Sudatt Kayal

Undergraduate Student at IIT Roorkee

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EDUCATION

B.Tech in Engineering Physics
Indian Institute of Technology Roorkee
2020 - Present *GPA(till 5th Semester): 8.531*

Intermediate (Class XII)
Puna International School
2020 *Percentage : 90.60%*

PROJECTS

Source Free Domain Adaptation in Medical Imaging | CSE Department, IIT Roorkee (01/2023 - Present)

- Currently gaining familiarity with present research work in this domain.
- Developed a strong understanding of domain adaptation techniques, including **Domain Adversarial Training** , Generative Adversarial Network, Semi-supervised Domain Adaptation, and **Meta Learning**.
- Analyzed and studied a research paper titled "MetaTeachers", which involves multi-class source-free domain adaptation on medical images for classification.
- Currently understanding and reproducing the results from the paper **in PyTorch**.

Image Colorization Using GANs | Course Project: CSN-382 Machine Learning (03/2023 - Present)

- Gained a strong understanding of Generative Adversarial Network and **conditional GANs.**
- Studied "**pix2pix**" paper to gain familiarity with the architecture for this image to image translation task.
- Currently implementing the model on COCO dataset by using **PyTorch.**

Simulation of Magnetic Skyrmion on Flat Lattice | Physics and Astronomy Club, IIT Roorkee (09/2022 - 01/2023)

- Developed a strong understanding of the Ising Model and Dzyaloschinskii Moriya Interaction and their application in generating magnetic skyrmions.
- Utilized the **Metropolis Algorithm**, a Monte Carlo simulation method, to simulate magnetic skyrmions on 2D lattices.
- Implemented the project using **Python** and **utilized Numpy libraries** for the simulation.

Quantum Image Processing and Edge Detection | Course Project: PHN-313 Signals and Systems (09/2022 - 11/2022)

- Successfully utilized **Quantum Probability Image Encoding** technique to convert the image into quantum states.
- Applied **Quantum Hadamard Edge Detection** algorithm on the quantum states for 256x256 Images.
- Implemented the project using Python and **utilized Qiskit libraries** for quantum computing.

Super Mario RL Agent | Vision and Language Group, IIT Roorkee (05/2022 - 06/2022)

- Implemented a Reinforcement Learning agent using **Double Deep Q Learning** and **Convolutional Neural Networks** to complete the first level of Super Mario Bros.
- Trained the model for 2000 epochs and obtained the plot for Episodes Trained vs Average Rewards (per 500 episodes).
- Used Python and libraries such as **PyTorch for GPU acceleration**.

LANGUAGES

C++ | Python | MATLAB | Basic SQL

ACHIEVEMENTS

First Runner Up in Start-bucks : A national level startup pitching competition organized by IIT BHU
We proposed an idea for improving restaurants business through data analytics

POSITION OF RESPONSIBILITY

Volunteer | Enactus, IIT ROORKEE (06/2022 - Present)
Currently working amongst team of14 members under Project Anushruti : A Sign Language Translator for Deaf.

Volunteer | National Social Scheme, IIT ROORKEE (12/2020 - 07/2021)
Volunteered in Rural Transformation through Education Cell 's tasks.

ADDITIONAL COURSES

Summer Analytics 2022 | Consulting and Analytics Club, IIT GUWAHATI
Worked on a dataset for prediction of discounted price offered to customers by an e-commerce store

Machine Learning by AndrewNg | Coursera

INTERESTS

Machine Learning | Artificial Intelligence | Data Science