Adnan Amara

Linkedin: adnan-amara
Email: adnanamara213@gmail.com
Portfolio: adnanamara.tech

Education

- **Master of Engineering - Electrical Engineering** — Montréal, Canada
  École de Technologie Supérieure — *January 2024 - May 2026*
- **Master of Engineering - Electronics and embedded systems** — Algeria
  École Nationale Polytechnique d'Oran Maurice Audin — *September 2018 - July 2023*

Skills summary

- **Languages**: Python, C, C++, SQL, VHDL, Octave, Latex, Matlab, x86 Assembly, SCADA
- **Communication Protocols**: RS-485/422/232, I2C, and Gigabit Ethernet/IEEE 802.3
- **Frameworks**: Scikit-learn, TensorFlow, Arduino, Mbed, ROS
- **Tools**: GIT, MySQL, Altium Designer, Cadence Virtuoso, Tia Portal, KiCad, SEE Electrical Expert
- **Platforms**: Linux, Windows, Arduino, ATmega2560, Raspberry, PLC (Siemens S7-1200: Ladder, SCL)
- **Soft Skills**: Cross-functional R&D collaboration, trilingual technical communication, autonomous ramp-up in unfamiliar industrial environments, knowledge transfer and public speaking, end-to-end design ownership

Experience

- **Electrical System Specialist R&D** — Montreal, Canada
  Cora Robotique — *April 2024 - December 2024*
  - In charge of low-level programming of an industrial autonomous mobile robot: embedded C/C++ on an ATmega2560 for the prototype, then a Siemens S7-1200 PLC programmed in SCL for the production model, driving the motor controller and monitoring the battery.
  - Responsible for the design and optimization of the robot's electrical system.
  - Development and implementation of technical solutions aimed at improving the performance and reliability of the robotic system.
  - Close collaboration with research and development teams to integrate innovative technologies and optimize the robot's performance.

- **Instrumentation Intern** — Algeria
  Sonatrach — *March 2023 - June 2023*
  - Gained in-depth experience in instrumentation and industrial processes.
  - Analyzed the Mark V lubrication system and the oil temperature control loop.
  - Advanced practice with Siemens Simatic WinCC.
  - Enhanced understanding of the oil and gas industry.

- **Automation and Electrical Systems Intern** — Algeria
  LM Electric — *June 2022 - August 2022*
  - Designed and installed an electrical power supply system.
  - Used EPLAN software for electrical schematics.
  - Programmed a Siemens S7-1200 PLC in ladder logic under Tia Portal for the system's automation.
  - Held full responsibility for setting up the electrical system.
  - Acquired advanced skills in electrical engineering and automation.

- **Maintenance Intern** — Algeria
  Shariket Kahraba El-Djazair-SKE — *March 2021 - January 2022*
  - Actively participated in electrical maintenance operations, including the diagnosis and repair of electrical machines and installation of electrical cabinets.
  - Contributed to the study and design of HVDC transmission systems, including converter stations, AC/DC interfaces, and associated electrical equipment.
  - Analyzed battery systems and gained practical knowledge of digital communication protocols and monitoring systems.
  - Applied industrial automation and control principles in electrical power-system applications.

Volunteer Experience

- **IEEE Power & Energy Society (IEEE PES) General Meeting 2026** Montréal, Canada
  Volunteer *July 2026*
  - Provided flexible, on-demand support across multiple event areas.
  - Assisted with signage placement and other logistical tasks to support smooth day-to-day operation of the conference.

- **American Corner Oran – US Embassy** Oran, Algeria
  Member *October 2021 - October 2023*
  - Organization of an electronics workshop and participation in cultural events to promote exchange and cultural engagement.
  - Leading discussion sessions and presentations to share technical and cultural knowledge with participants.

Projects

- **Intelligent Battery Management System (BMS) with Real-Time State-of-Health Estimation**: Designed and implemented a closed-loop BMS in MATLAB/Simulink and Simscape Battery for a 96-cell lithium-ion pack (Panasonic NCR18650BD). Built a custom dual-path SoH estimator reaching under 1% error at beginning of life, several orders of magnitude lighter than EKF and LSTM approaches, and directly portable to embedded code via Embedded Coder (TRL 4). Validated through dynamic-cycle, SoH-sweep, and twelve-step accelerated-aging protocols.
- **Design and Simulation of an Operational Amplifier in CMOS-0.18μm Technology and Chip Design**: I designed and simulated a two-stage operational amplifier using CMOS 0.18µm technology, focusing on achieving specific performance metrics such as high gain, phase margin, and low power consumption. The project involved creating both a standard operational amplifier and a cascode-based amplifier to compare their performance. I conducted extensive DC, AC, and transient simulations to validate the amplifier's functionality in open-loop and closed-loop configurations, ensuring stability and meeting design specifications. Additionally, I optimized the cascode structure to achieve higher gain and bandwidth while maintaining a phase margin of 53° and a gain of over 75 dB at low frequencies. The layout design phase included synthesizing the chip using Cadence tools, performing DRC and LVS checks, and running post-layout simulations to account for parasitic effects.
- **Design and Implementation of an embedded electronic and computer interface for localization and navigation of a mobile robot in an unknown environment**: Developed an autonomous navigation system for an indoor mobile robot using the Robot Operating System (ROS). The project involved three key modules: mapping (SLAM algorithm with 2D/3D sensor data), localization (AMCL approach for pose estimation), and planning (utilizing the navigation stack for collision-free trajectory generation and control commands).
- **Temperature Indicator**: A system that takes into account both external and internal temperatures, equipped with two temperature probes, one to be placed outside and the other inside the habitat (both to be kept in the shade). The motivation behind the development of this system stems from periods of high temperatures, during which it is recommended to ventilate the rooms at night and keep them closed during the day.
- **Arduino Based CNC Plotter Machine**: Numerous CNC machines exist globally, with some being highly technical and complex to manufacture or operate successfully. Due to this, the decision was made to construct a straightforward CNC machine based on the Arduino platform, which is by far the easiest to construct.

Language proficiency

- English - Fluent
- French - Fluent
- Spanish - Beginner
- Arabic - Native