CASSANDRA PHILOGENE

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EDUCATION

Concordia University	Montreal, QC
B.Eng., Electrical Engineering (Program Transfer), Expected May 2028	*Winter 2026 – Present*
Concordia University	Montreal, QC
Previous: B.Eng., Computer Engineering (coursework completed)	*Winter 2024 – Fall 2025*

TECHNICAL SKILLS

Programming: C/C++, Python, VHDL
Embedded/Robotics: Arduino, ROS2, sensor interfacing, closed-loop control (PID), motor drivers
Hardware: power distribution, wiring/harnessing, PCB design, circuit simulation (LTspice), CAD (Fusion 360)
Tools: Git/GitHub, Linux, Vivado, ModelSim, MATLAB, oscilloscope

ENGINEERING PROJECTS

Robot Operating System 2 (ROS2) Chess Robot Arm — Dec 2025 – Present (Target: Summer 2026)
IEEE Club Project — *Montreal, QC*
- Developed a ROS2 control stack in Python with modular nodes for command handling, state feedback, and motion execution
- Implemented motion execution pipeline (kinematics and trajectory generation) and safety constraints (joint limits, workspace bounds, basic fault handling)
- Documented system setup and run procedure to support team integration and repeatable demonstrations
- Planned next milestones: calibration and tuning for accuracy/repeatability; add performance metrics such as cycle time, success rate, and positioning error

Buck Converter PCB (Battery Eliminator Circuit) — Dec 2025 – Present (Target: Summer 2026)
SAE Club Project — *Montreal, QC*
- Designed a buck converter architecture to regulate input voltage to a stable rail for aircraft/RC power; selected controller, inductor, and protection features (UVLO/OCP/thermal)
- Created schematic and BOM; validated switching behavior, stability, and transient response in LTspice and iterated component values toward ripple and thermal targets
- Started PCB layout with EMI-aware routing practices: minimized high di/dt loops, defined grounding strategy, and placed decoupling capacitors for stable operation
- Planned next milestones: bench validation (efficiency vs load, ripple, load-step response, thermal rise) and layout revisions based on measurements

LEADERSHIP AND TECHNICAL ACTIVITIES

SAE Aero-Design — Systems — Jun 2025 – Present
Concordia University, Student Design Team — *Montreal, QC*
- Designed and assembled aircraft electrical and control subsystems (power distribution, wiring harnessing, connectors, control interfaces) for competition-ready integration
- Supported prototype integration by debugging electrical issues using incremental subsystem isolation; improved system reliability by resolving shorts and intermittent connections
- Contributed to flight testing by reviewing telemetry and proposing electrical/integration changes to improve stability and power delivery

Hovercraft Prototype Competition — Dec 2025
Concordia University — *Montreal, QC*
- Developed an autonomous hovercraft using Arduino and onboard sensors; implemented navigation logic to solve a maze and iterated behavior based on testing
- Designed a manufacturable 3D CAD model in Fusion 360; optimized layout for stability and serviceability (center of gravity and battery access)

Robowars Competition (Autonomous Robot) — Apr 2025
IEEE Competition — *Montreal, QC*
- Programmed an autonomous robot on Arduino Nano using modular control logic (sensor read, decision, actuation) for real-time behavior
- Integrated sensors and a motor driver; tuned control parameters to improve responsiveness and reduce unstable behavior during matches
- Improved mechanical and electrical robustness (mounting, wiring strain relief) to increase match uptime and reduce failures