Ashmit Khandelwal

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Pre-Final year Computer Science student at BITS Pilani. I'm a machine learning enthusiast and developer, with experience in implementing deep learning models for computer vision tasks, including semantic segmentation, and super resolution. Currently exploring Generative Models, Self-supervised learning, and Computer Vision research.

Education

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

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

Current CGPA: **9.41/10**

Relevant Coursework: Foundations of Data Science*, Applied Statistical Methods*, Operating Systems*, Object Oriented Programming, Data Structures and Algorithms, Discrete Structures in Computer Science, Database Systems

* = *ongoing*

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

Teaching Experience

QSTP 2022: Introduction to Deep Learning

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

- Co-instructing for the Introduction to Deep Learning course.
- The course provides introductory knowledge and assignments on 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*