Nadir Najeeb Kassim

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Education

Nanyang Technological University **Aug 2024 – Present**
Master of Science in Artificial Intelligence *Singapore*

Vellore Institute of Technology **Aug 2019 – Apr 2023**
BTech in Electrical and Electronics Engineering *Vellore, India*

***Relevant Coursework**: Large Language Models, Computer Vision, Deep learning, Time series analysis, Artificial intelligence, Fuzzy systems, Natural Language Processing, Data Structures and algorithms.*

Experience

Research Intern **Dec 2022 – Jun 2023**
Neuronics Lab, Indian Institute of Science *Bangalore, India*

- **ULP-ACE**: Built an ultra-low-power acoustic event classifier for edge devices using ARM Cortex-M4 processors, enabling autonomous detection of bird species through an AI-based TinyML model.
  - The classification model consumed only 5.5 mW and 49 KB flash memory, supporting real-time inference.
  - Achieved 8 m detection range, with the device operating continuously for 60 days on just 2 AAA batteries.
  - Captured and logged audio events with timestamps and geolocation data for ecological monitoring; integrated with the ThingsBoard dashboard for real-time visualization and remote access.
- **LoRa Communication**: Implemented a LoRaWAN communication framework for low-power embedded devices at 868 MHz, using UART for serial communication with the LoRa transceiver; achieved reliable data transmission over distances up to 2 km in obstructed environments.

Projects

RAG based Low-level CodeGen for QP problems | *C, RAG, Convex optimization solvers* **April 2025**
- Developed a generative AI framework that generates QP problems in C from corresponding python code.
- Built a benchmark suite of 30+ QP problems including Lasso, SVM, Huber regression and Portfolio Optimization..
- Achieved 93% accuracy (28/30) using RAG pipeline and different types of prompting methods.

Agent–Driven Hybrid Recommender System | *LLM, AI-Agents, RAG* **March 2025**
- Designed a hybrid recommendation systems with LLM and content based filtering
- Implemented Program-of-Thought prompting and RAG on MovieLens 32M, achieving 38.7% knowledge enrichment.
- Evaluated model performance achieving top 5 precision of 0.76, recall of 0.54, and NDCG of 0.81.
- Attained 82% relevance score on agent-generated follow-up questions, enhancing user interaction quality.

Revamping MobileNet V3 on segmentation task | *MobileNet, Computer Vision* **Feb 2025**
- Enhanced MobileNetV3 for facial segmentation, achieving 17.4% higher F1 Score (0.745 → 0.875) and 21.9% IoU improvement through architectural and training optimizations.
- Integrated Mish activation and LRASPP decoder, significantly improving edge detail and multi-scale context understanding with minimal computational overhead.
- Applied regularization and cross-validation, boosting generalization and robustness on the CelebA-HQ dataset with a lightweight, mobile-ready model.

Lightweight Face Parsing Model using Deep Learning | *U-Net, Computer Vision* **Feb 2025**
- Developed a U-Net-based face parsing model from scratch to test on the CelebAMask-HQ dataset.
- Optimized the model to lesser than 2M parameters for efficient segmentation.
- Trained the model using PyTorch, achieving an F1-score of 0.82 for precise facial segmentation.

Technical Skills

Languages: Python (Advanced), C/C++, Embedded C, R
Developer Tools: PyTorch, TensorFlow, TinyML, Computer Vision, LLMs
Technologies/Frameworks: Linux, Hugging Face, GitHub, Langchain, ChromDB, SQL (beginner), MLOps (MLflow, Docker–learning)

Certifications / Extracurricular

- **Introduction to machine learning operations (MLOps)**, Microsoft Ongoing
- **GenAI intensive course**, Google Apri1 2025
- **Head of electrical department**, Team Celerity Dec 2022