SWETHA GENDLUR NAGARAJAN

saiswe02@gmail.com | +1 (352) 682 0849 | LinkedIn Profile | GitHub

EDUCATION

Master's in Applied Data Science. (GPA 4.0/4.0) **Aug 2024 - Present**
University of Florida, United States

Bachelor's in Computer Science and Engineering (GPA:8.76/10) **Jul 2019 – Apr 2023**
PSG College of Technology, India.

TECHNICAL SKILLS

- **Python libraries & frameworks:** Keras, Pytorch, PySpark, TensorFlow, JAX, Data Prep, tkinter, streamlit, Gradio.
- **Data Engineering & Big Data:** MySQL, NoSQL (MongoDB, Neo4j, Firebase), Oracle, SQL Server, DataBricks.
- **Programming & Software Engineering:** Python, Java, C, JavaScript, Git, Flutter, Linux, C++, Docker, Fast API, Rest API.
- **Fine-tuning & Optimization:** LoRA fine-tuning, Bit quantization, Model compression, knowledge distillation, A/B testing.
- **Data Science**: Linear Algebra, Statistics & Optimization, Feature Engineering, Data Cleaning, Pattern Mining, Machine Learning, Natural Language Processing, Deep Learning.

WORK EXPERIENCE

***Researcher,* University of Florida.** **Oct 2024 – Present**
Dr. Sorger's Lab collaborated with NVIDIA

- Optimized deep learning models like LeNet-5 and ResNet18 to reduce power and memory usage for photonic AI chips by applying 6- and 8-bit quantization to weights and activations using TensorFlow and JAX, achieving 98% accuracy on MNIST, CIFAR-10, and RF datasets.
- Implemented an efficient co-design pipeline aligning CNN model design with hardware chip limitations, enabling energy-accuracy trade-offs through hardware-in-the-loop simulation and data-driven modeling.
- Spearheaded development of a photonic neural network framework compatible with EIC-PIC integrated systems, facilitating cross-institution collaboration and enabling faster prototyping using PyTorch and JAX.

Machine Learning Engineer **Jan 2024 – Jul 2024**
Optum (United Health Group), India

- Processed and aligned 1M+ patient records using Spark, resolving 30%+ mismatches between unstructured diagnosis texts and structured medical codes through efficient data ingestion and cleaning pipelines.
- Developed clinical NLP models using TF-IDF, and XGBoost to extract and predict medical codes from diagnosis narratives, improving ICD/CPT code mapping accuracy to 92.8% and enabling reliable structured data generation for downstream modeling.
- Customized a retrieval-augmented generation (RAG) system by integrating LoRA-tuned Hugging Face models with a FAISS-based knowledge base built from 2M+ patient records, reducing chatbot hallucinations by 15% compared to standard LLM responses.

Computer Vision Trainee **Jun 2022 – Dec 2022**
Ugam Solutions, India

- Designed and led the development of a ResNet-50 + LSTM-based architecture enhanced with spatial attention to better align visual features with textual tokens, reducing hallucinated descriptions by 22% over baseline models.
- Conducted a comparative study across VGG16, Inception-v3, and GRU models; introduced selective weight initialization and attention refinement, cutting training time by 18% while improving caption quality validated via BLEU, ROUGE, and METEOR metrics.

ACADEMIC PROJECTS

AI-Powered Career Recommendation Chatbot, *University of Florida* | GitHub **Jan 2025 – Apr 2025**

- Addressed the challenge of guiding users through job search and career development by integrating and analyzing 4 large datasets (Job Descriptions, LinkedIn, Coursera, Role-Skills) using pandas, scikit-learn, and NLP preprocessing pipelines.
- Built and evaluated classification models (Logistic Regression, Random Forest, SVM) for resume-role matching and user profile tiering; engineered 20+ features from resume PDFs and job specs, including skill density, seniority, and profile richness metrics.
- Deployed an intelligent job assistant with resume parsing, skill gap analysis, course and job recommendations; achieved 99%+ accuracy in tier prediction and 90%+ resume-role match classification through structured data transformation and feature selection.

***Research Paper Summarizer* ,** *University of Florida* | GitHub **Sep 2024 – Dec 2024**

- Identified inefficiencies in manual literature reviews and built a data pipeline to fetch, clean, and process 500+ academic PDFs using PyMuPDF, regular expressions, and structured text extraction for downstream analysis.
- Engineered an end-to-end NLP workflow using OpenAI LLMs, TF-IDF, and LangChain, converting dense academic papers into concise, section-wise summaries; improved precision and information coverage by 32% through prompt tuning and chain-of-thought prompting.
- Designed a searchable vector knowledge base using FAISS and OpenAI embeddings to store structured paper summaries; reduced manual literature scanning time by 55% and enabled faster data-driven research discovery.

ACHIEVEMENTS

***Cohort Finalist*, Cisco Ideation, India** | GitHub **Feb 2021 – Dec 2021**

- Tackled the problem of pest damage in Indian paddy fields by identifying 4 key pest classes; curated a dataset of 5,000 annotated images from web sources and local farmers, splitting 80/20 for training and testing.
- Trained and compared Inception-v3, VGG16, and SSD-MobileNet using TensorFlow's object detection API; VGG16 achieved the best performance of 94% accuracy on test set and real time data and was converted to TensorFlow Lite for mobile use.
- Led Flutter app development with Firebase integration for real-time detection and image storage; deployed a quantized model achieving 92ms inference speed, earning Top 10 recognition nationally.

WORKSHOPS & CERTIFICATIONS

- Completed NVIDIA DLI certified training in Gen AI with Diffusion Models and Fundamentals of Deep Learning, mastering U-Net architectures, Denoising Diffusion Probabilistic Models (DDPM), and CLIP-guided text-to-image pipelines through hands-on PyTorch implementations.