

# 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 Efficient Deep Learning.

## 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

## Projects

### Efficient Segmentation and VQA on Aerial Flood Images

BITS Pilani

**SUPERVISOR:** [SRAVAN DANDA](#) , BITS PILANI

Sep 2022 - Ongoing

- This project is related to the [EarthVision 2021 - FloodNet Challenge](#), which involves Semi-Supervised **Semantic Segmentation of aerial images of flood hit regions**, and **Visual Question Answering (VQA)** of the flood conditions based on the segmentation.
- Existing semantic segmentation models for such aerial datasets are **computationally intensive**. The project aims to obtain **near-real time** high quality results on such VQA tasks, and develop a Neural Network that can run on **computationally constrained devices** such as drones.

### 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.

## 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.

## Courses and Schools

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

Online

2022 **Amazon ML Summer School 2022**, Amazon

Online

## Teaching Experience

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### 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

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

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

## Committees

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2022 **Member**, Society for Artificial Intelligence and Deep Learning [↗](#)

*BITS Pilani, Goa*

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

*BITS Pilani, Goa*