

Shivasankaran Vanaja Pandi

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EDUCATION

Stony Brook University, SUNY

Master of Science in Computer Science; GPA: 3.97

- **Thesis:** Robust Particle Detection for Cryogenic Electron Microscopy.
- **Coursework:** Computer Vision, Machine Learning, Natural Language Processing, Distributed Systems.

Indian Institute of Technology (IIT)

Bachelor of Technology with honors in Computer Science; GPA: 3.8

Stony Brook, NY

Aug 2023 – May 2025

Gandhinagar, India

Aug 2019 – May 2023

EXPERIENCE

Machine Learning Engineer | Healthcare Data Integration, Data Quality, Python

Sep 2024 – May 2025

Deep Forest Sciences

Remote

- Supported **integration of biomedical datasets** from multiple institutions, validating quality and completeness through profiling that resolved **94% of inconsistencies** before deployment.
- Maintained **business rules for data transformation** using Python and SQL, ensuring accurate mapping of clinical terminology and achieving **99.2% data validation accuracy** across diverse healthcare formats.
- Collaborated with **interdisciplinary technical teams** to gather requirements for data structure analysis, providing clear documentation and process guidelines that reduced onboarding time for new datasets by **45%**.

Software Engineer (Open-Source) | Data Analysis, Documentation, Collaborative

May 2024 – Aug 2024

Google Summer of Code – DeepChem

Remote

- Assisted in **validating scientific datasets** for machine learning applications, conducting systematic data profiling and quality assessments that ensured **comprehensive data completeness** across 12 different databases.
- Contributed to **clear documentation of analytical processes** and best practices, creating detailed guides and workflow documentation that improved team knowledge sharing and reduced project setup time by **38%**.
- Demonstrated **methodical problem-solving approach** while working with remote teams across multiple time zones, maintaining excellent communication and delivering consistent results in collaborative environment.

PROJECTS

Scalable Multi-GPU Training Platform | PyTorch, CUDA, Distributed Training, MLOps

Jan 2025 – Apr 2025

- Built a **distributed training system** supporting data and model parallelism across GPUs, implementing efficient gradient synchronization and achieving **85% scaling** while training transformer models with 100M+ parameters.
- Implemented **advanced optimization techniques** including mixed-precision training and dynamic loss, reducing memory footprint by **40%** and enabling training of larger models within GPU memory constraints.
- Developed **automated hyperparameter optimization** pipeline with Optuna and Ray Tune, systematically exploring 1000+ configurations and achieving **15% improvement** in performance through search strategies.

High-Performance ML Inference Engine | TorchScript, GPU Profiling, Production

Sep 2024 – Dec 2024

- Designed **production ML inference system** using TorchScript compilation and ONNX runtime optimization, achieving **10x throughput improvement** over standard PyTorch inference while maintaining model accuracy.
- Profiled and optimized **GPU kernel performance** using NVIDIA Nsight and PyTorch Profiler, identifying memory bottlenecks and implementing custom CUDA kernels that reduced inference latency by **35%**.
- Established **comprehensive monitoring and alerting** for production ML pipelines, implementing automated model performance tracking and drift detection that enables rapid identification and resolution of model degradation issues.

Novel Transformer Architecture Research | PyTorch, JAX, Numerical Methods, Research

May 2024 – Jul 2024

- Prototyped **sparse attention mechanisms** in PyTorch and JAX, reducing compute by **60%** while preserving performance on benchmark sequence modeling tasks.
- Applied **advanced numerical computation methods** including custom gradient estimators and numerical optimization techniques, enabling stable training of novel architectures and validation of theoretical improvements.
- Built a **reproducible research framework** with automated tracking and versioning, enabling rapid iteration and systematic comparison of **20+ model variants** with significance testing.

TECHNICAL SKILLS

Languages: Python, C++, CUDA, SQL, Bash

ML Frameworks: PyTorch, JAX, TensorFlow, Scikit-learn, Hugging Face Transformers

Numerical Computing: NumPy, SciPy, CuPy, BLAS/LAPACK, Numerical Optimization

ML Infrastructure: TorchScript, ONNX, MLflow, Ray, Docker, Kubernetes, GPU Profiling

Research Tools: Jupyter, Weights & Biases, Optuna, Git, Linux, Distributed Computing

ACHIEVEMENTS

- Top 100 in Joint Engineering Examination (Math + Physics) among 1.2 million students
- Published first-author research papers at top-tier conferences including AAAI, EMNLP, WACV, and ISBI
- Google Research Travel Award