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EDUCATION: Specialty in Electromagnetics

Ph.D., Electrical Engineering University of Utah, 1994

Master of Science, Electrical Engineering, University of Utah, 1988

Bachelor of Science, Electrical Engineering, University of Utah, 1986

Minor: Mathematics (Magna Cum Laude/UofU Salutorian 1986)

WORK EXPERIENCE:

ASSOCIATE VICE PRESIDENT FOR RESEARCH

7/09 to present

University of Utah

Responsible for expanding and enhancing the research mission of the university, interface with outside agencies and corporate sponsors, and oversight of the Gauss Haus NMR facility and the Nuclear Reactor Safety Committee

PROFESSOR 7/06 to present and **ASSOCIATE PROFESSOR** 9/02 to 7/06

ASSOCIATE CHAIR for Undergraduate Studies 7/07 to 7/09

Dept. of Electrical and Computer Engineering, University of Utah

Director: Center of Excellence for Smart Sensors

Courses Taught: Electromagnetics, Microwave Engineering, Computational Electromagnetics, Wireless Communication

CHIEF SCIENTIST & CO-FOUNDER 3/04 to present livewiretest.com

LiveWire Test Labs, Inc. (spin off company from the Center of Exc. for Smart Sensors)

ASSISTANT PROFESSOR 9/97 to 8/01 and **ASSOCIATE PROFESSOR** 9/01 to 9/02

Dept. of Electrical and Computer Engineering, Utah State University

Courses Taught: Electromagnetics, Microwave Engineering, High Frequency (Digital) Engineering, Antennas and Radiation, Computational Electromagnetics, Wireless Communication

Director: Richard and Moonyeen Anderson Wireless Communication Research and Education Center

Director: Center of Excellence for Smart Sensors

RESEARCH ASSISTANT PROFESSOR 9/95 to 9/97

Dept. of Electrical Engineering, University of Utah

National Science Foundation Computational Sciences and Engineering Postdoctoral Research Fellow

RESEARCH ASSOCIATE and ENGINEERING INSTRUCTOR 3/94 to 9 /97

Dept. of Electrical Engineering, University of Utah

EE553: Numerical Methods in Electromagnetics (1994, 1995, 1996, 1997)

EE108/109: Electrical Engineering for Non-Majors (1997)

BOOK CHAPTERS:

1. O.P. Gandhi, C.M.Furse, G. Lazzi, "Monopole Antennas", Wiley Encyclopedia of Electrical and Electronics Engineering, John Webster, editor, 2000; Reprinted in Wiley Encyclopedia of RF and Microwave Engineering, 2003, Vol 4, pp. 3238-3244
2. C.M.Furse, O.P. Gandhi, G. Lazzi, "Dipole Antennas", Wiley Encyclopedia of Electrical and Electronics Engineering, John Webster, editor, 2000, 2006 (online); Reprinted in Wiley Encyclopedia of RF and Microwave Engineering, 2003, Vol 2, pp. 1047-1052
3. C.M. Furse, G. Lazzi, O.P. Gandhi, "Dipole, Monopole and Loop Antennas," Modern Antennas, Constantine Balanis, editor, 2006
4. C.M.Furse, "Antennas for Medical Applications," Antenna Engineering Handbook, 4th Edition, John Volakis, editor, McGraw-Hill, 2006
5. C.Furse, "Reflectometry for Structural Health Monitoring," *New Developments in Sensing Technology for Structural Health Monitoring*, edited by Dr. Subhas Chandra Mukhopadhyay, Springer-Verlag, 2011

BOOKS

J.Carlstrom, C. Furse, History of Emigration Canyon, Utah State University Press, 2002

C. Furse, D. Christiansen, C. Durney, Introduction to Bioelectromagnetics, 2nd Edition, CRC Press, 2008

JOURNAL PUBLICATIONS:

