Frankie Liu

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Technical Skills

ML	PyTorch, TensorFlow, scikit-learn, Hugging Face, Keras
NLP	Transformers, BERT, RAG, summarization, embedding models
CV	CNNs, U-Net, segmentation, DenseNet
Deployment	Vertex AI, Docker, Kubernetes, Airflow, ML pipelines, Ray, Spark
Programming	Python, Java (Guice), Scala, C, PHP, Typescript/React, SQL

Experience

Staff Software Engineer, Google, CA (2020 – present)

Led initiatives to improve operational efficiency across Google's global data center infrastructure, resulting in multi-million dollar cost savings.

- Designed and deployed a cross-service telemetry platform for real-time anomaly detection, reducing debugging latency by 10x.
- Built a system for multi-dimensional data aggregation and ML-assisted root cause analysis, cutting investigation time from weeks to days.
- Built a RAG LLM-based system to automate triage of support tickets, significantly reducing on-call toil and manual load.

Member of Technical Staff Software Engineer, Oracle (2010 – 2020)

Worked across automation, hardware optimization, and ML systems to improve design and operational workflows.

- Automated analog circuit generation at 10nm using ML-based design rules, improving performance by >10% and reducing product cycles by ~3.5 weeks.
- Built internal tools integrating simulation data to accelerate feedback loops for hardware design and verification.

PhD in Electrical Engineering, Stanford University, CA

Focus: Sub-atomic imaging of carriers in semiconductors using advanced microscopy.

Projects & Publications

- **Image Segmentation for Root Detection**: Developed a U-Net-based segmentation model (PyTorch) for identifying fine-grained root structures. Achieved 95% Dice coefficient, cutting manual annotation time from hours to seconds per image. Published in AGU, New Phytologist.
- **Satellite Image Classification Pipeline**: Built an ML pipeline for satellite image classification using DenseNet, including preprocessing and augmentation. Achieved 97% classification accuracy. [arXiv].
- **Scalable NLP Pipeline for Content Summarization and Tagging**: Designed and deployed a scalable BERT-based NLP pipeline for content summarization and tagging, serving approximately 1,000 queries/day. Improved content moderation throughput by 40% and reduced manual review workload.