

MOHAMED ABDALGADER

Software Engineer

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SUMMARY

Software Engineer with a strong foundation in computer science principles, data structures, and algorithmic optimization. Highly adaptable across polyglot environments (Java, Python, C++, TypeScript) with hands-on experience building full-stack applications, containerized architectures, and open-source systems.

Adept at tackling complex computational geometry problems and delivering scalable, well-documented code for both backend APIs and core engine logic.

Contributor to GraphHopper open-source routing engine with improvements in routing logic and edge-case navigation handling.

TECHNICAL SKILLS

- **Languages:** Java, TypeScript, JavaScript, Python, C++
- **Frameworks & Libraries:** Spring Boot, Spring Cloud, Spring Security, Spring Data JPA, Hibernate
- **Infrastructure & Data:** PostgreSQL, MongoDB, Redis, Apache Kafka
- **Architecture:** REST API Design, Microservices, Event-Driven Systems, Saga Pattern, Idempotency
- **DevOps & Tools:** Docker, Kubernetes, GitHub Actions, Git, Linux
- **Observability:** Prometheus, Grafana, Micrometer
- **Testing:** JUnit, Mockito, Testcontainers
- **Security:** OAuth2, JWT

Engineering Experience

- **GraphHopper Routing Engine (JAVA)** [\[GITHUB PR #1\]](#) + [\[GITHUB PR #2\]](#) + [\[GITHUB PR #3\]](#)

Technologies: Java, GraphHopper Core, OpenStreetMap Data, JUnit

- Improved turn instruction accuracy at complex intersections by redesigning fallback logic using OpenStreetMap destination tags.
- Fixed data inheritance issue causing incorrect road naming in roundabouts, improving real-world navigation correctness.
- Developed geometry-based routing adjustments to handle Y-forks and motorway exits.
- Added unit tests to prevent regression in routing logic.

PROJECTS

- **CrateMind - Event-Driven Grocery Delivery Platform** [\[GITHUB\]](#) [\[API DOCS\]](#)

Technologies: Java, Spring Boot, Apache Kafka, PostgreSQL, Kubernetes, Docker, Microservices, JUnit

- Designed a **multi-service architecture** (order, inventory, packing, delivery services) communicating through Apache Kafka events sustaining ~98.5 requests per second with a 6ms p95 latency under concurrent load testing.
- Implemented **idempotent consumers** to safely handle duplicate event delivery in distributed messaging scenarios.
- Built retry-safe event processing logic to ensure system resilience under service failures.
- Applied optimistic locking in inventory service to handle concurrent update scenarios and prevent race conditions.
- Containerized and deployed a multi-service system using Docker with Kubernetes orchestration for service isolation.

- **LinkGuard - Secure URL Expander & Analytics** [\[GITHUB\]](#) [\[API DOCS\]](#)

Technologies: Java, Spring Boot, PostgreSQL, React, Redis, Docker, GitHub Actions, JUnit

- Built REST API using Spring Boot for URL expansion and redirection handling achieving 50 requests per second with a 35ms p95 latency.
- Implemented Redis caching layer for frequently accessed URLs, reducing repeated database reads under load.
- Designed analytics tracking pipeline for recording and aggregating URL usage events.
- Built CI/CD pipeline using GitHub Actions for automated testing and deployment.

- **Fintech Wallet - Round-Up Investment Platform** [\[GITHUB\]](#) [\[API DOCS\]](#)

Technologies: Java, Spring Boot, Spring Security, Spring Data JPA, PostgreSQL, Docker, JWT, REST API

- Built secure REST APIs for transaction processing and user account management.
- Implemented JWT authentication with role-based access control (RBAC) for user separation.
- Designed asynchronous processing flow for round-up calculations triggered by transactions.
- Applied optimistic locking to ensure data consistency during concurrent financial updates.
- Documented API contracts using OpenAPI for frontend integration.

EDUCATION

Ain Shams University B.Sc. Computer Science

July 2026

CERTIFICATIONS

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- [Web Secure Coding](#): Cyberus ASU
 - [Java](#): Hacker Rank

Languages

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- **Arabic** Native
 - **English** Fluent