Nicholas Rathfelder

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Professional Summary

Adaptable and dependable engineering student interesting in digital and analog IC design. Eager to learn and explore all of the different aspects of the engineering design process process.

Technical Skills

Practical	Soldering, Wiring, Circuit Simulation, Waveform Analysis, Scope Capture, 3D Printing
Tools	Oscilliscope, Logic Analyzer, Digital Multimeter, LCR meter, Waveform Generator, Reflow Oven
Programming	Verilog, VHDL, TCL, Perl, ARM, Embedded C, C++, Python, MATLAB
Software	Vivado, Quartus Prime, ModelSim, Altium Designer, STM32 Cube, LTSpice, Solidworks, Proteus 8

Work Experience

Curtiss-Wright Defense Solutions *Kanata, ON*
FPGA Engineering Intern Sept. 2025 - Dec. 2025
- Developed RTL and integrated 3rd party IP to support the design, simulation and testing of mission-critical aerospace and defense systems
- Implemented a UART-based debug interface to provide visibility into internal hardware states during restricted-access environmental testing

Musashi AI *Waterloo, ON*
Controls and Electrical Engineering Intern Jan. 2025 - Apr. 2025
- Updated electrical drawings and developed PLC/robot programs for AI automotive inspection machines
- Upgraded the Automate 2025 tradeshow inspection cell to allow for onboard chatter inspection of automotive camshafts

Martinrea International *Tillsonburg, ON*
Electrical Engineering Intern Sept. 2023 - Dec. 2023
- Provided support for the engineering team in the maintainence and improvement of the line
- Integrated GPIO-triggered serial messaging into the in-house weld inspection system to improve system response time

Stelco - Lake Erie Works *Nanticoke, ON*
Process Engineering Intern Jan. 2023 - Apr. 2023
- Provided the operating team at the Hot Strip Mill insight into daily operations through the creation of Microsoft Power BI reports
- Started the development of a MATLAB and PLC based image analysis program to monitor slag build up on the walls of the BOF

Projects

Electromagnetic Projectile Accelerator
Designed, assembled, and tested 5 stage coilgun
- Designed and printed custom PCB for microcontroller power and interfacing with Altium Designer
- Programmed coil control logic on STM32 Black Pill in embedded C via STM32Cube
- Designed and 3D printed custom enclosure to house components using Solidworks and Bambu Studio

Water Reservoir Control System
Designed and prototyped a water reservoir control system for ECE298
- Programmed STM32 Nucleo board to control a multi-zone water pump system using STM32Cube
- Designed and validated PCB using Proteus 8 for component control and power

Education

University of Waterloo, Term 3A *Waterloo*
BASc in Electrical Engineering - 3.82 GPA Sep. 2022 - Jun. 2027
Relevant Coursework: Digital Computers, Digital Circuits, Electronic Circuits, Instrumentation and Prototyping

Awards and Honours

Apr. 2024	**Honour**:	Term Distinction in 2A, 2B, 3A
Aug. 2022	**Scholarship**:	WatPD Engineering Entrance Scholarship