

RITHVIKA TIRUVEEDHULA

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SUMMARY

Motivated and Enthusiastic graduate with hands-on experience in AI/ML, Data Science, and Software Engineering through Internship at TCS, Summer Internship, Research Capstone Projects & Academic projects. Seeking for any **Junior AI ML Enggr / Data Science Engr/ Data Analyst / Product Analyst / Business Analyst** where I can apply my technical skills and contribute effectively to the organization.

EDUCATION

• B.Tech	Computer Science & Engineering	Vellore Institute of Technology (VIT), Chennai, India	2021 - '25	7.7/10
• Class 12	MPC, PU Board	ALLEN/GRV PU College, Bangalore, India	2019 - '21	93.0 %
• Class 10	CBSE Board	Sri Chaitanya Techno School, Bangalore, India	2018 - '19	88.2 %

SKILLS

Languages: Python, SQL, R, Java | HTML/CSS/JS

Frameworks: Pandas, Numpy, Scikit-Learn, Matplotlib, NER, OpenCV, Gen AI, CNNs, Transformers, LLMs, RAG, LangChain, TensorFlow, Keras, PyTorch, PySpark

Tools: MySQL, Excel, PowerBI, Postman

Platforms: Kaggle, Visual Studio Code, PyCharm, Jupyter Notebook, Databricks, Hugging Face

WORK EXPERIENCE

AI/ML Intern | Tata Consultancy Services (TCS), Bangalore | 6 months Industry Internship

Dec 2024 - Jun 2025

- **Project & Thesis Title :** *"Fine Grain Image Similarity (FGIS) Techniques for the Application of Retail Apparel Similarity Matching Requirement in the TCS Optumera Product Suite"*
- **Built a Hybrid Deep Learning Model** (Using: **ResNet50 + Attention Mechanism + Attention Erasure**) that **improved Image Similarity Matching Precision by 20%** over the existed **TCS Optumera** models.
- **Achieved 90% retrieval accuracy**, with **98% similarity** across top-5 image matches, enabling near-duplicate apparel detection in a dataset of **32,190 images**.
- **Applied offline augmentation techniques** to increase **dataset size by 99%** (from **16,170 to 32,190**), and **designed custom L2-Normalized embedding heads** for scalable deployment.
- **Delivered a production-ready deployable AI solution** similarity-matching solution to the **TCS Optumera** team, **boosting catalogue uniqueness and reducing manual review workload** by an estimated **30-40%**
- **Tools & Technologies:** Python, TensorFlow, Keras, OpenCV, Grad-CAM, CNNs, Ensemble Learning, Transfer Learning

AI/ML Summer Intern | IOTA Analytics Pvt Ltd, Chandigarh | 2 months Summer Internship

Nov 2023 - Jan 2024

- **Project Title :** *"Personal Identifiable Information (PII) Recognizer & Named Entity Recognition (NER) in Natural Language Processing (NLP)"*
- **Built a PII recognition engine** using **Named Entity Recognition (NER)** and custom **Regex patterns**, achieving **98% precision** in redacting sensitive fields (e.g., names, emails, IDs) across **10K+ enterprise documents**.
- Developed a **privacy-preserving NLP pipeline** to sanitize unstructured text, reducing manual compliance efforts by **~60%**.
- Integrated a **Retrieval-Augmented Generation (RAG)** system using **Hugging Face LLMs**, enabling accurate domain-specific question answering with **<2s average response time**.
- Engineered modules for **semantic embedding**, **dynamic chunking**, and **prompt templating**, **improving LLM output** relevance by **~35%** in evaluation benchmarks.
- Deployed scalable **RESTful APIs** using **Flask**, with endpoint testing and validation in **Postman**, ensuring **100% functional coverage** before integration.
- **Tools & Technologies:** Python, Natural Language Toolkit (NLTK), Transformers, Hugging Face LLMs

Project Intern | Chakralayaa Analytics Pvt Ltd, VIT Chennai Startup | 2 months Internship

Jun 2023 - Aug 2023

- **Project Title :** *Supply Market Intelligence System (SMIS)* : Built analytics modules for the **Supply Market Intelligence System (SMIS)** to support real-time business intelligence for buyers and executives.
- Analyzed purchasing **KPIs** and buyer trends using **Python-based ML** techniques to improve decision-making insights.

