

Jessica Erin Ruyle

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EDUCATION

Ph.D., Graduate, 2011
University of Illinois, Urbana-Champaign, IL
Electrical Engineering
3.83 GPA

M.S., Graduate, 2008
University of Illinois, Urbana-Champaign, IL
Electrical Engineering
3.77 GPA

B.S., Graduate, Magna Cum Laude, 2006
Texas A&M University, College Station, TX
Electrical Engineering
3.81 GPA

RESEARCH INTERESTS

The development and characterization of new electromagnetic devices and platforms such as antennas and packaging to improve the performance of radiating systems in challenging environments.

PUBLICATIONS

J. E. Ruyle and J. T. Bernhard, "Placement-Insensitive RFID Antenna," Under preparation for submission to *IEEE Transactions on Antennas and Propagation*.

J. E. Ruyle and J. T. Bernhard, "Transmission Line Model for Archimedean Spiral Slot Structures," Under preparation for submission to *IEEE Transactions on Microwave Theory and Techniques*

J. E. Ruyle and J. T. Bernhard, "Accurate Transmission Line Model of Slot Antenna," Submitted to *IEEE Transactions on Antennas and Propagation*.

J. E. Ruyle and J. T. Bernhard, "Signal flow graph for a probe-fed microstrip patch antenna," *IEEE Antennas and Wireless Prop. Letters* vol. 8, pp. 935-938, July 2009.

CONFERENCE PUBLICATIONS & PRESENTATIONS

J. E. Ruyle and J. T. Bernhard, "Miniaturized Slot Antennas for RFID Systems: Design Methodology and Measurements," *Proceedings for the 2011 Antenna Applications Symposium*, Allerton Park, Monticello, IL Sept. 20-22, 2011.

J. E. Ruyle and J. T. Bernhard, "Investigation of Slotline Inductors as Loads for Miniaturized Slot Antennas," *Proc. USNC-URSI National Radio Science Meeting 2011*

J. E. Ruyle and J. T. Bernhard, "Investigation of miniaturized and dual-band slot antennas for RFID systems," *Proceedings for the 2010 Antenna Applications Symposium*, Allerton Park, Monticello, IL Sept. 21-23, 2010.

J. E. Ruyle and J. T. Bernhard, "Investigation of edge serrations to eliminate cavity effect in parallel plate configurations," *2010 National Radio Science Meeting*, Boulder, CO Jan. 6-9, 2010.

J. E. Ruyle and J. T. Bernhard, "Investigation of a reconfigurable stacked patch with beamsteering capabilities," *Proceedings for the 2008 Antenna Applications Symposium*, Allerton Park, Monticello, IL Sept. 16-18, 2008.

J. E. Ruyle, C. W. Jung, and J. T. Bernhard, “Reconfigurable stacked patch antenna with beamsteering capabilities,” *Proc. IEEE Antennas and Propag. Soc. Int. Symp. 2008*.

PATENT FILINGS

US Patent 7768455 “Antenna for Controlling Radiation Direction,” C. W. Jung, Y. E. Kim, J. T. Bernhard, J. E. Ruyle.

US Patent Application September 20, 2011 “Placement-Insensitive Antenna for RFID, Sensing, and/or Communication Systems” J. E. Ruyle and J. T. Bernhard.

TECHNICAL EXPERIENCE

Assistant Professor - University of Oklahoma
Current Position

December 2011 - Present

Research Assistant - University of Illinois
Advisor: Dr. Jennifer Bernhard

Fall 2008 - December 2011

Dissertation Title - Placement-Insensitive RFID Antenna

For my doctoral research I am investigating a placement-insensitive RFID antenna. Current “peel-and-stick” RFID systems are limited to tracking nearly electromagnetically transparent materials (e.g. paper, plastic). The antenna under development allows “peel-and-stick” RFID systems to track all materials (e.g., metal, water). The sponsor for this research is Sandia National Laboratories.

Research Assistant - University of Illinois
Advisor: Dr. Jennifer Bernhard

Fall 2006 - Summer 2008

Thesis Title - Reconfigurable antenna with beamsteering capabilities

My masters research was in pattern reconfigurable antennas. A patent was granted for this antenna. This microstrip patch antenna I developed can change the direction from which it receives a signal using simple switches. This research was funded by Samsung to be implemented as a cell-phone antenna.

