

Ali Mdaihly

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EDUCATION

American University of Beirut

Bachelor of Mechanical Engineering, cGPA: 3.8/4.0

Beirut, Lebanon

EXPERIENCE

Robotics Research Assistant

American University of Beirut – Dr. Bilal Kaddouh

2026 – Present

Beirut, Lebanon

- Designing a VTOL aircraft in SolidWorks with an internal-flow architecture, including the duct routing and the tilt mechanism that rotates the electric ducted fans (EDFs) between hover and forward flight.
- Sizing and selecting the propulsion set — EDF motors and ESCs — against thrust, current draw, and power requirements.

Biomedical Engineering Intern

Trad Hospital

Jul. 2026 – Aug. 2026

Beirut, Lebanon

- Rotated through the Biomedical, Emergency, ICU, Operating Theater, Radiology, and NICU departments, supporting preventive and corrective maintenance of medical equipment.
- Gained hands-on exposure to installation, calibration, safety testing, and quality control; completed as the GEP Medizintechnik Praktikum with Brünstlmedizinen Healthcare (Munich).

Robotics & Automation Engineering Intern

AgroCedrus Lebanon

Jun. 2026 – Jul. 2026

Menjez, Akkar

- Designed a PLC-automated tray-transfer system to replace manual drying-to-grinding handling on the aromatic-plant line.
- Engineered a solar tent dryer for carob (~6 t/batch) and a zone-based smart irrigation system for a 30-hectare organic farm.

Sustainable Energy Research Assistant

American University of Beirut – Prof. Shadi Najjar

Sep. 2025 – Jan. 2026

Beirut, Lebanon

- Researched Borehole Thermal Energy Storage (BTES) systems for underground sustainable heat storage.
- Contributed literature reviews, documentation, and presentations to support project milestones.

Robotics Research Assistant

American University of Beirut – Dr. Hussein Hussein

Jan. 2025 – Present

Beirut, Lebanon

- Developed low-level locomotion control for the Unitree Go1 quadruped, implementing Python/C++ routines that optimize gait and balance across trotting and walking.
- Trained the Go1 to carry an open container of liquid and suppress sloshing through gait alone, with no stabilizing hardware, using reinforcement learning (PPO) in MuJoCo Playground (MJX/JAX).
- Achieved 35–55% slosh suppression across flat, inclined, and rough terrain, traced the mechanism to a shift of acceleration energy out of the liquid's resonant band, and validated the controller in hardware experiments on the physical robot.

Engineering Intern

Al Zahrani Combined Cycle Power Plant

Jun. 2025 – Aug. 2025

Saida, Lebanon

- Participated in daily maintenance involving monitoring, inspection, and testing of gas and steam turbines, condensers, firefighting systems, and pumps.
- Supported chlorination, desalination, and demineralization operations, including filter cleaning, leak repair, and lubrication of machines and winches.

Engineering Tutor

Self-Employed & AUB Engineering Tutor Center

2023 – Present

Beirut, Lebanon

- Delivered academic support to engineering students and led large-group review sessions (50+ students) for MECH 201 (CAD Design).
- Provided targeted tutoring in MECH 310 (Thermodynamics), strengthening core concept understanding.

PROJECTS

Dobot CR10 Robotics Project | ROS 2, NumPy, Pinocchio

Spring 2026

- Built a full kinematics and dynamics pipeline for a 6-DOF Dobot CR10 robotic arm, including FK, DLS inverse kinematics, and Cartesian trajectory tracking.
- Computed joint velocities, accelerations, and torque trajectories using Jacobians and Pinocchio RNEA, achieving sub-0.1 mm IK accuracy.

Self-Balancing Robot | ESP32, MPU6050, PID Control

Fall 2025

- Built a self-balancing two-wheeled robot using ESP32 and MPU6050, implementing PID control for real-time stability.
- Calibrated sensors and tuned PID gains, achieving stable balance through PWM motor control.

RC Boat | CNC Machining, Fiberglass Layup

Fall 2025

- Designed and manufactured an RC boat, creating a CNC-milled mold and performing fiberglass layup for the hull.
- Applied manufacturing processes and tolerances, integrating propulsion and steering and validating on-water performance.

Autonomous Vision-Based Robotic Cart | Raspberry Pi 5, YOLO

Spring 2025

- Designed and built an autonomous robotic cart for the AUB Build-It competition using Raspberry Pi 5.
- Implemented real-time YOLO-based human detection and tracking with integrated actuation control across embedded Linux, vision pipelines, and hardware.

Powered RC Aircraft | LAAS IDEAS Competition – Winner

Spring 2025

- Designed, built, and flew an RC aircraft for a student engineering challenge.

LEADERSHIP & MEMBERSHIP

AUB Human-Powered Submarine Team

2026 – Present

Founder & Team Lead

Beirut, Lebanon

- Leading a newly formed AUB team preparing to compete in the International Submarine Races (ISR), a biennial human-powered submarine competition.
- Directing the current research phase — competition rules analysis and literature review on hull hydrodynamics, propulsion, buoyancy, and diver life-support — to define the design baseline and team structure.

International Association for the Exchange of Students (IAESTE) AUB

Sep. 2025 – Present

President, Member at Large & Head of Events

Beirut, Lebanon

- Coordinating technical exchange opportunities and promoting international internships among engineering students.
- Organizing outreach activities, events, and collaborations to strengthen student engagement.

American Society of Mechanical Engineers (ASME) AUB

Sep. 2025 – Present

Sports' Representative Cabinet & Operations Sub Cabinet

Beirut, Lebanon

- Organizing sports activities within ASME AUB and hosting student internship panels and technical workshops.

Help Desk Member

Jan. 2025 – May 2026

Mechanical Engineering Department, AUB

Beirut, Lebanon

- Supporting students with course registration and department-related inquiries.

HONORS & AWARDS

Dean's Honor List

Spring 2023 – Fall 2025

Winner – LAAS IDEAS Powered Aircraft Competition

Spring 2025

MVP – AUB Football Societies' League

Spring 2024

TECHNICAL SKILLS

Programming & Simulation: Python, C++, MATLAB, Arduino, LabVIEW, ROS 2 / RViz, MuJoCo (MJX/JAX), Pinocchio

Design & Analysis: SolidWorks, ANSYS, QBlade, 3D Printing, CNC Machining, Linux / WSL

Languages: Arabic (Native), English (Professional), German (A1)