

# Dragos Bajanica

Boisbriand, QC | [bajanica.dragos@gmail.com](mailto:bajanica.dragos@gmail.com) | (438) 921-0153 | [linkedin.com/in/dragos-bajanica](https://linkedin.com/in/dragos-bajanica)  
[github.com/Gnardisitor](https://github.com/Gnardisitor)

## Education

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- McGill University**, BE in Computer Engineering – Montreal, QC Aug 2024 – Dec 2027
- 3.98/4.0 CGPA, Dean's Honour List (2024/2025)
- Dawson College**, DEC in Pure and Applied Science – Montreal, QC Aug 2022 – May 2024
- 36.3 R-Score, Honours List (All Semesters)

## Skills

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**Programming:** C, C++, Python, Java, JavaScript, TypeScript, Bash  
**Developer Tools:** Git, GitHub, GitHub Actions, Docker, Make, CMake, GCC, LLVM  
**Operating Systems:** Windows, Linux  
**Languages:** English (fluent), French (fluent), Romanian (native)

## Experience

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- Rover Electrical Division Member**, McGill Robotics – Montreal, QC Sept 2025 – present
- Co-designed a custom UART hub around an STM32 ARM microcontroller, interfacing six peripherals over UART, RS-232, and RS-485, with a USB upstream link to the rover, using Altium Designer.
  - Developing bare-metal STM32 firmware in C for the UART hub, implementing interrupt-driven UART multiplexing and DMA transfers across all six peripheral channels.
  - Authored hardware documentation for the UART hub, including design decisions and their rationale.

## Projects

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### Solar System N-Body Simulator

- Developed a physics simulation engine in C to calculate gravitational forces between celestial bodies.
- Improved performance by nearly 100x compared to the initial Python version using manual memory management and efficient data structures.
- Integrated libcurl to fetch live ephemeris data from NASA's Horizons API, initializing simulation state from real-world orbital parameters.

### Graviton Engine

- Rewritten the entire n-body physics engine to take advantage of multi-threading and SIMD instructions using C++ and OpenMP, now capable of running 10,000 steps with 5,000 bodies in under 80 seconds using direct force method.

### Z80-Based Microcomputer

- Designed a custom 8-bit computer based on the Zilog Z80 CPU and an EEPROM programmer Arduino shield.
- Created complete schematics for the memory map, address decoding logic, and UART peripheral interfacing via a USB-to-UART bridge using KiCAD.