ALEXANDRE BARIL

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Portfolio
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EDUCATION

Bachelor's Degree in Robotics Engineering August 2021 - Ongoing
Université de Sherbrooke

DEC in Mechanical Engineering 2018- 2021
CEGEP Saint-Jean-sur-Richelieu

SKILLS

Languages

- Fluent French (5/5), Advanced English (4/5)

Mechanical

- Mastery of 3D modeling: SolidWorks, SolidEdge, OnShape, Fusion360, AutoCAD
- Knowledge of design for assembly (DFA) and design for manufacturing (DFM)
- CNC and conventional machining, mechanical systems analysis and iterative mechanism creation
- In-depth knowledge of 3D printing and manufacturing processes

Computer

- Programming languages: C, C++, Python, ST (with MX Cube), LaTeX
- Linux, Qt, ROS/ROS2, Git, VS Code, RTOS, Matlab, Simulink

Electronics

- Design printed circuit boards with microcontrollers (STM32, Arduino, ESP32), analog filters, linear gains, basic electrical systems
- Communication between components via CAN, I2C, UART, SPI and analog and digital signals

PROFESSIONAL EXPERIENCE

Robotics Engineering Intern Fall 2024
Chronomed, Sherbrooke

- Program a pill dispensing machine (99.9% success rate).
- Optimize C/C++ functions and contribute to mechanical design (OnShape) and electronics (ESP32).
- Contribute to mechanical design and create production-ready technical drawings using OnShape.
- Assemble, debug and test electronics controlled by ESP32s designed with EasyEDA.
- Collaborate effectively within a team to maximize the use of a single test machine

Robotics Engineering Intern Winter 2024
Creatrek – 3IT, Sherbrooke

- Design and program a multi-axis patient lift in C++ on Teensy with micro-ros.
- Develop sequential logic in Python with ROS2 for prototype demonstration.
- Integrate sensors and encoders to ensure precise movement control.
- Select and implement electronic system components.

Electronics Engineering Intern Summer 2023

Voltech International Inc., Saint-Germain-de-Grantham

- Create a test bench for LED luminaires, including STM32-based printed circuit boards.
- Program STM32 microcontroller under FreeRTOS and develop a Python user interface.
- Design analog filters and establish I2C and SPI communications for sensors.

3D modeling technician (internship) Summer 2021

Métal Saint-Jean (MSTJ)

- Parts modeling for laser cutting, bending and for cutting dies.
- Automating the deburring of 200 to 400 pieces weekly, with the design of a custom machine.

OTHER EXPERIENCES

ROVUS Director 2022- Ongoing

ROVUS - Robotique UdeS

2e place canadienne à la compétition CIRC 2024, Drumheller, AB

- Lead a 35-member team building a Mars-style autonomous rover for the CIRC.
- Managed mechanical, electrical, and software development across subsystems.
- Designed, built, and programmed a custom 5-DOF robotic arm.
- Mentored junior members and structured technical onboarding.
- Secured 2nd place in Canada at CIRC 2024 (Drumheller, AB).

VP Machine January 2024 – January 2025

Machine - Engineering Games 2025

- Lead the team to design, prototype and optimize the mechanics, electronics and programming of small mobile robots with advanced mechanisms in 4 months.
- Win the Machine competition at Jeux de Génie for my third consecutive year (2023, 2024 and 2025).

Engineering Competitions 2023-2025

- Canadian Engineering Competition (CEC):
  - 1st place, CEC 2024 (Schulich School of Engineering, Calgary, AB).
  - 3rd place, CEC 2023 (University of Waterloo, ON).
- Quebec Engineering Competition (QEC):
  - 1st place, QEC 2025 (Polytechnique, Montréal, QC).
  - 1st place, QEC 2024 (ULaval, Québec, QC).
  - 2nd place, QEC 2023 (ÉTS, Montréal, QC).
- Design and program a mobile robot in less than 10 hours, demonstrating ingenuity to meet strict time, resource and functionality constraints.
- Present our prototype in French and English to a jury of different expertise areas.

HOBBIES

- Outdoor activities, hiking and camping
- Alpine skiing, mountain biking, various sports
- Personal robotics, electronics and mechanical projects
- Design and manufacture a CoreXY 3D printer