Vikram Pande

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Education

North Carolina State University **Aug 2022 – May 2024**
Master of Science in Electrical Engineering; ***GPA: 3.97/4.00*** *Raleigh, NC*

Courses: Random Processes, Image Processing, Neural Networks, Advanced Machine Learning, Object Oriented Development, Pattern Recognition, Cloud Computing, Natural Language Processing, Computer Vision, Probabilistic Graphical Models

Savitribai Phule Pune University **Aug 2016 – May 2020**
Bachelor of Engineering Electronics and Telecommunication; ***GPA: 7.93/10.00*** *Pune, India*
Courses: Machine Learning, Image Processing, Data Structures & Algorithms, Computer Networks, Linear Algebra, Vector Calculus

Experience

Dentsply Sirona **June 2024 – Present**
Machine Learning Engineer *Charlotte, NC*

- **Led development and productionization** of ML systems and infrastructure, owning end-to-end codebases; **adopted by 75%** of internal sales teams.
- Reduced information retrieval latency by ∼**99.9%** (few days to seconds) by engineering an **LLM & RAG agentic workflow** using **LangChain**, **OpenAI**, and **Databricks**.
- Improved recommendation precision by **35%**, achieving **0.83 Precision@K** and **0.64 NDCG**, by designing a **two-tower neural recommender** system in **PyTorch**.
- Automated email summarization and classification with **LLMs**, cutting manual effort by ∼**60%**,and streamlining reporting.
- Boosted churn prediction accuracy by **18%** on **100K+ records** using probabilistic models (BG/NBD) and RFM features; improved product sales forecasting accuracy by **20%** using statistical and ML models (ARIMA/Prophet) in **PySpark**.
- Reduced model deployment time by **40%** by implementing scalable **MLOps pipelines** for legacy and new models.

Sozzani Lab, NCSU **Sep 2023 – May 2024**
Research Assistant *Raleigh, NC*

- Achieved **96% F1-score** in **protein sequence classification** by training a custom **CNN-Attention-LSTM** model on Arabidopsis data; published in Nature.
- Reduced model training time by **60%** by parallelizing **neural network training** using **High Performance Computing**.
- Developed an **Autoencoder & KMeans pipeline** to identify and cluster **plant subtypes** for improved phenotype mapping.
- Proposed and implemented a novel **Graph Convolutional Network** with attention to infer **Gene Regulatory Networks** and track plant cell type transitions.

Syngenta **June 2023 – Dec 2023**
Data Science Intern *Durham, NC*

- Applied **HDBSCAN** clustering and **t-SNE** dimensionality reduction to **25k**×**25k** genomic datasets for **subgroup discovery**.
- Optimized data processing by **55%** by automating **ETL pipelines** for genomic data using **Python** and **SQL**.
- Developed a PoC using **transformer-based embeddings** (**BioBERT**, **ESM2**) for **synthetic protein sequencing**.
- Built **interactive Tableau dashboards** to display **real-time KPIs** for stakeholders across **4 countries**.

Accenture **May 2021 – June 2022**
Machine Learning Engineer *Pune, India*

- Improved overall performance by **15%** of an **AI-based document processing platform** serving **25+ enterprise clients**.
- Achieved **82% F1-score** in multi-class document classification by developing an **OCR & BERT-based NLP pipeline**.
- Improved email sentiment analysis model accuracy by **15%** by implementing **TF-IDF, WordNet, and Naive Bayes**.
- Developed an **NER Module** using **LayoutLMv2** to extract entities, boosting parsing accuracy by **25%**, enabling automation.
- Built an OCR-engine **recommender system** using **RandomForests**, reducing client-side processing time by **20%**.

Projects

[NLP] LOLgorithm: Humor Classification (Python, PyTorch, TensorFlow, SciKit-Learn) [ArXiv] **Dec 2023**

- Leveraged **ColBERT** dataset to examine the humor content in a sentence and verify the linguistic theory of humor.
- Created hand-crafted **syntactic and semantic** features modifying the embeddings from **NRCLex, Word2Vec, and WordNet**
- Utilized **contextual BERT embeddings** and improved model accuracy by **14%** with all features using **Colbert model**.

[Computer Vision] Explainable AI for DeepFake Detection (Python, PyTorch) [GitHub] **Nov 2023**

- Achieved an F1 score of **98%** with **XceptionNet** for deepfake detection on **FaceForensics++** and **Celeb-DF** datasets.
- Applied **Explainable AI (XAI)** methods such as **GradCAM, LIME, and LRP** to highlight the relevance of input to the prediction and improved transparency and interpretability.

Tehchnical Skills

Programming Languages : Python, C++, C#, R, MATLAB, SQL
Libraries : Scikit-learn, Matplotlib, Seaborn, Langchain, LlamaIndex, NLTK, SpaCy, Hugging Face Transformers, MLFlow, OpenCV, Pillow, MMCV, OpenVINO, Detectron2, AutoML
Tools & Frameworks: PyTorch, TensorFlow, Keras, Databricks, PySpark, Azure, AWS, Tableau, Git, Docker, Kubernetes, HPC