VISHNU BEJI

vishnubeji@gmail.com | +1 (347)798 3743 | Linkedin | Github | Google Scholar

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

Indian Institute of Technology Madras, India Jul 2020
Bachelor of Technology in Electrical Engineering (EE)
Coursework: *Advanced Topics in AI, Data Structures and Algorithms*, *Applied Programming, Topics in Graph Theory*

TECHNICAL 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

Research Assistant - CILVR group - advised by Prof. Saining Xie
Multimodal Learning for Data-Efficient Zero-Shot Object Recognition 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, 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 transformer model**, to craft topic-keyword clusters, resulting in a **40% enhancement** in content relevance

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

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.

Routing Algorithms for Generalised QKD Networks [code] - Prof Abhishek Sinha Jan 2020 - Sep 2021

- Developed a novel network flow algorithm to optimize data traffic and ensure strong stability in a QKD-encrypted generalized network (handling unicast, multicast, and broadcast) based on the concept of Universal Max-Weight
- Produced better delay performance compared to the celebrated Back Pressure algorithm-backed QKD network and eliminated suboptimality arising from cycle hopping
- Won **Best Poster Award** at JTG/IEEE ITSoc 2022, IIT Mandi for work on the same

Multi-class classification of Diabetic Retinopathy Grades [code] - Digital Innovations Lab, IIM Bangalore Nov 2018 - Dec 2018

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