Sandra Hany

Software Engineer

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≅ SUMMARY

I am a Backend Engineer with a robust foundation in distributed systems, databases, and API design. I am currently expanding my expertise into Artificial Intelligence and Machine Learning through a Master's thesis and rigorous study. Experienced in building scalable backend architectures and proficient in algorithm design and problem-solving, I am dedicated to advancing my skills in AI and delivering impactful solutions.

ℰ EDUCATION

09/2024 - present MSc Computer Engineering, Cairo University

BSc Computer And Communications Engineering, Cairo University 09/2018 - 06/2023

Cairo, Egypt Grade: Very Good

Graduation Project : Excellent IGCSE, Misr Language School

Giza, Egypt Grade: 99.44%

■ WORK EXPERIENCE

10/2024 - present Cairo, Egypt

09/2015 - 06/2018

Senior Open API Software Engineer, Network International

- Migrated APIs from .NET Framework 4 to .NET Core, modernizing the architecture and improving performance and scalability
- Optimized API efficiency by refining LINQ queries and applying best practices such as async/await, caching, dependency injection, and query optimization
- Implemented observability with the ELK stack (Elasticsearch, Logstash, Kibana), enabling real-time monitoring, centralized logging, and faster incident resolution
- · Conducted technical meetings with banking clients, analyzing their applications and advising on API selection to align with business needs
- · Collaborated cross-functionally with stakeholders to ensure seamless integration and high system reliability
- Designed and implemented Buy Now, Pay Later (BNPL) APIs, enabling seamless integration with merchants and financial institutions
- Designed and implemented Analytics APIs for tracking user behavior
- Conducted peer code reviews, ensuring adherence to best practices and optimizing performance

09/2023 - 09/2024 Cairo, Egypt

Open API Software Engineer, Network International

- Developed and maintained RESTful APIs using .NET and SQL, optimizing data retrieval speed and enhancing overall system performance
- · Collaborated with cross-functional teams to design and implement a customer-facing API, increasing user
- Successfully resolved critical API issues within tight deadlines, ensuring customer satisfaction
- Worked on projects including card activation via ATM using OTPs, integrating the Falcon system, developing a card tracker, and creating APIs for instant payments

06/2023 - 09/2023 Cairo, Egypt

Software Development Intern, SilverKey Technologies

- Completed an intensive "Advanced Web Development using ASP.NET Core 8" program
- Enhanced skills in .NET 8, C#12, and ASP.NET Core, with practical experience in Minimal APIs, Razor Pages, and
- Applied knowledge to database design using EdgeDB, including implementing database indexing
- Demonstrated proficiency in software engineering principles and practices in a practical setting

07/2022 - 09/2022 Cairo, Egypt

Software Development Intern, Innovitics

- · Achieved a seamless deployment of the iOS app on the Azure cloud platform, guaranteeing scalability and reliability
- Skillfully crafted the backend infrastructure using LaravelPHP, laying a solid foundation for efficient data handling and API integration

10/2021 - 11/2021 Cairo, Egypt

Software Development Intern, Taqa Gas Company

- Spearheaded the development of cutting-edge UI components for the company's website using the .Net framework, enhancing user experience and engagement
- Played a pivotal role in crafting meticulously optimized CRUD queries and stored procedures for the SQL database, significantly boosting data retrieval and management efficiency

PROJECTS

Uber Clone (In Progress)

- Designing a ride-hailing system clone with real-time ride matching, fare calculation, and surge pricing.
- Building a microservices-based architecture using Cassandra, PostgreSQL, and Redis for scalable data handling.
- Leveraging Kafka for event streaming (ride requests, driver location updates, trip lifecycle).
- Implementing geospatial queries for efficient driver-rider matching.
- Integrating Keycloak for authentication, authorization, and identity management across microservices, enabling secure user sessions and rolebased access control.
- Aiming for a fault-tolerant, production-grade system inspired by Uber's large-scale distributed infrastructure.

Attention-VAE-GANs

- Conducted a comprehensive comparison of Variational Autoencoders (VAEs), Generative Adversarial Networks (GANs), and VAE-GAN hybrids on the Fashion MNIST dataset to evaluate image generation quality and latent space structure.
- Assessed model performance using metrics like Fréchet Inception Distance (FID) and visual inspection, focusing on realism, diversity, and reconstruction accuracy.
- Enhanced image generation quality by integrating an Attention Mechanism into the architectures, enabling the models to focus on important regions of the input and improve fine-grained details in the outputs.
- Demonstrated improved sample quality and more coherent feature representations, especially in VAE-GAN with attention, by comparing baseline results to the attention-augmented models.

