Aayan Akram

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EDUCATION

McMaster University Hamilton, ON, Canada
B.Eng., Engineering 1, Mechanical Engineering (prospective) *Expected May 2030*

Carmel College St Helens, England
A Levels: Maths, Further Maths, Physics (A*AB) *Sept 2023 – Aug 2025*

EXPERIENCE

Automation and Sustainability Research Intern August 2024
NGF Europe *Liverpool, England*

- Interviewed 5 executives across R&D, Operations, Engineering/Process Development, and Compliance to evaluate how automation could reduce energy use, waste, and emissions in glass-cord manufacturing
- Observed end-to-end batch production of glass cords and identified process stages where automation and waste-heat recovery could improve energy efficiency
- Investigated alternative materials to glass and carbon fibre (e.g., graphene-enhanced fibres, Galvorn) and assessed their sustainability and performance trade-offs for automotive applications
- Authored a 7-page findings report (shared as 5 pages due to confidentiality) and presented recommendations to the executive project team

Accelerator Science and Technology Centre Student Assistant July 2024 - August 2024
STFC @ Daresbury Labs *Warrington, England*

- Assisted with routine maintenance checks on the CLARA and VELA particle accelerators, including visually inspecting components and supporting staff in identifying potential issues
- Helped prepare and check seal quality on vacuum chambers/joints used in RF dipole crab cavities, destined for installation at the Large Hadron Collider (LHC)
- Used Molflow to simulate accelerator vacuum conditions and Opera 2D to model magnetic fields in different materials, developing an applied understanding of beamline design tools
- Supported visiting researchers and partner organisations by helping facilitate access to particle accelerator facilities and contributing to experimental setup tasks where appropriate

Embedded Systems and Satellite Mission Design Project Intern May 2024
Arm *Manchester, England*

- Programmed an ARM Cortex-M4 microcontroller to collect "re-entry" telemetry during drop tests, then analysed and graphed results in Excel to support design decisions for a satellite mission prototype
- Programmed collision-warning on Arm-based microcontrollers, defining a shared protocol (signal strength thresholds, distance criteria, alert behaviour) to coordinate multiple satellite prototypes across teams
- Built a secure radio link between a ground station and a simulated satellite, encrypting, transmitting, and decoding messages with acknowledgements

Digital Industries Development Intern February 2024
Siemens *Manchester, England*

- Modelled and calibrated digital twins of electromechanical systems using Siemens Simcenter, aligning thermal, electrical, and dynamic simulations with experimental/sensor data
- Applied digital manufacturing and automation concepts to analyse and optimise system workflows, supporting data-driven improvements across the product lifecycle
- Collaborated on a week-long *Hotel Project*, proposing how to retrofit an existing hotel using Siemens automation, smart-building and digital-twin technologies to address real customer complaints within a fixed budget

PROJECTS

Search and Rescue Autonomous Drone | *Ardupilot, OpenCV, MAVLink* November 2025 – Present

- Designed, built, and integrated a Pixhawk 6-based autonomous quadcopter with a Raspberry Pi 5 companion computer; achieved 20-25 minutes flight time in normal operation while developing onboard RGB/thermal vision processing
- Implementing Python/OpenCV person-detection on the Raspberry Pi, transmitting MAVLink alerts and target coordinates to the flight controller and ground control station for long-range search-and-rescue support
- Conducting independent research into search-and-rescue concepts for avalanche scenarios, including SNR challenges and using long-range autonomous UAVs to locate missing skiers