1. Sai Ananthanarayanan P.R., Alyssa Magleby Richards, Cynthia Furse," Measurement and Modeling of Multi-user Multi-antenna system in aircraft in the presence of electromagnetic noise and interference", *Microwave and Optical Technology Letters*, Volume 53, Issue 5, pages 1137–1144, May 2011
2. Sai Ananthanarayanan P.R., Alyssa Magleby Richards, Cynthia Furse," Measurement and modeling of Multi-Antenna systems in aircraft", accepted to *Journal of Aerospace Computing, Information, and Communication*
3. G. Barton, C. Furse, "Calculating grounding electrode impedance using fall-of-potential and impedance methods", *IEEE Antennas and Propagation Magazine*, 52(4), Aug 2010,pp. 151-154
4. Sai Ananthanarayanan P.R., Alyssa Magleby, James R. Nagel, Cynthia Furse, "Measurement and modeling of Interference for multiple antenna system," *Microwave and Optical Technology Letters*, Vol. 51, No. 9, pp. 2031-2037, June 2010
5. (invited paper) J. Nagel, A. Magleby, S. Ananthanarayanan, C. Furse, "Measured Multi-User

- MIMO Capacity in Aircraft," *IEEE Antennas and Propagation Magazine*, 52(4), Aug 2010, 179-184
6. Peiman Amini, Cynthia Furse, Behrouz Farhang-Boroujeny, "Filterbanks for Multicarrier Reflectometry," *IEEE Sensors Journal*, Vol. 9, No. 12, pp. 1831-1837, Dec. 2009
 7. C. Furse, P. Smith, M. Diamond, "Feasibility of Reflectometry for Nondestructive Evaluation of Prestressed Concrete Anchors," *IEEE Journal of Sensors*, Vol. 9. No. 11, Nov. 2009, pp. 1322 - 1329
 8. D. Landon, C. Furse, "MIMO Capacity Dependence on Realistic Cross-Polarization and Branch-Power-Ratios," *Microwave and Optical Technology Letters*, Vol 50, No. 5, May 2008, pp. 1384-1388
 9. Y Chung, N. Amarnath, C. Furse, J. Mahoney, "Capacitance and Inductance Sensor Circuits for Detecting the Lengths of Open and Short Circuited Wires ," *IEEE Trans. Instrumentation and Measurement*, Vol. 58, No. 8, Aug 2009, pp. 2495-2502
 10. C Lo, C Furse, "Modeling and Simulation of Branched Wiring Networks," *Applied Computational Electromagnetics Society (ACES) Journal*, Vol. 23, No. 2, June 2008, pp. 143-148
 11. David G. Landon, Cynthia M. Furse, "Recovering handset diversity and MIMO capacity with polarization-agile antennas," *IEEE Trans. Antennas and Propagation*, Volume 55, [Issue 11](#), Part 2, Nov. 2007 Page(s):3333 – 3340
 12. J.Rock Hadley, C.Furse, D. Parker, "RF coil design using a genetic algorithm," *ACES Journal*, Vol. 2, No. 2, July 2007, pp. 277-286
 13. Cynthia Furse, Lance Griffiths, Behrouz Farhang, and Geeta Pasrija, "Integration of Signals/Systems and Electromagnetics Courses through the Design of a Communication System for a Cardiac Pacemaker," *IEEE Antennas and Propagation Magazine*, Volume 47, Issue 2, April 2005 Page(s):117 - 119
 14. Chirag Sharma, Reid Harrison, Cynthia Furse, " Low-Power STDR CMOS sensor for locating faults in aging aircraft wiring," *IEEE Sensors Journal*, Volume 7, Issue 1, Jan. 2007 Page(s):43 - 50
 15. L. Griffiths, C. Furse, "Broadband and multi-band antenna design using the genetic algorithm to create amorphous shapes using ellipses," *IEEE Trans. Antennas and Propagation*, Volume 54, Issue 10, Oct. 2006 Page(s):2776 - 2782
 16. (INVITED PAPER) C.Furse, "A Survey of Phased Arrays for Medical Applications," *ACES Journal, Special Issue on Phased Arrays* , Vol. 21, No.3, Nov 2006, pp.365-379
 17. Shang Wu, Cynthia Furse, Chet Lo, "Non-Contact Probes for Wire Fault Location with Reflectometry," *IEEE Sensors Journal*, Volume 6, Issue 6, Dec. 2006 Page(s):1716 - 1721
 18. Pichitpong Soontornpipit, Cynthia M. Furse, You Chung Chung, and Bryan M. Lin, "Optimization of a Buried Microstrip Antenna for Simultaneous Communication and Sensing of Soil Moisture," *IEEE Trans. AP Special Issue on Antenna Applications*, Volume 54, Issue 3, March 2006 Page(s):797 - 800
 19. Lance Griffiths, Rohit Parakh, Cynthia Furse, Brittany Baker, "The Invisible Fray: A Critical

