Jad Sukkarieh

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Portfolio Summary

AUB Electrical & Computer Engineering student building end-to-end technical projects—from modeling and control design to embedded sensor integration, robotics mapping/localization, AI analysis and applications. This portfolio presents selected work with concise write-ups, figures, and demo links, emphasizing measurable validation and reproducible results.

Skills

Programming	Python, C/C++
Dev environment	Linux/WSL
Tools	MATLAB/Simulink, Excel, GitHub, ROS & gazebo
Domains	Control Systems, Embedded Systems, SLAM/State Estimation, Power Systems

Selected Projects

Fast Estimation of Local Marginal Prices (LMP) — Final Year Project

Sept 2025 – May 2026 (In progress)

Python | MATLAB | Excel | Benchmarking | Power Systems

What it is: Developed a workflow to estimate **ΔLMP** under system variations, reducing the need for repeated full recomputation.
Evaluation design: Validated on time-series operating points using multiple sampling strategies (short-window subsets and extended horizons, including weighted sampling) to benchmark accuracy and runtime.

Links:

- GitHub write-up: Project Portfolio (LMP page)

Ball-and-Beam Control System (Team Project)

Sept 2024 – Dec 2024

MATLAB | Simulink | Control

Modeled the ball-and-beam dynamics and implemented PI, PID, and LQR controllers in Simulink; benchmarked tracking and stability using transient/steady-state metrics (overshoot, settling time, steady-state error) across multiple simulation scenarios.

Links:

- GitHub write-up: Project Portfolio (Ball-and-Beam page)

StarSaber Interactive System (Team Project)

Jan 2025 – May 2025

ESP32 | C/C++ | Sensors | LED/Audio Feedback

Developed an ESP32-based, sensor-integrated interactive system with real-time LED and audio feedback; improved responsiveness and robustness through iterative testing, calibration, and integration

Links:

- GitHub write-up: Project Portfolio (StarSaber page)

Quiet Fan Development (Team Project)

Sept 2023 – May 2024

Experimental Testing | Iteration | Noise vs Airflow Tradeoff

Executed airflow and acoustic testing to quantify performance trade-offs; translated measurement results into design iteration recommendations to reduce noise without sacrificing airflow.

Links:

- GitHub write-up: Project Portfolio (Quiet Fan page)

Autonomous Maze Navigation (SLAM + Relocalization) (Team Project)

Sept 2025 – Dec 2025

Mapping | Localization | Navigation | Linux/Wsl | Simulation Twin (Gazebo)

Built a Gazebo simulation twin of a physical maze and delivered an autonomous pipeline for exploration/mapping and global relocalization with goal navigation from randomized start poses.

Links:

- GitHub write-up: Project Portfolio (Maze SLAM page)
- demo link: Google Drive (Maze SLAM Video)