Hussin Abdullah

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Education

- **Carleton University** — Ottawa, ON
  Bachelor of Engineering in Electrical Engineering; — *Sep. 2019 – May. 2025*

Project Experience

- **Fabricated CMOS Integrated Circuit – Pseudo-Random Sequence Generator** — Ottawa, ON
  Carleton University — *Dec. 2023*
  - Designed, simulated, and fabricated a full custom CMOS IC pseudo-random sequence generator (PRSG) using Cadence Virtuoso.
  - Built and verified schematics/testbenches for core logic (XNOR w/ reset, oscillator, D flip-flop, driver, input protection).
  - Completed custom layouts ensuring DRC/LVS compliance.
  - Performed wafer-level testing using Wentworth Probe Station, HP 4155A Semiconductor Analyzer, and Tektronix Oscilloscope, diagnosing discrepancies between simulation and silicon.

- **CMOS Operational Amplifier – 45nm SOI Process (Cadence Virtuoso)** — Ottawa, ON
  Carleton University — *Dec. 2023*
  - Designed and simulated a two-stage op-amp with differential input and output buffer under PVT corner analysis (27 variations: Process, Voltage, Temperature).
  - Optimized key performance metrics: open-loop gain, unity gain bandwidth, phase margin, power dissipation.
  - Developed a multi-finger transistor layout with symmetry utilizing dummy transistors.
  - Verified layout vs. schematic (LVS) and DRC compliance.

- **Gesture-Controlled Alpha-bot23 – Embedded Systems & RF Communication** — Ottawa, ON
  Carleton University — *April 2023*
  - Programmed Arduino Nano (glove transmitter) and Arduino Mega (robot receiver) in C++ for real-time 2.4 GHz RF (NRF24L01) communication.
  - Implemented gesture recognition using MPU6050 accelerometer/gyroscope, mapping tilt (pitch/roll) to motor control with PWM dead-zone filtering.
  - Integrated L298N motor driver with four DC motors for precise differential steering; added ultrasonic obstacle detection with auto-braking.
  - Designed and 3D-printed a custom PLA chassis in Fusion 360, optimizing weight, durability, and component placement.
  - Delivered a fully functional prototype demonstrating wireless wearable-controlled robotics with potential for accessibility and assistive technology applications.

Skills

- **Electronic Design Automation (EDA)**: Cadence Virtuoso, LTspice, ModelSim, Questa, Quartus, Vivado, Simulink.
- **IC Design & Verification**: CMOS analog/digital circuit design, schematic capture, custom layout, DRC/LVS, PVT corner analysis, transistor-level simulation.
- **Analog & Digital Circuits**: Op-amp design, current mirrors, differential amplifiers, sequential logic, pseudo-random sequence generators.

Programming Skills

- **Languages**: Verilog, Python, Matlab, Java
- **Technologies**: Cadence Virtuoso, Questa, Quartus,Vivado, ANSYS, MultiSim, PowerWorld