Taha Khamessi

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Summary

Computer Science graduate with specialization in full-stack software development and Artificial Intelligence. Strong expertise in machine learning, computer vision, and modern web technologies (front-end & back-end).
Seeking an apprenticeship opportunity to pursue an engineering degree or master's program, combining academic training with hands-on experience.

Education

Higher Institute of Information and Communication Technologies - ISTIC *Sept 2022 – May 2024*
Bachelor's Degree in Computer Science (BS)

- **Specialization:** Software Engineering and Information Systems
- **GPA:** 3.7/4.0 (equivalent to High Honors)
- **Final Year Project (Excellent Grade):** CarVision - AI-powered automotive recognition system

Preparatory Institute for Engineering Studies of Nabeul - IPEIN *Sept 2019 – April 2022*

- **Intensive training in Mathematics-Physics (MP)**
- Acquired solid foundations in advanced mathematics and theoretical physics
- Developed rigorous methods for analysis and problem-solving
- Strategic reorientation towards computer science to combine passion with scientific skills

Featured Projects

CosmicVue - NASA Space Apps Challenge 2024 (Global Finalist) *GitHub Repository*

- **International recognition:** Top 40 among more than 10,000 global teams
- Immersive 3D space simulator with real-time tracking of Near-Earth Objects (NEO) via NASA API
- Scientifically accurate astronomical visualizations with realistic orbital mechanics
- **Technologies:** React, Three.js, REST API integration, cloud deployment

CarVision - Computer Vision for Automotive *GitHub Repository*

- Complete automotive recognition system with custom CNN and price prediction
- Optimized ML pipeline: preprocessing, data augmentation, transfer learning, cross-validation
- **Industrial performance:** 70% accuracy, 2s processing time, 899 supported models
- **Architecture:** Node.js/REST API backend, MongoDB database, Flutter mobile app, TensorFlow-Lite

CCEditor - Collaborative Development Platform *GitHub Repository*

- Real-time multi-user code editor with instant synchronization
- Advanced features: syntax highlighting, auto-completion, conflict management, integrated chat
- **Stack:** React, Firebase Realtime Database, WebSockets, Firebase Hosting
- Latency optimization for professional pair programming sessions

HTRU2 Pulsar Detection – Scientific Machine Learning *GitHub Repository*

- Developed a complete ML pipeline for pulsar candidate classification using real radio telescope data (HTRU2)
- Benchmarked 10 algorithms (SVM, Random Forest, Neural Networks) with stratified cross-validation
- Applied SHAP explainability, feature importance analysis, and threshold optimization
- Achieved 97% ROC AUC and 90% reduction in manual review workload
- **Tools:** Python, Scikit-learn, SHAP, XGBoost, Pandas, Matplotlib

ALPR System - Computer Vision *GitHub Repository*

- Automatic License Plate Recognition system
- Hybrid architecture: YOLO for detection + custom OCR for recognition
- Robust preprocessing: perspective correction, contrast enhancement, noise reduction
- Multi-condition performance: variable lighting, multiple angles, international formats

Primordial Quantum Fluctuations Reconstruction via Deep Learning *Feb. 2025 - present*

- Personal research in computational cosmology combining deep learning and cosmological models

- Application of neural networks to cosmic microwave background data analysis
- **Technologies:** PyTorch, TensorFlow, numerical simulations (CLASS/CAMB)
- **Objective:** Open-source contribution for accelerating cosmological inference

Professional Experience

Software Developer - AI & Mobile (Final Year Internship) *Tunis, Tunisia*
Maghreb Code Multimedia *Feb. 2024 - May 2024*

- **CarVision:** Developed an AI system for automatic vehicle classification with price prediction based on DVM-CAR 2.0 dataset (1.45M images)
- **Performance:** 70% accuracy on 899 vehicle models, processing time 2 seconds
- **Optimization:** Reduced training time by 40% through transfer learning and data chunking
- **Tech stack:** TensorFlow/Keras, Flutter (mobile), Node.js/Express (backend), MongoDB
- **Collaboration:** 5-developer technical team with Agile/Scrum methodology
- **Innovation:** Implementation of predictive pricing system and comprehensive technical documentation

Cybersecurity & System Administration Intern *Tunis, Tunisia*
Tunisian Agency for Professional Training *July 2023 - Aug. 2023*

- Configuration and optimization of Fortinet firewalls for critical infrastructure (500+ users)
- Network security audit and implementation of enhanced security policies

Technical Skills

- **Backend Development:** Node.js/Express, Python, Java, Spring Boot, RESTful APIs
- **Artificial Intelligence:** TensorFlow, Keras, PyTorch, Computer Vision, Deep Learning, CNN, Transfer Learning
- **Frontend & UI:** React.js, Next.js, Three.js, HTML5/CSS3, modern interactive interfaces
- **Mobile:** Flutter, TensorFlow Lite, cross-platform development
- **Databases:** MongoDB, MySQL, PostgreSQL, Firebase Firestore
- **DevOps & Tools:** Git/GitHub, CI/CD, Docker, Linux, cloud deployment
- **Real-time Systems:** WebSockets, data synchronization, latency optimization
- **Security:** Secure APIs (JWT, OAuth), Security best practices (OWASP, encryption), Security audit (Fortinet experience)
- **Languages:** Python (Expert), JavaScript/TypeScript (Expert), Java (Advanced)

Soft Skills

Problem-solving and analytical thinking • **Collaboration** in international teams and technical communication • **Rapid adaptation** to new technologies and environments • **Technical project management** and deadline compliance • **Continuous technology monitoring** and self-learning

Certifications

- **Machine Learning Specialization** - DeepLearning.AI via Coursera (2024)
- **Deep Learning Specialization** - DeepLearning.AI (In progress, 2024)
- **Python for Data Science & AI Development** - IBM via Coursera (2020)
- **Data-driven Astronomy** - University of Sydney via Coursera (2020)

Awards & Engagements

Competitions: Global Finalist NASA Space Apps Challenge 2024 (Top 40/10,000+ teams)
Community: Open-source GitHub contributions and collaborative projects
Technology Monitoring: Research in computational astrophysics, scientific AI, emerging technologies

Languages

- **Arabic:** Native language
- **French:** Intermediate - Technical writing, professional communication
- **English:** Advanced - Technical documentation, scientific research, international communication