Tyrone Marhguy

Computer Engineering @ UPenn | Full-Stack Development & Systems Software Engineering
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Education

University of Pennsylvania Philadelphia, PA
Bachelor of Science in Computer Engineering Expected May 2028
Relevant Coursework: Data Structures & Algorithms, Machine Learning, Full-Stack Development, Database Systems, UX Research, Circuits & Systems

Technical Skills

Languages: Python, C++, C, TypeScript/JavaScript, Bash/Shell
Frameworks: FastAPI, React/Next.js, Node.js, Tailwind CSS, Material-UI, XGBoost, GraphQL/REST
Data & Cloud: PostgreSQL, Redis, MongoDB, Docker, AWS (EC2, S3, Lambda), pandas, NumPy, scikit-learn
DevOps & Testing: Kubernetes, Jenkins, Git/GitHub, GitHub Actions (CI/CD), Helm, Pytest, Jest
Tools: OAuth2, JWT Auth, SHAP, D3.js

Projects

UniBridge Ghana — National Admissions Platform **Project Link**

- **Engineered** Ghana's first centralized admissions portal for **350K+ applicants/year** using FastAPI, React, Redis, and PostgreSQL, achieving **99.9% uptime**.
- Optimized API endpoints to deliver **P99 <500ms** latency under **10K+ daily requests**, integrating XGBoost recommendation engine with **92% top-3 match accuracy**.
- Automated CI/CD pipeline with GitHub Actions and Kubernetes, cutting deployment time by **40%**.

MoMo Credit Score — Mobile FinTech Analytics **Project Link**

- **Constructed** Ghana's first consumer credit platform processing **1M+ transactions** with FastAPI microservices and XGBoost ML pipeline (**AUC 0.82, P99 <400ms**), improving lender approval rates by **32%**.
- Created **200+ feature** RFM analysis pipeline; **launched** bilingual React dashboard with SHAP explainability and AES-256 encryption.
- **Integrated** feature store (Feast) supporting **250 RPS** and sustaining **99.7% uptime**.

AtomAssembler — Custom 8-bit CPU Assembler **Project Link**

- **Devised** two-pass assembler translating 20+ mnemonics to Intel-HEX, reducing firmware build time by **70%**.
- Linked automated testbench validating **50+ programs** with **100% pass rate**, accelerating verification cycles by **60%**.
- Produced CLI with debugging hooks, cutting firmware iteration turnaround by **2×**.

Music and You — Full-Stack ML Platform **Project Link**

- **Introduced** ML-based music analytics platform (FastAPI, OAuth2) supporting **1M+ users**, sustaining **<2s P95 latency**.
- **Assembled** React interface with async streaming, reducing load times by **40%** and tripling user engagement.
- Orchestrated Dockerized CI/CD with GitHub Actions, **launched** in **6 min** and achieving **12 min MTTR**.

Experience

Teaching Assistant, CIS 1100 July 2025 – Present
University of Pennsylvania *Philadelphia, PA*

- Mentored **300+ students** weekly, cutting runtime errors by **40%** through live code reviews.
- Authored **50+ Pytest autograder suites**, reducing grading turnaround to **<24 hours**.

Computer Science Intern May 2025 – August 2025
Heag Pain Management *Greensboro, NC*

- **Implemented** HIPAA-compliant FastAPI + PostgreSQL system digitizing **10+ intake forms**, reaching **90% staff adoption**.
- Automated reporting workflow, trimming prep time from **72h to 4h** and improving data accuracy by **30%**.

Computer Science Instructor Feb 2025 – May 2025
Fife Academy, University of Pennsylvania *Philadelphia, PA*

- **Guided** 10-week Python curriculum to **16+ students**, increasing engagement by **25%** and reducing errors by **40%**.

Leadership & Activities

Google Developer Groups @ Penn & Penn Aerospace Club Sept 2024 – Present
Prototyped microcontroller systems and **crafted** Python ML dashboards for weather forecasting, used by **20+ members**.
ColorStack @ Penn & National Society of Black Engineers Sept 2024 – Present
Mentorship, professional development, and technical workshops supporting underrepresented engineers.