

MATTHEW GAINES

CONTACT

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EDUCATION

Case Western Reserve University Fall 2017 to Current
B.S. Electrical Engineering 2021
M.S. Electrical Engineering 2021
Circuit design focus
Undergraduate GPA: 3.903
Graduate GPA: 4.0

Relevant Coursework

Electronic Analysis & Design, Applied Circuit Design Laboratory, Semiconductor Devices, MOS Integrated Circuit Design, Signals and Systems.

SKILLS

PRODUCT DEVELOPMENT

PCB Fabrication
Soldering
Quick-Turn Prototyping
Version Control
Component Level Repair
Embedded Software Design

COMPUTER-AIDED DESIGN

Autodesk Eagle
Autodesk Inventor
LT Spice
Fusion 360

REFERENCES

Mark Desko · Keithley Instruments
Released Product Engineering Manager
Email: mark.desko@keithley.com
Mobile: (330)931-2862
Work: (440)498-2851

EMPLOYMENT

Case Western Reserve University Cleveland, OH
Undergraduate Research Assistant Jan. 2020 to Current
Designing hardware implementation of a real-time MRI guided robotic catheter for atrial fibrillation ablation.

Case Western Reserve University Cleveland, OH
Teaching Assistant Fall 2020 to Current
Laboratory teaching assistant for Applied Circuit Design Laboratory & Introduction to Electronics.

Keithley Instruments Solon, OH
Released Product Engineer Co-op Jan. 2019 to Aug. 2019
Responsible for diagnosing and repairing design flaws, frequent hardware failures, and finding replacements for obsolete components in released Keithley products.

PROJECTS

SteamVR Finger Tracking Glove Apr. 2021 to Current
The objective with this project is to create a standalone SteamVR controller that is integrated directly in to a glove.

- Tundra Labs TL448K6D-VR System in Package provides native SteamVR tracking compatibility.
- Hand pose determined by magnets and hall effect sensors attached to phalanges.
- Hall effect data handled by Teensy 4.0 microcontroller.

Scandeck - Interpolating Scanner Jan. 2019 to Aug. 2019
Capable of continuously fading between 10 analog signals with the turn of a single knob.

- Continuously variable scan width allows for multiple channels to be active at once.
- 100% analog design supports audio-rate modulation.
- All parameters can be voltage controlled from external sources.

Interactive Video Panel Aug. 2020 to Dec. 2020
High resolution illuminated panel which reacts to objects placed near it.

- Modular design allows for arbitrary display size.
- Infra-red proximity sensing per pixel determines if object is nearby.
- Intelligent RGBW LEDs enable control from affordable microprocessors.

Keithley Instruments Digital I/O Redesign Jan. 2019 to Aug. 2019
Legacy instruments from Keithley use an obsolete relay driver IC to handle digital I/O .

- Designed surface-mountable daughter board to sit in place of obsolete IC, mirroring its functionality.
- Daughter board acted as a contingency plan in case stock of obsolete part ran out.
- Completed a redesign with modern parts that would be used as a template for other Keithley products.

Keithley 2010 DMM Noise Floor Reduction June 2019 to July 2019
A customer reported inaccurate readings in the bottom half of the 10VAC range.

- Fault was caused by a data line run underneath RMS conversion stage.
- Data line in use when measuring VAC, causing artifacts in reading.
- Altering trace path solved the issue.

Keithley 6517B Electrometer Current Limiting Jan. 2019 to Mar. 2019
Investigated failures in the 6517B voltage source during short circuit conditions.

- Original current limiting circuit was unable to protect against 1200V short conditions.
- Implemented hardware that became active when unit enters High V mode.
- Probability of failure drastically reduced, unable to break modified unit.