Analysis of the Use of Reflectometry for Fray Location," *IEEE Journal of Sensors*, Volume 6, Issue 3, June 2006 pp. 697 – 670

20. Cynthia Furse, Craig Waterman, Lance Griffiths, "To-Average or Not-to-Average in FDTD Modeling of Dielectric Interfaces," *ACES Journal* , Vol:21 No:2 2006
21. Suketu Naik, Cynthia M. Furse and Behrouz Farhang-Boroujeny, "Multicarrier Reflectometry," *IEEE Sensors Journal*, Vol 6, No. 3, June 2006, pp. 812-818
22. (INVITED PAPER) Cynthia Furse, You Chung Chung, Chet, Lo, Praveen Pendayala, "A Critical Comparison of Reflectometry Methods for Location of Wiring Faults," *Smart Structures and Systems*, Vol. 2, No.1, 2006, pp. 25-46
23. (INVITED PAPER) April Kedrowicz, Sundy Watanabe, Damon Hall, Cynthia Furse, "Infusing Technical Communication and Teamwork within the ECE Curriculum," *Turkish Journal, ELEKTRIK*, special issue on Engineering education, Vol. 14, Issue 1, 2006
24. C.Furse, P.Smith, M. Safavi, C. Lo," Feasibility of Spread Spectrum Reflectometry for Location of Arcs on Live Wires," *IEEE Journal of Sensors*, Vol.5, No. 6, Dec 2005, pp.1445-1450
25. Lance Griffiths, Cynthia Furse, "Performing 3-D FDTD simulations in less than 3 seconds on a personal computer and its application to genetic algorithm antenna optimization," *Applied Computational Electromagnetics Society Journal*, Vol. 20, No. 2, July 2005, pp. 128-135
26. Pichitpong Soontornpipit, Cynthia M. Furse and You Chung Chung, "Miniaturized Biocompatible Microstrip Antenna using Genetic Algorithm," *IEEE Trans. Antennas and Propagation*, Vol. 53, No. 6, June 2005, pp. 1939-1945
27. P. Tsai, Y. Chung, C. Lo, C.Furse, ,"Mixed Signal Reflectometer Hardware Implementation for Wire Fault Location," *IEEE Sensors Journal*, Vol.5, No. 6, Dec. 2005, pp. 1479-1482
28. Y. Chung, C. Furse, Jeremy Pruitt "Application of Phase Detection Frequency Domain Reflectometry for Locating Faults in an F-18 Flight Control Harness ," *IEEE Trans. EMC*, Vol. 47, No.2, May 2005, pp. 327 - 334
29. P. Smith, C.Furse, J.Gunther, "Fault Location on Aircraft Wiring Using Spread Spectrum Time Domain Reflectometry," *IEEE Sensors Journal*, Vol.5, No. 6, Dec. 2005, pp. 1469-1478
30. C.Lo, C.Furse, "Noise Domain Reflectometry for Wire Fault Location," *IEEE Trans. EMC*, Vol. 47, No. 1, Feb. 2005, pp.97-104
31. J. Ward, C. Swenson,C.Furse," The Impedance of a Short Dipole Antenna in a Magnetized Plasma via a FDTD model," *IEEE Trans. Antennas and Propagation*, Vol 53, No8, Aug 2005, pp. 2711-2718
32. (INVITED PAPER) Cynthia Furse, Chet Lo, You Chung Chung, Paul Smith, Praveen Pendayala, Kedarnath Nagoti, "Spread Spectrum Sensors for Critical Fault Location on Live Wire Networks," *Journal of Structural Control and Health Monitoring*, Vol 12, 2005, pp. 257-267
33. Behrouz Farhang-Boroujeny and Cynthia Furse, "Robust Multicarrier Spread Spectrum Technique for Data Transmission over Partially Jammed Channels," *IEEE Transactions on Signal Processing*, Vol. 53, No. 3, March 2005, pp. 1038-1044, also presented at MILCOM

