SHRIYA NAGRATH

+1 (213) 677-5916 | nagrath@usc.edu | linkedin.com/in/shriya-nagrath | github.com/snagrath-sys

PROFESSIONAL SUMMARY

Machine Learning (ML) Engineer with a proven track record in high-impact research and development. I have led small teams to tackle complex problem statements in the area of computer vision. Proficient in end-to-end ML project pipelines, from feature engineering and data wrangling to training and optimizing large models (up to 340M parameters) and deploying them in scalable production environments. Extensive graduate-level coursework in ML, algorithms, and mathematics. Certified in Machine Learning, Computer Vision, Natural Language Processing, and more. Expertise in building and optimizing automated ML pipelines, cloud platforms, distributed systems, and cross-functional collaboration.

EDUCATION

***Master of Science, Computer Science*: University of Southern California(USC)** **Aug 2022–May 2024**
Machine Learning, Algorithms, Information Retrieval, Database Systems *GPA: 3.91/4.0*

***Bachelor of Engineering, Electronics and Telecom*: University of Pune** **Aug 2015–Jun 2019**
Valedictorian *GPA: 9.55/10*

WORK EXPERIENCE

Machine Learning Engineer, USC **Jan 2024–Present**
USC Keck School of Medicine, UCSD   Multimodal ML | OCR | RETFound | VGG | CV | XAI
- Leading the development of a robust ML model for glaucoma severity prediction, leveraging the **RETFound model** based on the **large Vision Transformer (ViT)** architecture. Trained on over 80,000 diverse, unbalanced scans from LA County and UCSD datasets, the model is designed for **scalability and deployment across numerous clinics**.
- Conducting **explainability analysis** using **Integrated Gradients**, **LIME**, **Grad-CAM**, and **Occlusion** to interpret critical features influencing model decisions, enhancing trust and usability in clinical settings.
- Utilizing **AUROC** and **Jaccard metrics** to rigorously evaluate model performance by comparing outputs to **gold standard images**, ensuring reliability in high-stakes medical environments.
- Collaborating with multidisciplinary teams, including distinguished faculty, physicians, and public health experts from **USC**, **UCSD**, and **LA County**, to ensure alignment with real-world clinical applications.

Machine Learning Engineer, USC **May 2023–Jan 2024**
USC Dornsife, Department of Molecular Biology   Python | Video analysis | Temporal Action Localization | Object detection | CV
- Led a team of **6 developers** to analyze Drosophila motion patterns using **customized YOLO** for small object tracking and **ActionFormer** for Temporal Action Localization, achieving **mAP 65.6**.
- Designed and managed the **data annotation pipeline**, ensuring fairness and high-quality annotations while determining appropriate annotation metrics.
- Tailored the internals of **YOLO** to detect small objects amidst challenging raw datasets, handling **anomalies in fly anatomy** and **varying photography conditions**.
- Optimized the handling of **100+ hours of video data (24fps)**, overcoming significant data processing challenges.

Research Assistant, USC **Aug 2022-Dec 2022**
Autonomous Networks Research Group   Python | Large model training | Anomaly detection| Time-series analysis | Meta Open Source
- Accomplished anomaly detection in multivariate, time-series data, leveraging GANs and time-series forecasting to ensure safe packet delivery across firewalls. Achieved **41%** improvement over baseline results.

Machine Learning Research Collaborator **May 2021–Sep 2021**
Indian Institute of Technology Bombay (Mumbai, India)   Natural language processing | Transformers
- Built training pipeline of a multi-lingual model to grade essays in six languages, leveraging monolingual and multilingual transformers. Leading to diminishing manual grading effort by **one-fourth**; attaining **90%** test accuracy.

Summer School Student **Aug 2021**
The Cornell, Maryland, Max Planck Pre-Doctoral Research School Germany (Saarland , Germany)
- **Among 150 students selected from 10,000 students worldwide**. Interacted with leading scientists | Exchanged views with like-minded students | Exposed to State-Of-Art(SOTA) research through lectures and project symposiums.