RESEARCH EXPERIENCE

Research Student | Capstone Project-2 | 4 months

Dec 2024 - Apr 2025

- **Project Title :** *"ChestVision-Lung Disease Classification using Ensemble Transfer Learning (Ensemble CNNs) & Grad-CAM for Visualization"*

- **Developed a deep learning ensemble of 5 CNN models** (InceptionResNetV2, MobileNet, DenseNet121, EfficientNetB2, InceptionV3) in **TensorFlow/Keras**, achieving **89.7% multi-label accuracy** and **79.1% AUC-ROC** on the **NIH CXR dataset**.
- Applied preprocessing and augmentation (Resizing, RGB Conversion, Rotation, Flip, Contrast) across **1,12,120 X-rays**, improving minority-class representation and boosting recall by **14%**
- Integrated **Grad-CAM** with **OpenCV** to generate interpretability heatmaps, enhancing model transparency and supporting radiologist validation across **14 lung diseases**, including Pneumonia and Fibrosis etc.,
- ***This work has been presented for Publication at: IEEE International Conference on Intelligent Signal Processing & Effective Communication Technologies, INSPECT-2025.***

Research Student | Capstone Project-1 | 4 months

Aug 2024 - Dec 2024

- **Project Title : “Ship Detection using SAR (Synthetic Aperture Radar) Images for Maritime Vigilance”**
- Applied SAR-specific preprocessing using OpenCV (Median, Sobel, pseudo-RGB), improving image clarity and reducing speckle noise by **31.5%**.
- **Built a ResNet-FPN detection model** with **Swish+TanH** activations and **PSO-optimized** features, improving small/occluded vessel detection by **28%** and overall accuracy by **22.3%** over **Faster R-CNN**.
- Delivered superior results on **SSDD**, surpassing **YOLOv4** and **SSD** with **+9.2% Precision**, **+11.4% Recall**, and **+13.7% F1-Score**, proving **strong robustness** for **real-world SAR maritime surveillance**.
- ***This work has been Published at: International Conference on Data Science, Agents and Artificial Intelligence (ICDSAAI) 2025***

ACADEMIC PROJECTS EXPERIENCE

Project-1 Title : “Arrhythmia Detection Using ECG Signals”

- Developed a **1D-CNN** for **classifying 5 arrhythmia types**, achieving **95.2% accuracy**, **93.8% F1-score**, and **0.96 ROC-AUC** on **109K ECG signals**. The model utilized **Z-score normalization** and **R-peak segmentation**, with validation performed using per-class metrics for both rare and common conditions.

Project-2 Title : “RAG + AES: Secure AI Chatbot for Confidential Documents”

- Developed a secure **RAG pipeline** utilizing **quantized Hugging Face models**, **llama-index**, and **AES (Fernet) encryption**. This enabled **document-aware Q&A** with **87% top-1 accuracy**. Semantic retrieval was enhanced by approximately **32%** through **SBERT**, **chunking**, and **prompt tuning**, with the solution **deployed via Flask API** achieving **less than 2-second latency**.

Project-3 Title : “Building a Chatbot using PyTorch and Natural Language Processing (NLP)”

- This project builds a **PyTorch-based chatbot** that uses **NLP** for **interactive, personalized** user engagement. It's applicable in various settings, including **customer service**, **online support**, or **personal assistance**.

RESEARCH PAPER PUBLICATIONS / CONFERENCE PRESENTATIONS

- **Rithvika T, Monish P, “Ship Detection using SAR Images for Maritime Vigilance”, IEEE International Conference on Data Science, Agents & Artificial Intelligence (ICDSAAI), Chennai, India, 2025. (Prof. Poonkodi M. contributed as a co-author)**
DOI: 10.1109/ICDSAAI65575.2025.11011861.
- **Rithvika T, Monish P, Poonkodi M, “Lung Disease Classification using Ensemble Transfer Learning and Grad-CAM for Visualization”, presented at IEEE International Conference on Intelligent Signal Processing and Effective Communication Technologies, INSPECT-2025.**

CERTIFICATIONS

- Introduction to Big Data | University of California at San Diego through Coursera
- Python for Data Science and Machine Learning Bootcamp | Udemy
- The Data Science Course 2023: Complete Data Science Bootcamp | Udemy
- SQL – MySQL for Data Analytics and Business Intelligence | Udemy

SCHOLASTIC THINGS

- Selected for Smart India Hackathon (SIH)'23 for VITC : Team Lead & Finished 11th among 35 final teams out of 276 total teams from VITC Campus.
- Academic Topper during 9th Std
- Vice- Captain, Viking House, in 8th std

NON-ACADEMIC AFFILIATIONS

- Treasurer, Board Member at IEEE Robotics & Automation Society, VIT Chennai
- Social Media Team Member, IEEE Women in Engg (WiE), VIT Chennai
- Management Team Member, IEEE Photonics Society Student Chapter, VIT Chennai
- Startup & Ideas Team Member, at Entrepreneur Cell (E-Cell), VIT Chennai
- Social Media Coordinator, PAN IIT Alumni Leadership Series(PALS), VIT Chennai

LANGUAGES KNOWN

- English
- Hindi
- Telugu (Mother Tongue)
- German (A-Level)

Sd/- (Rithvika Tiruveedhula)