

TECHNICAL EXPERIENCE

SENIOR SPECIALIST, ML ENGINEERING
Merck Sharp and Dohme LLC

JUNE 2024 — Current
Greater Philadelphia, PA

- Developed and deployed machine learning and deep learning models for process optimization, leveraging Python, TensorFlow, and PyTorch to improve manufacturing efficiency
- Designed and implemented computer vision solutions for defect detection and quality control using OpenCV and cloud-based AI services (AWS, GCP)
- Monitored and maintained ML models in production, ensuring performance consistency through drift detection, hyperparameter tuning, and model retraining
- Collaborated with cross-functional teams to integrate AI/ML solutions into manufacturing workflows, optimizing decision-making and process automation

ML ENGINEER

FEB 2024 — MAY 2024

SystemoneX

Boston, MA

- Developed, trained, and optimized machine learning models using TensorFlow, PyTorch, and Scikit-learn to enhance predictive accuracy
- Conducted data exploration, preprocessing, and visualization with Pandas, NumPy, and Matplotlib to identify patterns and improve model performance
- Built and deployed ML applications tailored to business needs, leveraging cloud platforms like AWS and Google Cloud, while researching and implementing suitable ML algorithms

TECHNOLOGY AND STRATEGY HEAD

JAN 2022 — DEC 2023

Northeastern University Sanskriti

Boston, MA

- Fine-tuned open source **LLMs** and deployed **REST API** endpoints on **AWS** to receive more contextual and factual information based on our data using **RAG** through **HuggingFace(Python)**, **LangChain**, **FAISS** and reduced hallucination
- Spearheaded data-driven strategies like A/B testing using Python, Flask, FastAPI, **Tableau**, **JIRA** and **SQL**. to assess complex business use cases, resulting in a significant enhancement of operational efficiency by approximately 50%
- Leveraged state-of-the-art data technology, collaborating cross-functionally to optimize resource allocation and drive strategic decision-making via **Agile** methodologies

MACHINE LEARNING ENGINEER

MAY 2021 — JAN 2022

Motorola Solutions

Somerville, MA

- Trained and deployed deep learning based social distancing tracking using **ONNX** and **FastAPI** in a server production environment in python(PyTorch, TensorFlow, sk-learn, OpenCV). Video data accessed in **AWS S3** using **MongoDB**.
- Containerized software via **Docker** and orchestrated using **Kubernetes** to ensure smooth and fast deployment and seamless dependency management of the trained model hence, maintaining the AI infrastructure
- Utilised quantization, pruning and network surgery to decrease model inference latency by 30% and operationalize the model, identified and monitored important metrics to ensuring smooth **CI/CD** via Bamboo
- Collaborated with cross-functional teams to create proof-of-concept for face recognition using **PyTorch** reducing false negatives by 30%, used **distributed computing(DDP, Sharding)** on GPU to accelerate training by 40%

CLINICAL DEEP LEARNING ENGINEER

DEC 2020 — DEC 2020

Center for Visual Information Tech, IIIT

Hyderabad, India

- Performed user research and collaborated with 5 doctors to devise evidence-based predictions on **mammograms** and **x-rays** and facilitated data creation and landmark detection on foetal ultrasound scans
- Implemented **weakly-supervised segmentation** via **U-Net** to get explainable predictions with multi-class classification and segmentation of affected regions using **CNNs**; achieved accuracy of 97.86% and authored a paper([paper](#))
- Experimented and validated deep learning models by training them on very large unstructured datasets on GPUs; used PyTorch and tensorflow along with other ML frameworks

MACHINE LEARNING ENGINEER

DEC 2018 — DEC 2019

Center for Computational Biology, IIIT

New Delhi, India

- Achieved 95.99% accuracy for prediction of protein-ligand interaction using **SVM**, **Random Forest**, **MLP** etc. by engineering features based on Binary/PSSM profiling of non-redundant protein sequences ([code-1](#), [code-2](#), [paper-1](#), [paper-2](#))
- Deployed an **open-source** web-server with executables to automate **feature generation** and prediction for co-factor(SAM) to cure arthritis, cancer, dementia, depression, etc. with 96% accuracy. Used **SQL** and **pandas** for data management and munging

EDUCATION

Master of Science in Electrical and Computer Engineering, Northeastern University, Boston

SEP 2020 — DEC 2022

Bachelor of Technology in Electronics and Communication Engineering, Shiv Nadar University, India

