

VEDANT JOSHI

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EDUCATION

University Of California San Diego

Master of Science in Computer Science

Sep. 2023 – Current

La Jolla, California

Indian Institute Of Information Technology Kottayam

Bachelor of Technology (Hons.) in Computer Science; GPA: 3.94 (9.82/10.0 - Gold Medalist)

Aug. 2017 – April 2021

Valavoor, Kerala

TECHNICAL SKILLS

Languages: Python, Java, C, C++, SQL

Developer Tools: Tensorflow, PyTorch, OpenCV, SciKit, TensorRT, Pandas, Numpy, Matplotlib, Onnx, Git, Google Colab, VS Code

Cloud Technologies: AWS, Microsoft Azure cognitive services, Google Cloud Platform

EXPERIENCE

Tonbo Imaging

Vision & Imaging Engineer - I

February 2023 – July 2023

Bangalore, Karnataka

- Enhanced YOLOv5 for infra-red image object detection by implementing thicker **CSP** layers for shallow feature propagation & **SK attention** module for achieving dynamic receptive field sizes. All these modifications yielded an improvement of **20%** in mAP.
- Solved the problem of data shortage by building a pseudo IR image generator from RGB data, by utilising **diffusion** based attention UNETs along with **neural style transfer** losses. The quality of generated images was further enhanced using SubPixel convolutions.

Vedantu Innovations

Data Scientist - I

July 2021 – December 2022

Bangalore, Karnataka

- Engineered a text matching pipeline using an ensemble mechanism of **n-gram SimHashing & Levenshtein distances**, to remove OCR misread strings present in search clusters. This module improved the overall match rate of elastic search engine by **40%**.
- Architected the image search engine by creating a search space of latent vectors through the SSL framework **BYOL**. Quality of matches was further enhanced through **domain specific augmentations**, which reduced the search redundancy by **72%**.
- Created a novel solution for **profanity detection** using **contrastive learning** on LSTMs to learn embeddings that are invariant to word variations. Along with a reduction in profane vocabulary size, a **10%** improvement in recall over baseline regex was achieved.
- Leveraged the SSL framework **SCARF & TabTransformers** to capture intricate patterns in click-stream & user interaction data. The results were clustered using **UMAP & K-Means** to build user cohorts that improved the productivity of marketing teams by **25%**.

TCS Rapid Labs

Research Intern

September 2020 – March 2021

Online

- For the task of lip reading, repurposed the decoder of the LipNet model from word to character level in order to train it on single word **LRW** dataset. Implementing **custom edit distance** metrics & **CTC loss**, allowed us to achieve a **25%** character error rate.
- Proposed **FYEO** which involved the addition of **attention mechanism** into the LipNet model which allowed it to dynamically shift its focus on appropriate lip movement video frame. This helped in achieving better frame to character alignment.

Vedantu Innovations

Deep Learning Intern

September 2020 – April 2021

Online

- Experimented with image de-noising/skewing models using **UNET segmentation & VAEs** to create binarised images that reduced the character error rate by **5%** during text extraction by Tesseract OCR.
- Enhanced the effectiveness of bi-directional embedding vectors from fine tuned **BERT** for the task of doubt subject classification using text normalisation & high frequency token mapping using **LDA topic modelling**.

PROJECTS

Coco Layers | B.tech Hons. Project

January 2020

- Curated a novel, small scale annotated coconut images dataset using drones at multiple locations in Kerala.
- Conducted a comparative study on model quantization & weight pruning for **SSDs & YOLOs** for edge based object detection.
- Developed a deployment pipeline with efficient frame buffer handling mechanisms to achieve a frame rate of **22 FPS** detection rate.

IoT Dashboard | SIH Hackathon Finals

July 2020

- Developed a real time, React based dashboard to display live IoT services data for the terminal manager.
- Implemented **Facebook's prophet model** to capture the periodicity in resource consumption for service demand prediction.