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OpenAI Residency Program
San Francisco, CA

Dear Residency Selection Committee,

I am applying for the OpenAI Residency 2026 because I want to understand why AI agents fail—and how to make them reliable.

At age 11, I won Gold at the Indian National Mathematical Olympiad (INMO). That early training in rigorous problem-solving shapes how I approach AI today: break complex problems into tractable pieces, test hypotheses systematically, and persist through confusion. Now, as a Graduate Research Assistant building multi-agent systems with CrewAI and LangChain, I've encountered a fundamental challenge: agents that work in demos fail unpredictably in production. One agent's hallucination cascades through the system, corrupting downstream decisions. Current retry mechanisms don't address why failures occur.

This is the problem I want to solve at OpenAI.

My technical foundation is strong. I fine-tuned Qwen3-4B using QLoRA with 4-bit NF4 quantization, achieving 9.5/10 quality scores while reducing GPU memory to 18-22GB—learned entirely through self-study in three weeks. I've deployed 8-microservice MLOps platforms on AWS, built Kubernetes architectures handling 500 RPS, and shipped 27 substantial projects across ML, backend, and infrastructure. I don't wait to know everything before building.

What excites me about OpenAI specifically:

1. RESEARCH AT THE FRONTIER: OpenAI's work on tool use, function calling, and autonomous agents directly connects to my research interests. I want to understand the theoretical foundations of reliable agency.

2. LEARNING FROM THE BEST: The Residency's mentorship structure would accelerate my transition from applied ML engineering to research. I learn fastest through immersion and feedback.

3. MISSION ALIGNMENT: I believe general-purpose AI should benefit humanity broadly. My work democratizing LLM fine-tuning through efficient quantization reflects this—making powerful AI accessible rather than exclusive.

I'm finishing my MS in Computer Science in December 2025, timing that aligns perfectly with the Residency. I'm ready to relocate to San Francisco, work from HQ, and immerse myself completely in frontier AI research.

Given access to OpenAI's researchers and infrastructure, I would prototype aggressively, iterate based on feedback, and contribute meaningfully from day one. My track record—from Olympiad gold to 27 shipped projects—demonstrates I can ramp quickly in any domain.

I would welcome the opportunity to discuss how my experience with agentic systems, efficient fine-tuning, and systematic problem-solving can contribute to OpenAI's research mission.

Sincerely,
V Harsha Vardhan Yellela