Galib Allahma Raid

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Education

University of Texas at Arlington May 2026
B.S. Computer Engineering *Arlington, TX*

- **Relevant Coursework:** Embedded Systems, Real-Time Operating Systems, Robotics, Machine Learning, Computer Architecture
- **Honors & Awards:** Freshman Distinction Roll, Maverick Academic Scholarship, Honor's College

Publications & Manuscripts

The Secure AI-Enabled IoT Edge: Attacks, Lightweight Defenses, and Privacy Challenges: A Systematic Review *(Under Review)* Dec. 2025

- Co-authored a systematic review on AI-enabled IoT edge security and privacy; synthesized threats, lightweight defenses, and evaluation practices across peer-reviewed literature.
- Supported taxonomy development and comparative analysis of edge-feasible defenses (e.g., authentication, ML-based detection, privacy-preserving learning) and identified open research gaps.

Green Energy Management Software (GEMS): AI-Driven Optimization of Hybrid Renewable Powerplants *(Manuscript)* Dec. 2025

- Co-developed a nature-inspired metaheuristic optimization engine for Green Energy Management Software (GEMS) to optimize hybrid renewable energy systems under techno-economic and reliability constraints.
- Designed and implemented multi-criteria decision-making (MCDM) algorithms integrating AHP, TOPSIS, and fuzzy logic to support transparent trade-off analysis across cost, emissions, and performance metrics.

Improving Memorability of System-Assigned Random Passwords Using Graphical and Textual Cues *(Manuscript)* Jan. 2026

- Co-developed a cue-based framework for learning system-assigned high-entropy passwords using graphical cues, chunking, and keystroke reinforcement.
- Contributed to methodology and experimental evaluation; the study reports high recall accuracy over time and analyzes usability–security trade-offs.

Research Experience

Research Assistant Jan. 2023 – Mar. 2023
University of Texas at Arlington Research Institute (UTARI) *Arlington, TX*

- Developed multi-fidelity neural networks achieving >92% predictive accuracy and reducing reliance on high-cost simulations by 60% through model-driven surrogate predictions.
- Performed model evaluation and error analysis; collaborated in an R&D workflow with iterative experimentation and reporting.

UR2PhD Research Training (CRA) Sep. 2025
Computing Research Association (CRA)

- Completed UR2PhD Undergraduate Pre-Research Experience program focused on reading technical papers, conducting literature searches, and analyzing/visualizing experimental data.

Selected Projects (Systems & Robotics)

Autonomous Ground Robot (IGVC) – Real-Time Guidance & Control
ROS2, C++, Sensors

- Designed a real-time perception-to-control pipeline by integrating GPS, IMU, and LiDAR, enabling stable and resource-constrained autonomous outdoor navigation on an IGVC ground robot.
- Improved navigation reliability by debugging sensor fusion, timing mismatches, and firmware–ROS2 communication issues under real-world operating conditions.

Real-Time Operating System
ARM Cortex-M4, C

- Implemented a preemptive real-time operating system by developing priority scheduling, synchronization primitives, and a task interface, enabling deterministic execution on ARM Cortex-M4F.
- Increased system robustness by adding modular control hooks and memory safeguards to support predictable behavior under varying workloads.

Multi-Effect Guitar Processor
STM32, PCB, DSP

- Built a low-latency embedded audio processing system by streaming ADC/DAC data over I^2S, achieving real-time DSP performance on STM32 hardware.
- Validated signal integrity and timing correctness by iterating on custom PCB integration and analyzing performance with oscilloscopes and logic analyzers.

Embedded LCR Meter
TM4C123, ADC, Bare-Metal C

- Achieved 95.6% measurement accuracy by implementing ADC-based signal capture, real-time calibration, and UART visualization on a custom embedded platform.

Leadership

Event Operations Leader Oct. 2022 – Present
UC Operations (UTA) *Arlington, TX*

- Led a 15-person AV/VC team across 100+ events, diagnosing real-time system failures and coordinating rapid recovery under strict timing, reliability, and client-facing constraints.

Technical Skills

Machine Learning: Python, PyTorch, neural networks, model evaluation
Embedded & Firmware: Bare-metal ARM (STM32, TM4C), FreeRTOS, interrupts, memory, DSP
Languages: C, C++, Python, Bash, ARM Assembly
Interfaces & Peripherals: SPI, I2C, UART, PWM, ADC/DAC, GPIO
Debugging & Tools: Oscilloscope, Logic Analyzer, GDB, Git, CMake, Linux CLI
Robotics & Systems: ROS2, motor control, GPS/IMU/LiDAR, navigation algorithms