Sam Wilton

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Summary

Third-year Mechatronics Engineering student at McMaster University with a strong foundation in computer science, CAD, embedded systems, dynamics, signal processing, and circuit design. I've gained hands-on experience through roles in solar vehicle design and bicycle dynamics research at the University of Calgary. I'm known for my teamwork, leadership, and communication skills, developed through research projects, tutoring, and three years of ski race coaching. I'm especially passionate about improving existing technologies and finding practical, efficient ways to solve real-world problems.

Projects

McMaster Solar Car – Suspension & Dynamics | *McMaster University* Sept. 2024 – Present
- Optimizing the suspension and steering system of the McMaster Solar Car
- Focused on modeling and analyzing dynamical interactions to improve performance and efficiency

Interactive Chess Trainer | *Flask, React, Stockfish, Python, JavaScript* April 2025 – Present
- Developed a web-based chess training platform that analyzes users past games to detect key mistakes and generate targeted quizzes as well as custom game play to help the user practice weaknesses
- Designed frontend in React and backend in Flask with persistent user data and mistake tracking

Interactive Holographic Display on LCD | *STM32, Python, Embedded Systems* Feb. 2025 – Mar. 2025
- Programmed an STM32 microcontroller to display interactive 3D wireframe models on a transparent screen
- Used Python to generate 3D meshes from 2D image topography for real-time holographic rendering

Room Automation Project | *Embedded Systems, IoT* Jan. 2025
- Automated room devices including lights, coffee maker, and heater using an MCU-based system controllable via smartphone
- Gained practical experience in embedded systems, microcontroller programming, and system integration

Experience

Research Assistant – Dr. Qiao Sun May 2024 – Present
University of Calgary — Calgary, AB
- **Bicycle Dynamics Research (May 2025 – Present):** Conducting research on the dynamic behavior and control of two-wheeled systems to improve stability and performance
- Developing simulations and contributing to modeling of bicycle motion under real-world conditions
- Assisting with experimental setup, sensor integration, and data acquisition workflows
- **Bearing RUL Test Rig Development (May – Aug 2024):** Designed and optimized a test rig to assess the remaining useful life of dynamically loaded bearings
- Performed sensor calibration, signal processing, and mechanical analysis to improve data accuracy
- Contributed to team task coordination and streamlined experimental procedures

Education

McMaster University Hamilton, ON
Bachelor of Engineering, Mechatronics Engineering (Co-op) *Sept. 2023 – Present*
- Recipient of Provost's Honor Roll Medal for achieving 12.0/12.0 GPA in Year One studies
- Awarded entrance scholarships totaling $24,000, including Engineering Dean's Excellence Scholarship, Engineering Research Experience Award, and SHAD Alumni Scholarship

Technical Skills

Programming Languages: Python, C/C++ , MATLAB, Maple
Software & Tools: NI LabVIEW, SolidWorks (FEA), Autodesk Inventor, Microsoft Office
Hardware & Systems: Embedded Systems, Circuit Design, Power Tools, Woodworking, 3D Printing
Languages: English (Fluent, oral and written), French (Fluent, oral and written)