

# Isabella Nicole Zaens

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## EDUCATION

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### The University of Texas at Austin

August 2022 - May 2026

*B.S. Electrical and Computer Engineering, Honors Program*

### Relevant Coursework

*Upcoming Fall 2024:* Algorithms, Linear Systems and Signals, Vector Calculus

*Completed:* Software Design and Implementation (Honors), Data Structures, Computer Architecture, Circuit Theory (Honors), Embedded Systems (Honors), Digital Logic Design, Probability and Random Processes (Honors), Discrete Mathematics, Linear Algebra, Differential Equations

## EXPERIENCE

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### Product Test Engineering Intern, AMD (Austin, TX)

May 2024 - August 2024

- Conducted system-level testing for next-generation Radeon GPUs, ensuring functionality and performance standards
- Debugged and characterized products to assess performance, process, and test sensitivities
- Performed yield analysis using industry-standard tools to support yield debug and failure analysis
- Developed multiple scripts and tools to automate release notes generation and publication

### Research Assistant, ReNeu Robotics Lab

September 2023 - Present

- Developed embedded software for an EMG-driven hand exoskeleton that aids in spinal cord injury rehabilitation
- Optimized performance of data acquisition system using C++, EtherCAT, ESI, and SOEM
- Created documentation and wiring diagrams to help build a new exoskeleton in collaboration with Sony
- Developing a new version of the exoskeleton by researching and integrating advanced hardware and software

### Electrical Engineer, Texas Battlebots League

January - April 2023

- Collaboratively developed a full-body spinner robot for combat competition
- Designed and implemented the robot's electrical system using Arduino Uno Rev3 microcontroller
- Integrated various control system elements, including ESC, RC controller, power supply, motors, and remote kill switch

## PROJECTS

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### Two-Player Space Invaders

- Developed a two-player Space Invaders game on a TM4C microcontroller using C++ and ARM assembly
- Implemented version control and peer-programming techniques for code efficiency and collaborative development
- Designed custom game controller PCB, sampled analog joysticks (ADC), displayed on LCD
- Incorporated interrupts for dynamic sound effects, outputted through DAC

### LC-3b Simulator

- Developed LC-3b simulator using C and LC-3b programming languages, microcode, and a control store
- Equipped with instruction execution, branching, virtual memory management, and interrupt and exception handling
- Added support for four types of exceptions: unaligned access, protection, page fault, and unknown opcode
- Modified existing datapath, state diagram, and microsequencer

### FPGA-Based Stopwatch and Timer

- Designed a programmable stopwatch/timer on the Basys3 FPGA with four counting modes using RTL methodology
- Developed a high-level state machine and datapath architecture to control operations and optimize efficiency
- Implemented in Xilinx Vivado using behavioral modeling, clock division techniques, and a 7-segment display

## SKILLS AND CERTIFICATIONS

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**Software:** C/C++, Java, Python, Verilog, ARM Assembly, MATLAB, SQL, R, HTML/CSS, Javascript, Tableau

**Hardware:** Circuitry, Oscilloscopes, FPGA, PCB Design

**Tools:** Unix/Linux, Keil, VSCode, Vivado, KiCad, EAGLE, AD2 Waveforms, AutoCAD, Fusion 360

**Certifications:** Google Data Analytics, IBM AI Foundations