

Faycal Kilali

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Education

Mount Allison University – B.Sc. (Hons) Computer Science and Mathematics – Sackville, NB	2022 – 2026
• Founder and President of the AI & Robotics Society – Sackville, NB	2023-2026
• Co-Founder and Vice President of the Mature Students Club – Sackville, NB	2023-2025

Professional Development

French Language Training – Quebec Government Francisation Program (MIFI) – Montreal, QC	2025
<i>Completed intensive French language coursework at Université du Québec à Montréal</i>	

Certifications

<i>Machine Learning with Python</i> – IBM, Coursera	2024
<i>Object-Oriented Design</i> – University of Alberta, Coursera	2024
<i>Microsoft Learn AI Skills Challenge</i>	2023

Experience

Fullstack Software Developer , AI Object Detection Framework and Educational Tool – Sackville, NB	May 2024 – Sep 2024
• Secured \$4,000 TD Ignite Grant and led development of AI-based object detection educational tool, implementing YOLOv10 model across Flask backend, Streamlit web interface, and Tkinter GUI with support for 243 languages	
• Architected full-stack educational game integrating real-time computer vision, REST API design, and multi-platform deployment, achieving comprehensive documentation with API specifications and workflow diagrams	

Mathematics and Computer Science Peer Tutor , Mount Allison University – Sackville, NB	Mar 2023 – Sep 2024
• Tutored 50+ students across various mathematical subjects effectively, resulting in positive feedback from students	

Technical Lead , Greater Dorchester Moving Forward – Dorchester, NB	Jan 2023 – Jul 2023
• Spearheaded technology operations for a nonprofit organization by leading data collection, mapping, and software development—enhancing impact and advancing the mission	
• Collaborated with other departments within the organization to integrate technical solutions relevant to the seated board.	

Projects

Room Scanner & Voice Guidance System Python, YOLOv10, Raspberry Pi, Hardware Schematics, Bash GitHub	2025
• Engineered embedded room scanning system integrating computer vision with custom hardware circuits (GPIO, LED indicators, push-button controls), implementing both hardware and software debouncing techniques	
• Developed real-time voice feedback system for object detection with respect to the physical location of the system, providing information/guidance for blind individuals throughout the observable area	
• Created comprehensive documentation of the hardware schematics and the software components with automated installation scripts, thereby emphasizing reproducible deployment	

Multi-Paradigm Wordle Puzzle Solver AI Agent Python, Streamlit GitHub	2025
• Implemented four AI paradigms (Information-Theoretic, Model-Based, Goal-Based, Utility-Based), utilizing entropy calculations and information gain maximization to achieve optimal 3-5 guess performance	
• Architected Streamlit visualization dashboard displaying real-time AI decision-making with time complexity of $O(W^2L)$, demonstrating advanced algorithm optimization and probabilistic reasoning	

Multivariate Regression Framework Python, PyTorch, NumPy GitHub	2024
• Developed machine learning framework from mathematical foundations, implementing gradient descent optimization, L2 regularization (Ridge), and closed-form solutions using PyTorch and NumPy	
• Conducted systematic experimental analysis across 5 dimensions (noise sensitivity, training set impact, parameter complexity, regularization effects) with comprehensive visualizations demonstrating theoretical ML concepts in practice	

Variable Elimination for Bayesian Networks Python GitHub	2024
• Implemented Variable Elimination Algorithm for Bayesian Networks to compute probability distributions with evidence	
• Optimized sum-product computation for efficient inference in complex probabilistic networks	

Open Source Video Games MBScript, Python, PHP Floris Evolved Tainted Paths Medieval Conquests	2015-2019
• Founded and led development of three major game modifications with 314,000+ active subscribers and 1.3+ million unique visitors across platforms, achieving 90-95% positive ratings	
• Architected & developed approximately 100,000 lines of MBScript & Python code for game logic and modular systems	

- Managed distributed teams of volunteers across multiple years, implementing complex features including custom gameplay mechanics and enhanced AI systems

Centralized Master Server | Python, PHP | GitHub

2019

- Architected first-of-its-kind centralized master server for the game, enabling real-time notifications to players without requiring client-side code updates

