

# Jacob M. Sindt

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## EDUCATION

**The University of Iowa College of Engineering**  
**B.S.E Electrical Engineering - Honors**  
**Minor in Mathematics**

**Anticipated May 2023**  
**Cumulative GPA: 3.90/4.0**

**Honors and awards:** Grant G. and Johanna J. Myers Scholarship Recipient (2021); Electrical Engineering Undergraduate Scholarship (2022); University Honors Student (3 years); President's List (1 semester) Dean's list (5 semesters); 2021 ICRU Research Fellow, Engineering Grand Challenges Scholar

## WORK EXPERIENCE

### **Electrical Engineering Co-op**

**05/2022 – Present**

Collins Aerospace, Cedar Rapids, IA

*RF Electronics – Mission Systems Business Unit*

- Utilized spectrum analyzers, signal generators, and network analyzers to test the functionality of 6 RF oscillator and mixer cards used to downconvert 12-20 GHz RF channels to 2-6GHz IF channels.
- Designed and made discrete component changes on RF oscillator and mixer cards to improve gain. Measured gain and noise figure, IMD3, P1dB, and channel leakage for 5 RF oscillator and mixer cards.

*Digital Electronics – Avionics Business Unit*

- Assisted in troubleshooting I2C lines, clock signal integrity, and power rail sequencing for an IO Expander circuit card containing two FPGAs.
- Reverse engineered and created circuit schematics for a breakout-box used to test electronics in avionics.
- Wrote a Design Verification Test (DVT) procedure describing how to verify the functionality of over 100 voltage rails, discrete IO lines, and I2C communication lines on an IO Expander circuit card.

### **Electrical Engineering Intern**

**02/2021 – 3/2022**

Firefly Photonics LLC, Coralville, IA

*Project: Setup and testing of mid-infrared (MIR) LED and photodetector based environmental gas sensors*

- Collaborated with the lead engineer at Firefly to set up the hardware of the MIR LED and photodetector-based sensor.
- Led the setup and optimization of the custom drive electronics, data collection system based on a digital oscilloscope, and optics to pulse a LED/photodetector pair within a gas testing chamber at UI's EHSRC.
- Coded a Python-based GUI for sensor data logging and analysis. Successfully demonstrated the detection of three different environmentally relevant gases: methane, acetone, and ethanol, using the MIR optoelectronic components.

## RESEARCH EXPERIENCE

### **Research Assistant**

**09/2020- 12/2020**

Fatima Toor's Photonics Research Lab, Electrical and Computer Engineering Department, University of Iowa

*Project: Design and optical characterization of lightweight 3D printed solar concentrators*

- Led the CAD design, 3D printing, and optical testing of parabolic solar concentrators to successfully demonstrate light concentration and increase in power conversion efficiency of silicon solar cells.
- Co-author on "Scalable Nano and Macro Light Management Approaches for Silicon Photovoltaics" for project results from Jacob Sindt and Fatima Toor.

## RELEVANT PROJECTS

- Designed, soldered, and tested a BJT amplifier with input, output, and biasing networks operating at frequencies of 925-975 MHz with minimum gain of 12.25 dB.
- Collaborated with 4 engineers to design, build, and test a 900MHz ISM band transmitter to upconvert a 70MHz IF signal and satisfy output power, input VSWR, current draw, and directivity requirements.
- Designed, built, and tested a Yagi-Uda antenna for a 900MHz ISM band transmitter with 1 other engineer.

## LEADERSHIP ACTIVITIES

- Engineering Grand Challenge's Scholar – Engineering solutions to enhance solar cell energy output
- Theta Tau – Planned group events for the entirety of the fall 2021 and spring 2022 semester
- Tau Beta Pi – Assisted in the planning of organization events for the spring 2022 semester
- Eagle Scout – Gained invaluable leadership experience designing and leading a community project

## **TECHNICAL SKILLS /RELEVANT COURSES**

- Languages: Proficient in ADS, Assembly, Python, C, C++, Java, MATLAB, Solidworks, Visio, Tinkercad
- Courses: RF Electronics, Advanced RF Electronics, Antennas, Advanced Circuit Techniques

