Yerrabandla Sai Pranav Reddy

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Education

Neil Gogte Institute of Technology   **2023 – Present**
Bachelor of Engineering in Computer Science and Engineering — CGPA: 9.04   *Hyderabad, Telangana*

Sri Chaitanya Junior College   **2021 – 2023**
State Board (XII) — 95.2%   *Hyderabad, Telangana*

Experience

K-Hub   **April 2025 - January 2026**
AI Research Intern, Onsite   *Hyderabad, Telangana*

- Led development of structure-aware generative and regression models for peptide and enzyme modalities using Graph Neural Networks (GNNs) and Diffusion architectures.
- **InversePep (Peptide Inverse Folding - Generative Modeling):** Architected a structure-conditioned sequence generation framework integrating GVP (Geometric Vector Perceptron), Graph Convolutional Networks (GCNs), Transformers, and Diffusion models with 3D backbone-aware encoders. Improved inverse folding benchmark performance by **7%+** over established baselines and optimized NVIDIA DGX training workflows to reduce overall training time. Co-authored manuscript submitted to *Journals* (under review).
- **DeepEnzyme (Enzyme Kinetics Prediction - Regression Modeling):** Engineered a structure-aware regression architecture using Squeeze-and-Excitation GVP-GNNs to predict enzyme kinetic parameters (KCAT) from sequence and 3D structural features. Improved predictive accuracy by **10%+** through dataset expansion, feature engineering and Architectural changes. Containerized training and inference workflows using Docker in Linux environments.

Projects

Bloom - AI-Powered Plant Disease Detection   **Live Demo | GitHub**

- Built an end-to-end plant disease classification system on 87k+ images across 38 classes to enable automated crop health diagnosis. Implemented CNN architectures from scratch in NumPy and production-grade TensorFlow models, achieving 92% accuracy with custom CNN and 97% accuracy using optimized TensorFlow pipelines.Also designed preprocessing and augmentation pipelines manually using OpenCV.
- Deployed a production-ready system with frontend (Vercel), backend APIs (Render), MongoDB for user and prediction management and model hosting (HuggingFace) for real-time inference.

NyayLens - Transformer-Based Legal QA System

- Designed and implemented a domain-specialized RAG architecture combining fine-tuned Legal-BERT embeddings for high-recall semantic retrieval with T5-based generative modeling to produce context-grounded, citation-aware legal answers across structured case corpora.
- Built an end-to-end optimization pipeline incorporating adaptive chunking, semantic reranking, normalization, and iterative supervised fine-tuning, measurably improving retrieval precision and factual consistency over vanilla vector-search baselines.

PranaSetu – Multimodal Mental Health Risk Assessment Platform   **GitHub**

- Developed a full-stack AI-powered monitoring system integrating BERT-based text analysis and EfficientNet image modeling to perform multimodal mental health risk assessment, generating real-time risk scores and clinical insight summaries from social and user-submitted data.
- Engineered a scalable architecture using Node.js, Express, MongoDB, and FastAPI (PyTorch backend), incorporating patient dashboards, longitudinal trend tracking, and AI-assisted reporting via Gemini for clinical interpretation.

Technical Skills

- **Programming:** Python, Java, JavaScript, C
- **Core CS:** Data Structures & Algorithms, Object-Oriented Programming, Database Management Systems, Operating Systems, Computer Networks
- **Web Development:** Node.js, Express.js, REST APIs, React.js, MongoDB, PostgreSQL, HTML, CSS
- **Machine Learning & AI:** PyTorch, TensorFlow, Neural Networks (ANNs CNNs), Transformers (BERT, T5), Graph Neural Networks (GNNs GCNs GVP), Diffusion Models
- **Tools & Systems:** Git, Linux (CLI, Bash), CUDA (basic), Postman, VS Code

Achievements

- Ranked in the **Top 5%** among 50,000+ participants in the Amazon ML Challenge (2025).
- Secured **3rd place** in a 12-hour internal hackathon at Keshav Memorial Engineering College (KMEC).

Certifications

- Oracle Cloud Infrastructure 2025 AI Foundations Associate - Oracle
- IBM Data Analysis Professional Certification - IBM