

Vikram Pande

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Education

North Carolina State University, Raleigh NC

August 2022 – May 2024

Master of Science, Electrical Engineering (Specialization: Machine Learning and Data Science)

GPA: 3.97/4.00

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

Savitribai Phule Pune University, Pune, India

August 2016 – May 2020

Bachelor of Technology, Electronics and Telecommunication Engineering

GPA: 7.93/10.00

Courses: Machine Learning, Data Structures and Algorithms, Artificial Intelligence, Computer Networks, Linear Algebra, Calculus

Work Experience

Machine Learning Engineer, [Dentsply Sirona](#), Charlotte, NC

June 2024-Present

- Spearheaded Machine Learning initiatives to enhance business efficiency and drive impactful outcomes for DS products.
- Engineered an LLM and RAG powered agentic workflow, reducing information response times from a day to seconds.
- Designed and implemented twin-tower product recommendation engine with 0.83 Precision@K and 0.64 NDCG.
- Developed and deployed customer churn prediction and sales forecasting AutoML models for stakeholders.
- Built and optimized scalable end-to-end MLOps pipelines with Databricks and Azure Cloud for legacy models.

Machine Learning Research Assistant, [Sozzani Lab, NC State University](#), Raleigh

Sep 2023-May 2024

- Built a Neural Network for protein sequence classification achieving F1 score of 96%. (*Published in Nature*)
- Trained a custom CNN-Attention-LSTM network and parallelized model training on HPC reducing runtime by 60%.
- Designed and developed an Autoencoder-kmeans pipeline to identify subtypes of Arabidopsis plant.
- Proposed a Graph Convolutional-based architecture to infer GRNs and cell type changes in Arabidopsis plants.

Data Science Intern, [Syngenta](#), Durham, NC

June 2023-Dec 2023

- Implemented classification, clustering and dimensionality reduction algorithms on big genomic data.
- Developed a PoC for protein sequencing with LLMs leveraging transformer-based embeddings to model interactions.
- Automated and optimized manual data pipelines for raw data and reduced processing speed by 55%
- Created monitoring Tableau dashboards displaying KPIs for stakeholders.

Computer Vision Research Assistant, [Active Robotic Sensing Lab, NC State University](#), Raleigh NC

Jan 2023-Sep 2023

- Conducted research to segment damaged and healthy parts of the St. Augustine turfgrass under drought conditions.
- Implemented image processing HSV space thresholding and mean clustering and achieved an average SSIM of 72%.
- Implemented data augmentation, utilized YOLOv8 for object detection and achieved mAP of 89.8% and transfer learning with ViT-16 Vision Transformer for semantic segmentation.

Machine Learning Engineer, [Accenture](#), Pune, India

May 2021-June 2022

- Developed and optimized AI-based document processing platform for 25+ enterprise clients.
- Deployed a document classification model with OCR and BERT transformer and achieved an F1 score of 79%.
- Designed and developed NLP models for Sentiment Analysis and NER for improved document extraction.
- Trained and deployed classification and developed a recommender system for suggesting online OCR services.

Publications

[Identification of Plant Transcriptional Activation Domains \[Nature 2024\]](#)

Morffy N, Van den Broeck L, Miller C, Emenecker RJ, Bryant JA Jr, Lee TM, Sageman-Furnas K, Wilkinson EG, Pathak S, Kotha SR, Lam A, Mahatma S, **Pande V**, Wao A, Wright RC, Holehouse AS, Staller MV, Sozzani R, Strader LC.

Projects

Explainable AI for Deepfake Detection [\[GitHub\]](#)

- Achieved an F1 score of 98% with XceptionNet architecture for deepfake detection on FaceForensics++ and Celeb-DF dataset. 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.

Integrating Semantic, Syntactic and Contextual Elements for Humor Classification [\[GitHub\]](#)

- Leveraged ColBERT dataset to examine the humor content in a sentence and verify the linguistic theory of humor hence. Created hand-crafted syntactic and semantic features modifying the embeddings from NRCLEx, Word2Vec, and WordNet and utilized contextual BERT embeddings and analyzed model performance for all feature types using classical ML and ColBERT model hence performed SHAP analysis for feature importance.

Technical Skills

Languages: Python, C++, C#, SQL, R, MATLAB, SparkSQL

Libraries: Scikit-learn, Matplotlib, Seaborn, Langchain, LlamaIndex, NLTK, SpaCy, Hugging Face Transformers, MLFlow, OpenCV, Pillow, MMCV, OpenVINO, Detectron2, AutoML

Frameworks & Tools: PyTorch, TensorFlow, Keras, Databricks, PySpark, Azure, AWS, Tableau, Git, Docker, Kubernetes