Ashmit Khandelwal

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Pre-Final year Computer Science student at BITS Pilani. I have a strong interest in Deep Learning, particularly Computer Vision. I've worked on projects involving Computer Vision and Machine Learning. Aim to further my knowledge in Deep Learning concepts and research, and work on projects to implement new ideas.

Education

Birla Institute of Technology and Science, Pilani — *Goa, India*

B.E. Computer Science, with Minor in Data Science — *2020 - 2024 (expected)*

Current CGPA: **9.51/10**

Relevant Coursework: Object Oriented Programming, Data Structures and Algorithms, Discrete Structures in Computer Science, Database Systems, Probability and Statistics, Linear Algebra

Work Experience

National Centre for Polar and Ocean Research — *Remote*

Research Intern — *Jun - Jul 2022*

- Worked on **Forecasting** of Antarctic weather, using **Deep Learning** models on **time-series** data gathered from Indian Antarctic research stations.
- **Implemented and compared** various Deep Learning models, such as **1D CNNs, LSTMs, and Seq2Seq** models.
- Used **trend, seasonality, and auto-correlation** for deciding model architecture and tuning parameters.

Projects

Semantic Segmentation with U-Net

Code and Results — *Jul 2022*

- **PyTorch implementation** of the U-Net from the *U-Net: Convolutional Networks for Biomedical Image Segmentation* paper, trained on the **Carvana Dataset** from Kaggle.
- Improved on the model's architecture by applying **batchnorm**, tested the effectiveness of the **copy-crop connections**, and visualized what the **model is looking for**.

Image Super Resolution

Code and Report — *Feb 2022*

- Developed a **Convolutional Neural Network** to **upscale low resolution images**, by a factor of 2.
- **Contrasted model architecture** designs, such as **CNNs, ResNets, Transposed Convolution, and SubPixel Convolution**. Prepared a detailed report for the same.

Bayesian Multi Layered Perceptron

Code and Report — *Feb 2022*

- A **Bayesian MLP** to classify a simple XOR dataset. The model can easily be extended to work with more complex datasets.
- Defined **posterior and likelihood functions**, and used Markov Chain Monte Carlo Sampling. Specifically used the **Metropolis-Hastings algorithm**, for **optimal weight sampling**. Produced a brief report of the results.

Stashify - Spotify Playlist Archive

Personal Project | Repository — *Feb 2022 - ongoing*

- Developing an **API and web interface**, wrapping the **Spotify API**, to **archive stale songs** in a Spotify user's playlist. The API allows said archived songs to be **restored** in the future.
- Using **MongoDB** for storing playlist archives, **ExpressJS** for writing the API, and **OAuth** for authenticating and connecting with Spotify.

Courses and Schools

2022 **CS231n: Deep Learning for Computer Vision***, Stanford — *Online*

2022 **6th Summer School on AI***, CVIT, IIITH — *Online*

2022 **Amazon ML Summer School 2022**, Amazon — *Online*

* = *ongoing*

Teaching Experience

QSTP 2022: Introduction to Deep Learning

Instructor | Quark, BITS Pilani - Goa *Jul 2022 - ongoing*

- Co-instructing for the Introduction to Deep Learning course.
- The course provides introductory knowledge about Deep Learning, Computer Vision, Natural Language Processing, and Generative Models.

Skills

Programming Languages: Python, Javascript, Java, C/C++, SQL, HTML/CSS

Frameworks and Libraries: PyTorch, Tensorflow/Keras, Numpy, Pandas, Scikit-Learn, MongoDB, ExpressJS, ReactJS

Committees

2022 **Member,** Society for Artificial Intelligence and Deep Learning *BITS Pilani, Goa*

2021 **Core Member,** Developer's Society, BITS Goa *BITS Pilani, Goa*