

# Rishab Sharma

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## EDUCATION

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- **Dayananda Sagar College of Engineering** Bengaluru, India  
*Bachelor of Engineering - Computer Science; GPA: 9.54*  
*Relevant Courses: Deep Learning, Artificial Intelligence & Machine Learning, Data Structures*  
Dec 2020 - Jun 2024

## SKILLS SUMMARY

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- **Languages:** C++, Python, Bash
- **Libraries & Frameworks:** Pytorch, Numpy, Matplotlib, STL
- **Tools & OS:** Git, GitHub, Linux, Windows

## EXPERIENCE

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- **Indian Institute of Science** Onsite  
*Research Intern* Aug 2023 - Present
  - **Contrastive Learning, Deep Metric Learning & Visual Assessment of Clusters:** Evaluate proposed methods against SOTA models (SimCLR, Barlow Twins etc.) on MNIST, FMNIST, CIFAR10, and Intel Image datasets.
  - **Low-Rank Latent Space Deterministic Autoencoders:** Coded up the architecture with **Nuclear norm penalty** to learn low-rank latent space. Also conducted experiments to compute metrics like **FID** to evaluate generative capabilities.
  - **ADAS system using Object detection:** Implemented an Advanced Driver Assistant System (ADAS) using **YOLOv8** object detection on vehicles in a driving simulator setting. Alerts were raised when a threshold area of the vehicle's bounding box was present in the region of interest.

## PUBLICATIONS

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- **Learning Low-Rank Latent Spaces with Simple Deterministic Autoencoder: Theoretical and Empirical Insights** [[Paper](#)]
  - **Authors:** Alokendu Mazumder, Tirthajit Baruah\*, Bhartendu Kumar\*, **Rishab Sharma**, Vishwajeet Pattanaik and Punit Rathore (\* denotes equal contribution)
  - **Published in:** IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) 2024, Hawaii, USA

## PROJECTS

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- **PyTorch-GANs** [[GitHub](#)]  
*Paper- Generative Adversarial Networks* Mar 2023  
*Tech Used: PyTorch, Matplotlib, Numpy*
  - A PyTorch implementation of Vanilla GAN architecture.
  - The models are trained using **MNIST dataset**.
  - Both the **Generator & Discriminator** networks use **Batch Normalization & LeakyReLU**
- **PyTorch-Image-Captioning** [[GitHub](#)]  
*Paper- Show and Tell: A Neural Image Caption Generator* Apr 2023 - Jun 2023  
*Tech Used: PyTorch, Matplotlib, Numpy, NLTK*
  - A PyTorch implementation of Image Captioning using **CNNs + LSTMs**.
  - The CNN encoder uses **transfer learning** on **ResNet152**.
  - The encoded image is passed to the LSTM decoder to give captions.
  - Achieved a **BLEU score of 27.5** on **MSCOCO** dataset.
- **PyTorch-Siamese-CNN** [[GitHub](#)]  
*Paper- Change Detection Based on Deep Siamese Convolutional Network for Optical Aerial Images* Jun 2023  
*Tech Used: PyTorch, Matplotlib, Numpy*
  - An implementation of change detection using Siamese CNN.
  - A Siamese CNN was used to find the **distance map** between two images.
  - A custom **Contrastive Loss function** was used.
- **Schizo-XAI** [[GitHub](#)]  
*Schizophrenia Detection using Wavelet Transforms on EEG data and GradCAM Explainability* Ongoing  
*Tech Used: PyTorch, MNE-python, GhostiPy, MEEGkit*
  - Used **Continuous Wavelet Transforms** with Morse Wavelets for extracting features from **EEG signals**.
  - **Transfer Learning** was used on **Resnet-18** pre-trained on ImageNet to train on the wavelet scalograms.
  - **GradCAM** was used as explainability to localize parts of the scalogram that were important for **binary classification**.

## COURSES AND CERTIFICATES

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- **Machine Learning Specialization**

[Certificate]

*Course* - Andrew Ng

*Aug 2022 - Nov 2022*

- Explored fundamental machine learning concepts including **regression, classification, clustering, neural networks** and **deep reinforcement learning** and recommender systems like **collaborative filtering & content-based filtering**.

- **Deep Learning Specialization**

[Certificate]

*Course* - Andrew Ng

*Feb 2023 - Dec 2023*

- Deepened understanding of **Neural networks, Convolutional networks, and Sequence models**.
- Built & trained feed-forward neural networks, grasping **backpropagation & gradient descent math**  
Improved them through techniques like **batch normalization, dropout, & hyperparameter tuning**.

## ACHIEVEMENTS

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- Smart India Hackathon Winner 2023
- **Second Place** in **SLoP** - An Open Source Program
- Best rank of **2639** in **Google Kickstart**
- A max rating of **1233 (pupil)** on **Codeforces**
- A max rating of **1818 (4 star)** on **Codechef**

## EXTRACURRICULAR EXPERIENCE

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- **Point Blank**

DSCE

*Member*

*Dec 2021 - Present*

- \* **Description:** Point Blank is an interdisciplinary team of programmers that focus on developing a coding culture in college through participation in competitions such as ACM-ICPC, GSoC & SIH.
- \* **Events:** Conducted a technical seminar on machine learning.