Nic Bolton

Toronto, ON | nic@cs.toronto.edu | (519) 817-6511 | nicbolton.ca

EDUCATION

Master of Science in Applied Computing | University of Toronto, Toronto, ON — Sep 2025 – Dec 2026

- *Relevant coursework:* applications of parallel and distributed computing, 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

Java/C++ Programmer | Wayne State University, Detroit, MI — May 2022 – May 2024

- Developed an ImageJ plugin in Java and C++ to quantify magnetic moments of small spherical MRI objects
- Built responsive GUI enabling users to load MRI images and visualize computed magnetic-moment parameters through a structured multi-step workflow
- Implemented 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 — May 2024 – Aug 2024

- Created numerical quantum mechanics simulation in Python to model High Harmonic Generation and electron dynamics in periodic potentials
- Implemented various algorithms to generate synthetic datasets and solve the Time-Dependent Schrödinger Equation using SciPy, NumPy, and Numba

Research Assistant | University of Windsor, Windsor, ON — Dec 2022 – Apr 2024

- Contributed to Python code employing Principal Component Analysis and Neural Networks to identify elements from bacterial spectra, supervised by Dr. Steven Rehse
- Achieved an 83% reduction in program runtime through data preprocessing optimization

PROFESSIONAL EXPERIENCE

Software Developer | Case FMS, Lakeshore, ON — May 2023 – Present

- 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, N8N
- Created multiple interactive dashboards for account managers to track and communicate with service partners, saving licensing costs and removing dependencies on Salesforce
- Optimized PostgreSQL queries for client portal resulting in 40% improvement of render time

Teaching Assistant | University of Windsor, Windsor, ON — Sep 2022 – Dec 2024

- 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

- Constructed various web sites and applications for local companies
- Collaborated directly with company representatives to identify design requirements

PROJECTS

Bolton Cup Hockey Tournament — boltoncup.ca

- 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 updates
- Built 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 system
- Delivered 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 our solar system and discovered exoplanets
- 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

- Developing capstone project involving quantum computing and cryptography, supervised by Dr. Shaoquan Jiang
- Project involves a classical implementation of Shor's algorithm to demonstrate how it can break cryptosystems such as RSA and EIGamal

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