2004, October 31 - November 3, 2004

34. Damon Hall and Cynthia Furse, "Take a Stand: Speaking to Learn about RF Safety," *IEEE Antennas and Propagation Magazine*, Vol. 6, No. 6, December 2004, pp. 146-150
35. P. Soontornpipit, C.M. Furse, and Y.C. Chung, "Design of Implantable Microstrip Antenna for Communication with Medical Implants," Special Issue of *IEEE Transactions on Microwave Theory and Techniques* on Medical Applications and Biological Effects of RF/Microwaves, Vol. 52, No. 8 Part 2, Sept. 2004, pp. 1944-1951
36. C.Furse, R.Woodward, M. Jensen, "Wireless Local Area Network Laboratory for Microwave Engineering Courses," *IEEE Trans. Education*, Vol. 47, No. 1, Feb2004, pp.18-25
37. Cynthia Furse, You Chung Chung, Rakesh Dangol, Marc Nielsen, Glen Mabey, Raymond Woodward, "Frequency Domain Reflectometry for On Board Testing of Aging Aircraft Wiring," *IEEE Trans. Electromagnetic Compatibility*, Vol 45, No. 2, May 2003, p.306-315.
38. C.Furse, N. Kamdar, "Development of an Inexpensive Distance Measuring System for Location of Robotic Vehicles," *Microwave and Optical Technology Letters*, April 20, 2002
39. D.Johnson, C.Furse, A.Tripp, "FDTD Modeling and Validation of EM Survey Tools," *Microwave and Optical Technology Letters*, Sept. 20, 2002
40. D.Johnson, E.Cherkaev, C.Furse, A.Tripp, "Cross-Borehole Delineation of a Conductive Ore Deposit -- Experimental Design," *Geophysics*, May/June 2001
41. C.Furse, R. Haupt, "Down to the Wire: The Hidden Hazard of Aging Aircraft Wiring," *IEEE Spectrum*, Vol. 38, No. 2, Feb. 2001, pp.35-39
42. C.Furse, "Design of an Antenna for Pacemaker Communication," *Microwaves and RF*, March 2000, p. 73-76
43. A Tripp, R.McNeary, C.Furse, "Prof. James Wait and Mining Production Technology -- An appreciation," *IEEE Trans. Antennas and Propagation*, Sept. 2000, 48(9), pp. 1438-1441
44. C.M. Furse, D.H. Roper, C.H. Durney, D.A. Christensen, "Treatment of DC Offsets in FDTD Simulations," *IEEE Transactions on Antennas and Propagation*, Vol. 48, No. 8, October 2000, pp. 1198-1208
45. D.Johnson, C.Furse, A.Tripp, "PML for FDTD Modeling of a Conductive Ore Deposit in a Lossy Dielectric," *Microwave and Optical Technology Letters*, Vol. 25, No.4, May 20, 2000, pp. 253-255
46. (INVITED PAPER) C. Furse, "Faster than Fourier-- Ultra-Efficient Time-to-Frequency Domain Conversions for FDTD Simulations," *Antennas and Propagation Magazine*, Vol. 42, No.6, Dec. 2000, pp. 24-34
47. (INVITED PAPER) C.M. Furse, D.M. Johnson, A.C. Tripp, "Application of the FDTD Method to Geophysical Simulations," *Applied Computational Electromagnetics Society Newsletter*, March 1999
48. C. Furse, O.P. Gandhi, "Calculation of Electric Fields and Currents Induced in a Millimeter-Resolution Human Model at 60 Hz Using the FDTD Method," *Bioelectromagnetics*, Vol. 19 No. 5, 1998, pp.293-299

