

EDUCATION

Ibn Tofai University

- Master's in Artificial Intelligence (Dec 2023 - July 2025)
- Bachelor's in Mathematics and Applications (Sep 2019 - Juin 2023 )

**Relevant Coursework :** Deep learning & Reinforcement Learning ,Machine learning ,Computer Vision, NLP, AI agent, Data structure & Algorithms, Advanced statistical analysis, Optimization, Probability and statistics, Linear algebra, Predictive modeling, Data analysis

SKILLS

- **Programming & Frameworks:** Python, C/C++, SQL, Bash | TensorFlow, PyTorch, Scikit-Learn, OpenCV, Transformers, XGBoost
- **AI Agents & LLM Systems:** LangChain, LangGraph, CrewAI, AutoGen | OpenAI/Anthropic APIs, Groq, Ollama | RAG Pipelines, Vector Databases (FAISS, Pinecone), Prompt Engineering, Fine-tuning (LoRA, QLoRA)
- **MLOps & Infrastructure:** Docker, Kubernetes, AWS (EC2, S3, Lambda, SageMaker) | CI/CD (GitHub Actions), Model Serving (vLLM, TensorFlow Serving), MLflow, A/B Testing, Performance Monitoring
- **Web Development & APIs:** Flask, Django, FastAPI, Streamlit, RESTful APIs | SQLite, MongoDB

EXPERIENCE

AI Agent Assistant | Mindrift | jun 2025 – present , Freelance

- Engineered prompt refinement workflows to enhance LLM alignment with user intent and domain relevance across diverse topics.
- Developed structured evaluation pipelines integrating human-in-the-loop feedback with semantic web search strategies for fact verification.
- Analyzed and annotated generative outputs to detect hallucinations, inconsistencies, and irrelevant content, supporting LLM response optimization.
- Designed modular review systems to improve clarity, tone, and factuality of AI-generated responses using standardized evaluation protocols.
- Collaborated with cross-functional teams to iteratively improve annotation guidelines and task efficiency for large-scale model training.

IA Expert | Université du Québec à Trois-Rivières(UQTR)| feb 2025 – July 2025, full time

- Working with Professor [Abdeslam Hassani](#) and Professor [Khaoula BOUKIR](#) on developing and evaluating an AI-based methodological framework for automating systematic literature review (SLR) processes
- Developed a comprehensive ETL system to extract and transform bibliographic data from RIS format into a relational database, ensuring data integrity and standardization
- Implemented multi-stage relevance screening system using Groq API and LangChain with explainable AI decision-making, human-in-the-loop validation, and continuous model improvement capabilities
- Achieved 80-90% time reduction in systematic review processing while maintaining academic rigor and research quality standards

**Objective :** *Apply advanced NLP and machine learning techniques to automate systematic review workflows, addressing the time-intensive nature of literature processing and improving consistency in academic research, with findings targeted for publication in peer-reviewed journals.*

IA Engineer | LifeLine Africa | Août 2024 – feb 2025, Internship

Advanced Conversational AI System :

- Engineered end-to-end RAG architecture leveraging Llama3 model via Groq AI API with domain-specific knowledge base on medical literature corpus, deployed via Flask RESTful API with authentication and rate limiting, achieving 55% improvement in response accuracy over baseline
- Implemented semantic search pipeline using FAISS vector database with HuggingFace embedding models, architected LangGraph workflow for multi-step reasoning and query processing, optimizing retrieval performance through quantization techniques
- Designed scalable transformer-based architecture with modular components for easy model swapping, integrating HuggingFace transformers with LangGraph orchestration for complex medical query workflows, deployed through Flask microservices with load balancing and automated model versioning for production deployment

#### Multi-Modal AI Pipeline with Custom Model Integration:

- Developed hybrid NLP-Computer Vision pipeline combining BaddleOCR for text extraction with custom-trained classification models for drug categorization, implementing model ensembling techniques to achieve 94% accuracy on pharmaceutical text recognition
- Engineered production-ready ML serving infrastructure using Flask with model versioning and A/B testing capabilities, implementing batch inference optimization and real-time model performance monitoring
- Built intelligent data processing pipeline with SQLite backend, implementing automated model retraining workflows and feature engineering for continuous improvement of drug recognition accuracy based on user feedback loops

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### IA Engineer | Ibn Tofail Laboratory, SETIME , Août 2024 – feb 2025, Internship

#### Intelligent Fall Detection & Voice Assistant

- Architected and deployed a CrewAI-powered multi-agent system with 5 specialized AI agents (Market Analyst, News Sentiment, Risk Assessment, Strategy Coordinator, Compliance Officer) for automated financial research and trading recommendations, processing 10,000+ data points daily
- Implemented hybrid data pipeline integrating real-time financial APIs (Alpha Vantage, Yahoo Finance), Apache Airflow orchestration, and Redis inter-agent communication system, achieving 99.2% uptime and sub-second response times
- Developed advanced backtesting framework with walk-forward optimization and multi-modal analysis capabilities (text, charts, numerical data), resulting in 23% improvement in strategy performance over traditional approaches
- Built production-grade monitoring and compliance system with PostgreSQL persistence, real-time alerting, and regulatory requirement validation, ensuring 100% audit trail compliance and risk management protocols

#### Multi-Agent Financial Research & Trading Advisory System

- Engineered sophisticated RAG architecture combining dense vector embeddings (Qdrant), sparse retrieval (Elasticsearch), and graph-based knowledge relationships (Neo4j) with dynamic query routing, improving answer accuracy by 35% over standard RAG approaches
- Designed multi-modal document processing pipeline handling text, PDFs, images, code, and structured data with contextual chunk splitting and sliding window techniques, successfully indexing 500,000+ enterprise documents across multiple formats
- Implemented advanced query processing system featuring query expansion, multi-hop reasoning, confidence scoring, and uncertainty quantification with real-time streaming responses via FastAPI and Streamlit, reducing average query response time to 1.2 seconds
- Developed enterprise-ready deployment architecture with multi-tenant support, role-based access control, active learning mechanisms, and comprehensive monitoring via LangSmith, serving 1,000+ concurrent users with 99.7% availability

#### Enterprise Knowledge Assistant with Hybrid RAG Pipeline

- Engineered comprehensive ML data pipeline including automated video annotation, multi-angle data augmentation, and quality filtering algorithms, creating robust training dataset with stratified sampling for balanced class distribution across diverse scenarios
- Developed custom temporal feature extraction framework combining MediaPipe pose estimation with YOLOv5 object detection, implementing attention mechanisms and sequence modeling to process 33-point skeletal landmarks and create discriminative temporal feature vectors
- Designed and optimized ensemble ML classifier achieving 98% accuracy through advanced feature engineering of pose angles, velocity patterns, and temporal dynamics, implementing hyperparameter tuning with Bayesian optimization and cross-validation strategies
- Deployed production-grade ML inference system with Flask API supporting real-time video processing, integrating multi-modal AI capabilities (computer vision + NLP) and implementing automated model monitoring with performance alerts and fallback mechanisms

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## CERTIFICATES & COURSES & ACHIVEMENT

- Voluntary role: Organized and managed Moroccan Cuisine Day at Center Le Havre in Trois-Rivières, cooking for and sharing Moroccan culture
- Awarded the Mitacs Globalink Research Scholarship (2025) for AI-focused research at Université du Québec à Trois-Rivières , Canada
- C1 English Certificate (Sigma Centre, Kenitra, Morocco).
- Agentic AI Fundamentals: Architectures, Frameworks, and Applications (course )
- Advanced Python: Object-Oriented Programming (course )
- Reinforcement Learning Foundations (course)