Mustafa Omran

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Education

The University of Texas at Austin — Austin, TX
B.S. Electrical & Computer Engineering; Minor: Statistics & Data Science — *Jun 2025 – May 2027 (Expected)*
- Relevant Coursework: Probability/Random Processes; Discrete Mathematics; High Performance Computational Engineering; Engineering Physics II

Texas A&M University–Corpus Christi — Corpus Christi, TX
B.S. Electrical & Computer Engineering — *Aug 2024 – May 2025*

Experience

Texas A&M University Autonomy Research Institute (ARI) — FAA UAS Test Site — May 2025 – Sep 2025
Engineering Intern (Federal Aviation Administration) — *Corpus Christi, TX*
- Built a field-ready LiDAR measurement device (Raspberry Pi + Arduino) with IMU-guided aiming/orientation correction, calibration workflow, startup self-checks, and redundant logging (SD + cloud); **1500 LOC** across Python + C++ and dual 16×2 LCD UI.
- Improved reliability via fault detection and serviceable enclosure/wiring design; tool used by **10+** engineers/technicians/field users for accurate, repeatable measurements.
- Developed a mobile-friendly radar field-of-view/positioning web app (single-file HTML/CSS/ES6, Tailwind via CDN, Canvas API) to visualize radar cones and recommend alignment/placement.
- Rebuilt and flight-tested a decommissioned hexacopter on ArduPilot with a Pixhawk flight controller and safety-focused power management; achieved **11 min** flight time and supported a 7S camera + gimbal payload.
- Built a 3-axis remote gimbal controller over 900 MHz (RFD900X) with a physical "mirror gimbal" for real-time visualization; wrote user guides/troubleshooting docs.

Texas A&M University–Corpus Christi — Sep 2024 – Aug 2025
Undergraduate Research Assistant — *Corpus Christi, TX*
- Conducted undergraduate research on conductive cementitious composites and supercapacitor concepts; co-authored a peer-reviewed journal article in *Construction and Building Materials* (2025) on nano-carbon black (nCB) dispersed cement composites.
- Performed charge/discharge cycling and related testing; processed results into plots/comparisons and basic statistics to support research deliverables.
- Ran multiscale mechanical testing and connected material behavior to device-level performance; maintained reproducible documentation.

Texas A&M University–Corpus Christi — May 2025 – Aug 2025
S-RISE Scholar — Student Research Assistant — *Corpus Christi, TX*
- Selected for S-RISE (Student Research & Innovation Summer Experience), a competitive, university-funded research program.
- Developed conductive cement composites (incl. nano carbon black): mixed/cast specimens, ran mechanical testing and electrical characterization (conductivity/resistivity), and presented results at the showcase.

Harvard University — Jul 2023 – Aug 2023
Student Assistant — *Cambridge, MA*
- Maintained and prepared lab equipment supporting engineering projects for 30+ students; ensured safe operation and adherence to precise standards.

Massachusetts Institute of Technology (MIT) — Jun 2021 – Jul 2023
Research / Student Intern (CSHub; Jameel Clinic) — *Cambridge, MA*
- CSHub: supported concrete conductivity research; Jameel Clinic: learned ML workflow fundamentals for medical imaging and communicated takeaways via short presentations.

Projects

Radar Field-of-View & Alignment Web App | *JavaScript (ES6), HTML/CSS, Tailwind, Canvas*
- Interactive visualization of radar cone geometry with placement/orientation recommendations; supports presets and manual parameter entry for new systems.

LiDAR + IMU Measurement Device | *Raspberry Pi, Arduino, Python, C++*
- IMU-guided measurement workflow with calibration and sensor health checks; redundant SD + cloud logging to reduce field errors.

Hexacopter Rebuild (ArduPilot) | *Pixhawk, RF Telemetry, Sensors*
- Electrical rebuild and integration emphasizing safety/reliability (redundant comms/sensing, power management); flight tested and supported camera + gimbal payload.

Leadership & Service

Belmont After School Enrichment Collaborative (BASEC) — Mar 2023 – Jun 2024
Assistant Educator — *Belmont, MA*
- Led/supported **30** middle-school students with disabilities; delivered primarily 1:1 tutoring and activity leadership across ELA/math/science; applied behavior-support training and CPR certification.

Technical Skills

Programming: Python, C/C++, JavaScript (ES6), HTML/CSS, LaTeX
Embedded / UAS: Raspberry Pi, Arduino, Pixhawk, ArduPilot, RF telemetry (900 MHz), LiDAR/IMU/GPS integration
Tools: Linux/UNIX (coursework), Git (coursework), Excel, CAD, 3D printing, HTML5 Canvas, Tailwind CSS
Experimental: Mechanical testing, electrical characterization, electrochemical-style measurements, data processing/plotting