Kapil Wanaskar

San Francisco, CA, US ✉ kapilw25@gmail.com 📞 +16698379485 in LinkedIn 🔷 Google Scholar

💼 Work Experience

First American Title, *Senior ML Engineer*   Apr 2025 – Present | Remote, CA, USA
- Engineered MultiAgent [WebSearch + Verification] workflow automating 250,000+ daily repetitive tasks, eliminating $1.25M in manual processing costs ($5 per task) while achieving 98% accuracy rate [**Patent** Pending]
- Optimizing model costs by 78% through knowledge distillation: Fine-tuned Qwen2.5-VL-7B to replace Gemini-2.5-Pro-API, deployed via Ollama achieving 2.3x faster inference speeds in production MultiAgent workflow

Amazon Web Services (AWS), *Applied ML Engineer*   May 2024 – Mar 2025 | Cupertino, CA, USA
- Implemented GRPO, an advanced Reinforcement Learning (RL) fine-tuning strategy, to optimize Llama3.1; improved training efficiency by 40% over PPO while preserving accuracy across 100K+ samples
- Optimized large-scale distributed model training across 100+ Trainium accelerators with int4 quantization, implementing efficient data parallelism that reduced inter-node communication overhead by 35% and memory usage by 60%

Intuitive Surgical, *Software Engineer - ML*   May 2023 – May 2024 | Sunnyvale, CA, USA
- Built FastAPI + VectorDB-based inference pipeline to detect out-of-distribution robotic surgery logs; achieved 98% precision, enabling early-stage anomaly flagging by the clinical safety team
- Supervised fine-tuned (SFT) LLM via PEFT (LoRA) on few-shot human-labeled feedback
- Post-trained embedding encoders and re-indexed FAISS via Online Reinforcement Learning (RL) for similarity updates, improving security by 13%
- HyperParameter tuned 130,000+ variations of unsupervised models on 150+ GB data using SageMaker + MLflow; achieved 92% precision and 99.9% accurate training inputs

Vectorr.in, *Software Engineer*   Mar 2018 – Jul 2022 | Mumbai, India
- Engineered unsupervised customer segmentation system 10k+ (daily) visits stored in Snowflake database, surging customer satisfaction from 3.1 to 4.8.
- Integrated Apache Kafka and Superset to segment real-time audience data for digital marketing while training Unsupervised models on AWS EC2, amplifying ROI by 23%.

📖 Research Publications

A Framework for Switchable LLM Alignment via CITA – Contrastive Instruction-Tuned Alignment 🔗   2026
- Achieved 86.7% instruction-alignment efficiency on Llama-3.1-8B with 25% higher reward margins (7.5 vs 6.0) **outperforming DPO** by 30.6pp, **GRPO** by 50.6pp, and **PPO** by 66.3pp across multi-dimensional evaluation
- Created ECLIPTICA benchmark with 3,000 prompt across 10 instruction types and 5 benchmarks
- Developed CITA algorithm with unified training pipeline (SFT→DPO→CITA) combining contrastive preference optimization and mandatory KL anchor, validated through Optuna-based hyperparameter search across 13 trials

A Comprehensive Dataset for Human vs. GenAI Image Detection 🔗   2026
- Created MS COCOAI dataset with 96,000 semantically-aligned real/synthetic pairs from 5 Text2Image models for controlled artifact studies
- Established dual-task benchmark achieving 80.1% binary detection and 44.9% model attribution
- Designed frequency-domain ResNet-50 robustness framework, detecting with 80.1% accuracy across 4 perturbations

Multimodal Benchmarking and Recommendation of Text-to-Image Generation Models, *IEEE CISOSE 2025* 🔗   2025
- Received the "BDS **Best** Student **Paper**" **award**
- Evaluated 12+ (text-to-image) models (Stable Diffusion, CogView, FLUX, etc.) with ground truth from DeepFashion Multimodal dataset for alignment
- Designed Weighted Score metric combining CLIP-Score, LPIPS, FID, MRR& Recall@3 via min–max normalization
- Integrated metadata features and CLIP embeddings to align generated with ground truth image and prompt context
- Metadata-augmented models (Flux, InContext LoRA) showed ~19% higher Weighted Score & ~15 point FID reduction

Prompt Recommendations for AI art, *IEEE AIKE, California, USA* 🔗   2023
- Extracted features of 5000 images via text embeddings and ensemble models
- Proposed Graph-based evaluation of 3 recommendation Algorithms and Community Detection Algorithms, via analyzing absence of ratings or preference scores

🎓 Education

MS in Artificial Intelligence, Computer Engineering,   CA, USA
San José State University

Master of Computer Integrated Manufacturing and Bachelor of Engineering, *Indian Institute of Technology (IIT) Bombay*   Mumbai, India