Vist my website here!

# GABRIEL GEBREMEDHN

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## PROFESSIONAL SUMMARY

I'm an Electrical Engineering student with a passion for building hardware that moves. From designing satellite power systems to engineering a mechanical heart, I specialize in embedded systems, circuit design, and testing hardware to ensure reliability in high-stakes environments. I love the challenge of taking a complex idea and turning it into a working, physical prototype.

Embedded Systems Development | Analog & Digital Circuit Design | Hardware Validation & Troubleshooting | Mechatronics & Actuator Control | Sensor Calibration & Signal Processing | PWM & Arduino Interrupts | Ultrasonic Sensors (HC-SR04) | ADC & UART Communication | Technical Documentation & Engineering Reporting | CAD Design & Electrical Drawings

## EDUCATION

**Bachelor of Science in Electrical Engineering** | **U**niversity of Alberta | Expected Date: May 2027
**Coursework**: Embedded Systems | Electrical Circuits, Power Systems | Digital Logic Design | Microprocessors

## ENGINEERING EXPERIENCE

**Alberta Heart (Student Engineering Team) - Edmonton, AB** **Sep 2025 – Present**
**Electrical & Embedded Systems Member**

- **Hardware Testing & Support:** Assisted with hands-on hardware testing and basic troubleshooting using oscilloscopes and multimeters to help identify circuit issues during team testing sessions.
- **Control Circuit Assistance:** Supported the design and assembly of analog and digital control circuits for the Total Artificial Heart (TAH) project, focusing on power delivery and basic safety functions.
- **System Tuning**: Enhance pumping accuracy, responsiveness, and long-term reliability by designing, implementing, and tuning closed-loop feedback control systems under varying operating conditions.

**University of Alberta Solar Car Club (USCC) - Edmonton, AB** **Sep 2024 – Present**
**Electrical Subsystem Team Member**

- **Battery & Power Management**: Drive power subsystem optimization for solar-powered electric vehicle by analyzing and integrating battery management systems, MPPT controllers, AC/DC charging infrastructure, and power architecture.
- **Electrical Subsystem Design**: Boost performance electrical subsystem through circuit design, subsystem modeling, and coordinated integration while ensuring stable and efficient energy delivery across the vehicle.

**AlbertaSat (University Satellite Engineering Team) - Edmonton, AB** **Jan 2025 – Sep 2025**
**Power Systems Team Member**

- **EPS Design & Review:** Utilized Altium Designer to review solar panel PCB layouts and verify trace routing, ensuring the circuitry met the requirements for the satellite's Electrical Power System (EPS) architecture.
- **Solar Panel Testing**: Led fabrication and performance testing of Hyperion solar panels for Ex-Alta 3 aimed at improving power output, efficiency, and overall system reliability for successful satellite deployment.

## KEY PROJECTS

**Servo-Powered Ultrasonic Sonar Scanner**

- **Object Detection:** Developed a rotating sonar system using an ultrasonic sensor and servo to map objects across a 180° field, using the timing of sound pulses for real-time distance tracking.
- **Hardware Integration:** Programmed an ATmega328P to coordinate motor movement with RGB LED and buzzer alerts, providing immediate interactive feedback as objects move closer.

**Multistage BJT Audio Amplifier**

- **Circuit Modeling:** Designed and simulated a two-stage BJT amplifier in LTspice, analyzing signal behavior to achieve a stable voltage gain of ~11 V/V at 2 kHz.
- **Signal Optimization:** Prototyped the circuit on a breadboard and used an oscilloscope to monitor output waveforms, adjusting components to eliminate clipping and ensure a clean, undistorted sound.

## TECHNICAL SKILLS

**Programing languages**: C/C++ | Python |MatLab |Arduino IDE |Verilog/VDHL| Assembly | Microcontroller programing
**Applications**: Altium Designer| KiCad | LtSpice |SolidWorks |AutoCAD |Word/ Excel | Microsoft 365/MS Office
**Availability:** Seeking a 4, 8, or 12-month internship starting May 2026.