Abhiram Dodda

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EDUCATION

Pennsylvania State University — Aug 2025 – May 2027
Master of Science in Computer Science and Engineering (GPA: 3.89/4)

Gokaraju Rangaraju Institute of Engineering and Technology — Dec 2021 – Jun 2025
Bachelor of Technology in Computer Science and Engineering (GPA: 9.38/10.0)

EXPERIENCE

Software Development Intern — May 2025 – Jul 2025
Platform3Solutions — *Remote*

– Architected a self-hosted **Retrieval-Augmented Generation (RAG)** pipeline by deploying **Llama 3** via an **Ollama** server, utilizing **Flask** to facilitate **semantic search** for **500+** concurrent users with a mean query latency of **<200ms**.

– Optimized **retrieval precision by 76%** by engineering a **hierarchical metadata filtering** layer within **ChromaDB**, integrating **fine-grained RBAC** to ensure **100% data isolation** across multi-tenant project environments.

– Engineered **scalable, containerized Flask REST APIs** orchestrated via **Docker**, managing an **automated ingestion pipeline** that processed **5,000+ documents per hour** with **asynchronous local embedding** generation.

Data Science Intern — Mar 2025 – Jun 2025
CaptainFresh — *Remote*

– Executed comprehensive **Exploratory Data Analysis (EDA)** on **100k+** multi-band spectral observations, utilizing **automated statistical profiling** to identify significant correlations (**r > 0.82**) between specific spectral bands and pond health indicators.

– Engineered a robust feature suite by deriving **12+ spectral indices** and applying **Principal Component Analysis (PCA)** to reduce input dimensionality by **30%** while preserving **95%** of the variance in the dataset.

– Trained and benchmarked various machine learning architectures (**Random Forest, XGBoost**) to predict pond ecosystem conditions, achieving an **R-squared of 0.88** through iterative **hyperparameter tuning** and 5-fold cross-validation.

Research Assistant — Sep 2023 – Mar 2025
GRIET — *Hyderabad, India*

– Developed **high-precision diagnostic systems**; designed a **CNN** for dermatological classification (**95.27% accuracy**) and a plant pathology framework with a **96.82% top-1 accuracy** across **38** distinct classes.

– Designed a **multi-model ensemble architecture** for **Optical Coherence Tomography (OCT)** analysis, fusing **VGG16, InceptionV3, and U-Net** backends to reach a state-of-the-art accuracy of **98.86%** and an **AUC-ROC of 0.99**.

– Developed a patented Assistive AI system for the visually impaired, integrating a custom **YOLO-based** object detection model (operating at **30+ FPS**) with **Tesseract OCR** to provide sub-second auditory feedback for obstacle avoidance.

– Mitigated severe **class imbalance** in medical datasets through a **hybrid pipeline** of **synthetic data augmentation** and strategic **under-sampling**, improving minority class **F1-scores by 14%**.

Research Intern — May 2024 – Dec 2024
IIIT Hyderabad — *Hyderabad, India*

– Quantified **semantic stability** in **Transformers** by proposing a **semi-intrinsic evaluation metric**; analyzed probability distribution shifts (median $\Delta \approx 0.03$) across 10^4 **synonym substitutions** to measure **embedding robustness**.

– **Fine-tuned BERT-large** models for domain-specific **sentiment analysis**, achieving an **80% F1-score** and optimizing hyperparameters to reduce **training convergence time by 20%**.

– Optimized **Information Retrieval (IR)** systems for judicial cross-referencing, utilizing **BM25** and **Cosine Similarity** to achieve a **Mean Reciprocal Rank (MRR) of 0.82** across heterogeneous legal datasets.

PUBLICATIONS & PATENTS

Publications

- **A Novel Deep-Learning Based Classification of Skin Diseases**
  Tabitha Indupalli*, Dodda Abhiram*, Rayapuraju Srivatsav, Singamsetty Aashrith, Vudiga Vineeth
  5th IEEE Global Conference for Advancement in Technology (GCAT), 2025
  Developed a Deep CNN achieving 95.27% accuracy for multi-class skin disease classification using data augmentation + under-sampling to address imbalance.

