Omar Alghannam

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Education

Zewail City of Science and Technology **Sep. 2024 – May 2028**
Bachelor of Science in Data Science and Artificial Intelligence — GPA: 2.8 *6th of October City, Giza*

Relevant Coursework

- Data Structures
- Probability
- Python Programming
- Linear Algebra
- Data Governance
- Data Acquisition
- Database
- OOP

Experience and Projects

Mowasla – Uber-like Ride-Hailing System (SQL + CSharp) **December 2025**

- Developed the system backend using CSharp and structured the database using SQL.
- Designed system architecture connecting passengers with drivers through real-time ride handling.
- Modeled real-world entities: Passenger, Driver, Vehicle, Ride, Location, Payment, Rating, Wallet, Transaction..
- Built passenger features: ride requests, fare estimation, live driver tracking, cancellation/reschedule, trip history.
- Implemented driver features: accept/reject rides, update ride status, earnings dashboard, passenger rating.
- Designed an admin panel to manage users, monitor ongoing rides, review reports, and generate system statistics.

Premier League Analytics Dashboard (Data Visualization/BI Project) **December 2025**

- Designed an interactive data visualization dashboard analyzing the 2023–24 Premier League season
- Built 10 advanced visualizations (bar, stacked bar, donut, scatter, lollipop, area charts) using AmCharts 5
- Visualized key performance indicators (KPIs) including goals, assists, squad value, wage efficiency, and revenues
- Implemented dynamic filters (club, position, minimum goals) with real-time chart updates
- Transformed raw SQL Server data into clear, actionable visual insights
- Applied dark-theme UI/UX principles to enhance readability and professional presentation
- Delivered analytical insights on player efficiency, club rankings, stadium ROI, and income distributionn

Timber v2 – Python GUI Chatbot with Data Acquisition **Apr 2025 – Aug 2025**

- Built a chatbot with Tkinter GUI, supporting games, movie recommendations, translation, and voice interaction.
- Web scraping with BeautifulSoup.
- APIs for live data.
- Selenium automation for dynamic web extraction.
- Visualized activity with NetworkX network graphs and heatmap logging.

Jarvis – C++ Modular Chatbot with Localhost Integration **Jul 2025 – Aug 2025**

- Designed a C++ chatbot inspired by Timber, extending it into a modular system with headers/sources.
- Implemented OOP principles (inheritance, encapsulation, operator overloading) for scalability.
- Connected to a localhost web server, enabling interaction via HTML interface for a modern user experience.
- Showcased project evolution: Timber (Python + Tkinter) → Jarvis (C++ + Web Integration).

Data Governance Project – Credit Card Fraud Detection **Feb 2025 – May 2025**

- Applied data cleaning, validation, and quality control on Kaggle's Credit Card Fraud dataset.
- Implemented privacy methods: encryption, hashing, GDPR/CCPA/HIPAA compliance, RBAC.
- handled encryption and GDPR compliance.

Smart City Traffic Management Simulation **December 2025**

- Built a full simulation of a Smart City Traffic Control Center (TCC) using advanced data structures.
- Implemented scheduling for EV, PT, NC, and FV vehicles with dynamic priority rules and fairness policies..
- Handled multi-event system: arrivals, cancellations, promotions, accidents, lane closures.
- Designed event-driven simulation with timesteps, promotion logic, rerouting, zone-based rules, and switching-cost optimization.
- Supported interactive, step-by-step, and silent simulation modes with detailed output-file reporting.
- Generated full performance statistics: waiting times, crossing durations, signal switches, utilization, and cancellation rates.

Mini Database Engine (CSharp, SQL, Systems Design) **Jan 2026**

- Built a mini relational database engine from scratch implementing core DBMS components.
- Implemented storage layer (heap files, pages, record IDs), indexing with B+ Trees, and full table scans.
- Designed SQL parser and query execution engine (SELECT, WHERE, projection, JOIN).
- Implemented query optimizer with cost-based plan selection (Index Scan vs Table Scan).
- Built transaction manager with ACID properties, locking, isolation levels, and deadlock handling.
- Implemented recovery using Write-Ahead Logging (WAL) and ARIES (REDO/UNDO).
- Simulated distributed database features: sharding, replication, two-phase commit (2PC), and CAP theorem trade-offs.

Robotics Course – Arduino Projects **July 2025**

- Line follower robot with TCRT5000 sensor.
- Obstacle-avoiding robot using ultrasonic and IR sensors.
- Bluetooth-controlled robot for manual navigation.
- MPU6050 (motion tracking and calibration).
- nRF24L01 (wireless communication).
- Flame sensor module (calibration for fire detection).
- Servo and DC motors for movement and actuation.

University Campus Network Design – Computer Networks **Dec 2024**

- Designed and implemented a network infrastructure for a multi-faculty university campus.
- Applied CIDR subnetting and hierarchical star/mesh topologies across labs, floors, and faculties.
- Configured VLANs for segmentation and tested inter-VLAN connectivity.
- Developed and executed network test scenarios including communication between PCs and servers, inter-faculty access, and VLAN communication.
- Implemented RIP (Routing Information Protocol) for dynamic routing between faculties and the Scientific Computation Center.

Technical Skills

Languages: Python, C++/C, CSharp, SQL, JavaScript, HTML/CSS
Developer Tools: Google Colab, PyCharm, Visual Studio 2022, VS Code
Technologies/Frameworks:TensorFlow, Scikit-learn, Selenium, Flask, Tkinter, AmCharts 5, Pandas, NumPy, Matplotlib, Plotly, REST APIs, OOP, Data Visualization, KPI Dashboards, Data Cleaning, Data Analysis, Web Scraping

Competitions and Achievements

Certificate of Participation – 20th Undergraduate Research Forum (UGRF), Nile University, Egypt Aug 2025
Project: : Cleaning System Robot