

MAHDI RIZK

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EDUCATION

University of Michigan

Ann Arbor, MI

Bachelor of Science in Computer Science

May 2026

Relevant Coursework: Data Structures and Algorithms, Database Management Systems, Web Systems, Computer

Architecture, Software Engineering

EXPERIENCE

Teli.ai

Southfield, MI

Software Engineer

Sept. 2026 – Present

- Sole engineer on an in-house loan origination system (LOS) to replace a third-party vendor on an AI mortgage platform; audited 162 vendor API operations and scoped a phased migration plan approved by the CTO and leadership.
- Shipped two vendor-replacement slices to production (React, TypeScript, Supabase): loan tasks, and a storage back end behind a feature switch that creates and serves loans without the vendor, backed by 436 pgTAP assertions.
- Designed a 39-table PostgreSQL schema covering the mortgage application, credit, documents, and milestones, with row-level security, field-level audit logging, and SSN masking; mapped all 433 Fannie Mae DU data points to it.
- Built a production MISMO 3.4 XML exporter and importer in TypeScript from Fannie Mae's public specifications; 9 of 9 test loans validate against the DU schema and round-trip with zero differences.
- Identified a vendor defect that misstated debt-to-income ratios by 100x on loans with rental properties and corrected it in the in-house calculation; fixed a path-traversal vulnerability in the vendor API proxy.

PROJECTS

SillyQL Relational Database Engine | C++, STL, CMake

Mar. 2025 – Apr. 2025

- Built an in-memory relational database engine supporting six SQL-inspired commands and typed columns for integers, doubles, booleans, and strings.
- Implemented hash and binary search tree indexes, reducing filtered queries from $O(n)$ scans to average $O(1)$ or $O(\log n)$ lookups.
- Developed deterministic, index-aware joins and validated memory safety through Valgrind and stress testing with zero memory violations.

Pipelined CPU and Cache Simulator | C, Assembly, Computer Architecture

May 2025 – June 2025

- Built a cycle-accurate simulator for a five-stage pipelined LC-2K processor, modeling fetch through write-back with explicit pipeline registers.
- Implemented data forwarding, load-use stalls, and branch prediction to preserve correct execution across data and control hazards.
- Integrated a configurable write-back cache with LRU replacement and created 20+ assembly tests that met mutation-testing thresholds.

LEADERSHIP AND ADDITIONAL EXPERIENCE

Hamido Restaurant

Dearborn Heights, MI

Manager

June 2018 – May 2026

- Managed scheduling and front-of-house operations for a 16-person team while coordinating 2,100+ weekly orders and \$8K+ in daily sales.

Society of Ahlulbayt

Ann Arbor, MI

President

Aug. 2025 – May 2026

- Secured \$6K in recurring annual funding and directed twice-monthly events for 70+ attendees, coordinating speakers, budgets, logistics, and feedback.
- Led weekly programming for 40 students and drove engagement initiatives that earned first place nationally, \$1K, and conference representation.

TECHNICAL SKILLS

Languages: C, C++, Python, Java, JavaScript, TypeScript, SQL, Bash, HTML/CSS

Frameworks and Technologies: React, Flask, PostgreSQL, Supabase, MongoDB, JDBC, REST APIs, TCP/IP Sockets

Developer Tools: Git, Linux, Docker, CMake, Make, GDB, Valgrind, GitHub Actions, AWS, pgTAP, Vitest, Playwright