VISHNU BEJI

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EDUCATION

New York University May 2025
Master of Science in Computer Science (Recipient of Merit-based scholarship)
Coursework: *Machine Learning, Deep Learning, Big Data, Artificial Intelligence-I*, Computer Vision CG: 4.00/4.00

SKILLS

Languages: Python, C, C++, R, SQL, Latex **Tools::** Jupyter, Git, Gitlab,, VScode, Linux, Docker, MLOps
Frameworks: TensorFlow, Keras, PyTorch, NLTK, Hadoop, OpenCV, Apache Spark, Apache Kafka, Scikit-Learn, cuDNN, Pandas, MongoDB

WORK EXPERIENCE

Lowe's May 2024 - Aug 2024
Machine Learning Intern

- Optimized Visual Search using **ConvNeXt** and **Vision Transformer** dual-tower **CLIP** to increase hit-rate from **75.05% to 83.21%**.
- Leveraged Google Cloud Platform and BigQuery to extract, preprocess, and handle large chunks of multi-modal data effectively to create a dataset of 290k image pairs, which were cleaned using Vision-based LLMs.
- Implemented search expansion and **cross-encoder**-based reranker post-retrieval to enhance search relevance.

CILVR group - advised by Prof. Saining Xie
Research Assistant, Multimodal Learning for Data-Efficient Zero-Shot Object Recognition using LLMs Nov 2023 - Present

- Developed a **Feature Fusion** for **Multi-modal Large Language Models** that fuses visual and textual features into a shared semantic space, enhancing the model's ability to understand and recognize objects efficiently.
- Annotated a comprehensive dataset with rich semantic attributes, enabling the model to predict object attributes from both images and text, bridging the semantic gap and improving object recognition accuracy.
- Utilized advanced **few-shot learning** techniques to adapt the model to unseen object categories with minimal examples, leading to robust zero-shot object recognition performance using ImageNet 21k+1k.

Oracle Nov 2020 - Aug 2023
Senior Member of Technical Staff *Areas:* ***Distributed Systems, Data Structures, OS, Databases***

- Led the redesign of the Slice Management Layer (SLM), introducing "slicing" to improve query speed and performance while ensuring **99.9% system availability**
- Refactored the hierarchical structure of SLM Catalogs (a set of metadata tables) residing at Level 2 of table abstraction to establish astute separation of logical and physical entities
- Enabled In-memory Transaction Private Journal to handle variable length bitmaps
- Mentored and guided new hires on Database and systems architecture concepts, development tools and RDBMS bug fixing

Samsung Research Jun 2019 – Aug 2019
Summer Intern *Areas:* ***NLP, LLM, Machine Learning, Data Structures***

- Augmented Bixby Search Engine by developing **Intelligent Grouped Keywords** feature using **SMS data** to reduce query processing time by **20%**
- Optimized the Latent Dirichlet Allocation **(LDA)** based model with a self-developed algorithm for probabilistic topic modeling.
- Fine-tuned the **BERT model**, to craft topic-keyword clusters, resulting in a **40% enhancement** in content relevance

Digital Innovations Lab, IIM Bangalore Nov 2018 - Dec 2018
Research Intern

- Designed **Reti-Net**, a CNN-based Diabetic Retinopathy grade classifier inspired by **VGG-net** architecture **[code]**
- Prototyped a **U-Net** architecture-based image segmentation model to detect lesions and hemorrhages in the retina

PUBLICATIONS

- **Vishnu B**, A. Sinha, Fast and Secure Routing Algorithms for Quantum Key Distribution Networks, International Conference on Communication Systems and Networks **COMSNETS 2022**.
- Md Shahbaz Akhtar, Krishnakumar G, **Vishnu B**, Abhishek Sinha, Fast and Secure Routing Algorithms for Quantum Key Distribution Networks, **IEEE/ACM Transactions on Networking,** Feb 2023

PROJECTS

ComicGen - Winner of MongoDB Gen AI Hackathon, New York Nov 2023 - Present

- Developed a **RAG**-based scene generation model to create comic-book-style renderings of fan theories and plot extensions.
- Using **Stable Diffusion 1.0** and **Mistral-7B-Instruct-v0.2**, generated comic strips in a user-specified illustration style.

Temporal Localisation for Action Detection on Streaming Video [code] -Prof Juan Rodriguez Nov 2023 - Present

- Developed an object detection model for **Temporal Localisation** on **Youtube-8M Segment dataset** achieving **80.2% accuracy**.
- Used a **Context-Gated DBoF model** for temporal aggregation on rich static features from a pretrained Inception V3.
- Created a **Kafka** pipeline to handle live streaming video input that performs real-time scene understanding.