**Nathan Carlson**

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**Education** **Bachelor of Science in Electrical Engineering,** August 2021 - May 2025

The University of Alabama, Tuscaloosa, AL

Cumulative GPA: 4.0/4.0

**High School Dual-Enrollment,** August 2017 - May 2021

Community College of Allegheny County, West Mifflin, PA

GPA: 3.9/4.0

**Work Experience** **Power Electronics Research Understudy,** *UA Department of Electrical and Computer Engineering,* Tuscaloosa, AL, September 2023 – Present

* Assisted in the design of a new silicon carbide power module utilizing jet impingement cooling technology
* Authored an academic paper on power module manufacturing methods
* Constructed power modules by programming an automatic wire-bonding machine and a solder convection reflow oven
* Ensured module quality through X-ray imaging
* Designed a PCB for MOSFET gate signal transmission and temperature sensing
* Learned how to conduct professional research
* Conducted research on the material science behind reliable solder connections and gained a deep understanding of the potential failure modes of soldered joints.
* Read hundreds of published research papers in the IEEE database on power module design.
* Learned how to conduct professional research

**Circuit Design Engineer,** *Johnson Outdoors,* Eufala, AL, Summer 2023

* Designed switch-mode power supplies for board-level power regulation
* Study and implementation of stable power supply feedback loops
* Learned how modern application-level electronic design is conducted
* I designed Switch-Mode Power Supplies for board-level power regulation, including power to the processor, sonar transducer, and backlight. Worked on creating stable feedback loops through compensation, and also analyzed efficiency.
* PCB design for SMPS test PCBs.
* Analyzed the characteristics of a new ethernet magnetics device
* Learned how to select electronic components from online distributors
* Learned how modern application-level electronic design is conducted.
* Gained a strong understanding of the lab equipment (oscilloscope, power supply, soldering iron, function generator, EMI probe, active load, thermal chamber)
* Learned how to operate in a professional environment

**Project Assistant,** *UA Department of Mechanical Engineering*, Tuscaloosa, AL, August 2022 – Present

* Wrote software for mobility device for young girl with cerebral palsy
* Developed motor control algorithms utilizing multi-sensor input
* Utilized technical skills to assist teams in creating impactful engineering projects
* Demonstrated willingness to learn new skills as they are needed
* Practiced working in a team environment

**Landscaping,** *Jarosh Landscaping,* Pittsburgh, PA, Summer 2021

* Work Ethic
* Teamwork
* Adaptability

**Tutoring and Child Care,** *Raquel’s Household,* Pittsburgh, PA, Fall 2018 – Fall 2019

* Responsibility
* Organizational skills
* Communication skills through tutoring

**Skills Software Skills**

* C | Python | Microsoft Office | MatLab | Altium | KiCAD | Solidworks | LTSpice

**Technical Skills**

* Automatic wire-bonder operation | Solder reflow oven | X-ray imaging | Soldering iron | Oscilloscope | Waveform generator | Transistor I-V curve tester

**Interpersonal Skills**

* Ability to communicate technical details
* Uplift and motivate others in a team environment
* Fluent public speaker
* Teamwork (STEM MBA groups, landscaping, business camp)
* Skilled presenter (STEM MBA, communications class, weekly presentations in 7th grade)
* Technical explanation (tutoring)

**Organizational Skills**

* Have maintained a detailed personal and school calendar since Fall 2017
* Write all tasks into daily to-do list

**Leadership Skills**

* Led senior design team using a curiosity-based encouragement style
* Mentored a group of freshmen in through class discussions, study groups, and external events

**Involvement Senior Design**, January 2024 – Present

* Developed a radar-based fall detection system, utilizing digital signal processing and artificial intelligence

**Tutoring**, Fall 2021 – Present

* Demonstrated willingness to help others by assisting classmates
* Improved ability to communicate technical details

**General Art Club,** November 2021 – March 2023

**Chess Club,** September 2022 – March 2023

**Misc**

Graphical user interface

Description automatically generated