

RISHI SHARMA

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EDUCATION

RWTH Aachen University

Computer Science, RWTH Exchange Worldwide

October 2019 - February 2020

Overall Grade: 1.0

Indian Institute of Technology Mandi

Bachelor of Technology (Final Year)

Computer Science and Engineering

August 2017 - June 2021

Overall CGPA: 9.33/10

TECHNICAL STRENGTHS

Computer Languages

C/C++, Python, Go

Parallel Programming

OpenMP, MPI, OpenACC, CUDA

Machine Learning

PyTorch, Tensorflow, Keras, Scikit-Learn

Web Technologies

Flask, React, JavaScript, PHP

Tools & Familiar Technologies

Git, Bash, MySQL, Apache Spark

WORK EXPERIENCE

D. E. SHAW INDIA PRIVATE LIMITED

Associate Developer Intern

April 2020 - May 2020

- Refactored *Resize and Reorder* functionalities of the React-JS based *fixed-data-table-2* project into a more customizable and maintainable Plugins module and obviated the use of Redux.
- Received offer for *Member Technical* full-time position after graduation on the basis of excellent performance during the internship.

IT SECURITY GROUP, RWTH AACHEN

Research Assistant (HiWi)

November 2019 - February 2020

Prof. Ulrike Meyer

- **Iterative Adversarial Training for removing Blind Spots in DNN**
- Investigated the performance of adversarial attacks and adversary transfer on Deep Neural Networks for DGA generated domain names by emulating and inverting the non-differentiable embedding layer.
- Implemented iterative adversarial training to improve the robustness of the classifier using adversaries generated from the gradient-based attacks.

THEORY OF HYBRID SYSTEMS, RWTH AACHEN

Research Assistant (HiWi)

November 2019 - February 2020

Prof. Erika Ábrahám

- **Freight Train Scheduling with Satisfiability Checking**
- Formulated the scheduling of a freight train in the German railway network as a satisfiability problem in propositional logic and implemented the solution using Z3 Solver.
- Optimized the various steps of the problem formulation to reduce the problem blow-up from quadratic to linear and improved the feasibility of the approach in real-life railway network.

PUBLICATIONS

Sharma R. et al. (2020) *An Online Low-Cost System for Air Quality Monitoring, Prediction, and Warning*. In: Hung D., D'Souza M. (eds) Distributed Computing and Internet Technology. ICDCIT 2020. *Lecture Notes in Computer Science*, vol 11969. Springer, Cham.

PROJECTS

DISTRIBUTED GAMING FRAMEWORK

Kafka, Go

April 2020 - Present

Open Source

- Designing a framework for offloading intensive computations to the server in multiplayer games using Kafka Server as a bridge in order to improve the performance on low-end machines.
- Researching methods to improve the efficiency and reduce the effect of network as a bottleneck.

SPARKY-AD

Apache Spark & Algorithmic Differentiation

February 2019 - March 2020

Dr. Arti Kashyap, IIT Mandi

- Developed a python library to compute derivatives of multivariate functions using Algorithmic Differentiation and Big Data framework to mitigate the Curse of Dimensionality.
- Tangent Mode Differentiation is distributed across nodes using Apache Spark and the API allows Jacobian Computation without requiring changes in the pre-written functions.

THE EINSTEINPY PROJECT

Python

April 2019 onwards

Open Source

- Designed the Coordinates Module with 3 systems with comprehensive tests as part of the EinsteinPy Python package for General Relativity and Gravitational Physics.
- Mentored a student in Google Summer of Code 2020 to improve the EinsteinPy package.

RELEVANT COURSES

Advanced Data Structures and Algorithms

Paradigms of Programming¹

Information and Database Systems

Mathematical Foundations of Computer Science

Operating System and Networks¹

Computational Differentiation

High Performance Computing

Machine Learning

Satisfiability Checking

Compiler Design¹

POSITION OF RESPONSIBILITY

Teaching Assistant

Data Science III

September 2020 - Present

IIT Mandi

- Duties included assisting with assignments and evaluating weekly labs remotely in the online semester.

Teaching Assistant

Information and Database Systems

February 2020 - August 2020

IIT Mandi

- Assisted the course instructor with tutorials and evaluations of the assignments.

Heuristics - Machine Learning and AI Club

Founder Coordinator

August 2019 - August 2020

IIT Mandi

- Set up the new club and the related culture by organizing contests and sessions on Machine Learning.
- Widened the horizon of the club to incorporate High Performance Computing & Big Data.

ACHIEVEMENTS AND EXTRA-CURRICULAR

- Foundation Day Outstanding Academic Performance Award for 1st & 2nd year.
- Ranked 86/3464 in Codeforces Div. 3 #490 and Rated 2021 on Codechef.
- Winner of Capture The Flag in intra-college tech-fest Utkarsh 2019 and Second runner up in 2017.
- Regular participant in Hikes and Treks organized by the Hiking and Trekking Club - IIT Mandi.

¹To be completed by December 2020.