

# SHAHD GAMAL

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## EDUCATION

Cairo University Faculty of Engineering (CUFE)

2021 - 2026

- Bachelor of Electronics and Communications (EECE) With Cumulative Grade: (Very Good).

## SKILLS

**Digital:** HDL languages (VHDL, Verilog, System Verilog) - TCL - FPGA Xilinx - Linting.

**Software:** C/C++ - OOP - MATLAB - Assembly - Data Structures - Algorithms - Qt - Git & GitHub - AI tools.

**Embedded:** Atmega16/32 (AVR) - Embedded C - FreeRTOS - I2C - USART - SPI.

**OS:** Linux - Windows.

## PROJECTS

**SPI Slave with Single-Port RAM** | [Link](#)

Spring 2025

- Designed SPI slave with FSM and RAM in Verilog, verified via testbench in QuestaSim.
- Compared FSM encodings (Gray, One-Hot, Seq) to optimize timing and resource use.
- Technologies: Verilog - SPI - FSM - QuestaSim - Vivado - QuestaLint - FPGA.

**DSP48A1 Implementation on Spartan-6 FPGA** | [Link](#)

Spring 2025

- Implemented a DSP slice with registers and multiplexers for arithmetic operations.
- Verified RTL design using QuestaSim and performed synthesis in Vivado.
- Technologies: Verilog - QuestaSim - QuestaLint - Vivado - FPGA.

**Dual Microcontroller Door Locker System** | [Link](#)

Summer 2024

- Designed a dual-microcontroller door lock system with password auth and EEPROM data logging.
- Included PIR-based motion sensing and H-Bridge controlled door actuation.
- Technologies: ATmega32 - I2C - USART - EEPROM - PIR - H-Bridge.

**Student Management System** | [Link](#)

Summer 2024

- Built a CLI-based student DB with CRUD operations, GPA calc, and memory safety.
- Used linked lists and structs to efficiently manage dynamic data.
- Technologies: C - Linked Lists - Structs - Pointers - File I/O.

**Self-Driving Robots - Path Planning & Obstacle Avoidance**

Spring 2023

- Developed an autonomous robot navigation system using Fast-Marching Method 2 (FMM2).
- Compared FMM2 with A\* algorithm, achieving smoother paths in MATLAB simulations.
- Technologies: MATLAB - FMM2 - A\* Algorithm - Path Planning.

**CMOS Analog Circuit Design**

Fall 2023

- Designed CMOS circuits using UMC 0.13um technology, including current mirrors and amplifiers.
- Conducted simulations for DC, transient, and noise analysis in Cadence.
- Technologies: UMC 0.13um - Cadence Simulator - NMOS Transistors - Current Sources.

## OTHER PROJECTS

- MATLAB Signal Processing and Simulink Control System Projects.
  - Analog IC Design Projects on Cadence.
  - Smart Home Automation | [Link](#)
  - Advanced Digital Multimeter on PCB | [Link](#)
  - Real-Time Operating System (RTOS) Project
  - Advanced Tic Tac Toe Game | [Link](#)
  - Reverse Tic-Tac-Toe AI Development | [Link](#)
  - Stopwatch with Dual Mode | [Link](#)
  - Car Parking Sensor | [Link](#)
  - Maze-Solving Line-Follower Robot Car
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## COURSES

### Digital Design Diploma | Eng: Kareem Waseem | [Certificate](#)

*Jan 2025 - Mar 2025*

- RTL Design & FPGA Flow - Verilog, synthesis, timing analysis, and optimization.
- FPGA Prototyping - Vivado flow, constraints, IP integration, and validation.
- Advanced Design - CDC, low-power, and protocol implementation.

### Digital Verification Workshop | IEEE CUSB

*Apr 2025 - Current*

- Verification Flow - SystemVerilog (SV) Basics - OOP & Constrained Randomization.
- Functional & Code Coverage - Assertions - SV Interfaces - UVM Fundamentals.
- Testbench Development - Stimulus Generation - Checkers & Subscribers.

### FPGA Workshop | IEEE ASUSB

*Aug 2024 - Sep 2024*

- SoC Design - FPGA Basics - Scripting Skills (TCL).
- Optimization Techniques (Area, timing, and power) - CDC Techniques.

### Embedded AVR Diploma | Eng: Mohammed Tarek | [Certificate](#)

*Jun 2024 - Oct 2024*

- Basic Concepts of Embedded Systems - C Programming - Embedded Tools - Real Time OS(RTOS).
- Data Structures (Linked-List, Stack and Queue) - Software Engineering - HW Labs.
- AVR Micro-controllers Interfacing (Implement all the drivers) - C For Embedded Applications (Embedded C).

### Robotics Workshop | Beta Academy

*Jul 2022 - Sep 2022*

- Arduino board - Basic Concepts of Embedded Systems - Basics of C Programming.
- HW components: LED, Resistor, Breadboard, potentiometer, sensors, 7-segment display, Motors, H-bridge.

### Solar PV Training | ECOEGY

*Jul 2023 - Aug 2023*

- Engineering design and shop drawings, Solar project development and calculations.
  - Project management for grid-connected stations, Field installations experience.
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