Machine Learning Research Assistant **Feb 2021–Aug 2021**
Defence Research and Development Organisation (New Delhi, India)   AI in healthcare | Life sciences | Tableau
- Drove research towards detecting fatigue in subjects, operating biological parameters and quantifiable responses. SOTA models deployed for supervised classification, led to a **10 point** improvement over baseline results.

Software developer   **June 2024–Present**

Juniper Networks (Westford, MA)   C | C++ | System Design | Operating System

- Developed high-performance networking applications for Routers, coding in C/C++ as part of the Packet Forwarding Group, ensuring scalability, efficiency, and reliability.
- Engineered workflow optimizations and implemented new features, improving system efficiency and resource utilization.
- Collaborated in a dynamic, fast-paced team, engaging in cross-functional problem-solving and integrating customer-driven requirements into production-grade solutions.

Software Developer, *CGBU*   **Jul 2019–Jun 2022**

Oracle *(Bengaluru, India),*   C++ | Design | Operating System | Networking | Customer satisfaction | Collaboration

- Conducted critical performance enhancements and memory leak resolutions, shrinking core latencies by **20%**.
- Led initiative to ease team's bug load by **15%**, solving **25 critical bugs** and **4 customer escalations**.
- Designed and programmed traffic emulation tool with **90+ customer scenarios** and capacity to generate upto **5 million** sessions in 6 hours, minimizing dependency on customer packet captures, snipping issue closure time by **30%**.

PROJECTS

Business catalog application: crowd-sourced reviews, reservation manager, and more.   **Aug 2022**

- Built a business search app using Yelp APIs. Frameworks deployed: Flask, NodeJS, Angular, and Android. Executed various functionalities and gained experience in more than **10 full-stack technologies.**

Richter's Predictor: Modeling Earthquake Damage   **Feb 2023**

- Based on aspects of building location and construction, predicted level of damage to buildings caused by the 2015 Gorkha earthquake in Nepal. Achieved a **micro F1 score of 75.12 and ranked 3rd on class leader-board**.

SKILLS

Languages: Python, SQL, C, C++, Java, JavaScript, HTML/CSS

Machine Learning/Deep Learning Frameworks: Computer Vision, Numpy, Pandas, Seaborn, Scikit-learn, Keras, Tensorflow, PyTorch, OpenCV, CT Imaging, ResNet, NLP, Large Language Models(LLMs), transformers, Generative Adversarial Networks, Multimodal ML, explainable AI (XAI)

Tools/Tech/Database: Distributed Systems, Data Analysis, Predictive Analytics, Tableau, Bootstrap, Flask, MongoDB, Valgrind, XML, Protocol Buffers, Wireshark, GNU Debugger, Kafka, Spark, Agile, AWS, Azure, Oracle Cloud, Jira, Git, Redis, React, Angular, Android, JSON,DOM, Google Cloud Platform.

EXTENDED EDUCATION

1. Coursera - Machine Learning by Stanford University
2. Coursera - Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization
3. Coursera - Sequence Models
4. Coursera - Convolutional Neural Networks
5. Coursera - Neural Networks and Deep Learning
6. Coursera - Structuring Machine Learning Projects
7. Coursera - Mathematics for Machine Learning: Linear Algebra
8. Coursera - Mathematics for Machine Learning: Multivariate Calculus
9. Coursera - Natural Language Processing with Classification and Vector Spaces
10. Coursera - Natural Language Processing with Probabilistic Models
11. Coursera - Natural Language Processing with Sequence Models
12. Coursera - Natural Language Processing with Attention Models
13. Oracle University - EDV Python
14. Oracle University - EDV Data Science and Machine Learning Using Python EMP LVC
15. NPTEL - Analog Circuits
16. NPTEL - Programming, Data structures and Algorithms using Python
17. NPTEL - Computer Organization and Architecture