AUG 2015 — MAY 2019

RESEARCH EXPERIENCE

- **Publication Count:** 7
- **Reviewer Forums/Venues:** AAAI 2025, ICLR 2025, CHIL 2025, ICLR 2024 Machine Learning for Genomics Explorations 2024, ICLR 2024 Time Series for Health - Program Committee and Reviewer, etc.
- **Peer-Review Count:** 25
- **Citation Count:** 152
- Agrawal, P., Mishra, G., & Raghava, G. P. S. (2020). SAMbinder: A web server for predicting S-adenosyl-L-methionine binding residues of a protein from its amino acid sequence. *Frontiers in Pharmacology*, 10, 1690.
- Joshi, A., Mishra, G., & Sivaswamy, J. (2020). Explainable disease classification via weakly-supervised segmentation. In *Interpretable and Annotation-Efficient Learning for Medical Image Computing: Third International Workshop, iMIMIC 2020, Second International Workshop, MIL3ID 2020, and 5th International Workshop, LABELS 2020, Held in Conjunction with MICCAI 2020, Lima, Peru, October 4–8, 2020, Proceedings 3* (pp. 54–62). Springer International Publishing.
- Patiyal, S., Agrawal, P., Kumar, V., Dhall, A., Kumar, R., Mishra, G., & Raghava, G. P. S. (2020). NAGbinder: An approach for identifying N-acetylglucosamine interacting residues of a protein from its primary sequence. *Protein Science*, 29(1), 201–210.
- Mishra, G., & Raghava, G. P. S. (2019). *In-Silico Drug Discovery using Protein-Small Molecule Interaction*. (PhD Thesis). Shiv Nadar University.
- Mishra, G., Ahluwalia, U., Praharaj, K., & Prasad, S. (2019). RF and RFID based Object Identification and Navigation system for the Visually Impaired. In *2019 32nd International Conference on VLSI Design and 2019 18th International Conference on Embedded Systems (VLSID)* (pp. 533–534). IEEE.
- Pande, A., Patiyal, S., Lathwal, A., Arora, C., Kaur, D., Dhall, A., ... Raghava, G. P. S. (2019). Computing wide range of protein/peptide features from their sequence and structure. *BioRxiv*, 599126.
- Agrawal, P., Mishra, G., & Raghava, G. P. S. (2019). SAMbinder: A web server for predicting SAM binding residues of a protein from its amino acid sequence. *BioRxiv*, 625806.

RELEVANT EXPERIENCE(FULL PROJECT LIST AND PUBLICATIONS HERE)

Custom LLM expert via RAG and FAISS using Langchain: Utilised RAG and FAISS to configure LLM based expert on in-house pdfs via LangChain, OpenAI, StreamLit and HuggingFace. Reduced hallucinations and resulted in more accurate generation [code](#)

Accelerated LLM based sentiment analysis using multi-processing: Deployed a sentiment-analysis model(DistilBert) with multi-processing using gunicorn to decrease inference time and used Huggingface to fine-tune the model and deploy it [code](#)

Doctor-patient conversation summary using fine tuned LLMs:- Fine-tuning LLMs for summarising conversation for easy referrals using Parameter efficient Fine tuning(LORA) via Huggingface(Transformers) for fast and efficient usage ([code](#))

Face Recognition:- Employed contrastive learning approaches like SimCLR, CLIP and SimCSE to train a backbone model; formulated deep metric learning and multi-task learning problems to accurately predict if two people are related using PyTorch([code 1](#), [code 2](#), [code 3](#))

Financial Complaint Classification via Fine Tuned LLMs:- Classified text complaints via parameter efficient fine-tuning(LoRA) in Huggingface to optimise compute and storage ([code](#))

Graph NNs: Identified selective inhibitors using GNNs to avoid drug side effects for JAK proteins and predicted pKi value of proteins from SMILES of molecules with an RMSE of 6.16 using **Graph CNNs** in PyG using Pytorch, numpy, etc.

SKILLS

- ML** NLP, Computer Vision, Generative AI, LLMs, GPT, LLaMa, Fine-Tuning, Contrastive Learning, Metric Learning, Information Retrieval, Dropout, Network Surgery, Quantization, Face Recognition, BERT, Transformers, Attention, Regularization
- ML** HPC, Slurm, Lightning, ONNX Runtime, Github, Weights&Biases, Azure, AWS, Docker, CI/CD, Kubernetes, Bamboo, PyTest, GitLab, Github Action, Snowflake, DeepSpeed, Horovod, , GTest, GitK, Python(scikit-learn, Tensorflow, PyTorch, Keras, Pandas, Numpy, HuggingFace, NLTK)
- MISC.** C++, , MATLAB, SQL, Shell Scripting, Linux, JIRA, Agile, Scrum, Tableau