Joseph Kofi Adu

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Education

- **Grambling State University** Expected Graduation May 2028
  B.S. in Computer Science - GPA: 4.0 *Grambling, Louisiana, USA*
  - Relevant Coursework: Data Structures, Algorithms, Operating Systems, Database Systems, Machine Learning, Object-Oriented Programming, Discrete Structures

Technical Skills

- Python, C++, JavaScript (ES6+), SQL, HTML/CSS, Flask, React, Next.js, REST APIs, PostgreSQL, Vision LLM APIs, Multimodal Systems, Git, GitHub, Linux CLI

Technical Experience

- **Hackathon Participant - NexHacks 2026** Jan 2026
  Built TokenSqueeze: Task-Aware Vision Optimization System *Carnegie Mellon University*
  - Designed and implemented a task-aware preprocessing pipeline to optimize visual inputs for multimodal models based on inferred user intent.
  - Built intent classification and routing logic to select task-specific optimization strategies including OCR, object detection, and scene understanding.
  - Integrated and orchestrated multimodal inference workflows using Vision LLM APIs to reduce token usage while preserving task-level accuracy.

Projects

- **NavGuard - Navigation Validation & Telemetry Analysis System**
  Python, FastAPI, Pandas, NumPy, Pytest, GitHub Actions, Linux
  - Designed and implemented an automated validation pipeline to compare navigation software versions using telemetry-style route data.
  - Defined route quality metrics (ETA accuracy, route efficiency, turn correctness) and implemented threshold-based regression detection for release gating.
  - Built a backend FastAPI service and CI-driven test workflow to ensure reliable, repeatable validation across navigation updates.
- **TokenSqueeze - A Semantic Image Optimizer**
  Python, Vision LLM APIs, Multimodal Systems, API Integration
  - Built a task-aware preprocessing system that dynamically optimizes image inputs for Vision LLMs based on user intent, reducing unnecessary visual token usage.
  - Implemented an intent classification pipeline to select optimization strategies for different query types including binary checks, OCR, object detection, and scene understanding.
  - Integrated with GPT-4o Vision APIs and TheTokenCompany's Bear-1 API to form a full multimodal cost-optimization workflow.
  - Achieved up to 90%+ token reduction on low-detail tasks while preserving response accuracy.
- **Runners - Music Event Discovery & Ticketing Platform**
  Next.js, React, TypeScript, Supabase, PostgreSQL, Stripe, Tailwind CSS
  - Built a full-stack web application that enables users to discover live music events and securely purchase digital tickets through a modern, responsive interface.
  - Implemented server-side rendering and dynamic routing with Next.js App Router to deliver fast, scalable event pages and a production-ready frontend architecture.
  - Integrated Supabase authentication and relational database design with row-level security to manage users, events, orders, and user-specific ticket ownership.
  - Developed a Stripe-powered checkout system to process payments and generate digital tickets after successful purchases.

Leadership and Extracurricular

- **ColorStack - Grambling State University Chapter** 2024 – Present
  Member
  - Participate in a nationwide community supporting Black and Latinx computer science students through mentorship, coding workshops, and networking.
  - Collaborate with peers on technical interview preparation and skill-building activities for internship readiness.
  - Engage in initiatives promoting diversity and inclusion in computing.