

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 (III Year)

Computer Science and Engineering

August 2017 - Present

Overall CGPA: 9.34/10

TECHNICAL STRENGTHS

Computer Languages

C/C++, Python

Parallel Programming

OpenMP, MPI, OpenACC, CUDA

Machine Learning

PyTorch, Tensorflow, Keras, Scikit-Learn

Web Technologies

Flask, React, JavaScript, Redux, PHP

Tools & Familiar Technologies

Git, Bash, MySQL, OpenCV, Hadoop, Apache Spark

WORK EXPERIENCE

IT SECURITY GROUP

Student Research Assistant

November 2019 - February 2019

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

Student Research Assistant

November 2019 - February 2019

Prof. Erika Abraham

- **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.

PROJECTS

POLLUTION MONITOR AND PREDICTOR

Machine Learning, Flask, Internet of Things

March 2019 - August 2019

Dr. Varun Dutt

- **Publication:** "An Online Low-Cost System for Air Quality Monitoring, Prediction, and Warning", Accepted at ICDCIT 2020. Published in Springer Lecture Notes in Computer Science series.
- **Fundings:** Project IITM/DST-HP/VD/240, funded by Department of Environment, Science & Technology, Government of Himachal Pradesh, for setting up systems across the state.
- **Objective:** Prototyped a low-cost, IoT-based real-time solution for air quality monitoring, prediction and warning. Designed and deployed a full-stack web application for the system.
- **Machine Learning:** Investigated the performance of an Ensemble Model of Multi-Layer Perceptron and Long-Short Term Memory for a 12 variable multi-variate time series on air quality and weather data and reached RMSE 0.05 on test data.

EINSTEINPY: COORDINATES MODULE

Python

April 2019
Open Source

- **Member:** One of the eight members of the EinsteinPy Organization.
- **Objective:** Designed the Coordinates Module with 3 systems with comprehensive tests.

CIF VALIDATOR WITH REST API

Materials Cloud

May 2019 - July 2019
Dr. Arti Kashyap

- **Collaboration:** Collaborated with Material Science Group, EPFL, Switzerland.
- **Experience:** Coordinated with a team of 3 to design this real-world, open source tool, to be integrated with materialscloud.org tools, with thorough documentation.
- **Objective:** Developed a tool for validating CIF Files using a REST API.
- **Technology:** Used Flask on a Barebone Docker Container, validated using PyCODCIF.

OBJECT LOCALIZATION

AutoEncoder + Regressor in Keras

February 2019
Flipkart GRiD Te[a]ch The Machines

- **IOU and Rank:** With IOU 83.46%, secured top position among 7 teams of the college.
- **Objective:** Designed and trained a Deep Neural Network from scratch comprising of AutoEncoder and Regressor, to produce bounding boxes, over 13,000 images provided by Flipkart.

ACADEMIC ACHIEVEMENTS

- Foundation Day Outstanding Academic Performance Award for 1st & 2nd year.
- Ranked in the All-India Top 1% (amongst 11,86,000 candidates) in JEE - Main 2017.
- All India Rank 3 in National Anveshika Experimental Skills Test (NAEST) 2016
- Secured 470/500 marks in AISSCE 2017 & CGPA 10/10 in AISSE 2015.

RELEVANT COURSES

Advanced Data Structures and Algorithms	Computational Differentiation
Paradigms of Programming ¹	High Performance Computing
Information and Database Systems	Machine Learning
Mathematical Foundations of Computer Science	Satisfiability Checking

POSITION OF RESPONSIBILITY

Heuristics - Machine Learning and AI Club

Founder Coordinator

August 2019 - Present
IIT Mandi

- **Responsibility:** Heading the Core Team of 8 people to set up the new club and the related culture by organizing contests and sessions on Machine Learning.
- **Goals:** Widening the horizon of the club to incorporate fields such as High Performance Computing, Big Data and Data Science.

EXTRA-CURRICULAR

- Problem Setter and Tester in Codeforces Good Bye Summers 2k19.
- Active participant in Competitive Programming Contests.
- Ranked 86/3464 in Codeforces Div. 3 #490 and Rated 2021 on Codechef.
- Winner of Capture The Flag event in Utkarsh-2019 and Second runner up in Utkarsh-2017.
- Regular participant in Hikes and Treks organized by the Hiking and Trekking Club - IIT Mandi.

¹To be completed by June 2020.