Jack Rademacher

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EDUCATION

University of Michigan — Ann Arbor, MI

B.S. Electrical Engineering *Graduating December 2021*

- **GPA:** 3.97 / 4.0 - Dean's List: Fall 2017, Winter 2018, Fall 2019
- **Coursework:** Analog ICs (EECS 311), Digital ICs (EECS 312), Statistics (EECS 301)
  Antennas & Wireless Systems (EECS 330), Device Physics (EECS 320), Signals (EECS 216)

WORK EXPERIENCE

Analog Devices — Colorado Springs, CO *May 2020 — August 2020*

Microwave Product Engineering Intern, Aerospace & Defense (ADEF) Business Unit

- Created test setup for characterizing IP3 and P1dB of MMICs and test cells from 2-50GHz
- Designed NI LabWindows/CVI application to automate aforementioned testing and plot measurements vs. device variables

Apple — Sunnyvale, CA

Electrical Engineering Intern, Special Projects Group (SPG) *January 2019 — August 2019*

- Designed the schematic and layout for a "wireless oscilloscope" PCB to measure and log voltage, current and temperature
- Wrote embedded C to wirelessly live-stream ADC samples using the MQTT protocol
- Wrote embedded C to continuously write ADC samples to an on-PCB SD card in SPI mode
- Designed a concurrent embedded application using FreeRTOS to manage ADC sampling, WIFI connectivity, wireless streaming & device control, SD card reading/writing, and RTC initialization using network time
- Tested power supplies under various load conditions along with other parameters such as UVLO, ripple, OCP, and thermals

PROJECT EXPERIENCE

University of Michigan Hyperloop — Ann Arbor, MI

Power sub-team lead *September 2018 — December 2019*

- Manage a team of roughly 8 members to design the electric vehicle systems for propelling a hyperloop pod to high speeds
- Work with cross-functional teams to ensure reliable mechanical and electrical integration of wire harnesses, PCBs, power conversion units, battery compartments and battery management systems
- Designed a custom low voltage battery management system to monitor a 2S-8S high power battery pack
- Facilitated the design of a custom power conversion board with 3 independent buck, boost, and buck-boost blocks

Controls sub-team: Batteries and Power Electronics *September 2017 — September 2018*

- Designed and integrated the systems needed to manage and maintain the safety of high power battery packs, including battery management systems, pre-charge and isolation detection modules, and fault-redundant control circuits for microprocessor compatibility
- Developed power distribution electronics requiring custom PCBs to manage heat and high current busses for regulating a low power battery pack to stable 24V, 12V, 5V, and 3.3V supplies

LED Audio Visualizer

Independent project *Fall 2018*

- Designed and built an audio-reactive LED strip visualizer based on RGB LEDs and an Arduino for living room
- Created a simple circuit to sample audio into Arduino and programmed to react to signal amplitude

Backyard Ice Rink Scoreboard

Independent project *Winter 2016*

- Built a full-scale, wireless scoreboard powered by LED strip lights for use at a backyard ice rink
- Programmed a locally hosted web server to listen for HTTP messages from a QR-code accessible mobile web application
- Used an Arduino to drive individually addressable RGB LEDs for timekeeping

ADDITIONAL SKILLS

Programming Languages: C/C++, Python, Java, HTML/CSS, JavaScript (React, ReactNative, NodeJS), Elm

Software Packages: Altium Designer, Cadence Allegro, KiCAD, NI Labwindows/CVI, NI Max, Cadence Virtuoso, Ansys HFSS, LTSpice, Siemens NX, Microsoft Office