Onyie Okoye

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Education

Stanford University Stanford, CA
BS in Mathematics, MS in Computer Science (AI Track), GPA: 3.9/4.0 *September 2022 – Expected June 2026*

- **Coursework**: Deep Learning for Computer Vision, Natural Language Processing, Operating Systems, Computer Systems, Probability, Data Structures and Algorithms

Experience

Bridgewater Associates Stamford, CT
Investment Engineer Intern *June 2025 – August 2025*

- Built a **natural-language research interface** that converted free-form text prompts into interactive financial visualizations for internal investment teams.
- Developed and backtested **systematic trading models** in Python using macroeconomic and market signals to evaluate quantitative investment strategies.
- Built analytical tooling and model-driven research workflows in collaboration with investment teams to operationalize quantitative insights.

Stanford Global Positioning System (GPS) Lab Stanford, CA
Software Engineering and Research Intern *June 2024 – September 2024*

- Rebuilt a GPS authentication system in **MATLAB** with stronger cryptographic guarantees, increasing HMAC size from 16 to 28–37 bits and implementing aggregated authentication logic.
- Implemented **error-correction algorithms** enabling authentication under up to 40% message loss.
- Achieved **100% test coverage** through optimized unit and end-to-end testing.
- Dockerized the development environment for reproducible builds and faster testing.

NASA Jet Propulsion Laboratory Pasadena, CA
Mars Science Laboratory Robotics and Software Engineering Intern *June 2023 – August 2023*

- Accelerated Curiosity rover planning scripts by **90%** through modular refactoring, mocked service calls, and runtime profiling.
- Built an automated **HTML reporting pipeline** for rover operations workflows with dynamic text and image generation.
- Improved reliability by expanding automated test coverage for rover operations tooling.

Projects

Founder & Technical Lead – Adaptive AI Language Tutor | *Flutter, Supabase, Claude, Whisper, ElevenLabs* 2025 – Present

- Built a **Flutter + Supabase** language learning platform with a real-time LLM-driven conversational tutoring system, persistent learner profiles, and RLS-enforced per-user data isolation.
- Designed a **multi-model AI pipeline** using Claude for dialogue generation, pedagogical analysis, and feedback, integrated with dual speech recognition and neural TTS.
- Implemented adaptive learner modeling using **EMA-based proficiency tracking** and **FSRS-6 spaced repetition** across vocabulary, grammar, communicative skills, and kanji progression.
- Developed a persona-driven end-to-end testing harness that simulates learner interactions through the live AI pipeline and validates downstream learner profile behavior.

Offline RL for Adaptive Language Tutoring | *PyTorch, Offline RL, LLM Systems* May 2026 – Jun 2026

- Formulated conversational vocabulary scheduling as a sequential decision problem and trained an offline RL policy to optimize long-term retention while preserving conversational naturalness.
- Built a stochastic learner simulator with FSRS-inspired forgetting dynamics and knowledge-state evolution to train and evaluate adaptive teaching policies.
- Benchmarked learned scheduling policies against heuristic spaced repetition and direct LLM prompting, analyzing trade-offs between retention and dialogue quality.

Gravitational Lensing Detection via Deep Learning | *PyTorch, NumPy, scikit-learn* Mar 2025 – Jun 2025

- Designed and implemented an end-to-end deep learning system for strong gravitational lens detection, achieving >**90% accuracy** on realistic simulated datasets.
- Benchmarked **CNN**, **Vision Transformer**, and **SVM** architectures for classification and Einstein radius regression, including robustness and ablation studies.
- Applied **Grad-CAM** interpretability analysis to connect model attention with physically meaningful lensing features.

Leadership and Activities

President of Alumni Relations | *Alpha Kappa Psi Business Fraternity* June 2025 – Present
Coauthor | *Modernization of Command Line Tools for MSL Rover Operations* June 2023 – Present

Skills

Programming: Python, C++, C, Java, JavaScript, SQL, MATLAB
AI / ML: PyTorch, Hugging Face Transformers, Offline RL, LLM Systems, NLP, Computer Vision
Systems / Product: Flutter, Supabase, Docker, Linux, Git, Jupyter