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, Operating Systems, Cloud Computing* CG: 4.00/4.00

SKILLS

Languages: Python, C, C++, R, SQL **Tools:** Git, Docker, CUDA, cuDNN, Kubernetes, Apache Spark, Apache Kafka, MongoDB, AWS, GCS
Frameworks: TensorFlow, Keras, PyTorch, NLTK, cuDNN, Pandas, LangChain, LlamaIndex, Transformers

WORK EXPERIENCE

Lowe's - Charlotte, NC 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.

Courant Institute of Mathematical Sciences, NYU - New York City, NY Nov 2018 - Dec 2018
Graduate Teaching Assistant

- Head Teaching Assistant and Tutor for Advanced Computer Vision and Advanced Machine Learning
- Designed self-contained programming and theoretical assignments on topics like Transformers, VAEs, GANs and Diffusion models

Oracle - Bangalore, India 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**
- Mentored and guided new hires on Database and systems architecture concepts, development tools and RDBMS bug fixing

Member of Technical Staff

- Enabled In-memory Transaction Private Journal to handle variable length bitmaps
- 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

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

- Augmented Bixby Search by developing **Intelligent Grouped Keywords** 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

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.