

Xavier Hill Roy

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Hamilton, Ontario

Education

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| McMaster University <i>Master of Science in Computing & Software; GPA: 4.00/4.00</i> | Hamilton, ON Expected Aug. 2027 |
| Western University <i>Honours Specialization in Computer Science; GPA: 3.78/4.00</i> | London, ON Apr. 2025 |

Honors & Awards

Szilard Award in Theoretical Computer Science (2025) - Highest merit among graduating CS students, Western University
Dean's Honour List (2022-2024) - Western University

Publications

Hill Roy, X., & El-Sakka, M.R. (2025). Enhancing JPEG XL's Weighted Average Predictor: Genetic Algorithm Optimization of Expanded Sub-Predictor Ensemble. *Electronics*, 14(20), 4116. doi:10.3390/electronics14204116

Research Experience

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| Graduate Research Assistant <i>McMaster University - Creative Algorithms Lab, Advisor: Dr. Stephen Kelly</i> | Sep. 2025 – Present Hamilton, ON |
| <ul style="list-style-type: none">Developing Linear Genetic Programming systems with typed memory for visual RL and classification tasks, investigating GPU/FPGA acceleration and hybrid evolutionary-gradient optimization approaches for interpretable AI | |
| Undergraduate Thesis Research <i>Western University - Advisor: Dr. Mahmoud El-Sakka</i> | 2024 – 2025 London, ON |
| <ul style="list-style-type: none">Enhanced JPEG XL lossless compression by 2.7% through genetic algorithm optimization of 8-predictor ensemble (WOP8), extending standard 4-predictor system with JPEG-LS, PNG Paeth, and CALIC-based predictors | |

Work Experience

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| App Development Intern <i>AC, Singapore</i> | Jan. 2024 – Jun. 2024 Singapore |
| <ul style="list-style-type: none">Developed scheduling web app with Dart/Flutter, Firebase, and Google Cloud Functions with API securityOptimized search and response workflows, reducing admin team workload by 50%+ by replacing slow manual processes with automated web-based system | |
| IT Training Course Designer Intern <i>Septodont of Canada Inc.</i> | May 2023 – Dec. 2023 Canada |
| <ul style="list-style-type: none">Designed AI training workshops for employee productivity, achieving company-wide adoption and transforming organizational AI workflows | |

Projects

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| Terminal-Typer: Distributed Typing Game <i>Python, gRPC, Protocol Buffers, Redis, Curses</i> | 2025 |
| <ul style="list-style-type: none">Architected distributed typing game with gRPC and Protocol Buffers for low-latency communication, handling concurrent client connectionsImplemented real-time chat and leaderboard system with Redis persistence, automatic file backups, and responsive terminal UI with ASCII art rendering | |
| The Fighting Game: 2D Combat on Embedded Hardware <i>C++, Raspberry Pi, TDD</i> | 2023 |
| <ul style="list-style-type: none">Led team development of 2D fighting game in C++ on Raspberry Pi, coordinating from novice to functional delivery while implementing Test-Driven Development, UML design, and managing embedded systems constraints | |

Technical Skills

Languages: Python, C/C++, Java, Dart, RISC-V Assembly, SQL
Technologies: NumPy, gRPC, Protocol Buffers, Redis, Flutter, Firebase
Research: Evolutionary Computation, Visual Reinforcement Learning, GPU/FPGA Acceleration