

# Jackson Luna-McCrocklin

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## Education

Purdue University, West Lafayette, IN  
Bachelor of Science in Computer Engineering  
Minor in Management  
GPA: 3.39/4.00

Expected Graduation: *May 2024*

## Skills

- Programming: C, C++, Python, Java, RISC-V Assembly, ARM Assembly, OpenGL, System Verilog, MATLAB
- Embedded Systems: SPI, I2C, UART, DMA, DAC, ADC
- Software: KiCad, AutoCAD, STM32CubeIDE, System Workbench, VS Code, Visual Studio
- Technologies: Oscilloscope, Multimeter, Waveform Generator
- Debugging Tools: Valgrind, GDB

## Relevant Coursework

- Microprocessor Systems and Interfacing
- Object-Oriented Programming
- Operating Systems Engineering
- Introduction to Compilers and Translation Engineering
- Introduction to Digital Design
- Circuit Analysis

## Projects

### Customizable Electronic Role-Playing Game Board

*November 2023 - Present*

- Prototyped an infinitely customizable electronic game board that reduces the workload of the DM and the learning of curve for players that creates a unique experience not seen in any product currently on the market.
- Designed and developed the PCB, firmware, and packaging, incorporating KiCAD, STM32 microprocessor programming principles, and CAD to create a cohesive product that catches consumer attention.
- Created the system requirements and helped debug the Unity-based companion application for customizing and importing maps and characters to the game board.
- Placed 4<sup>th</sup> in the Purdue Electrical and Computer Engineering Spark Challenge for product design.
- Progress Journal Link: <https://engineering.purdue.edu/477grp1/Team/progress/progress3.html>

### Java-Based Compiler

*August 2023 – December 2023*

- Developed a C language to RISC-V Assembly compiler in Java from scratch, utilizing parsing and ASTs to read and convert the code.
- Optimized the compiler utilizing computer architecture techniques, specifically in limitations regarding register allocation and memory access speeds.

### Water Freezing Graphics Simulation

*October 2023 – December 2023*

- Developed a dynamic water freezing simulation in OpenGL, combining multiple types of wave generation and cellular automata to replicate movie effects.
- Allowed for user-interaction in simulation by calculating matrices in NDC using various ray-intersections for mouse detection, and added refraction, reflection, and transparent lighting effects to enhance the user-experience.

### Embedded Systems Audio Player

*March 2022 – May 2022*

- Programmed an STM32 microprocessor in C to develop a user-interactive audio player, allowing for .wav files to be imported and played on a speaker.
- Installed buttons for user manipulation of selecting and replaying songs, using an LCD to display result of manipulation, all wired on a breadboard.