

# Aiden Wenzel

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## EDUCATION

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### University of Michigan

- Major, Electrical Engineering (BSE)
- Minor, Computer Science
- GPA: 3.45/4.00

## RELEVANT COURSE WORK

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- **Data Structures and Algorithms:** Studied data structures such as stacks, queues, trees, heaps, hashtables, sets, directed, and undirected graphs. Utilized algorithms such as DFS, BFS, quicksort, merge sort, heapsort, Prim's algorithm, Dijkstra's algorithm, and various DP algorithms. Projects utilized C++ STL and involved extensive optimizations using complexity analysis, perf profiling, and valgrind memory checker.
- **Computer Organization:** Studied assembly style languages and how they are assembled into machine code. Second half of class focused on single and multicycle datapaths, pipelined processors, caches, and virtual memory. Projects included building a simple assembler, linker, pipeline simulator, and cache simulator.
- **Electrical Engineering System Design:** Built autonomous robot with a team of three other engineering students. Project involved implementing odometry, motor controls, acoustic range finding, thermal sensors, and opencv image processing to control the robot's movement.
- **Introduction to Circuits:** Studied analog circuits. Topics included nodal analysis, diodes, op amps, MOSFET transistors, RLC circuits, AC circuits, and filters.
- **Signals and Systems:** Studied mathematical concepts such as LTI systems, convolution, fourier series and transform, laplace trasform, sampling, and control systems. Labs included designing filters, an envelope detector, and a mock AM radio on breadboards, as well as simulating control systems in Simulink.
- **Digital Logic Design:** Studied combinational circuits such as multiplexer, adders, decoders, and encoders and sequential circuitis such as D flip-flops, registers, multipliers, and counters. Investigated optimization and analysis techniques through timing analysis, two level logic minimization, and state minimization. Projects involved using Modelsim and Verilog to model a trafic light controller, combinational and sequential calculator on Altera FPGA.

## PROFESSIONAL EXPERIENCE

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### Coretek Services

- Worked with HTML, CSS, and C# to develop intuitive ASP.NET UIs.
- Used C# APIs to pull cloud resource information from MS Azure and ticket information from ServiceNow.
- Used KQL to query and summarize cloud resource analytics in Azure dashboards.

## SKILLS

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- **Programming Languages:** C, C++, Python, Lua, MatLab, Verilog HDL, L<sup>A</sup>T<sub>E</sub>X.
- **Linux:** Debian, WSL2, grep, cmake, make, tmux, vim, ssh.
- **Software:** Simulink, Waveforms Oscilloscope, LtSpice, Modelsim, Jupyter Notebooks.

## PROJECTS

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### Fractal Visualizer

- Utilized OpenGL APIs to accurately visualize the Mandelbrot set and Julia sets.
- Implemented custom panning and zoom functionality for near-infinite zooming into complex geometries.

### Conway's Game of Life

- Wrote custom implementation of Conway's Game of Life using SDL.
- Customized build system and dependency management with CMake.

### Instrument Recognition Software

- Worked with a team of 3 other engineering students to build an instrument recognition app.
- Input audio data would be processed using the Librosa library. Harmonic overtones in audio samples would be extracted using the FFT algorithm.
- Processed audio data would be used to train a CNN which would take audio files as input, process them, and predict what musical instrument is featured in the sample.

## EXTRACURRICULARS

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### Michigan Marching Band

- Dedicated approximately 20 hours each week to rehearsals and performances in the Big House.
- Performed at the Big Ten Championship against the University of Iowa 2023, and the ReliQuest Bowl against the University of Alabama in 2024.

- Initiated as an official brother of Kappa Kappa Psi (*KKΨ*), the National Honorary Band Fraternity.
- Performed with the Michigan Hockey Band at Yost Ice Arena.