

Ahmed Salah El-Din Shemais

Software Engineer

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Profile

Backend Software Engineer with expertise in architecting scalable, event-driven microservices on GCP and Node.js. Proven track record in the healthcare domain (HIPAA/DICOM standards), delivering high-availability systems that handle massive data throughput. Focused on designing robust distributed architectures, system reliability, and integrating Generative AI into enterprise workflows.

Education

Bachelor's Degree - Systems & Biomedical Engineering, Cairo University

2016 – 2021

Work Experience

Software Engineer, Voyance

2023 – Present

- Cloud-Native Architecture:** Implemented key components of a **Google Cloud (GCP)** based PACS system using **Node.js** and **Kubernetes (GKE)**, decomposing monolithic workflows into domain-specific microservices.
- Event-Driven Orchestration:** Designed the central orchestration service using **Google Pub/Sub** to decouple critical workflows like DICOM ingestion and study archival, ensuring system resilience.
- Cost Optimization:** Reduced storage costs by **70%** and mitigated **\$140/TB** in export fees by engineering a custom retention service that migrates aging DICOM studies to cold storage.
- Scalability & Performance:** Engineered the ingestion pipeline to handle **150x peak traffic loads** using **Redis caching** strategies and GKE autoscaling to optimize query performance and throughput.
- Security & Access Control:** Implemented granular **Role-Based Access Control (RBAC)** for user authorization and enforced strict data isolation, supporting a secure multi-tenant SaaS environment.
- Integrations Ecosystem:** Integrated **GCP Healthcare API** for compliant DICOM storage, alongside **Stripe** for billing, **Dropbox** for exports, and **MailTrap** for transactional emails.
- Frontend & Desktop Support:** Provided versatile support to the frontend team during high-demand cycles by building responsive UIs and rapid prototypes, while helping maintain legacy C# desktop acquisition software.

Software Engineer, Maxwell.ai (Part-Time)

2025 – Present

- AI-Driven Backend Architecture:** Architecting a provider-agnostic email platform using **NestJS** and **PostgreSQL**, decoupling the backend from specific providers (Gmail, Outlook) to ensure extensibility.
- Generative AI Integration:** Implementing **LangChain** and LLM workflows to automate complex features like thread summarization, daily digests, and context-aware auto-replies.
- RAG Implementation:** Engineered a "Chat with your Inbox" feature using **Retrieval-Augmented Generation (RAG)**, enabling efficient natural language querying over massive email datasets.
- Reliability & Synchronization:** Engineered robust synchronization logic to maintain state consistency between local databases and external providers. Implemented intelligent **rate-limiting and backoff strategies** to handle strict API quotas from Gmail and Outlook without service interruption.

Freelance Development

- Delivered web applications and backend solutions, handling server-side logic, database integrations, and deployment.
- Managed end-to-end software development lifecycles (SDLC) for diverse clients, translating business requirements into technical specifications and production-ready code.

Projects

Medical Image Analysis Plugin

A plugin for 3DSlicer aiding in health assessment by analyzing heart CT images and calculating related health risk factors.

- Developed a cloud-connected 3DSlicer plugin for heart CT analysis, deploying the processing backend on **AWS EC2**.
- Integrated Deep Learning models for accurate segmentation and implemented multiprocessing techniques to optimize image processing speed.
- The results and methods of this project were published in the 2024 41st National Radio Science Conference (NRSC). 

Technical Skills

Programming Languages

JavaScript | TypeScript | Python | Java | C/C++/C# | PHP

General Concepts

Microservices | Event-Driven Architecture | System Design | CI/CD

Technologies

GCP | AWS | Docker | Kubernetes | Linux | Git

Frameworks

ExpressJS | NestJS | ReactJS | Spring Boot | Flask | Next | Jest | PyQt | Meteor

Database

MongoDB | PostgreSQL | Redis | BigQuery | MySQL