Venkata Raghavendra Nouduru

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Research Statement

As a graduate research scholar, I approximated hardware simulations with ML, and explored ensemble diversity in imbalanced data and interned on reducing LLM hallucinations. I seek to pursue a PhD in **trustworthy deep learning** that focuses on **personalized health care** and **aiding scientific discoveries**. I aim to work on *designing neural network architectures inspired by natural laws that can adapt to skewed data distributions of different modalities and stay dependable across multiple practical applications.*

Education

International Institute of Information Technology, Hyderabad — Hyderabad, Telangana
M.S by Research in Electronics and Communication Engineering: 7.38/10 CGPA — *2022 – 2025*

Sant Longowal Institute of Engineering and Technology — Longowal, Punjab
Bachelor of Engineering in Electronics and Communication Engineering: 8.87/10 CGPA — *2018 – 2022*

Publications

C=Conference, J=Journal, F=Fellowship, S=In Submission, T=Thesis

[C.1] N. V. Raghavendra, D. Amuru and Z. Abbas, (2024). **"MetaCirc: A Meta-learning Approach for Statistical Leakage Estimation Improvement in Digital Circuits"**. In *IEEE International Symposium on Circuits and Systems (ISCAS)*, pp. 1-5. IEEE. 05/2024, Singapore. DOI: 10.1109/ISCAS58744.2024.10558185

[S.1] N. V. Raghavendra, Prof. Amir Ahmad, Prof. Zia Abbas (2025). **"Balancing data in healthcare: A review of ensemble diversity"**. Manuscript submitted for publication in *Expert Systems With Applications*.

[S.2] Sagnik Ghosal, N. V. Raghavendra, Prof. Venkanna U., Prof. Debanjan Das. **"RiQualis: Rice Quality Analysis"**. Manuscript status: *Draft*.

Work Experience

Machine Learning Intern — Apr. 2024 – Nov. 2024
xLM - Continuous Validation — *Remote*
- Developed Flask and FastAPI-based backends for a chatbot and a data analysis tool
- Mitigated LLM hallucinations using tagged context
- Implemented similarity search to fetch relevant context from books
- Deployed AWS Lambda functions
- Delivered a delayed project's prototype demo within 1.5 months of joining

Research Internship - Machine Learning — May 2021 – May 2022
IIIT, Naya Raipur — *Remote*
- Developed an algorithm to extract Regions of Interest and physical features using OpenCV
- Trained and embedded Random Forest into a mobile app to predict rice quality using images from a smartphone

Agents of Style: Mobile App Development — 2021
InternWell — *Remote*
- Contributed to UI/UX Prototyping of a Flutter-based mobile application for an international client
- Effectively managed client communication and progress to fast-track development and ensure delivery as promised

Academic Services

Manuscript Reviewer - ISCAS'25 — Sep. 2024 – Oct. 2024
IEEE CASS — *Remote*
- Reviewed ML-related submissions for technical accuracy, originality, and relevance to the field
- Ensured high-quality research contributions and compliance for the conference proceedings
- Conducted rigorous evaluations of proposed methodologies

Teaching Assistant - Digital VLSI Design (S24) — Jan. 2024 – May 2024
International Institute of Information Technology, Hyderabad — *Hyderabad, Telangana*
- Gave tutorials on applied machine learning and meta-learning in VLSI
- Taught the basics of Machine Learning, Deep Learning and Meta - Learning to a class of 100 students
- Conducted evaluations of ML projects and assignments

Fellowships

F=Fellowship

[F.1] N. V. Raghavendra, Prof. Zia Abbas (2023). **"Exploring Meta-learning approaches to improve statistical leakage estimation in digital VLSI circuits"**. Fellowship granted by *IHub Data*.

[F.2] N. V. Raghavendra (2023). **"Intro to Effective Altruism (EA) Fellowship"**. Fellowship granted by *Effective Altruism*.

Relevant Coursework

Graduate: Statistical Methods in AI (SMAI); Behavioral Research: Statistical Methods (BRSM); Advanced Computer Architecture (ACA); Design For Testability (DFT); Principles of Semiconductor Devices (POSD); Computer Vision (CV)
Undergraduate: Engineering Mathematics; Numerical and Statistical Methods; Signals and Systems;
MOOCs:

Womanium: AI Module; Quantum + AI: QBronze; Pennylane QML
University of Helsinki: Big Data Platforms
Coursera: Deep Learning Specialization; Tensorflow Developer Specialization; Machine Learning
World Quant University: Data Science and Machine Learning

Skills & Volunteering

Languages: **Python**, C++

Frameworks: LM Studio, AnythingLLM, Flask, FastAPI, Serverless, **AWS Lambda**, **MongoDB**, Azure MSAL

Developer Tools: Git, Docker, VS Code, Jira, Confluence, Slurm

Libraries: **PyTorch**, LightningAI, LLamaIndex, **LangChain**, **HuggingFace**, Scikit-learn, Pandas, NumPy, Matplotlib, OpenCV

Volunteering: Placement Coordination, Lab Representative, Student Parliament (**Volunteer Award**), Cadet @ NCC

Projects

RAG-based offline travel assistant - AMDxHackster | *LM Studio, AnythingLLM* Aug. 2024
- Developed RAG-based offline chatbot to store and embed provided articles in the knowledge base for later use
- **Won AMD's Ryzen AI mini-pc** in AMD's Pervasive AI Competition
- Attempted quantization of Zephyr-beta-7B model using SmoothQuant

Statistical analysis of StudLife Dataset - BRSM-S24 | *Python, statsmodels, Pandas, Matplotlib* May. 2024
- Analyzed the student life dataset of Dartmouth University
- Performed various statistical tests on multiple hypotheses
- Studied correlation of stress and other factors of a student's college life

Style Transfer using AdaIN - SMAI-S23 | *PyTorch, Python* May. 2023
- Implemented Adaptive Instance Normalization in PyTorch
- Experimented with Style Transfer using AdaIN block
- Added adversarial loss to check for improvements

Optimizing DistilRoBERTa for emotion detection | *Python, HuggingFace API, PyTorch* Apr. 2023
- Used HuggingFace API to quantize and optimize DistilRoBERTa
- Performed post-quantization fine-tuning and testing
- Contributed a tutorial notebook to OpenVINO notebooks repository

Achievements

Samridh Rural - Together 2022 Jan. 2022
- Grabbed 17th position in Together 2022 organized by Schulich School of Business Canada with Startup India

RFID based attendance cum surveillance Jan. 2022
- Reached the finals of National Innovation Contest organized by Ministry of Education's Institute Innovation Cell
- Received a grant of INR 50,000 to build a prototype

References

[R.1] **Prof. Zia Abbas**: Thesis Advisor | IIIT Hyderabad | zia.abbas@iiit.ac.in

[R.2] **Prof. Amir Ahmad**: Research Co-Advisor | UAE University | amirahmad@uaeu.ac.ae

[R.3] **Prashant Gajavelli**: Intern Project Advisor | Syneos Health | prashant.gajavelli@syneoshealth.com