Ashmit Khandelwal

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Third year undergraduate Computer Science student at BITS Pilani. I'm a machine learning researcher, broadly interested in Deep Learning and Computer Vision research. I have experience in implementing neural networks for tasks such as visual question answering, semantic segmentation, and super resolution.

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, Theory of Computation, Database Systems

* = *ongoing*

Work Experience

Adobe Media and Data Science Research — *Remote*

Research Intern — *Nov 2022 - Ongoing*

- Working on finding correlations between and predicting **Saliency and Memorability** of short video **advertisements**.
- Saliency data is collected by tracking eye movements of participants while showing ads, while memorability data is collected using questionnaires given after the ad showing.

Projects

Efficient Segmentation and VQA on Aerial Flood Images — *BITS Pilani*

Supervisor: Sravan Danda, BITS Pilani — *Sep 2022 - Ongoing*

- Working towards an **Image Segmentation and Visual Question Answering (VQA)** system for the FloodNet challenge, which is efficient enough to run on computationally constrained devices such as flood rescue drones.
- The VQA system is based on **4-adjacency graphs** of the segmentation maps, using connected components to count the number of flooded/non-flooded houses and roads. The segmentation network is currently in progress, training the already efficient GLNet on FloodNet's aerial dataset.

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.

Courses and Schools

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

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

Teaching Experience

Introduction to ML and DL

BITS Pilani, Goa

Instructor | Center for Technical Education *Nov 2022 - Ongoing*

- Co-instructing for the Introduction to Machine Learning and Deep Learning course.
- As an instructor, I provide lectures and assignments/project work on Machine Learning, Deep Learning, Computer Vision, and Natural Language Processing.

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*