SJ Arulprasaad

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Summary

Proficient in Data Structures and Algorithms using Java, with deep expertise in advanced machine learning and deep learning architecture designing. Specialized in developing and optimizing novel neural models with a keen focus on efficiency, mathematical grounding, and optimization for high-performance computing. Proven ability to translate cutting-edge research into scalable, high-impact solutions for complex problems.

Education

Bachelor of Technology, Computer Science and Engineering (AI/ML)
VIT Chennai, Tamil Nadu, India — Aug 2023 – May 2027
CGPA: 9.43/10

Maharishi Vidya Mandir, Chennai, Tamil Nadu — May 2023
Score: 94.5%

Technical Expertise

Languages: Python, Java, SQL, C/C++, R, JavaScript, React
Frameworks: PyTorch, TensorFlow, Hugging Face Transformers, scikit-learn, XGBoost
Advanced Techniques: WGANs, Custom Attention Mechanisms, Bio-Inspired Optimization, Few-Shot Learning, Quantization, Computer Vision
Tools & Platforms: Docker, FastAPI, Airflow, NumPy, Pandas, PostgreSQL, MySQL

Soft Skills

Problem-Solving, Critical Thinking, Teamwork, Adaptability, Leadership, Time Management

Applied Research Experience

Quantum-Inspired Anomaly Detection — Summer 2024
VITC University — Python, NumPy, scikit-learn

- **Engineered** end-to-end anomaly detection pipelines for streaming datasets (30M+ rows) using quantum-inspired embeddings.
- **Automated** sliding-window monitoring, reducing manual validation workload by **70%**.

Key Projects

Neuro-loop WGAN: Bio-Inspired Feedback for Image Generation — PyTorch, WGAN

- **Designed** a customized WGAN with biological critic-feedback, reducing training epochs by **15%**.
- **Optimized** dynamic loops for high-resolution training under **12 GB VRAM**.

Few-Shot Multilingual Learning with a Mini-Transformer — PyTorch, HF Transformers

- **Developed** a lightweight Transformer achieving **88% accuracy** on unseen languages with only 10 samples.
- **Enhanced** generalization via prompt-based adaptation and RL tuning.

Recurrent Memory Transformer for Long-Context Efficiency — PyTorch, Recurrence, Long-Term Dependencies

- **Architected** a memory-efficient Transformer variant using a **recurrent mechanism** to maintain state across long sequence segments.
- **Enabled** processing of sequences **5x longer** than standard models by reusing past hidden states instead of full attention calculation.
- **Demonstrated** stable performance on long-range dependency tasks while achieving a **40% reduction in inference memory footprint**.

Dynamic Programming for Sequence Prediction and Alignment — Python, DP, Sequence Modeling, Beam Search

- **Integrated** the **Viterbi Algorithm** (a DP technique) into the prediction layer of a sequence model to determine the globally optimal label sequence.
- **Developed** a custom DP-based decoding mechanism, improving the sequence-level **F1 score by 5%** in a Named Entity Recognition (NER) task.
- **Implemented Beam Search** during inference to efficiently navigate the prediction space, balancing speed and optimality.

Honors and Awards

- Ranked **1st** in AI/ML specialization, Semester 1, VIT Chennai.
- Top **15 team** (out of 100+), Data Mission Impossible (Kaggle Workshop).