Ayman Pathan

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Technical Skills

Languages: Python, C/C++, Java, JavaScript/TypeScript
Frameworks/Tools: FastAPI, Node.js, Firebase, Git, VSCode, CLion, Swagger UI, React
ML/CV: PyTorch, OpenCV, MediaPipe, YOLO, NumPy, LLM Integration, Prompt Engineering, OOP
Embedded: STM32, VESC, ESP32, Arduino, Raspberry Pi, Encoders, Sensors, PCB design

Education

University of Waterloo — Waterloo, ON
Bachelor of Applied Science - BASc, Computer Engineering (Honours) — *Sep. 2025 – Present*
- Presidential Scholarship recipient (95%+ admission average)

Experience

AI Software Engineering Intern — Oct. 2025 – Present
Meril Life Sciences (Hybrid / Onsite Dec–Jan) — *Vapi, India*
- Built an OpenCV-based anti-cheat system for remote interviews using gaze/eye-position, face-presence, and motion tracking to detect suspicious behavior in real time; filtered a 5,500-sample dataset and tuned detection thresholds to reduce false positives
- Developed a Python/FastAPI backend integrating LlamaAPI to automate candidate screening workflows; supported 30 internal users and processed ∼400 requests/day.
- Delivered an AI email generation module (prompting + parameter tuning) that reduced drafting time by ∼70%, saving up to ∼3 hours/week per HR team member.
- Deployed 8 production FastAPI endpoints with validation and structured error handling to support stable day-to-day operation.

Firmware Engineer — Sep. 2025 – Present
Electrium Mobility Design Team (University of Waterloo) — *Waterloo, ON*
- Developed STM32-based embedded firmware for an e-bike control system interfacing with VESC motor controllers and Bluetooth telemetry.
- Implemented encoder-based sensing for speed/odometry and incline estimation; achieved ∼4% odometry error across 12 tests and 35 km logged.
- Defined and debugged comms + telemetry payloads (UART/CAN/BLE), enabling repeatable bench testing and smoother subsystem integration.

Software Engineering Intern — July 2024 – Aug. 2024
Senro Canada Inc. — *Toronto, ON*
- Developed a Java-based dataset management tool that automated dataset iteration and filtering, reducing dataset processing time by 86% (from 7 mins to 1 min).
- Integrated rotary encoders and embedded sensors to improve system feedback quality; supported hardware-software integration and validation, improving reliability during testing and debugging cycles across 4 devices.

Projects

Voice-Activated Patient Emotion Monitoring System | *OpenCV, DeepFace, FFT* — Nov. 2025
- Engineered a Raspberry Pi system that detects patient distress in 2–5 seconds using FFT audio + facial-expression checks (vs. ∼4-hour nurse rounds making it ∼720x faster).
- Tested the system on 10/10 simulated distress events with 0 false alerts during 6 hours of normal activity, using 16 kHz audio sampling and threshold-based detection.
- Delivered a working $200 prototype with modular audio + camera logic, tuned through 3+ hours of test runs to improve reliability.

Smart Avionics Power Sequencer & Fault Manager | *KiCad, Python, State Machines* — Dec. 2025
- Designed an ERC/DRC-clean PCB converting 12V input to sequenced 5V and 3.3V rails, with two software-controlled power enables and two ADC voltage sense channels.
- Developed MicroPython firmware with CLI interface for power sequencing, voltage monitoring, and automated fault detection with graceful shutdown on brownout conditions.

Publications

The Impact of CodeHS on AP Computer Science Student Performance — Sep. 2025
- Conducted a controlled study showing CodeHS improved AP CS outcomes by 64.5% vs 19.1%.