

Ezan Hamdia

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SUMMARY

B.S. Computer Engineering student at Milwaukee School of Engineering seeking a Summer 2027 internship in firmware, software, or hardware engineering.

EDUCATION

B.S. Computer Engineering | Milwaukee School of Engineering | Expected December 2028

TECHNICAL SKILLS

Languages: C, VHDL, ARMv4 assembly

Embedded/hardware: STM32F411 (ARM Cortex-M4), Intel MAX 10 FPGA (DE10-Lite), register-level drivers, ADC, DMA, I2C, PWM, interrupts, memory-mapped I/O, finite-state machines

Tools/systems: STM32CubeIDE, Intel Quartus, ModelSim, Linux (Ubuntu/WSL), Bash, POSIX multiprocessing, TCP/IP sockets, Git/GitHub

PROJECT EXPERIENCE

STM32 Pong (Independent): Build a two-player Pong game on an STM32F411 microcontroller using analog joysticks and a 16x8 LED matrix display.

- Wrote register-level C drivers for ADC, I2C, DMA, and PWM audio without HAL libraries, using interrupt-driven ADC conversions to read both joysticks.
- Stored 128 bicolor pixels in a 32-byte frame buffer and sent each display update as two 17-byte DMA transfers over 100 kHz I2C, replacing CPU-driven byte writes.
- Built a four-state finite-state machine (idle, countdown, gameplay, scoring) with function-pointer dispatch, wall/paddle collision detection, and progressive difficulty for a playable two-player game.

32-bit Single-Cycle Processor (Independent): Build an ARMv4-subset CPU in VHDL with fetch, decode, execute, memory, and writeback in a single-cycle datapath.

- Implemented a 16 x 32-bit register file (three read ports, one write port), a 32-bit ALU with NZCV condition flags, and immediate decoding with sign/zero extension and rotation.
- Designed a combinational controller with 12 control signals for operand selection, register/memory writes, flag updates, and conditional branch and branch-with-link control.
- Debugged lost register updates by tracing ModelSim waveforms to an incorrect MOV writeback select, then verified correct accumulation in a 1–10 summation program.
- Fitted the processor on an Intel MAX 10 FPGA (2,713 logic elements) and ran it on a DE10-Lite board.

Concurrent TCP/IP Chat System (Team of 2): Build a multiuser chat application in C for Linux that lets users send and receive messages at the same time through a shared server.

- Developed the client using IPv4 TCP sockets while a teammate primarily developed the multithreaded server (pthreads, mutex locking, configured for up to 8 connections).
- Forked separate send and receive processes so incoming messages appear while the user types.
- Added alphabetic username validation and contributed timestamped conversation logging and participant tracking; tested messaging with 3 simultaneous clients.

WORK EXPERIENCE

Manager | NYC Slice Shop | Kenosha, WI | May 2026 – August 2026 (Seasonal) | 40 hrs per wk

Sales Associate | J. Crew | September 2023 – July 2025 | 25 hrs per wk

Sales Associate | Express | January 2023 – August 2023 | 20 hrs per wk

LEADERSHIP EXPERIENCE | CO-CURRICULAR INVOLVEMENT

Project Leader | MSOE SAE Formula Hybrid | September 2026 – Present | 10 hrs per wk

Electrical/Controls Team Member | MSOE Lunabotics | September 2025 – May 2026 | 6 hrs per wk