

Nic Bolton

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EDUCATION

Master of Science in Applied Computing University of Toronto, Toronto, ON	Sep 2025 – Dec 2026
<ul style="list-style-type: none"><i>Relevant coursework:</i> advanced computational methods for statistics, high performance scientific computing, stochastic models in investments, vector databases	
Bachelor of Science in Physics and Computer Science University of Windsor, Windsor, ON	Sep 2020 – Apr 2025

RESEARCH EXPERIENCE

Research Assistant University of Windsor, Windsor, ON	May 2024 – Aug 2024
<ul style="list-style-type: none">Created numerical quantum mechanics simulation in Python to model High Harmonic Generation and electron dynamics in periodic potentialsImplemented various algorithms to generate synthetic datasets and solve the Time-Dependent Schrödinger Equation using SciPy, NumPy, and Numba	
Java/C++ Programmer Wayne State University, Detroit, MI	May 2022 – May 2024
<ul style="list-style-type: none">Developed an ImageJ plugin in Java and C++ to quantify magnetic moments of small spherical MRI objectsBuilt responsive GUI enabling users to load MRI images and visualize computed magnetic-moment parameters through a structured multi-step workflowImplemented and optimized C++ numerical routines for 3D array interpolation, phase background removal, and magnetic-moment estimation, significantly improving computational performance	
Research Assistant University of Windsor, Windsor, ON	Dec 2022 – Apr 2024
<ul style="list-style-type: none">Contributed to Python code employing Principal Component Analysis and Neural Networks to identify elements from bacterial spectra, supervised by Dr. Steven RehseAchieved an 83% reduction in program runtime through data preprocessing optimization	

PROFESSIONAL EXPERIENCE

Software Developer Case FMS, Lakeshore, ON	May 2023 – Present
<ul style="list-style-type: none">Designed and implemented full-stack web application to streamline the procurement of service partners for domestic client contracts, integrating a machine learning model for cost prediction using .NET, PostgreSQL, Python, N8NCreated multiple interactive dashboards for account managers to track and communicate with service partners, saving licensing costs and removing dependencies on SalesforceOptimized PostgreSQL queries for client portal resulting in 40% improvement of render time	
Teaching Assistant University of Windsor, Windsor, ON	Sep 2022 – Dec 2024
<ul style="list-style-type: none">Instructed and graded weekly labs (Introductory Physics I/II)Assisted students with assignments and learning C++ techniques (Advanced Object Oriented System Design Using C++)	
Freelance Web Development Self-employed, Windsor, ON	Sep 2023 – Aug 2024
<ul style="list-style-type: none">Constructed various web sites and applications for local companiesCollaborated directly with company representatives to identify design requirements	

PROJECTS

Bolton Cup Hockey Tournament	boltoncup.ca
<ul style="list-style-type: none">Engineered a .NET ecosystem with real-time interactivity using SignalR, supporting 100+ players and live tournament operations ranging from team drafts to on-ice scoring and stat updatesBuilt a comprehensive tournament management platform featuring an interactive draft interface, scoresheet app, and public website for player stats and schedules — each integrated through a shared backend systemDelivered a polished and scalable user experience with MudBlazor, deployments with Docker, and custom	

authentication, helping the annual Bolton Cup reach 100K+ social media users, secure sponsorships, and award \$1000+ in prizes while automating the bulk of the event workflow

Emergency Dispatch Simulator

nicbolton.ca?project=eds

- Developed a web-based training platform for 911 operators with real-time, two-way voice conversations with AI callers using Boson AI's Higgs Audio V2 models for speech generation and comprehension
- Designed frontend and backend integration through WebSocket streaming, featuring dynamic scenario generation and automated performance analysis via transcriptions
- Constructed entire app for a hackathon with three other team members over one weekend, placing top 6 out of 80+ teams

Exo Explorer

nicbolton.ca/ExoExplorer

- Created interactive 3D web application for exploring NASA's exoplanet database using Three.js for navigation through discovered exoplanets in the Milky Way
- Project constructed over two days for the NASA Space Apps Challenge, placed third out of 15 teams

Classical Simulation of a Quantum Algorithm for Breaking the Factoring Problem

- Undergraduate capstone project involving a classical implementation of Shor's algorithm to demonstrate how it can break cryptosystems such as RSA and ElGamal

POSTERS

- Rehse S et al., **Bolton N**, (Rehse Lab). *Detection of Bacteria in Blood using Laser-Induced Breakdown Spectroscopy*. 2024 CAP Congress, Western University, London, ON. May 2024
- Rehse S et al., **Bolton N**, (Rehse Lab). *Diagnosing Bacterial Urinary Tract Infections Using Laser-Induced Breakdown Spectroscopy*. 2024 CAP Congress, Western University, London, ON. May 2024
- Rehse S et al., **Bolton N**, (Rehse Lab). *Toward the development of a rapid diagnostic test for bacterial meningitis using laser-induced breakdown spectroscopy*. 2024 CAP Congress, Western University, London, ON. May 2024

TECHNICAL SKILLS

- **Languages:** C, C++, C#, Java, JavaScript, Python, SQL
- **Frameworks/Libraries:** .NET, FastAPI, Flask, Matplotlib, NumPy, OpenAI API, Pandas, Scikit-learn, SciPy, Qiskit
- **Technologies:** Azure, Docker, Git, Hugging Face, N8N, Nginx, Ollama, PostgreSQL, Postman, Visual Studio

EXTRACURRICULARS

Lakeshore Canadiens Jr. C Hockey Team

Nov 2022 - May 2024

- Committed approximately 25 hours per week to practices, games, and travel while maintaining full course load
- 2024 Schmalz Cup champions