- **A Novel Two-Stage Deep Learning Framework for Plant Disease Detection**
  Dodda Abhiram*, K. Anuradha, V.Srilakshmi, K. Adilakshmi
  5th IEEE Global Conference for Advancement in Technology (GCAT), 2025
  Proposed a two-stage hierarchical model (species → disease) achieving 96.82% accuracy on PlantVillage dataset.

- **Deep Learning and OCT Imaging: A Novel Ensemble Approach for Eye Disease Diagnosis**
  Dodda Abhiram*, R. Aruna Flarance, V. Srilakshmi, K. Anuradha
  4th International Conference on Cognitive & Intelligent Computing (ICCIC) – Springer
  Ensemble of VGG16, InceptionV3, and InceptionResNetV2, achieving 98.86% accuracy in OCT-based eye disease detection.

- **Ensemble Approach for Blood Vessel Segmentation in Retinal Images**
  Dodda Abhiram*, Y. Ekantha Sai, B. Siddarth Mahesh, K. Anuradha, B. Sankara Babu
  International Conference on Intelligent Systems & Sustainable Computing (ICISSC) – Springer
  Hybrid U-Net + SegNet with logistic regression refinement, achieving 97.021% segmentation accuracy.

Patent

- **Smart Glasses for Visually Impaired Individuals**
  Sreejyothsna Ankam, Manav, Abhiram Dodda, Dinesh Chandra,Nagireddy Padmakshaya
  Patent No. 202541000874 A, Issued Jan 11, 2025
  Wearable assistive device with object detection, obstacle recognition, OCR-based reading, currency detection, and voice-controlled smartphone integration.

PROJECTS

Distributed ML Inference Engine | C++, ONNX, CUDA, Consistent Hashing, Multi-threading   Link

- Engineered a high-performance C++17 distributed inference system using **ONNX Runtime** with optional **CUDA acceleration** and automatic CPU fallback for heterogeneous hardware support.
- Achieved a throughput of **522.64 req/sec** and a **100% success rate** by implementing a **Dynamic Batching** layer (32-request max size) and a thread-safe **LRU Cache** maintaining a **99.7% hit rate**.
- Architected a robust Gateway utilizing **Consistent Hashing** with 150 virtual nodes for load balancing and **Circuit Breakers** to manage worker health, resulting in a **P99 latency of 164.29ms**.

Speech to Sign Translation | Whisper, T5-Transformer, PyTorch, OpenCV, NLP   Link

- Architected a multimodal pipeline integrating **Whisper-Large-v3** for robust speech-to-text and a **fine-tuned T5-Transformer** for linguistic text-to-gloss translation.
- Achieved a **77% translation accuracy** and a **BLEU score of 0.42**, benchmarking the system against standard ASL datasets.
- Maintained a sub-second (**1.1s**) average inference time per sequence through **INT8 model quantization** and optimized tokenization streams.

FarmEase: Two-Stage Diagnostic System | Tensorflow, EfficientNet, YOLO, Flask   Link

- Developed a dual-stage framework using an **EfficientNet-based localizer** for leaf isolation and a **Stage-2 classifier** for disease identification.
- Achieved **96.8% accuracy** and a **94.2% macro-F1 score** across 38 classes, addressing high-variance agricultural environments.
- Implemented **Stochastic Gradient Descent with Restarts (SGDR)** to improve convergence stability and prevent the model from settling in local minima.

ACHIEVEMENTS

- **Merit Endowment Award** (2021-2022), Gokaraju Rangaraju Institute of Engineering and Technology

- **Merit Endowment Award** (2022–2023), Gokaraju Rangaraju Institute of Engineering and Technology

- **Merit Endowment Award** (2025), Gokaraju Rangaraju Institute of Engineering and Technology

- Ranked in **Top 5%** nationally: IIT Madras NPTEL Data Science for Engineers.

SKILLS

Languages: C/C++, Python, Java, JavaScript, SQL, HTML, CSS, Shell Scripting
Frameworks & Libraries: Flask, Django, VueJS, PyTorch, TensorFlow, JAX, scikit-learn, pandas, NumPy, CUDA
Big Data & Databases: PySpark, Apache Spark, PostgreSQL, MySQL, NoSQL (MongoDB, Redis), ETL
Tools: AWS (EC2, S3, Lambda), Docker, Git, GitHub, Linux, Terraform, gRPC, RESTful API, Latex, Tableau