

Iyed Mdimegh

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Education

National Institute of Applied Sciences and Technology (INSAT) – Tunis, Tunisia 09/2022 – 09/2027
Engineering Degree (Diplôme National d'Ingénieur), Software Engineering — 5-year program, M.Eng. equivalent

Skills

Languages: Python, C, C++, Java, JavaScript, SQL, PHP

AI & Machine Learning: PyTorch, TensorFlow, Keras, Scikit-Learn, OpenCV, NumPy, Pandas, Matplotlib, Deep Reinforcement Learning, Computer Vision (CNN, YOLO), RAG, LLM Agents, Vector Search (Qdrant)

Distributed Training & Efficiency: PyTorch RPC, model parallelism, mixed-precision training (AMP), `torch.compile`, frugal / Green AI

Backend & Web: FastAPI, Django, Node.js, Express.js, React.js, Socket.io, Symfony, PostgreSQL, MongoDB, Redis, D3.js

DevOps & Tools: Docker, Git, Jira, SAP Joule, IoT & Edge Computing

Experience

EFREI Paris – *Research Intern, in partnership with the French Tennis Federation (FFT)* 06/2026 – 08/2026

- Researched ball tracking that holds up under motion blur for multi-sport video analysis (tennis, badminton, table tennis), building on current state-of-the-art approaches.

Freelance – *Software Engineer* 04/2026 – 07/2026

- Built a conference management platform covering the full event workflow: attendee registration, paper submissions, document management and payment processing.

EFREI Paris – *Research Collaborator, Frugal AI & Sustainable Deep Learning* 11/2025 – 06/2026

- Contributed to the thesis research of a PhD candidate at EFREI Paris, guided week to week by the candidate and co-supervised by an INSAT faculty member.
- Co-designed a model-parallel distributed architecture for the Introvert pipeline using PyTorch RPC and Docker, cutting CO2 emissions by 42.6% while holding accuracy flat.
- Built a training optimization pipeline combining mixed-precision training (AMP), `torch.compile` and asynchronous data loading, cutting training time by 33.7%.
- Designed a composite frugality metric based on the Analytic Hierarchy Process (AHP) that scores AI deployments on energy, memory, FLOPs and predictive accuracy in a single measure.

Free2Move – *Software Engineering Intern, SAP Joule Integration* 07/2025 – 09/2025

- Built AI-driven automation on SAP Joule to streamline business processes running on SAP S/4HANA.
- Created custom agents that handle recurring work such as report generation for business users.

Vectors – *Software Engineering Intern* 06/2025 – 07/2025

- Rebuilt the “Jira Comment Toolkit” on a modern stack, replacing the legacy codebase.
- Shipped an Atlassian app that sorts and tags Jira comments automatically using AI, improving the team’s workflow.

Pixemantic – *AI & Software Engineering Intern* 07/2024 – 09/2024

- Applied deep reinforcement learning to 3D bin packing, improving how efficiently objects were arranged inside shipping containers.
- Turned the model into a full-stack web application built with Django and React.

PROXYM Group – *Software Engineering Intern* 06/2024 – 07/2024

- Built a social network web application from scratch on the MERN stack with Socket.io.

Publications & Conferences

Mdimegh, I. (First Author), et al.
Intelligent Chess Robot Tutor: A Low-Cost, Vision-Guided Multi-Level System with Real-Time Tracking and Advanced Gameplay Analysis.
IEEE International Conference on Systems, Man, and Cybernetics (SMC), Vienna, Austria, 2025.
[View paper](#)

IEEE SMC 2025 — Oral Presentation 10/2025
Presented the work above to an international audience, covering educational robotics, YOLO-based detection and AI-driven adaptive gameplay.

Projects

Multimodal RAG Knowledge System 01/2026
Built a modular RAG system that lets users sort, organize and find files across formats — PDF, Word, images, audio — using graph-augmented retrieval and continuous monitoring of cloud storage. FastAPI backend with Qdrant vector search, PostgreSQL and Redis, fronted by a D3 constellation-style graph view for exploring the knowledge base interactively.

INSAT Chess Tutoring Robot 09/2024 – 01/2025
Led development of a chess tutoring robot combining computer vision and robotics. Prototyped a robotic arm that moves pieces in real time, paired with gameplay that adapts to the player's level.

SMARTSHIELD — AI-Driven Cybersecurity Incident Response Platform 09/2024 – 12/2024
Led a multidisciplinary student team through the full development cycle of an AI-driven cybersecurity platform, training real-time threat detection models and integrating them into a response pipeline designed to scale.

Awards & Honors

2nd Place — AESS Sustainability Hackathon, Egypt (AESH 2026) 07/2026
International IEEE hackathon run by the IEEE AESS Tunisia, Jordan and Egypt sections, with 193 competing teams. Designed SISP, a fault-tolerant inter-satellite communication protocol for CubeSat constellations.

1st Prize — National Re · Tech Fusion (IEEE PES × PELS INSAT Joint Chapter) 05/2026
National competition built around a real industrial challenge posed by Kilani Group. Developed an industrial energy intelligence platform combining IoT, edge computing and analytics to monitor and cut a factory's energy consumption.

1st Prize — IEEE TSYP 12 Challenge (SMC Chapter) 12/2024
National competition drawing entries from over 20 Tunisian universities. Built a low-cost chess tutoring robot with vision-guided piece detection.

2nd Prize — IEEE TSYP 12 Challenge (CS Chapter) 12/2024
Same competition, separate track. Co-created SMARTSHIELD, an AI-driven cybersecurity incident response platform.

3rd Place — AINS Hackathon (Artificial Intelligence National Summit) 07/2024
National AI competition, 20 teams selected from universities across Tunisia.

Leadership & Organizations

IEEE INSAT SB CS Chapter – Vice-President & Instructor 08/2024 – 07/2025
Ran AI tutoring sessions, mainly on Deep Reinforcement Learning, and organized the chapter's technical workshops and events.

Junior Enterprise INSAT – Hackathon Organizing Committee Chair & Senior Member 09/2023 – 02/2025
Ran “Hack for Good”, a nationwide competition on Corporate Social Responsibility themes, together with its three supporting workshops.

Notre Grand Bleu – Senior Member 04/2021 – 08/2023
Non-profit working to protect marine life in the Mediterranean.

Languages

English: Fluent (B2 onSET) **French:** C1 (TCF certified) **Arabic:** Native **Spanish:** Beginner **German:** Beginner