Customer Segmentation

- Leveraged PySpark for large-scale customer data processing and clustering, applying techniques such as K-Means and Hierarchical Clustering.
- · Identified distinct customer segments based on purchasing behavior, demographic data, and interaction history.
- Compared segmentation results using evaluation metrics like Silhouette Score and Within-Cluster Sum of Squares (WCSS) to ensure meaningful insights.

Ecommerce

- Developed a fully functional backend for an e-commerce platform using Spring Boot, incorporating REST APIs for user management, product listings, and order processing.
- Implemented secure authentication with JWT (JSON Web Tokens), and managed roles and permissions for admin and customer access.
- Integrated MySQL for data persistence and used Hibernate/JPA for seamless ORM (Object Relational Mapping).

Handwritten Notes

- Built a cross-platform notes app using Flutter, offering a clean, responsive UI and seamless user experience.
- Integrated Google Drive API to allow users to sync notes to their cloud storage, enabling easy backup and multi-device access.

Object Detection in Adverse Weather

- Performed an in-depth comparative analysis of various object detection models (e.g., YOLO, Faster R-CNN) under challenging weather conditions like fog, rain, and snow.
- Fine-tuned pre-trained models for robustness and accuracy, and implemented a voting ensemble module to combine model outputs and enhance reliability.

Number Plate Recognition System

- Designed a pipeline for automatic license plate recognition, incorporating advanced image preprocessing techniques such as histogram equalization, binarization, and gamma correction to enhance image quality.
- Trained a machine learning model to accurately extract and recognize alphanumeric characters from diverse plate styles and lighting conditions.
- Ensured system robustness by testing across datasets with varied resolutions, angles, and environmental noise.

Search Engine

- Engineered a web crawler-driven search engine employing a versatile tech stack comprising Java, Node.js, and React.js.
- Demonstrated proficiency in full-stack development, bringing to life a powerful search solution with robust backend capabilities and an engaging user interface.

Twitter Web clone

- Orchestrated the deployment of a Twitter website clone, showcasing adept utilization of AWS cloud infrastructure and Docker containerization.
- Seamlessly contributed to a project emulating the Twitter blogging service, underscoring technical prowess and collaborative project engagement.

Match Reservation System

- Developed a scalable backend system using Node.js, focusing on high-performance and asynchronous capabilities to handle multiple user reservations concurrently.
- Integrated MongoDB for efficient NoSQL data handling, optimized schema design for quick queries, and ensured smooth data flow through RESTful API endpoints.

Board Game

- Conceptualized and built a dynamic and engaging board game in C++, emphasizing clean architecture through OOP principles.
- Utilized key Design Patterns (Factory, Singleton, Strategy) to promote maintainability, reusability, and modular game logic.

於 TECHNICAL SKILLS

AI & Machine Learning

- Deep Learning (PyTorch, TensorFlow basics, Hugging Face)
- PySpark for big data processing
- Generative Models (VAEs, GANs, Attention Mechanisms)
- Clustering & Segmentation (K-Means, Hierarchical)

Databases & Storage

• PostgreSQL, MySQL, MongoDB, Cassandra, Redis, EdgeDB

DevOps & Cloud

- Docker, Kubernetes, AWS (EC2, S3, RDS), Azure
- CI/CD (GitHub Actions, Jenkins)
- ELK Stack (Elasticsearch, Logstash, Kibana) for observability

Frontend & Mobile

• React.js, Flutter, Razor Pages, Blazor

Backend & Frameworks

- $\bullet\,$.NET Core, ASP.NET $\ensuremath{\square}$, Spring Boot, Node.js
- REST API & GraphQL design
- Hibernate/JPA, Entity Framework

Distributed Systems & Messaging

- Apache Kafka, RabbitMQ
- Microservices Architecture, Event-Driven Systems

Security & Identity

- Keycloak (Authentication & Authorization)
- JWT, OAuth2, Role-Based Access Control

Software Engineering Practices

- Design Patterns (Factory, Singleton, Strategy, Observer)
- OOP, SOLID Principles, Clean Architecture
- Problem Solving (Data Structures & Algorithms, Competitive Programming

(4) LANGUAGES

English

German

French

Arabic