

Basem Esam Omar

Backend Engineer

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SUMMARY

3rd-year Computer Science student and backend engineer specializing in scalable REST APIs, backend architecture, authentication systems, and secure Node.js applications using Express.js and MongoDB. Architected and deployed a 77-endpoint backend for a live student learning platform featuring RBAC, dual-token JWT authentication, and a zero-cost media architecture.

EDUCATION

Suez Canal University – Faculty of Computers & Informatics

B.Sc. Computer Science; GPA: 3.48/4.0

Port Said, Egypt

2023 – 2027 (Expected)

- **Relevant Coursework:** Software Engineering, Operating Systems, Computer Networks, Data Structures, Database Systems
- **Activities:** ICPC Competitor, Trosc Vice IT Head, GDG & Mech Hackers Member

EXPERIENCE

Vice IT Head — Backend Lead

Trosc Student Club, Suez Canal University

Jan 2025 – Present

Port Said, Egypt

- Architected and deployed a production REST API with **77 endpoints** across **6 Mongoose models** and **9 dedicated services**, serving tracks, courses, sessions, events, and announcements for a student learning platform used by 200+ members.
- Implemented **dual-token JWT authentication** (bearer header + httpOnly Secure SameSite cookie) with bcrypt (cost 12), role-based access control across **3 tiers** (student/instructor/admin), and automatic token invalidation on password changes via `passwordChangedAt` tracking.
- Designed a **cascade enrollment service** using `Promise.all` to atomically sync enrollments across tracks, courses, and sessions, eliminating data drift and dangling refs under concurrent join/leave operations.
- Built reusable factory middleware (`checkOwnership`, `catchAsync`) and an `APIFeatures` utility class supporting **8 MongoDB query operators** (gte, gt, lte, lt, in, ne, regex, options), sorting, field selection, pagination with metadata (totalPages, hasNext, hasPrev), and full-text search via compound and text indexes.
- Hardened the API with a **7-layer security model** (Helmet, express-mongo-sanitize, HPP, CORS whitelisting, tiered rate limiting, dual-token JWT, RBAC) and **Joi schema validation** across 6 files co-located with Swagger docs; stripped sensitive fields (`role`, `students`, `courses`) from `req.body` to prevent privilege escalation.
- Implemented a **zero-cost media strategy** by validating external URLs against a whitelist of **11 trusted hosts** (YouTube, Google Drive, Cloudinary, Imgur, GitHub) with protocol enforcement and dangerous file-extension blocking; eliminated server-side storage for stateless horizontal scaling.

OOP Instructor

Google Developer Groups (GDG) SCU

Apr 2025 – May 2025

Port Said, Egypt

- Taught C++ and object-oriented programming to **50+ students** over 8 weeks, covering inheritance, polymorphism, and SOLID principles; mentored students through code reviews emphasizing clean, testable, factory-pattern architecture.

PROJECTS

Trosc Club Backend | *Node.js, Express, MongoDB, Mongoose, JWT, Swagger, Joi* — github.com/Basem3sam/trosc-backend

- Open-source production backend for a student-club learning platform. Service-layer architecture with **thin controllers delegating to 9 services**, reusable factory middleware, and MongoDB querying with compound indexes and virtual population.
- Features: **3-tier RBAC** with dual-token auth, enrollment prerequisites (public/track-only/private), bulk user operations with admin-protection guards, and an email service with **4 HTML templates** (welcome, reset, enrollment, reminder).
- Documentation: **Swagger/OpenAPI 3.0** auto-generated from JSDoc, served interactively at `/api-docs` with try-it-now auth.

Laravel E-Commerce App | *PHP, Laravel, MySQL, Blade* — github.com/Basem3sam/laravel-ecommerce-app

- Built a full-stack e-commerce app (auth, admin dashboard, cart, order placement) using **Eloquent ORM relationships** with eager loading, MVC architecture, and Laravel form-request validation with database transaction wrappers.

NeuroScan-AI | *Python, PyTorch, CNN, KNN, KMeans, OpenCV* — github.com/Basem3sam/neuroscan-ai

- Built a hybrid brain-tumor detection pipeline across **6+ CNN-KNN-KMeans ensemble models** with OpenCV preprocessing and multi-model consensus scoring; added data augmentation and cross-validation with a swappable classifier architecture for reproducible A/B testing.

TECHNICAL SKILLS

Backend & APIs: Node.js, Express.js, REST API Design, JWT Authentication, PHP, Laravel, JavaScript, Python, C++

Databases: MongoDB (Mongoose ODM), Schema Design, Compound & Text Indexing, Aggregation Pipelines, MySQL

DevOps & Tools: Docker, Git, Linux, Bash, Nodemon, ESLint (Airbnb Config), Prettier

Security & Docs: Swagger/OpenAPI 3.0, Joi Validation, Helmet, express-rate-limit, express-mongo-sanitize, HPP, CORS

Architecture & Patterns: Service Layer, Factory Pattern, RBAC, Middleware, Data Modeling, Pagination, MVC

CERTIFICATIONS & ACHIEVEMENTS

- Cloud Architecture — Professional Certification, ITI · PHP Web Development — 120-hour Full Stack Track, ITI
- Certificate of Appreciation — OOP Instructor, GDG SCU (2025)
- HR Coordinator, Mech Hackers Community (×2 terms)