

# RISHI SHARMA

B-13 Beas Kund Hostel ◊ IIT Mandi - North Campus , H.P. 175005

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## EDUCATION

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**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

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<b>Computer Languages</b>	C/C++, Python
<b>Machine Learning</b>	PyTorch, Tensorflow, Keras, Scikit-Learn
<b>Web Technologies</b>	React, Flask, JavaScript, Redux, PHP
<b>Tools</b>	Git, Vim, Bash, Jupyter Notebooks, Pandas
<b>Familiar Technologies</b>	MySQL, OpenCV, Hadoop, Apache Spark

## WORK EXPERIENCE

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**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

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**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

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- Foundation Day Outstanding Academic Performance Award for 1<sup>st</sup> & 2<sup>nd</sup> 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

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Advanced Data Structures and Algorithms  
Paradigms of Programming<sup>1</sup>  
Information and Database Systems  
Mathematical Foundations of Computer Science

Computational Differentiation  
High Performance Computing  
Machine Learning  
Satisfiability Checking

## POSITION OF RESPONSIBILITY

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### 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 and managing the first, month-long Campus Machine Learning Challenge by HackerEarth India at IIT Mandi in September 2019.

## EXTRA-CURRICULAR

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- 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.

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<sup>1</sup>To be completed by June 2020.