RISHABH JAIN

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Education

Indian Institute of Technology, Ropar   **July 2019 - May 2023**
B.Tech in Computer Science and Engineering   *CGPA: 8.7*
with Honors in Artificial Intelligence   *Honors focus: Federated Learning, Computer Vision*

Industry Experience

Arista Networks, Bengaluru, India   **July 2023- present**
Software Engineer, Pluribus Team
- Contributing to the **Arista Firewall** in the Arista **Extensible Operating System** (EOS)

General Electric Healthcare, Bengaluru, India   **May 2022- July 2022**
EID Intern (Software Engineering)   *Certificate* ↗
- Worked on **deep learning models and computer vision algorithms** for patient monitoring in a team of 2.
- Deployed the developed models in an **autonomous patient monitoring pipeline**.
- Technologies: **Python, PyTorch, OpenCV, Docker**

Research Experience

Bodily Behaviour Recognition (MultiMediate 2023)   **May 2023 - July 2023**
Supervised by Dr. Abhinav Dhall   *IIT Ropar*
- **Secured second place** in the Bodily Behaviour Recognition track of **ACM Multimedia 2023** Grand Challenges   .
- Co-authored paper **"MAGIC-TBR: Multiview Attention Fusion for Transformer-based Bodily Behavior Recognition in Group Settings"** which was accepted in the ACM MM 2023 Conference. Link ↗
- Co-authored paper **"Multi-View Attention Fusion for Explainable Body Language Behavior Recognition"**, currently in review at **IEEE Transactions on Affective Computing**.
- Technologies: **Python, PyTorch, OpenMMLab**.

Deep Federated Recommender Systems   **August 2022 - July 2023**
Supervised by Dr. Shweta Jain   *IIT Ropar*
- Developed strategies to optimise costs involved while training **deep federated recommender systems**.
- Studied and implemented client selection algorithms on MovieLens datasets.
- Technologies: **Python, PyTorch**.

Spatio-Temporal Hotspot Detection in Microsoft Azure   **August 2022 - July 2023**
*Supervised by Dr. Viswanath Gunturi and **Microsoft India***   *IIT Ropar*
- Developed **data mining algorithms** to track **spatio-temporal patterns** of usage spikes(hotspots) in **Microsoft Azure** Cloud Services in India.
- Co-authored a paper **Periodic Spatio-Temporal Colored Hotspot Detection in Azure Traffic Data**, currently in review in the **GeoInformatic Journal**.
- Technologies: **Java, Python, PostgreSQL, PostGIS**

Epilepto Systems   **January 2022 - May 2022**
Supervised by Dr. Ashish Sahani   *Certificate* ↗
- Contributed to an **Android cum WearOS smartwatch application** to monitor patients suffering from epilepsy.
- Ensured reliability of data transmission from watch to phone and vice-versa in the situation of frequent disconnection.
- **Co-authored a conference paper** titled **"A General System for Dataset Generation from Smartwatch Sensors for Biomedical Research"** accepted in COMSYS-2022.

Technical Skills

Languages: Python, C, C++, Java, Icarus Verilog, RISC-V 32I ISA
Query Languages: PostgreSQL, PL/pgSQL, PostGIS
Developer Tools: Git, Bash, Powershell, Docker, Postman, Linux, Anaconda, Google Cloud App Engine(GCP)
Libraries/Frameworks: Flask, OpenCV, Tensorflow, PyTorch, OpenAI Gym, Numpy, Pandas

Key Projects

Efficient Image Super-Resolution (NTIRE 2023)
February 2023 - May 2023

Supervised by Dr. Abhinav Dhall   *IIT Ropar*

- Worked on a deep learning based image super-resolution system as a part of **NTIRE-2023** challenge.
- Designed an efficient system by modifying and improving the RFDN baseline model and achieved a higher PSNR on the DIV2K dataset.

Dynamic Scheduling of Planning in DYNA-Q
August 2022 - November 2022

Supervised by Dr. Shashi Shekhar Jha   *IIT Ropar*

- Introduced **dynamic scheduling of planning steps** in **DYNA-Q** and **Deep DYNA-Q** reinforcement learning algorithms.
- Studied trade-off of model performance and training cost with a dynamic schedule for planning.

Full Stack "Employee Application Management" Web Portal, IIT Ropar
January 2022 - May 2022

Supervised by Dr. Puneet Goyal   *IIT Ropar*

- Implemented a **full stack web application** with user authentication and multi-stage application propagation **as a part of IIT Ropar's website** to facilitate staff to avail LTC(Leave Travel Concessions); and deployed on Google Cloud App Engine.
- Technologies: **PostgreSQL, Flask, React.js and Google Cloud APIs**.

Academic Information Management System
September 2021 - November 2021

Supervised by Dr. Viswanath Gunturi   *IIT Ropar*

- Implemented an Academic Information Management System to store, manage and process academic data; entirely in **PostgreSQL and PL/pgSQL**.
- Implemented user permissions along with stored procedures to perform operations on academic data.
- Source code- github.com/r-rishabh-j/academic-portal-dbms ⬀

Field Programmable Gate Array
November 2020

Supervised by Dr. Neeraj Goyal   *IIT Ropar*

- Implemented an **FPGA in Icarus Verilog** to simulate an adder, encoder and synchronous counter on the same fabric.
- Co-authored a paper **"Designing Re-configurable Fabric: A Pedagogical Learning Experience"**.
- Source code- github.com/r-rishabh-j/FPGA ⬀

Relevant Coursework

CSE: Algorithms & Data Structures, Operating Systems, Software Engineering, Databases, Computer Networks, Digitial Logic Design, Programming Paradigms and Pragmatics, Computer Architecture, Theory of Computation
Honors in AI: Fundamentals of Data Sciences, Artificial Neural Networks, Artificial Intelligence, Reinforcement Learning, Computer Vision, Advanced Computer Vision, Research Methodology
Math: Calculus, Discrete Math, Linear Algebra, Probability and Statistics, Differential Equations, Optimization Techniques

Positions of Responsibility

Robotics Club, IIT Ropar
October 2020 - September 2022

Club Mentor and Representative (Head)   *Certificate ⬀*

- Conducted club mentorship sessions for freshmen and led club projects.
- Overcame challenges to organise competitions in IIT Ropar's first-ever online techno-cultural fest 'Advitiya' and 'General Championship' during the pandemic.

ISMP, 2020
November 2020

Event head, Robotics Club events   *IIT Ropar*

- Event head of Robotics Club competitions in ISMP, a yearly freshmen induction program at IIT Ropar.

Scholastic Achievements

- Participated in the prestigious coding competition **ICPC Asia Amritapuri Regionals 2020** after qualifying **ICPC Amritapuri Preliminary 2020**, ranking 366 out of 8000+ teams. Certificates ⬀ .
- Recipient of **Institute Merit Scholarship from IIT Ropar thrice** for academic excellence.
- Participated in **ABU-ROBOCON Robotics Competition 2020**, qualifying for the national round of **DD-ROBOCON 2020** held in an online mode at IIT Delhi.