49. G.Lazzi, S.S. Pattnaik, C.M. Furse, O.P. Gandhi, "Comparison of FDTD-Computed and Measured Radiation Patterns of Commercial Mobile Telephones in Presence of the Human Head," *IEEE Trans. Antennas and Propagation*, Vol. 46, No. 6, June 1998, pp.943-944
50. A.D. Tinniswood, C.M. Furse, O.P. Gandhi, "Computations of SAR Distributions on Two Anatomically-based Models of the Human Head using CAD Files of Commercial Telephones and the Parallelized FDTD Code," *IEEE Transactions on Antennas and Propagation*, 1998, pp.829-833
51. A.D. Tinniswood, C.M. Furse, O.P. Gandhi, "Power Deposition in the Head and Neck of an Anatomically-Based Human Body Model for Plane Wave Exposures," *Physics Med. Biology*, 43(8), Aug. 1998, pp. 2361-2378
52. (INVITED PAPER) C.M. Furse, "Application of the Finite-Difference Time-Domain Method to Bioelectromagnetic Simulations," *Applied Computational Electromagnetics Society Newsletter*, Jan. 1997
53. C.M. Furse, Q.S. Yu, O.P. Gandhi, "Validation of the Finite-Difference Time-Domain Method for Near Field Bioelectromagnetic Simulations", *Microwave and Optical Technology Letters*, Vol. 16, No.6, 1997, p. 341-345
54. C.Furse, Y.Cui, G.Lazzi, O.Gandhi, "Use of PML Boundary Conditions for Wireless Telephone Simulations," *Microwave and Optical Technology Letters*, Vol. 15 No.2, 1997, pp. 95-98
55. O.P. Gandhi, C.M. Furse, "Currents Induced in the Human Body for Exposure to Ultrawideband Electromagnetic Pulses," *IEEE Transactions on Electromagnetic Compatibility*, Vol. 39, No.2, May 1997, pp. 174-180
56. O.Gandhi, G.Lazzi, C.Furse, "Electromagnetic Absorption in the Human Head and Neck for Mobile Telephones at 835 and 1900 MHz," *IEEE Transactions on Microwave Theory and Techniques*, Vol. 44, No. 10, Part 2, Oct. 1996, pp. 1884-1897
57. O.P. Gandhi, R.A. Hart , D. Wu , X.B. Chen, C.M. Furse, "Comparison of endogenous with exogenous electric fields and current densities induced in the human body by commonly encountered EMF sources: Power lines, hair dryers, and hair clippers", *Project abstracts: The Annual Review of Research on Biological Effects of Electric and Magnetic Feilds from the Generation, Delivery, and Use of Electricity*, San Antonio, TX, Nov. 19-21, 1996, p. 26
58. C.M. Furse, O.P. Gandhi, "A Memory Efficient Method of Computing Specific Absorption Rate in CW FDTD Simulations," *IEEE Transactions on Biomedical Engineering*, Vol. 43, No.5, May 1996, pp. 558-560
59. C.M. Furse, O.P. Gandhi, "Why the DFT is Faster than the FFT for FDTD Time-to-Frequency domain Conversions," *IEEE Microwave Theory and Guided Wave Letters*, 5(10) October 1995, pp. 326-328
60. O.P. Gandhi, C.M. Furse, "Millimeter-resolution MRI-based models of the Human Body for Electromagnetic Dosimetry from ELF to Microwave Frequencies," *Voxel Phantom Development: Proc. Of the International Workshop held at NRPB, July 1995*, Peter Dimbylow, editor
61. C.M. Furse, J.-Y. Chen, O.P. Gandhi, "Use of the Frequency-Dependent Finite-Difference

Time-Domain Method for Induced Current and SAR Calculations for a Heterogeneous Model of the Human Body," *IEEE Transactions on Electromagnetic Compatibility*, Vol. 36, No. 2, May 1994, pp.128-133

62. J.-Y. Chen, C.M. Furse, O.P. Gandhi, "A Simple Convolution Procedure for Calculating Currents Induced in the Human Body for Exposure to Electromagnetic Pulses," *IEEE Transactions Microwave Theory and Techniques*, Vol. 42, No. 7, July 1994, pp. 1172-1175
63. C.M. Furse, J.-Y. Chen, O.P. Gandhi, "Frequency-Dependent Finite-Difference Time-Domain Method for Induced Current and SAR Calculations for a Heterogeneous Model of the Human Body," Electricity and Magnetism in Biology and Medicine, Martin Blank, Ed., San Francisco Press, 1993, pp. 575-577
64. J.-Y. Chen, C.M. Furse, O.P. Gandhi, "Video Displays of Induced Current Distributions for an Anatomically Based Model of the Human Body for Exposure to Short and Ultrashort Electromagnetic Pulses," Electricity and Magnetism in Biology and Medicine, Martin Blank, Ed., San Francisco Press, 1993
65. C.M. Furse, S.P. Mathur, O.P. Gandhi, "Improvements to the Finite-Difference Time-Domain Method for Calculating Radar Cross Section of a Perfectly Conducting Target," *IEEE Transactions on Microwave Theory and Techniques*, 38(7), July 1990, pp. 919-927.
66. M.F. Iskander, A.M. Tume, C.M. Furse, "Evaluation and Optimization of the EM Characteristics of Interstitial Antennas for Hyperthermia," *International Journal of Radiation, Oncology, Biology, and Physics*, April 1990
67. C.M. Furse, M.F. Iskander, "Three-dimensional Electromagnetic Power Deposition in Tumors using Interstitial Antenna Arrays," *IEEE Trans. on Biomedical Engineering*, Vol. 36, October 1989, pp.977-986.

