

AHMED MOHAMED SOBHY

COMPUTER ENGINEERING STUDENT

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ABOUT

An innovative and enthusiastic computer engineering student. Dealt with computers since childhood and have always been obsessed with technology. I am constantly seeking new challenges and opportunities to improve my skills and knowledge. I am skilled in **C++** and **Python**, with strong interests in system design, performance optimization, and writing clean, maintainable code.

EDUCATION

Cairo University, Faculty of Engineering - B.Sc. Computer Engineering

October 2022 – July 2027

Grade: Excellent (GPA: 4.0/4.0) (**first in class**)

Relevant Coursework: Algorithms, Data Structures, Database Systems, Microprocessors, Operating Systems, VLSI

EXPERIENCE

Software Engineering Intern - Siemens Digital Industries Software

July 2025 – August 2025

- Collaborated with the **R&D team** on (HDS)[™], a creation tool and IDE for VHDL and Verilog design
- Resolved multiple customers reported bugs and implemented feature enhancements using **C++** and **TCL**
- Led efforts to upgrade the (HDS)[™] compiler from **Visual Studio 2008** to **Visual Studio 2019**, ensuring compatibility while maintaining stability of extensive legacy codebases
- Improved software performance and maintainability by modernizing build processes and refactoring critical modules

Freelance Full-Stack Web Developer

July 2023 – November 2024

- **Multi-Tenant Hotel Reservation System:** Web application for managing reservations across multiple hotels with centralized administration
- **IFoundIt (Lost & Found Website):** Startup project in Egypt enabling users to report and recover lost items
- **Mr IELTS:** Fully custom online testing system with secure authentication and results tracking

RESEARCH EXPERIENCE

Query Optimization and Indexing Strategies (2nd Place, TCCD Research Day) (Python - SQL) | December 2024

Repository: <https://github.com/AhmedSobhy01/query-optimization-research>

- Benchmarked 7 SQL query types like multi-JOIN, GROUP BY, LEFT JOIN IS NULL on datasets up to 10M rows
- Analyzed impact of 5 indexing strategies and 3 memory configurations on execution time
- Performed ANOVA and Tukey HSD to identify statistically significant differences in index-query pairs
- The study provided recommendations for improving query performance based on dataset size and query type

PROJECTS

WebSocket Server (C++ - Make - Networking) | Feb 2026

Repository: <https://github.com/AhmedSobhy01/websocket-server>

- Built RFC 6455-compliant WebSocket server from scratch in C++17 with no external dependencies
- Implemented complete protocol stack: HTTP Upgrade handshake with Sec-WebSocket-Accept generation, frame encoding/decoding, message fragmentation, client mask enforcement, and graceful close handshake with status codes

Raven (X clone) - Team Lead (TypeScript - NestJS - Nuxt - React Native - PostgreSQL - Redis) | Dec 2025

Demo: <https://raven.cmp27.space> • Repository: <https://github.com/raven-swe> • Video Demo: <https://youtu.be/DN5XKKzmzC8>

- Led 18-member team using Scrum methodology with direct hands-on in mobile development team to deliver production Twitter clone with comprehensive social features: tweets with hashtags/mentions/media, nested reply threads, quote tweets, retweets, likes, messages, notifications, and algorithmic "For You" feed with AI

Redis Clone (C++ - Make - Networking) | Aug 2025

Repository: <https://github.com/AhmedSobhy01/redis-clone>

- Built a lightweight Redis clone with in-memory key-value storage, sorted sets, and TTL support with non-blocking I/O event loop for handling concurrent clients

Sherlock Search Engine (Java - Spring Boot - React - Tailwind CSS - Docker) | May 2025

Demo: <https://sherlock.ahmedsobhy.net> • Repository: <https://github.com/AhmedSobhy01/sher-look>

- Indexed 6,000 HTML docs into SQLite in < 2 min using parallel analyzers and batching
- Built TF-IDF - PageRank ranking pipeline: cold-cache 20-50 ms, warm-cache < 5 ms

WebRTC Video & Audio Chat (WebRTC - WebSocket - Node.js - React - MongoDB) | September 2024

Demo: <https://webrtc-video-chat.ahmedsobhy.net> • Repository: <https://github.com/AhmedSobhy01/webrtc-video-chat>

- Created a peer-to-peer video/audio chat app built on WebRTC technology allowing users to create/join private rooms, supporting up to 20 simultaneous rooms with < 300 ms latency

Machine Fault Recognition (Python - PyTorch - Librosa - Docker) | May 2026

Repository: <https://github.com/AhmedSobhy01/machine-fault-recognition> • Demo: <https://bit.ly/495ASRP>

- Designed a 0.24M-parameter CNN for 6-way acoustic fault classification on 56K clips (54 GB), reaching 91.9% test accuracy
- Built a PCEN + log-mel pipeline and section-disjoint splits via spectrogram clustering to eliminate leakage from naive random splits. Applied Frequency-MixStyle for cross-section domain generalisation, with a Dockerized inference pipeline running in tens of ms per clip on CPU

2D Convolution Accelerator (Verilog - ASIC Design - VLSI) | Jan 2026

Repository: <https://github.com/AhmedSobhy01/convolution-accelerator>

- Designed a high-performance 8x8 Systolic Array accelerator implementing Weight Stationary (WS) dataflow to optimize MAC operations and reduce DRAM bandwidth achieved 0.444W total power consumption
- Architected a Split-Kernel folding mechanism and Dual-Port SRAM hierarchy to process large kernels (up to 16x16) with efficient DMA-based streaming and partial-sum accumulation without read-modify-write cycles

HACKATHONS & COMPETITIONS

NASA Space Apps Hackathon | October 2024

Demo: <https://exocreate.vercel.app> • Repository: <https://github.com/AhmedSobhy01/exocreate> • [Certificate](#)

- Designed and shipped an interactive 3D web app in 24 hours, allowing users to explore 3 fictional exoplanets with guided learning paths using Three.js through animated environments and content slides

SOFTWARE SKILLS

Programming Languages: C, C++, Java, Python, JavaScript, TCL, PHP, Verilog, VHDL

Frameworks: Node.js/Express, React.js, Vue.js, Laravel, Tailwind CSS, Bootstrap

Databases: MySQL, PostgreSQL, MongoDB, SQLite

Tools: Docker, Linux, Git, Networking, gRPC, WebRTC, WebSocket

SOFT SKILLS

Time Management

Communication Skills

Conflict Resolution

Teamwork

LANGUAGES

English - Fluent

Arabic – Native Language