Aly Farghali

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Education

Georgia Institute of Technology — Atlanta, GA
Bachelor of Science in Computer Engineering; GPA: 3.92/4.0 — *Expected May 2028*

Experience

Caterpillar Inc. — Fairburn, GA
Software Engineering Intern — *Aug. 2026 – Dec. 2026*

- Deployed real-time operations app (React, Flask) integrating an internal Caterpillar API, centralizing warehouse data in PostgreSQL and S3, and surfacing 15+ KPIs that 50+ daily operators use to spot bottlenecks
- Developed end-to-end ML pipeline (KNN on semantic embeddings) classifying supplier quality and compliance emails at 94% accuracy, saving 20+ manual screening hours weekly
- Architected ETL migration of 4,000+ parts and CAD drawings (Python, SQL) with automated checksum validation, achieving zero data loss during legacy system sunset

Georgia Tech Center for Academic Success — Atlanta, GA
Dashboard Team Lead (Data Engineering) — *July 2026 – Present*

- Implemented Python/SQL ETL merging 6 datasets (15K+ records) into a normalized PostgreSQL warehouse
- Cut query latency 80% (10s to <2s) via indexing and incremental refresh for 40+ weekly Power BI reports
- Led a 4-person engineering team, establishing the team's code review process and SQL query optimization rules

Georgia Tech ByteFight — Atlanta, GA
Software Engineer — *April 2026 – Present*

- Engineered AWS-hosted game server and bot evaluation platform adopted by 2 Georgia Tech CS courses, supporting 100+ concurrent participants with ELO ratings and automated tournament generation
- Created game engine and Docker-sandboxed bot pipeline running Python, Java and C++ under CPU/time limits

Projects

SpinCycle | *C, Go, MQTT, PostgreSQL/TimescaleDB, Redis, React* — spincycle.alyfarghali.com

- Built IoT laundry monitor: ESP32-C6 sensors stream telemetry over MQTT/TLS to a Go service that classifies machines as free, running or finished, serving 70+ students
- Designed crash-safe ingest (ack-after-commit, transactional dedup), verifying exactly-once storage of 3,000/3,000 readings across a forced crash; load-tested to 10K connections at 12K msg/s, p99 50 ms
- Wrote ESP-IDF firmware in C (FIFO driver, RMS signal processing, backoff reconnect, verified TLS) and a hysteresis state machine tuned on real wash cycles

ReWeave | *Python, FastAPI, OpenCV, SQLite, React* — reweave.alyfarghali.com

- Launched full-stack marketplace converting fabric-waste photos into priced lots, with OpenCV segmentation extracting each scrap's color histograms and dimensions for automated grouping and quality grading
- Designed pricing engine across 10 fabric types with purity, color, weight and count multipliers, served over REST

Technical Skills

Languages: Python, Go, C, C++, Java, JavaScript/TypeScript, SQL, Rust, Bash
Frameworks: React, React Native, Redux, Flask, FastAPI, Spring Boot, Node.js, Express
Cloud & DevOps: AWS (Lambda, DynamoDB, S3, RDS), Docker, Kubernetes, Linux, Git, GitHub Actions
Data & Systems: PostgreSQL, TimescaleDB, Redis, SQLite, MongoDB, scikit-learn, OpenCV, MQTT, ESP-IDF

Leadership & Activities

AWS Builders Club (Cloud Computing Lead) · RoboJackets (Software Team) · SiliconJackets (Digital Design) · GT Venture Capital (Director of Research)