Raenita A. Fenner

Curriculum Vitae Assistant Professor of Engineering Loyola University Maryland 4501 N. Charles Street Baltimore, MD 21210 **a**:410.617.2512 | 🖂: rafenner@loyola.edu

APPOINTMENTS Loyola University Maryland Baltimore, MD July 2011 - Present Assistant Professor Department of Engineering · Clare Boothe Luce Endowed Professor EDUCATION 2007-2011 Michigan State University East Lansing, MI Ph.D. Concentration: *Electromagnetics* Electrical Dissertation: "Error Analysis of Free-Space Material Characterization Methods" Engineering Defense Date: April 29th, 2011 Advisor: Dr. Edward J. Rothwell 2005-2007 Michigan State University East Lansing, MI Master of Science **Concentration:** *Electromagnetics* Electrical Thesis: "Bandwidth Extension of a Body-Worn Antenna Vest" Engineering Advisor: Dr. Edward J. Rothwell 2001-2005 Morgan State University Baltimore, MD Bachelor of Science Major: Electrical Engineering Magna Cum Laude · GPA: 3.75 **RESEARCH EXPERIENCE** 2007-2011 Michigan State University East Lansing, MI Research Assistant Doctoral Research · Electromagnetics Research Lab · Sponsor: Boeing Performed Rigorous Error Analysis of Common Free-Space Material Characterization Methods Researched and Developed Novel Free-Space Material Characterization 檾 Methods for Conductor-Backed Media * Proved Ineffectiveness of Multiple Overlay Layers for Free-Space Material Characterization Methods Performed Measurements Using HP 8510 Network Analyzer to Extract Material Parameters using Free-Space Methods 2005-2007 Michigan State University East Lansing, MI Research Assistant Master's Research · Electromagnetics Research Lab * Explored Various Antenna Designs for Body-Worn Antenna Vest Simulated and Optimized Antenna Designs in FEKO * Designed and Simulated Self-Structuring Antenna Vest using Genetic Algorithms * Fabricated and Measured Self-Structuring Antenna Vest INDUSTRY EXPERIENCE Summer 2006 Southwest Research Institute San Antonio, TX Intern Signal Exploitation and Geolocation Division * Researched Body Worn Antenna Vest for 20-150 MHz Frequency Range Designed a Solution to the Body Worn Antenna Vest Problem Summer 2005 Southwest Research Institute San Antonio, TX Intern Signal Exploitation and Geolocation Division

	Became Proficient in Electromagnetic Simulator Wipl-D Software
	Assisted with Antenna Pattern Measurements
Со-Ор	Summer 2004 NASA Goddard Space Flight Center Wallops Island, VA Wallops Flight Facility
	 Assisted with Antenna Pattern Measurements
	Learned LabView Software
	Performed Thermal Cycle Testing
	 Designed & Validated PCM/FM Link Margin Analysis
Intern	Summer 2003NASA Goddard Space Flight CenterGreenbelt, MDSummer Institute in Electrical & Computer Applications
	Designed Waveguide Antennas
	Tested Waveguides in the Anechoic Chamber and with Vector Network Analyzer
	Worked on Communication Subsystem of the Simulated Satellite Project
	TEACHING EXPERIENCE
	Present Loyola University Maryland Baltimore, MD
Instructor	Courses Taught:
	& EG 331: Linear Circuit Analysis
	EG 031: Linear Circuit Laboratory
	EG 333: Signals and Systems
	EG 432: Electronic Circuits
Teaching Assistant	Spring 2011Michigan State UniversityEast Lansing, MIECE 407: Electromagnetic Compatibility · Electrical & Computer EngineeringDepartment
Instructor	Summer 2009 Michigan State University East Lansing, MI ECE 305: Electromagnetic Fields and Waves I · Electrical & Computer Engineering Department
Teaching Assistant	Spring 2007Michigan State UniversityEast Lansing, MIECE 407: Electromagnetic Compatibility · Electrical & Computer EngineeringDepartment
Teaching Assistant	Fall 2006Michigan State UniversityEast Lansing, MIECE 405: Fields and Waves II · Electrical & Computer Engineering Department
Peer Reviewed	PUBLICATIONS
Journals & Conference Papers	 E. Rothwell, R. Fenner and B. Crowgey, "A Simple Time-Domain Method to Characterize a Conductor-Backed Low-Conductivity Material," Studies in Applied Electromagnetics and Mechanics (Electromagnetic Nondestructive Evaluation XIII) vol. 33, pp. 53-60, 2010.
	 Fenner, R. Rothwell, E.J., "On the Inadequacy of the overlay method for characterizing a conductor-backed material using free-space measurements," Antennas and Propagation Society International Symposium (APSURSI), 2010 IEEE, vol., no., pp.1-4, 11-17 July 2010.
	 Fenner, R. A., E. J. Rothwell, and L. L. Frasch (2012), A comprehensive analysis of free-space and guided-wave techniques for extracting the permeability and permittivity of materials using reflection-only measurements, Radio Sci., 47, RS1004, doi:10.1029/2011RS004755.

4. Fenner, R.A., E.J. Rothwell, "Deficiency in the Error Propagation Method for Sensitivity Analysis of Free Space Material Characterization Methods," Proceedings of the Toulouse Space Show 2012, 15th International Symposium of Antenna Technology and Applied Electromagnetics, Toulouse, France, June 25-29, 2012.