Intern - Sandia National Laboratories
Supervisor: Brent Jones and Jean-Paul Davis

Summer 2006

In addition to expanding on the work that I did in the summer of 2005, I wrote software to validate simulations of z-pinch reactions. My software took energy data from a 3-Dimensional Magneto-Hydrodynamic simulation of the z-machine and converted it into a 2-Dimensional X-ray image. Using my software, the output from the simulations could be compared to actual X-ray images taken during experiments.

Team Director - Senior Design Project
Industry Advisor: James McSpadden - Raytheon

Spring 2006

I directed the team for my industry sponsored senior design project. In a team of five, we designed an antenna and tracking system that could be mounted on top of a vehicle to receive satellite TV.

Intern - Sandia National Laboratories
Supervisor: Jean-Paul Davis

Summer 2005

I was given an independent project as a part of an overall research project in Isentropic Compression Experiments on the Z-Machine. The Z-Machine is a fusion reactor, sometimes referred to as the z-pinch, which is also used to evaluate material properties through Isentropic Compression Experiments. The experiments require that the current in the center of the reactor be shaped to prevent a shock in the material. I developed an algorithm to find the optimum settings on the Z-Machine for current pulse shaping.

	<i>Intern - Sandia National Laboratories</i> <i>Supervisor: Robert Huelskamp</i> I worked in the public policy division of the lab and researched the effect of the expansion of nuclear power production on nuclear weapons proliferation. The information I gathered was used to inform policymakers on the topic.	Summer 2004
ENTREPRENEURIAL ACTIVITIES	Cozad New Venture Competition Finalist National Collegiate Inventors and Investors Alliance (NCIIA) Advanced Invention to Venture Workshop	Spring 2010 Summer 2010
MENTORING EXPERIENCE	<i>Graduate Mentor -</i> <i>Summer Research Opportunities</i> <i>Program for Undergraduates (SROP)</i> SROP is a program that gives underrepresented students an opportunity to complete undergraduate research. I was paired with a student to work as his graduate mentor. I taught him the background material required to complete his project. I also served as his advisor for his research throughout the summer.	Summer 2010
	<i>Graduate Mentor -</i> <i>Illinois Scholars in Undergraduate Research (ISUR)</i> ISUR is a program that gives underrepresented students in engineering an opportunity to complete undergraduate research. I was paired with a student to work as her graduate mentor. I taught her the required background material and served as her advisor throughout the 2009-2010 school year.	Fall 2009 - Spring 2010
UNIVERSITY SERVICE	<i>Graduate Teaching Assistant -</i> <i>Worldwide Youth in Science and</i> <i>Engineering Summer Camp (WYSE)</i> WYSE is a summer camp for high school students that introduces the different fields of engineering. The Department of Electrical and Computer Engineering hosts a lab section for the students in which they learn about basic ECE lab equipment and build an FM transmitter. For each lab section (four in total), I gave a short lecture on antennas and their uses and aided the students in completing the lab.	Summer 2010
	<i>Graduate Mentor -</i> <i>Professional Development and Leadership Skills</i> <i>in Engineering through Mentoring</i> I participated in a program that paired a graduate student with a sophomore and freshman woman in Electrical Engineering. I advised both women for a semester. As a mentor, I advised them on how to cope with common issues arising from being a woman in engineering. Despite a difficult first year, the freshman woman I mentored remained in the program and is now thriving as a junior in ECE. The sophomore remained in engineering but switched departments to General Engineering.	Fall 2008
TRAINING & TEACHING EXPERIENCE	<i>Course on College Teaching and Academic Careers</i> I completed a course that instructs graduate students in effective teaching at the college level. Assignments for the course included: readings of current literature on effective teaching practice, a classroom observation of a well-regarded teacher, the compilation of a syllabus for a course that I would likely teach, a philosophy of teaching statement, and a scholarship of teaching and learning research proposal. My research proposal detailed an intervention method to retain women in an engineering program.	Spring 2010
HONORS & AWARDS	National Instruments Endowed Scholarship for Excellence Award Outstanding Academic Achievement Award from Dwight Look College of Engineering	2005 2002

Texas A&M President's Endowed Scholar	2002
Texas A&M Director's Excellence Award	2002
National Merit Scholar	2002
ACTIVITIES	
Eta Kappa Nu	
• President	Fall 2005 & Spring 2006
• Treasurer	Spring 2005
• Recording Secretary	2004
Tau Beta Pi	2004
Society of Women Engineers	
• Momentum Chair	2004-2006
Engineering Scholars Program	2002-05
REFERENCES	
<i>Dr. Jennifer Bernhard</i>	
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1406 W. Green	
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