

SANA SAAD

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Education

Lebanese American University (LAU) | Lebanon, Expected Graduation: May 2027.

Bachelor of Engineering in Mechatronics Engineering

Experience

Lab Assistant | Lebanese American University Lab

September 2025 – Present

- Assisted in electrical circuit setup, system testing, and troubleshooting, relevant to practical engineering applications.
- Provide technical and operational support for engineering laboratory sessions, ensuring smooth execution of experiments and equipment usage.
- Assist in inventory management, equipment organization, and maintenance of lab components, improving accessibility and reducing setup time for students.
- Support students during lab sessions by troubleshooting hardware and circuit-related issues, enhancing learning efficiency.
- Collaborate with faculty and lab supervisors to prepare laboratory materials and ensure compliance with safety protocols.

IT Assistant | Lebanese American University Library

September 2023 – June 2025

- Performed routine maintenance on printers and PCs, ensuring 99% uptime for library users.
- Provided technical support to **50+** students daily, reducing average issue resolution time by **70%**.
- Managed PC assembly and hardware upgrades, improving system efficiency across library facilities.

Technical Operations Volunteer | Ministry of Social Affairs

2018 – 2019

- Assisted in the technical setup and maintenance of electrical installations, sound systems, and event equipment during community activities.
- Supported infrastructure preparation, including basic wiring, equipment assembly, and system troubleshooting to ensure operational continuity.
- Contributed to logistics coordination and resource management, optimizing material distribution and site organization.
- Collaborated with multidisciplinary teams to execute structured community projects under tight timelines.

Projects

Biped Robot | Python, Raspberry Pi, Robotics, Control Systems

Spring 2026

- Designed and implemented a biped robot capable of bi-directional walking with impact recovery mechanisms.
- Developed a fuzzy-logic control system to dynamically select between walking strategies for balance.
- Integrated MPU9250 IMU for orientation sensing and FSR sensors for real-time contact and pressure feedback.
- Implemented control algorithms using Python (NumPy, SciPy, fuzzy logic libraries).
- Built the hardware system using Raspberry Pi 5, servo driver, servos, and 3D-printed structural components.

User Behavior Prediction in Food Delivery Applications | Python, Machine Learning, Kaggle

Spring 2026

- Built a machine learning model to predict order completion using session-level user data, performing preprocessing, feature engineering, and model comparison (XGBoost, LightGBM)

Intelligent Hand Gesture Controlled Robotic System | Python, OpenCV, MediaPipe, Arduino

Spring 2026

- Developed a real-time hand gesture recognition system for robotic control using computer vision and machine learning techniques.
- Implemented gesture tracking and classification using MediaPipe and OpenCV for touchless robot navigation and command execution.
- Integrated Arduino-based motor control with Python processing pipeline for real-time communication and actuation.

Predictive Maintenance System for Motor Failure Detection | Python, Machine Learning, Scikit-learn

Spring 2026

- Built a machine learning model to predict motor failures using sensor-based operational data including temperature, vibration, and rotational speed.
- Performed data preprocessing, feature engineering, and comparative model evaluation using Random Forest and XGBoost algorithms.
- Developed data visualization and performance analysis pipeline to improve predictive accuracy and fault detection efficiency.

Real-Time Object Detection and Tracking System | Python, YOLO, OpenCV, Deep Learning *Spring 2026*

- Developed a deep learning-based object detection system capable of real-time identification and tracking of dynamic objects.
- Implemented YOLO-based computer vision algorithms for obstacle detection and intelligent scene analysis.
- Optimized detection performance for real-time applications in robotics and autonomous systems.

Monsef E-Municipality Platform | HTML, CSS, JavaScript, Node.js, Django, MySQL, DockerC *Fall 2025*

- Built secure e-governance platform with role-based authentication and real-time request tracking.
- Developed backend logic and relational database schema using Node.js/Django and MySQL.
- Deployed containerized architecture with Docker for scalable cloud hosting.
- Integrated AI chatbot API for automated user support.

Smart Home system | C++, Arduino, Electronics, CAD, 3D Printing *Fall 2025*

- Designed and implemented a multi-module smart home prototype using Arduino Mega as the central controller.
- Integrated RFID access control and environmental sensors (PIR, flame, DHT11, rain, soil moisture).
- Developed automated safety and control systems including temperature-based ventilation, irrigation, and garage door operation (stepper + ULN2003).
- Fabricated the physical prototype using laser-cut housing and 3D-printed components.

Inverted Pendulum | MATLAB, Simulink *Fall 2025*

- Derived and linearized system dynamics and formulated a state-space model.
- Designed and implemented PID and LQR controllers for upright stabilization and validated performance on QUBE Servo 3 hardware.

3-Stage Elevator System | Assembly, HCS12 Microcontroller Implantation *Fall 2025*

- Designed and implemented a real-time three-floor elevator system using HCS12 microcontroller integrating interrupts, digital inputs, ATD-based weight sensing, PWM buzzer control, LED indicators, and LCD communication for state-driven movement and safety monitoring.

Robotic Arm-Automatic Sorting Handler | LabView, MyRio, Computer Vision, Robotics *Spring 2025*

- Developed an autonomous color-based robotic sorting system integrating real-time computer vision, LabVIEW-controlled servo/DC motors, ultrasonic sensing, and H-bridge motor control for automated pick-and-place operations.

Automated Solar Tracking System with Temperature Monitoring | Analog Electronics *Spring 2025*

- Designed and implemented dual-axis solar tracking system with real-time temperature monitoring using analog electronics.

V6 Car Engine Design | SolidWorks, Motion & Stress Analysis *Spring 2026*

- Designed and assembled a full V6 engine model in SolidWorks, performing motion simulation and stress analysis to evaluate displacement, strain, and factor of safety.

Technical Skills

Programming Languages: Python, Java, JavaScript, HTML/CSS, Assembly, C++.

Frameworks & Tools: NumPy, MATLAB, LabView, Quartus, SolidWorks, Primavera, AutoCAD, Revit Raspberry Pi, PLC.

Specialized Skills: Machine Learning, Deep Learning, Robotics Navigation.

Leadership & Activities

Member: IEEE AI Club, Robotics Club, Women in Engineering club

Awards & Honors

- Dean's Distinguished List