

David Mitchell

David.S.Mitchell-1@ou.edu • (918)914-2574

EDUCATION

- Master of Science (M.S.) in Electrical Engineering
 - GPA: 4.00 / 4.00
 - Advisor: Dr. Jessica Ruyle
 - Graduated: August 2018
- Bachelor of Science (B.S.) in Electrical Engineering
 - GPA: 3.86 / 4.00
 - Advisor: Dr. Jessica Ruyle
 - Graduated: August 2017

RESEARCH INTERESTS

- The development of high frequency electromagnetic structures, such as antennas and high impedance surfaces, and of novel methods of fabrication for the creation of previously unrealizable structures.

EXPERIENCE

3D Printed Antenna Engineer

Laboratory for Physical Sciences, College Park, MD

Sep 2018 – Present

- My responsibilities include using additive manufacturing techniques to develop novel antenna designs and to simplify existing designs, all in close collaboration with others.

Graduate Research Assistant

University of Oklahoma, Norman, OK

Aug 2017 – Aug 2018

Advisor: Dr. Jessica Ruyle

“Examination Of Additively Manufactured Chokes For Size Reduction And Performance Improvement In RF And Microwave Applications”

- My masters thesis focused on utilizing my experience with 3-dimensional design and printing to expand upon existing technologies using additive manufacturing. The first technology improved were sleeve baluns. I used several different techniques to develop a novel, folded, dielectrically loaded sleeve balun that was significantly smaller than a traditional sleeve balun. The second technology I addressed were choked horn antennas. I constructed several horn antennas with chokes that reduced sidelobe levels and controlled factors such as beamwidth.

Graduate Teaching Assistant

University of Oklahoma, Norman, OK

Aug 2017 – Dec 2017

Professor: Dr. Jessica Ruyle Course: Electromagnetic Fields I

- As a teaching assistant, I assisted in the grading of exams and held office hours several days of the week. In my office hours, I worked directly with the students to help improve their understanding of electromagnetic fields and the importance of applied electromagnetics.

Intern

XLIM Research Institute, University of Limoges, Limoges, France

Jun 2016 – Aug 2016

Supervisor: Dr. Nicolas Delhote

- In prior experiments at this lab, an electromagnetic, ceramic filter with a high quality factor was developed. This filter, however, did not perform as intended due to losses in the adhesives used. I was tasked with characterizing various aluminum cements. In order to do this, I had to develop methods of creating samples of the cement. This involved understanding the curing process of all of the cements and designing and building an apparatus for producing the samples.

Undergraduate Research Assistant

University of Oklahoma, Norman, OK

Jan 2016 – Aug 2017

Advisor: Dr. Jessica Ruyle

- Chip baluns offer the potential benefit of a smaller form factor over sleeve baluns, but their actual performance was unknown. In order to determine their performance, I first attempted to simulate the chip baluns using software, such as HFSS and MWO, to measure their characteristics analytically. I then measured their characteristics experimentally using a jig I designed and manufactured.

Undergraduate Research Assistant
University of Oklahoma, Norman, OK
Supervisor: Rusty Boyd

May 2015 – Aug 2015

- At the center of the Large Hadron Collider at CERN, there are pixel detectors which detect the subatomic particles created during the experimental collisions. In order to minimize the number of cables going into the collider, a pulsed power system was needed to allow for the transmission of both power and information on a single cable. I assisted in the initial stages of this research. I was responsible for developing an interface between Matlab and a Tektronix oscilloscope and for developing an arbitrary waveform generator with fuzzy logic control to run on an Arduino Due using Simulink. I also assisted in testing a coating for wire bonds to be put in the intense magnetic fields within the collider.

Honors Undergraduate Research
University of Oklahoma, Norman, OK
Advisors: Dr. Jessica Ruyle Dr. Caleb Fulton

Jan 2015 – May 2015

- The Radar Innovations Lab had just built new anechoic chambers for radar and antenna testing this year. I was part of a group of students responsible for testing and characterizing these anechoic chambers. I was also individually responsible for developing a method for importing the data from the chambers into Matlab for analysis.

Audio Visual and Sound Technician
First United Methodist Church, Bartlesville, OK, OK Mozart, Bartlesville, OK, The Wesley
Foundation, Norman, OK

Aug 2010 – May 2016

- I was responsible for operating and maintaining an array of audio visual and sound equipment for a wide range of events, such as lectures, meetings, and amateur and professional musical performances. During my time in this position, I became very familiar with many aspects of video and image editing and sound engineering.

- PUBLICATIONS**
- D. S. Mitchell, J. E. Ruyle, "Development of Folded Sleeve Baluns using Additive Manufacturing," in progress for submission to *IEEE Transactions on Antennas and Propagation*.
 - D. S. Mitchell, J. E. Ruyle, "Construction of Additively Manufactured Choked Horn Antennas for Reduced Sidelobe Levels and Improved Beam Control," in progress for submission to *Electronics Letters*.
 - D. S. Mitchell, H. H. Sigmarsson, J. E. Ruyle, "Lost-Shell Casting for Rapid Prototyping in RF and Microwave Application," featured in Issue 18 of *Electronics Letters*.

- SCHOLARSHIPS
AND AWARDS**
- National Merit Scholar 2013
 - Ernest W. Reynolds Scholarship 2016 – 2018
 - Clyde L. Farrar Scholarship 2015
 - James L. Box Electrical Engineering Scholarship 2015
 - Billy A. Couch Electrical Engineering Scholarship 2014
 - Chevron Phillips Dependents Scholarship 2013 – 2018
 - Bowerman Honorarium 2013

- ACTIVITIES**
- OU Apes of Wrath Ultimate Frisbee Team 2013 – 2018
 - OU Outdoors Club 2014 – 2016
 - OU Triathlon Club, *Swim Captain* Spring 2017
 - OU in Arezzo Student Activities Council, *Sports and Recreation Chair* Fall 2016
 - Avid Long Distance Runner 2010 – Present