SHORT COURSES:

C.M. Furse, "Application of the Finite-Difference Time-Domain Method to Simulation of Electromagnetic Coupling to the Human Body," The 14th Annual Review of Progress in Applied Computational Electromagnetics, ACES Symposium, Monterey, CA, March 16-20, 1998

Selected IEEE Antennas and Propagation Society Columns on Education:

1. Thirteen crazy, notorious things to do in an EM class, Volume 47, Issue 3, June 2005
Page(s):133 – 134
2. Teaching and learning combined (TLC), Volume 45, Issue 3, June 2003 Page(s):166 – 167
3. Take a stand: speaking about RF safety, Volume 46, Issue 6, Dec 2004 Page(s):146 – 150
4. New IEEE AP-S education web site: course/lab notes, scholarships, K-12 outreach, Volume 46, Issue 1, Feb 2004 Page(s):141 – 142
5. Integration of signals/systems and electromagnetics courses through the design of a communication system for a cardiac pacemaker, Furse, C.; Griffiths, L.; Farhang, B.; Pasrija, G.; Volume 47, Issue 2, April 2005 Page(s):117 – 119

CONFERENCE PRESENTATIONS:

1. D. Richerson, A. Bergerson, C. Furse, "University Partnership with High School Teachers to Increase Student Awareness of Engineering," ASEE Annual Conference, 2011
2. T. Yasin, R. Baktur, C. Furse, 'A Comparative Study on Two Types of Transparent Antenna,' 30th URSI General Assembly, Aug 13-20, 2011, Istanbul, Turkey
3. S. Ananthanarayanan P.R., C.M. Furse, 'Antenna Optimization for Vehicular Environments,' 2011 IEEE AP-S International Symposium on Antennas and Propagation and 2010 USNC/CNC/URSI Meeting in Spokane, WA July 4-8, 2011
4. T. Yasin, R. Baktur, C. Furse, 'A Study on the Efficiency of Transparent Antennas Designed from Conductive Oxide Films,' 2011 IEEE AP-S International Symposium on Antennas and Propagation and USNC/CNC/URSI Meeting in Spokane, WA July 4-8, 2011
5. A.M. Richards, S. Ananthanarayanan P.R., C. Furse, 'Vehicular Channel Measurement and Modeling for Multi-Antenna Communication,' 2011 IEEE AP-S International Symposium on Antennas and Propagation and USNC/CNC/URSI Meeting in Spokane, WA July 4-8, 2011
6. B. Jones, C. Furse, 'Leaky Fields from Damaged Shields,' 2011 IEEE AP-S International Symposium on Antennas and Propagation and USNC/CNC/URSI Meeting in Spokane, WA July 4-8, 2011
7. B. J. Willis, S. Ananthanarayanan P.R., C. Furse, 'Small Antenna Design Using 3D Rapid Prototyping,' 2011 IEEE AP-S International Symposium on Antennas and Propagation and USNC/CNC/URSI Meeting in Spokane, WA July 4-8, 2011
8. D.J. Lubbers, K. Golden, J. Lin, C. Furse, 'Electrical Measurements of Sea-Ice Cores,' 2011 IEEE AP-S International Symposium on Antennas and Propagation and USNC/CNC/URSI Meeting in Spokane, WA July 4-8, 2011
9. E. Lundquist, C. Furse, 'Novel Inverse Methods for Wire Fault Detection and Diagnosis,' 2011 IEEE AP-S International Symposium on Antennas and Propagation and USNC/CNC/URSI Meeting in Spokane, WA July 4-8, 2011
10. J.D. Carter, N. Thronton, S. Ananthanarayanan P.R., C.M. Furse, 'Development of Tri-Band Antennas for Use in Body Centric Networks, 2011 IEEE AP-S International Symposium on Antennas and Propagation and USNC/CNC/URSI Meeting in Spokane, WA July 4-8, 2011
11. S. M. Smith C. Furse, 'A Stochastic FDTD Method for Statistically Varying Biological Tissues,' 2011 IEEE AP-S International Symposium on Antennas and Propagation and USNC/CNC/URSI Meeting in Spokane, WA July 4-8, 2011
12. T. Iskander, C. Furse, 'Women in Engineering: Statistical Analysis of ACT Data and Proposed Procedure to Reverse Trend, 2011 IEEE AP-S International Symposium on Antennas and Propagation and USNC/CNC/URSI Meeting in Spokane, WA July 4-8, 2011
13. E. Lundquist, S. Wu, B. Jones, C. Furse, C. Lo, 'Aging Wire Fault Diagnosis Using Faster, Higher-Precision Methods, 2011 Aircraft Airworthiness and Sustainability Conference, April 18-21, 2011, San Diego, CA
14. J. Saberlin, C. Furse, "Passive Feed Methods for Meshed Antennas," 2010 IEEE AP-S International Symposium on Antennas and Propagation and USNC/CNC/URSI Meeting in Toronto, ON, Canada, July 11-17, 2010
15. J. Saberlin, C. Furse, T. Yasin, R. Baktur, "Challenges with Optically Transparent Patch Antennas for Small Satellites," 2010 IEEE AP-S International Symposium on Antennas and

