Vedant Joshi

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Education

University Of California San Diego — **Sep. 2023 – Current**
Master of Science in Computer Science; GPA : **4.0/4.0** — *La Jolla, California*

Indian Institute Of Information Technology Kottayam — **Aug. 2017 – April 2021**
Bachelor of Technology (Hons.) in Computer Science; GPA : **9.82/10.0 - Gold Medalist** — *Valavoor, Kerala*

Technical Skills

Languages: Python, Java, C, C++, SQL, JavaScript, Golang
Developer Tools: Tensorflow, PyTorch, JAX, OpenCV, SciKit, TensorRT, Pandas, NumPy, Matplotlib, Onnx, Git, Docker, MATLAB
Cloud Technologies: AWS, Microsoft Azure congnitive services, Google Cloud Platform

Experience

Tonbo Imaging — **February 2023 – July 2023**
Computer Vision & Imaging Engineer - I — *Bangalore, Karnataka*

- Achieved a **20%** improvement in detection performance on thermal images by re-engineering the base layers of **YOLOv5** which significantly improved the robustness of Tonbo's autonomous driving software stack for heads up displays.
- Reduced the error rate by **7%** in depth map generation from monocular videos using **PoseNet** & self-supervised learning, for **Nvidia Xavier NX** devices to improve the spatial awareness of self-driving solutions.
- Leveraged **Generative A.I.** based diffusion models coupled with **neural style transfer** losses to generate realistic thermal images from RGB videos to solve the data shortage problem for training perception models.

Vedantu Innovations — **July 2021 – December 2022**
Data Scientist - I — *Bangalore, Karnataka*

- Architected a real time graph based search engine by learning a compressed latent space of doubt images through **self supervised learning** along with domain specific augmentations that reduced the redundancy of searchable elements by **72%**.
- Productionized a novel solution for profanity detection in real time tuition classes that achieved a **10%** improvement in recall over regular expressions by using contrastive learning to perform **zero shot learning** on LSTMs for low resource languages.
- Improved the quality of matches returned by elastic search engine by **40%**, through creation of a text cleaning pipeline that used n-gram SimHashing & **Levenstein** distances to remove results that had no syntactic similarity with a particular text cluster.
- Improved the productivity of marketing teams by **25%** through generation of user behaviour clusters by implementing **TabularTransformers** to capture intricate patterns in click-stream & user interaction data.

TCS Rapid Labs — **September 2020 – March 2021**
Research Intern **(Won Best Paper at IEEE 8th ICSCC)** — *Online*

- Generated a **25%** character error rate on the task of single word lip reading from videos by re-modelling the **LipNet** model from word to character level along with an efficient **CTC loss** that helped patients suffering from hearing deformities.
- Proposed FYEO, an **attention** based LipNet model to reduce the error rate by **2.5%** & improve model transparency through heat maps that showcase the time frames used for a particular character prediction.

Vedantu Innovations — **September 2020 – April 2021**
Deep Learning Intern — *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 F1-score on bi-directional embedding vectors from fine tuned **BERT** by **14%** for the task of subject classification on low resource classes by text normalisation & **LDA topic modelling**.

Projects

Edge device object detection | *B.tech Hons. Project* — **January 2020**

- Curated a novel, small scale annoted coconut images dataset using drones at multiple locations in Kerala.
- Researched on weight quantization & pruning strategies to achieve high edge performance on **SSDs** & **YOLOs** for object detection.
- Deployed a TinyYoloV4 with **22** FPS detection rate on a Nvidia Jetson Nano & achieved **0.4** mAP results on a camera mounted drone.

IoT Dashboard | *SIH Hackathon 2020 Finals (Machine Learning)* — **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 adapt to the trend, periodicity & seasonality of resource consumption data at the terminal of an airport & predict the service demand by different cohorts of flyers.