Studied common node-allocation algorithms and working of popular resource management systems particularly SLURM
- Reviewed the SLURM source code to understand the implementation of different scheduling algorithms
- Identified limitations of existing node-allocation algorithms in scheduling communication-intensive jobs
- Developed a new greedy node-allocation algorithm which uses network-topology information to minimize network-contention
- Displayed the advantage of the proposed algorithm over the default SLURM algorithm by emulating parallel workloads

Relevant Projects

Hostile-Post Detection in Hindi Posts

CONSTRAINT-2021 Workshop collocated with AAAI 2021

Oct 2020 - Dec 2020

Advisor: Prof. Arnab Bhattacharya, Department of Computer Science and Engineering, IIT Kanpur

- Studied state of the art techniques used for hate-speech detection particularly in regional languages such as Hindi
- Worked in a team of four to implement LSTM, GRU and BERT models to classify a post as fake, hate speech, defamation, offensive or non-hostile

Workshops and Training

Summer School on Computational Neuroscience

Jul 2020

Neuromatch Academy

- Attended interactive lectures and tutorials in core topics of neural data science and computational neuroscience such as neuron models, network science, Bayesian modeling, and deep learning
- Developed a Logistic Regression model to predict action decisions from behavioral and neural data in mice using Steinmetz et al. 2019 dataset as a part of the group project

ACM-India Winter School on High Performance Computing

Dec 2019

ACM India, C-DAC, IIT Kanpur

- Attended lectures aimed at introducing fundamental concepts of High Performance Computing
- Gained practical experience of parallel programming through hands-on sessions with MPI and OpenMP

CODESS Mentorship Program

May 2019 - Jul 2019

Microsoft India

- Selected to attend the Microsoft CODESS Event, 2019 held in Bangalore
- Mentored by experienced Microsoft employees to improve coding skills
- Successfully completed the different activities of the program including coding assignments and mock interview

Summer School for Women in Mathematics and Statistics

May 2018

Prof. Siva Athreya and Prof. Anita Naolekar, ISI Bangalore

- One of the 45 selected candidates to attend the two-week summer school at ICTS, Bangalore aimed at developing problem-solving skills
- Participated in problem-solving courses in Linear Algebra, Advanced Calculus, Probability and Statistics and Mathematical Logic

Honours & Awards

- 2018-20 **Academic Excellence Award, IIT Kanpur** For outstanding academic performance for three consecutive years
- 2017 **All India Rank 917** Joint Entrance Exam Advanced amongst 0.17 million candidates
- 2017 **All India Rank 264** Joint Entrance Exam Mains amongst 1.2 million candidates
- 2016 **All India Rank 132** KVPY 2016 organised by IISc, Bangalore
- 2015 **All India Rank 221** KVPY 2015 organised by IISc, Bangalore
- 2016 **Vijyoshi National Science Camp** organised for KVPY fellows by the Department of Science and Technology, India
- 2015 **State Rank 5** Regional Mathematics Olympiad organised by National Board of Higher Mathematics, India
- 2015 **Scholar of National Talent Search Examination** organised by NCERT New Delhi
- 2017 **Certificate of Merit in Chemistry, CBSE** For being in top 0.1% candidates

Technical Skills

Languages Python, C, C++, MySQL

Tools & Utilities Shell, GNU Octave, Git, MariaDB, Auto-CAD, Micro-Cap

Relevant Coursework

Computer Science	Data Mining [#] , Machine Learning for Signal Processing*, Introduction to Machine Learning [#] , Data Structures and Algorithms, Fundamentals of Computing
Mathematics	Time Series Analysis [#] , Probability and Statistics, Linear Algebra and Ordinary Differential Equations, Complex Variables, Calculus, Partial Differential Equations*
Electrical	Digital Signal Processing*, Electromagnetic Theory, Digital Electronics, Microelectronics, Control System Analysis,
Engineering	Principles of Communications, Signals Systems and Networks, Power Systems, Power Electronics

Awarded A grade for excellent performance [#]Ongoing

Miscellaneous

- **Student Research Associate**, Under Prof. Preeti Malakar, IIT Kanpur Mar 2020 - Apr 2020
- **Student Guide**, Counselling Service, IIT Kanpur Jul 2018 - Jul 2019
 - Assisted in conducting a week-long orientation for over 800 freshers and supervised group movements during the event
 - Provided personal academic guidance and emotional support to 6 freshers and helped them make a smooth transition
- **Member, Music Club**, IIT Kanpur Jul 2017 - Jul 2018
 - Performed in Freshers'17, Musical Extravaganza'17 and Acoustic Night'18 organized by the Music Club of IIT Kanpur