RAYEN GHALI

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Education

University of Moncton	**Jan 2024 – Exp. Dec 2025**
*Master of Applied Science (MASc)	Faculty of Engineering	CGPA: 4.15/4.3*	*New Brunswick, Canada*

University of Carthage	**Sep. 2018 – Oct. 2023**
*National Engineering Diploma in Instrumentation and Industrial Maintenance	National Institute of Applied Science and Technology (INSAT)	Graduated with High Honours*	*Tunis, Tunisia*

Experience

Research Assistant   **Jun 2024 – Nov 2024**
CEAAC (Centre d'études acadiennes Anselme-Chiasson)   *New Brunswick, Canada*
- Implementing an open-access natural language processing system with agentic retrieval augmented generation for efficient querying of Acadian archives.
- Developing a ChatGPT-like interface to enhance accessibility of Acadian heritage for researchers and the public, leveraging large language models and knowledge graphs.
- Designing a knowledge management system to integrate expert archivists' insights into the AI-powered query process.
- Project website: chatacadien.ca
- Tech stack: Python, Langchain, Neo4j, Docker.

Research Assistant   **Dec 2023 – Present**
CFRIA, University of Moncton   *New Brunswick, Canada*
- Collaborating on diverse projects, focusing on Robotics and Research in computer vision for few-shot defect detection and Big Data Time Series Analysis.
- Tech stack: Python, PyTorch, Pandas, Bash.

Research Intern   **May 2023 – Aug 2023**
CFRIA, University of Moncton   *New Brunswick, Canada*
- End-of-studies Project focused on 'Industrial surface defect detection employing computer vision and a KUKA arm robot.' Funded by Mitacs Globalink scholarship.
- Applying contrastive learning with YOLO and DETR based models for few-shot object detection for limited datasets of industrial surface defects for wood and steel products.
- Explore techniques to improve object detection of small-size defects.
- Tech stack: Python, PyTorch, Bash, SAHI

Data Science Intern   **Jul 2022 – Sept 2022**
TICDCE (Tunis International Center for Digital Cultural Economy)   *Hybrid*
- Create a recommendation system based on collaborative filtering for tourists interested in historical places in Tunisia.
- Explore different models of recommendation systems (Content-Based, Collaborative, or Hybrid).
- Apply Augmentation techniques for a private dataset containing numeric and categorical features.
- Tech stack: Python, TensorFlow, scikit-learn, SMOTE.

Embedded Systems Developer Intern   **Feb 2022 - June 2022**
STMicroelectronics — INSAT   *Tunis, Tunisia*
- Load image decoding library libsail on top of Azure RTOS libraries.
- Contribute to the realization of a demo based on the ported libsail library running on an STM32 card.
- Tech Stack: C/C++, libsail, STM32CubeIDE, Git.

Back-End Developer Intern   **Jul 2021 – Sept 2021**
ST2i (Société Tunisienne d'Informatique pour l'Ingénierie)   *Hybrid*
- Study and compare different open-source IAM (or IdP) layers based on OAuth 2.0 for identity management and user access control.
- Implement the 'Keycloak' layer as a RESTful API in a micro-service architecture application.
- Tech Stack: JAVA, Angular, Spring Boot, PostgreSQL.

Technical Skills

Languages: Python, SQL
Technologies: Git, Docker, Pytorch, MongoDB, Streamlit, Langgraph

Languages

Arabic : Native   **French :** Bilingual   **English :** Full Professional Proficiency