Rayen Ghali

+1 506-925-0056 | rayenghali02@gmail.com | linkedin.com/in/rayenghali | github.com/Rayen023

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

Academic Projects

Master's Thesis

- Explored the use of Vision Language Action models (VLAs) for robotic manipulation tasks with industrial robots KUKA (get model) focusing on enhanced robot ability to understand and execute complex commands through visual and linguistic inputs.
- Fine-tuned Vision language models using Q-LORA, Unsloth.
- Developed simulation environments, reinforcement learning, and evaluation datasets like libero.
- Explored quantization techniques and their impact on model performance.
- Explored tokenizers discrete vs continuous tokenizers for modeling robotic actions.
- Prototyped using the Nvidia Isaac gr00t family of models and the SO-101 mini robots with hf/lerobot library for dataset trajectories collection, motors calibration, fine-tuning and inference.

Experience

Research Assistant **May 2025 – Aug 2025**
CFRIA, University of Moncton *New Brunswick, Canada*

- Implemented an open-access natural language processing system with agentic retrieval augmented generation for efficient querying of Acadian archives.
- Designed a multimodal RAG pipeline for speech-to-text and text-to-speech question answering.
- Designed a knowledge management system to integrate expert archivists' insights into the AI-powered query process.
- Project website: Robots
- Tech stack: Python, Langchain, Neo4j, Docker.

Research Assistant **Jan 2025 – Apr 2025**
CFRIA, University of Moncton *New Brunswick, Canada*

- Implemented an open-access natural language processing system with agentic retrieval augmented generation for efficient querying of Acadian archives.
- Developed a ChatGPT-like interface to enhance accessibility of Acadian heritage for researchers and the public, leveraged large language models and knowledge graphs.
- Designed a knowledge management system to integrate expert archivists' insights into the AI-powered query process.
- Project website: chatcapitalhumain.ca
- Tech stack: Python, Langchain, Neo4j, Docker.

Research Assistant **Jun 2024 – Dec 2024**
Centre d'études acadiennes Anselme-Chiasson (CEAAC) *New Brunswick, Canada*

- Implemented an open-access natural language processing system with agentic retrieval augmented generation for efficient querying of Acadian archives.
- Developed a ChatGPT-like interface to enhanced accessibility of Acadian heritage for researchers and the public, leveraged large language models and knowledge graphs.
- Designed a knowledge management system to integrate expert archivists' insights into the AI-powered query process.
- Project website: chatacadien.ca, chatpatrimoineacadien.ca
- Tech stack: Python, Langchain, Neo4j, Docker.

Research Assistant **Apr 2023 – Jun 2024**
CFRIA, University of Moncton *New Brunswick, Canada*

- Collaborated on diverse projects, focused on Robotics and Research in computer vision for few-shot defect detection and Big Data Time Series Analysis.
- Accepted/Presented conference papers: ICRA 2024, IROS 2024, ICDM 2024.

- Tech stack: Python, PyTorch, Pandas, Bash.
- Completed end-of-studies Project focused on 'Industrial surface defect detection employing computer vision and a KUKA arm robot.' Funded by Mitacs Globalink scholarship.
- Applied 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.
- Explored techniques to improve object detection of small-size defects.
- Tech stack: Python, PyTorch, Bash, SAHI

Data Science Intern **Jul 2022 – Sept 2022**

Tunis International Center for Digital Cultural Economy (TICDCE) *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.

Technical Skills

Languages: Python, SQL
Technologies: Linux, Docker, Git, MongoDB, Streamlit, PyTorch, Langchain

Languages

Arabic : Native **French :** Bilingual **English :** Proficient