RSA Encryption & Decryption System | Python | GitHub

2021

- Implemented RSA cryptographic algorithm from mathematical foundations, including key generation using prime number factorization, modular exponentiation, and Euler's totient function with configurable prime digit lengths for customizable security levels
- Developed modular encryption system supporting both file and string encryption/decryption with Unicode numeral representation, integrating multiple in-house implementations of the algorithms (prime generation, modular arithmetic, extended GCD) into a cohesive cryptographic framework

Dreamy Pastures (Multiplayer Board Game Engine) | Java, UML | GitHub

2024

- Collaboratively developed local multiplayer board game supporting up to 4 concurrent players with real-time state synchronization and turn-based game logic, demonstrating OOP Design Patterns, and extensive UML Documentation

Design Patterns Library | Java, UML | GitHub

2024

- Created detailed library of OOP design patterns with UML diagrams and implementations, aligning with best practices.

Skills

Programming Languages: Python, Java, C, C++, BASH/Shell Scripting, MBScript, Assembly (MIPS, RISC-V), LaTeX, SQL

Frameworks & Libraries: PyTorch, TensorFlow, NumPy, Flask, Streamlit, YOLOv10, REST API

Tools & Platforms: Git, MySQL, Figma, Unity, Linux/Unix, Windows, AWS, Azure, Raspberry Pi, Arduino

AI & Machine Learning: Machine Learning, Computer Vision (Neural Networks), Bayesian Networks, AI Agents (Information-Theoretic, Model-Based, Goal-Based, Utility-Based, Logic-based), Information Theory

Embedded Systems & Hardware: Hardware Design, Hardware Schematics, Debouncing (Hardware & Software), Automation

Software Engineering: Object-Oriented Programming (OOP), MVC Architecture, System Design, Parallel Processing, Procedural Programming, Logic Programming, Database Programming

Algorithmic Paradigms: Divide and Conquer, Greedy Algorithms, Dynamic Programming, Decrease and Conquer

Methodologies: Agile, Scrum, DevOps

Domain Expertise: Systems Programming, Game Engines, Security/Cryptography, Server Infrastructure, GIS, Digital Signal Processing, Computer Graphics, Haptics, Computer Networks, VR/AR

Languages: English (Native), Standard Arabic (Professional), Saudi Arabic (Professional), Darija (Native), French (Beginner)

Mathematical: Tensor Calculus, Multivariable Calculus, Linear Algebra, Mathematical Modeling, Probability and Statistics, Discrete Structures, Real Analysis, Mathematical Optimization

Coursework: Software Design, Modern Algebra, Operating Systems, Advanced Data Structures & Algorithms, Database Systems, Computer Networks, Graph Theory, Data Structures & Algorithms, Algorithm Analysis, Systems Programming, Digital Electronics and Digital Signal Processing, Artificial Intelligence, Simulation and Modeling, Computer Organization & Architecture, Object-Oriented Design, Applied Calculus, Calculus 2, Multivariable Calculus, Vector Calculus, Real Analysis, Linear Algebra, Advanced Linear Algebra, Probability and Statistics, Differential Equations, Discrete Structures, Introduction to Data Science, General Physics I, General Physics II.

Transferable Skills

Leadership: Led diverse teams to deliver high-quality results, demonstrating strategic vision and inspiration

Communication: Mentored 50+ students, simplified concepts, and secured funding through compelling pitches

Project Management: Directed large-scale projects with 314,000+ users, ensuring timely delivery and satisfaction

Problem Solving: Proved 600+ mathematical propositions, showcasing advanced analytical and logical skills

Awards & Accomplishments

- **3rd Place Winner, The Pitch Competition (\$1,000)** – Mount Allison University
Secured recognition for presenting a scalable solution bridging AI and healthcare, showcasing hardware-software integration and algorithm design for medical assistance devices
- **Global eSports Excellence:** Top 100 Global Ranking Achievement in League of Legends (EUW) in Season 3
 - **Exceptional Global Ranking:** Achieved top 100 position among over 70 million active monthly players globally, placing in the 0.000001% of competitive players
 - **Strategic Mastery:** Exhibited exceptional split-second decision-making and strategic acumen in high-pressure competitive environments
 - **Competitive Success:** Dominated multiple tournaments, securing numerous 1st place victories and consistently achieving top 3 placements