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, Big Data, Artificial Intelligence-I

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, 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

RESEARCH PROJECTS

Temporal Localisation for Action Detection on Streaming Video -Prof Juan Rodriguez   Nov 2023 - Present
- Developed an object detection model for **Temporal Localisation** on **Youtube-8M Segment dataset** achieving **78.2% accuracy**.
- Leveraged **PySpark** framework to enable distributed preprocessing and exploratory data analysis.
- Devised a multi-attention model to detect the the presence of a particular action in live-streaming video data using **Kafka**.

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