GOUTHAM VARMA INDUKURI

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EDUCATION

Masters of Science in Artificial Intelligence Jan. 2024 – Present

University of Aberdeen *Aberdeen, UK*

- **Coursework**: Software Agents and Multi-agent Systems, Natural Language Generation, Symbolic AI, Knowledge Representation and Reasoning, Data Mining and Deep Learning, Machine Learning

Bachelor of Technology in Computer Engineering and Data Science Aug. 2019 – June 2023

Presidency University | CGPA: 8.1/10.0 *Bangalore, IN*

- **Coursework**: Cloud Computing, OOPs in Java, MySQL database management, Computer Vision, Machine Learning, Deep Learning, Optimization Techniques, Database Management, Information Retrieval and Organization, Big Data

EXPERIENCE

Open Research Advisor Aug. 2024 – Present

University of Aberdeen *Aberdeen, UK*

- Engineered an automated publication metrics system using **Cloud** infrastructure and **OpenAlex APIs**, enabling daily updates of research analytics across the institution
- Developed a dynamic dashboard integrating multiple data sources (Web of Science, Scopus, OpenAlex, Pure) using **Python** and **Power BI** for real-time research impact visualization
- Implemented automated ETL pipelines for continuous data processing and metric calculation, reducing manual analysis time by 90%
- Contributing to responsible metrics framework by developing algorithmic approaches for fair research evaluation
- Leading cross-functional initiatives to enhance research visibility through automated ORCID integration and optimization

Research Assistant March 2024 – July 2024

University of Aberdeen *Aberdeen, UK*

- Engineered an automated clinical trial analysis pipeline for detecting fabrication while achieving 30 scientific papers/minute processing rate for data extraction and structuring
- Developed robust extraction system using **OpenAI** foundation models after comprehensive evaluation of various frameworks, including **Hugging Face**, **CrewAI** and **LangChain**, among others
- Implemented document vectorization and retrieval system for efficient storage and analysis of clinical trials
- Built seamless integration between Python-based extraction pipeline and team's R analysis framework, enabling automated end-to-end processing
- Independently developed entire Python infrastructure while collaborating with medical researchers to ensure output meets clinical validation requirements

Machine Learning Research Intern July 2022 – Sept. 2022

La Trobe University *Remote*

- Conducted comparative analysis between Split Learning and Federated Learning, focusing on privacy preservation in distributed ML
- Researched novel split learning architectures that reduce computational overhead while maintaining data privacy

- Implemented privacy-preserving neural network architectures using **PyTorch**, achieving 95% accuracy while keeping data localized
- Published findings on split learning's advantages in scenarios requiring strict data isolation and limited computational resources

Data Management Intern March 2023 – Sept. 2023

Centre for Wildlife Studies *Bangalore, India*

- Developed data collection protocols for wildlife field surveys across multiple regional languages
- Processed and digitized over 150 multilingual field surveys, ensuring data accuracy and consistency
- Implemented quality control measures for data entry, reducing error rates in wildlife observation records
- Restructured existing database schemas to improve data organization and accessibility for research teams

RESEARCH INTERESTS

- **Primary**: Large Language Models, Multi-modal AI Systems, AI for healthcare
- **Secondary**: Open-Source Development, Scalable Machine Learning, Knowledge Integration

PUBLICATIONS

Smart Healthcare System for Symptom Diagnosis and Disease Prediction July 2023

- Published in proceedings of ICRAET Conference (IFERP), developing an efficient ML pipeline achieving 97% accuracy in multi-disease classification using patient symptom data
- Engineered lightweight model architecture reducing computational requirements while maintaining diagnostic accuracy across diverse patient populations
- Implemented model optimization techniques achieving 65% reduction in resource usage while preserving real-time inference capabilities

ACHIEVEMENTS

KaggleX Fellow Aug. 2024 - Present

Google - Kaggle *Global*

- Selected among top 2% of global applicants for Google's KaggleX Cohort 2024 mentorship program
- Architecting mental health counselling system by fine-tuning **Gemma** foundation models using PEFT techniques and curated instruction datasets with RAG augmentation
- Optimizing model inference through quantization and context windowing with **Vector AI**, implementing production deployment on GCP with custom monitoring metrics
- Researching novel applications of **Mixture of Experts** (MoE) and **Constitutional AI** principles for more controlled and efficient domain adaptation

TECHNICAL EXPERTISE

- **ML Architecture & Systems:** PyTorch, Tensorflow, Large Language Models, Multi-modal Learning Systems, Neural Networks, Agentic AI, Vision-Language Models
- **Tools:** C++, C, Java, Tableau, R, Python,AWS, GCP, Azure ML, MLflow, SQL, Hadoop, Hive, Weights & Biases, Model Interpretability, LaTeX, Git, Power BI, LaTeX
- **Natural Language Processing:** RAG Systems, Generative models, Knowledge Representation, Rules-based Systems, Prompt Engineering, Text Generation, Foundation Model Fine-tuning