Conference Presentations

- R.A. Fenner, J.M. Tomasic, and K.E. Lenz "A Reconfigurable Antenna with Magnetically-Coupled Switches," IEEE AP-S International Symposium and URSI Radio Science Meeting, Chicago, IL, July 8-13, 2012 [Upcoming].
- R. Fenner and S. Keilson, "Student Journaling and Problem Solving Enhancement" Mid-Atlantic Regional Meeting of the ASEE, Newark, DE, April 20-21, 2012.
- 3. E.J. Rothwell, R.A. Fenner, and L.L. Frasch, "Error Analysis for the General Extraction Formulation of the Permeability and Permittivity of a Material Layer Using Free-Space, Reflection-Only Measurements", IEEE AP-S International Symposium and URSI Radio Science Meeting, Spokane, WA, 2011.
- 4. E.J. Rothwell, R.A. Fenner, and L.L. Frasch, "Using Angle and Thickness Refinement in the Two-Polarization Method for Free-Space Material Characterization", National Radio Science Meeting, Boulder, CO, January 5-8, 2011.
- R.A. Fenner, E.J. Rothwell, and L.L. Frasch, "A General Formulation for Extracting the Permeability and Permittivity of a Material Layer Using Free-space, Reflection-only Measurements", National Radio Science Meeting, Boulder, CO, January 5-8, 2011.
- R.A. Fenner and E.J. Rothwell, "Effects of Wavefront Curvature on the Two-Polarization Method for Material Characterization", IEEE AP-S International Symposium and URSI Radio Science Meeting, Toronto, ON, July 11-17, 2010.
- R.A. Fenner and E.J. Rothwell, "Error Analysis of the Two-Polarization Method for Material Characterization Using Interval Analysis", IEEE AP-S International Symposium and URSI Radio Science Meeting, Toronto, ON, July 11-17, 2010.
- 8. R.A. Fenner and E.J. Rothwell, "Error Analysis of the Two-Polarization Method for Material Characterization", IEEE AP-S International Symposium and URSI Radio Science Meeting, Toronto, ON, July 11-17, 2010.
- O. Akinlabi, R.Fenner, B. Crowgey, and E.J. Rothwell, "Analysis of a Body-Worn Self-Structuring Antenna Vest", IEEE AP-S International Symposium and URSI Radio Science Meeting, Toronto, ON, July 11-17, 2010.
- R.A. Fenner, E.J. Rothwell, and L.L. Frasch, "Error Analysis for Several Free-Space Material Characterization Methods", 2009 IEEE AP-S International Symposium and USNC/URSI.
- 11. R.A. Fenner, O. Akinlabi, and E.J. Rothwell, "The Adaptation of a Body-Worn Antenna Vest to Changes in Human Body Position", Poster at the 2009 Women in Electromagnetics Conference.
- R.A. Fenner, O. Akinlabi, and E.J. Rothwell, "Body-Worn Antenna Adaptation to Changes to Human Body Position", 2009 IEEE AP-S International Symposium and USNC/URSI.
- R.A. Fenner and E.J. Rothwell, "Bandwidth Extension of a Body-Worn Antenna Vest", USNC/URSI National Radio Science Meeting, Ottawa, June 2007.

AWARDS & FELLOWSHIPS

- Morgan State University Founder's Day Award · October 2011
- Michigan State University, Alliances for Graduate Education and the Professoriate (AGEP) Scholar Award · 2008, 2009, 2010, 2011
- Alfred P. Sloan Scholar Fellowship · 2006 2010
- GEM Master Fellowship (Sponsor: Southwest Research Institute) · 2005 2007

- Michigan State University, University Enrichment Fellowship · 2005 2010
- Morgan State Regents Honor Scholarship Award · 2001 2005

PROFESSIONAL MEMBERSHIPS

- * Member, The Institute of Electrical and Electronics Engineers (IEEE)
- Member, American Society of Engineering Education
- * Member, Tau Beta Pi, The Engineering Honor Society
- ✤ Society of Women Engineers

PROFESSIONAL ACTIVITIES

- Faculty advisor for the Loyola University MD Society of Women Engineers collegiate interest group
- Advancing the Careers of Women in Science, Technology, Engineering, and Mathematics at Predominantly Undergraduate Institutions through Professional Networks · Fall 2011 - Present
- Judge at Western High School's VEX Robotic Competition · February 25, 2012
- Faculty advisor for the Loyola University Maryland undergraduate team for the NIH Go Viral Challenge · Spring 2012
- Technical liaison and judge at the Roland Park Country School Introduce a Girl to Engineering Day ·December 2011
- Guest Speaker at Annapolis Middle School Career Day · October 2011
- Guest Speaker at the Roland Park Country Inner City Youth Outreach Program · July 2011
- Michigan State University Recruiter and Participant at the NSF Emerging Researchers Conference · Washington, D.C. · February 2011
- ✤ AGEP· Michigan State University · 2011-2007
- Mentor for Prospective Students, Enhance Your Future · 2010, 2009, 2008, 2007
- Panel Member · Morgan State University's Science Career Workshop · How to Survive in Graduate School · Oct 2010
- Presenter · Michigan AGEP Alliance Spring Symposium · Survey of Self-Structuring Antenna Technology
- Panel Member · Michigan State AGEP · What You Need to Know About Graduate School · August 2008
- Chalk Talk · Michigan State AGEP Meeting · Understanding Free-Space Material Characterization · March 2010
- Chalk Talk · Michigan State AGEP Meeting · Basics of Electromagnetics and Self-Structuring Antennas · April 2008