

# VISHNU BEJI

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## EDUCATION

### New York University

Master of Science in Computer Science

May 2025

Coursework: Machine Learning, Big Data, Artificial Intelligence-I

### Indian Institute of Technology Madras, India

Bachelor of Technology in Electrical Engineering (EE)

Jul 2020

Coursework: Advanced Topics in AI, Data Structures and Algorithms, Applied Programming, Topics in Graph Theory

## TECHNICAL SKILLS

Languages: Python, C, C++, R, SQL, Latex

Frameworks: TensorFlow, Keras, PyTorch, Hadoop, Apache Spark, Jupyter, Git, Github, VScode, Rstudio, Scikit-learn, cuDNN

## PROFESSIONAL EXPERIENCE

### 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
- Integrated SLM refactoring to Topology Cache and Control Cluster modules resulting in 3% reduction of system errors
- Created comprehensive test frameworks for SLM components using SQL and Python to achieve 95% test coverage
- 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 topic modeling
- Leveraged BERT transformer model, to craft topic-keyword clusters, resulting in a 40% enhancement in content relevance

## RESEARCH PROJECTS AND PUBLICATIONS

### 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

### Routing Algorithms for Generalised QKD Networks [\[code\]](#)

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
- Formulated **TQD** method and its comprehensive proof of queue stability using Lyapunov Drift minimization
- 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 [\[code\]](#)

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

### Structure Learning on Bayesian Networks

Oct 2019 - Nov 2019

- Constructed a Bayesian Network model for the patient monitoring system using Jiao–Venkat–Han–Weissman(**JVHW**) estimator with the **Chow Liu algorithm** [\[code\]](#)
- Leveraged Quantum Annealing to execute structure learning on Bayesian Networks, encoding it into a Quadratic Unconstrained Binary Optimization (QUBO) problem with precision and efficiency [\[code\]](#)

## LEADERSHIP

Event Head, Tech N Innovation Fair, Shaastra 2019, IIT Madras

Jun 2018 - May 2019

Project Head, National Service Scheme, IIT Madras chapter

Jun 2017 - May 2018