

Mohamed Ali Jemmali

Full-Stack Engineer · AI & Computer Vision Developer · Engineering Student

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Engineering student at TEK-UP with a Licence in Information Technology, building and shipping software across academic, internship and personal projects. I build across the stack, from React and TypeScript frontends to Spring Boot and FastAPI backends, and I work on applied computer vision and LLM systems: trained YOLOv8 detection pipelines, RAG retrieval, and multi-agent workflows. I ship things that run: released desktop applications, deployed web apps, and models measured against held-out test sets rather than demos.

PROFESSIONAL EXPERIENCE

Computer Vision Engineering Intern — IN2 Technologies

Aug – Sep 2026

Automatic number plate recognition for Tunisian plates, without OCR

- Built a two-stage YOLOv8 pipeline under a hard constraint: no external OCR engine. A detector locates the plate ($mAP@50 = 0.995$), then a second model treats each digit and the Arabic word *tounes* as distinct object classes and reads the plate from the spatial order of the detections ($mAP@50 = 0.984$ across 11 classes).
- Reached 93.3% exact full-plate accuracy on a held-out test set, and read 8 of 9 plates correctly from 4K street footage at 3.4 ms per plate crop.
- Solved the annotation bottleneck without hand-labelling 11,000 boxes: PCA plus k-means over 9,533 digit crops turned roughly 120 operator decisions into 7,025 labels, and a self-bootstrapping template matcher located the Arabic word in 1,694 of 1,694 images.
- Evaluated YOLOE open-vocabulary detection as an automatic annotator, measured its resolution threshold, and rejected it with the evidence documented. Five further optimisations were implemented, measured, and reported as negative results.
- Delivered a reproducible repository: both model weights, a video pipeline with tracking and per-character voting, the annotation tooling, and a full technical report.

Python · YOLOv8 / Ultralytics · PyTorch · OpenCV · scikit-learn · Roboflow

Full-Stack & AI Developer — ACOBA, Tunis

Feb – Jun 2025

Final year project · Cam2Drive SaaS platform serving real clients

- Built an intelligent video surveillance dashboard integrated into a live SaaS product, shipped across four sprints with client feedback driving each iteration.
- Designed a split-backend architecture: Node.js, Express and JWT for authentication, FastAPI and Python for all AI processing.
- Delivered licence plate recognition, people counting, live and IP camera analysis, heatmap generation and daily summaries.

React · TypeScript · Tailwind CSS · Node.js · FastAPI · YOLOv8 · OpenCV · MongoDB Atlas · FFmpeg

Software Development Intern — Quetatech, Mahdia

Dec 2023 – Jan 2024

- Built an employee attendance desktop application in PHP, a WordPress REST API plugin, and a QR code PDF certificate scanner plugin.

SELECTED PROJECTS

Riftbound Survivors — wave-survival game, released

github.com/notAnKy/riftbound-survivors

- Complete game built solo in Godot 4 and shipped for Windows: 20 waves, a shop economy, 11 weapons, 25 items, local co-op on one machine, open source under GPL-3.0.
- Integration suite of 397 assertions that boots the real game and drives it through real input and physics frames rather than unit-testing around the edges. Every sprite and icon is generated as SVG by scripts in the repository.

Godot 4.7 · GDScript

HardwareProbe — browser hardware diagnostics

hardwareprobe.vercel.app

- Client-side testers for controllers, monitors, GPUs, speakers, microphones, keyboards and mice: stick drift and circularity, dead pixels, frame-time and 1% lows, n-key rollover, true polling rate from coalesced pointer samples, and click-chatter detection.
- Every tester sits directly on a browser API with no runtime dependencies beyond the framework. Fully static export, nothing uploaded, WCAG AA contrast throughout.

Next.js 16 · React 19 · TypeScript · Tailwind CSS 4 · WebGL / WebGPU · Web Audio · Gamepad API

Clip — desktop video editor, released

github.com/notAnKy/clip

- Windows application that converts wide gameplay recordings into a single vertical video: trim, crop, hook text, music, export. Runs entirely offline with bundled FFmpeg.

- Two-pass FFmpeg pipeline, normalise then concatenate with stream copy so the video is never re-encoded twice. The renderer has no filesystem access; every value is re-validated in the main process across an IPC contract before reaching FFmpeg.

Electron · React · TypeScript · Vite · FFmpeg

StudyMind — multi-agent AI study assistant

- Four specialised LLM agents orchestrated in a directed LangGraph workflow: Summarizer, Quiz Maker, Quality Reviewer scoring output out of ten, and Explainer. Accepts PDF and DOCX.

FastAPI · LangGraph · LangChain · Groq (Llama 3.3 70B) · PostgreSQL · React

SecureOps — cybersecurity management platform

- Full-stack platform connecting companies with security specialists: request submission, task assignment and report validation across three role-based portals, with JWT auth, BCrypt, password reset by email, a live analytics dashboard and a Gemini-powered assistant.

Spring Boot 3.5 · Spring Security 6 · JWT · PostgreSQL · React · TypeScript · Gemini API

Internship Assistant — RAG pipeline from PDF ingestion to ChromaDB embeddings to LLM analysis with source citations, grounded strictly in the user's own documents. FastAPI · LangChain · ChromaDB · Groq

FNHub — live Fortnite companion web app: item shop, map, cosmetics search, player stats and news, deployed on Vercel. React 19 · TypeScript · Tailwind CSS v4 · Vite

EDUCATION

ISSET Mahdia — Licence in Information Technology (bachelor's degree, 180 ECTS) 2022 – 2025
Software systems development · Honours (Mention Bien)

TEK-UP University, Tunis — Diplôme National d'Ingénieur (in progress) 2025 – 2028
Applied Sciences and Technology · engineering cycle

TECHNICAL SKILLS

Frontend	React 18/19, TypeScript, Next.js, Angular, Tailwind CSS v4, Vite, React Router, Axios
Backend	Spring Boot 3.5, FastAPI, Node.js / Express, PHP / Symfony, JEE, .NET / C#
AI & computer vision	Python, PyTorch, YOLOv8, OpenCV, scikit-learn, LangChain, LangGraph, RAG, Groq, Gemini, ChromaDB
Security & auth	JWT, Spring Security 6, BCrypt, RBAC, OAuth2, Spring Mail
Databases	PostgreSQL, MongoDB Atlas, MySQL, SQL Server, ChromaDB
Tools & DevOps	Git / GitHub, Docker, Electron, Godot 4, FFmpeg, Postman, Figma, Jira, Maven, Agile / Scrum
Languages	Arabic (native), English (B2, upper-intermediate), French (intermediate)