

Marwan AbuLebdeh

Arlington, TX | abulibdeh43@gmail.com | github.com/marwanthestudent

Technologies

Languages & OS's: C/C++, Python, ARMv7 Assembly, LaTeX, Java, Verilog, Linux, Unix, MacOS, Windows.

Tools: Clang, LLDB, Git/GitHub, CCSTUDIO, KiCad, LTspice, MATLAB, Pandas, NumPy, Matplotlib, React, TailwindCSS.

Education

University of Texas at Arlington

Arlington, TX

BS in Computer Engineering Honors; GPA: 3.83

Aug. 2022 - May 2026

Organizations: Tau Beta PI, SASE, HackUTA Organizer.

Work Experience

The Hybrid Atelier

Arlington, TX

Research Intern

Jan. 2025 - Ongoing

- Captured over 30 materials' pressure signals by a custom rheological sensing pipeline controlled by an embedded system.
- Implemented real-time data transmission by programming an ESP32 Thing-Plus microcontroller to send filtered rheological signals to a central database for analysis.
- Classified materials into 7 categories using a custom AI model that was trained using structured noise from the signal, improving accuracy in identifying fabrication errors and material consistency.
- Co-authoring a paper on rheological sensing & material classification, currently in preparation for journal submission.

The University of Texas at Arlington

Arlington, TX

Electronics Teacher Assistant

Jan. 2025 - Ongoing

- Leading weekly lab sections for 53 students, grading exams & assignments, & supporting them in office hours.

Tutoring Mentor - Supplemental Instruction Mentor

Aug. 2024 - Jan. 2025

- Training 5 SI-Leaders on instructional strategies throughout the semester, in addition to amending the mentor manual.

Tutor - Supplemental Instruction Leader

Feb. 2023 - Aug. 2024

- Lead sessions that improved students' GPA by 31% in Intro to Computer Science & Intermediate Programming.

Projects

Multi-Threaded Image Processing Application – C, POSIX Threads, libpng, GNU troff

- Developed algorithms that apply Sobel & High-pass filters on images for edge detection & sharpening from scratch.
- Improved runtime by 92% by designing the program to be multi-threaded using pthreads which enables it to run with up to 32 threads when compared to a single-thread implementation.
- Supported images with 2, 3 or 4 color channels by utilizing libpng to copy pixels & metadata, ensuring original image preservation regardless of size.

Wireless Communication System – C, MATLAB, KiCad, EmbeddedSystems, Signal Processing

- Transmitted modulated waveforms (BPSK/QPSK/16QAM) using a custom signal generator on a microcontroller.
- Achieved >17" transmission range at -70dBm using a custom-fabricated 2.4GHz patch antenna with 2dBi simulated gain.
- Reached up to 46% BER under low-SNR conditions using MATLAB for frequency correction, filtering, and full signal demodulation.
- Implemented an FIR-based filter on the transmitter to reduce inter-symbol interference before DAC output.

CustomAlloc – C, Makefile, POSIX system calls

- Designed a memory allocator supporting 4 Heap allocation algorithms: First, Next, Worst & Best fit.
- Reduced compilation time by 10% by implementing shared library generation with position-independent code.
- Created testing suites that collected 9 performance metrics like fragmentation & splits to compare the different algorithms.
- Achieved up to 100% reduction in external fragmentation by developing algorithms for coalescing, block splitting, & heap growth.