- Propagation and USNC/CNC/URSI Meeting in Toronto, ON, Canada, July 11-17, 2010
16. S. Ananthanarayanan, D. Ferguson, C. Furse, "2.5 GHz Microwave Thermal Ablation for Performing Thermosensitive Polymer-Chemotherapy for Cancer," 2010 IEEE AP-S International Symposium on Antennas and Propagation and USNC/CNC/URSI Meeting in Toronto, ON, Canada, July 11-17, 2010
 17. S. Ananthanarayanan, A. Magleby, C. Furse, "Measurement and Modeling of Noise and Interference in Aircraft System," 2010 IEEE AP-S International Symposium on Antennas and Propagation and USNC/CNC/URSI Meeting in Toronto, ON, Canada, July 11-17, 2010
 18. J. Carter, J. Saber, T. Shah, S. Ananthanarayanan, C. Furse, "Inexpensive Fabric Antenna for off-Body Wireless Sensor Communication," 2010 IEEE AP-S International Symposium on Antennas and Propagation and USNC/CNC/URSI Meeting in Toronto, ON, Canada, July 11-17, 2010
 19. Tursunjan Yasin, Reyhan Baktur, Jason Saber, Cynthia Furse, "Inkjet-Printed Transparent Antennas Integrated on Solar Cells," 24th Annual AIAA/USU Conference on Small Satellites, August 2010
 20. Peruvemba R. Sai A, James Nagel, Alyssa Magleby and Dr. Cynthia Furse, "Wireless and Surface Wave Communication for Aircraft Sensor Networks," 2010 Aircraft Airworthiness and Sustainment (AA&S) Conference, May 10-13, 2010, Austin, TX
 21. Cynthia Furse, Chet Lo, Kevin Wheeler, "Fast, Modular Wire Simulation Tools to Better Understand Small Wire Faults," 2010 Aircraft Airworthiness and Sustainment (AA&S) Conference, May 10-13, 2010, Austin, TX
 22. J. Nagel, A. Magleby, S. Ananthanarayanan, C. Furse, "Measured Multi-User MIMO Capacity in Aircraft," AMTA Symposium, Salt Lake City, Utah 2010
 23. T. Turpin, M. Mahmoud, R. Baktur, C. Furse, "Integrated After-Market Solar Panel Antennas for Small Satellites," 23rd Annual AIAA/USU Conference on Small Satellites, August 2009
 24. E. Tiffany Iskander, Paul A. Gore, Cynthia Furse, "Gender differences in expressed interests in engineering-related fields over a 30-year span," 2009 ASEE Annual Conference and Exposition, June 14-17, 2009 Austin, TX
 25. Amy Aldous Bergerson, and Cynthia Furse, "Work on Progress: Outreach and Retention in the University of Utah's Engineering Programs," Frontiers in Education, San Antonio, TX, Oct 18-21, 2009
 26. Alyssa Magleby, Cynthia Furse, Z. Q. Yun, "3D Ray Tracing for Intravehicle MIMO," IEEE /URSI Antennas and Propagation Symposium, Charleston, SC, June 1-5, 2009
 27. Peruvemba R. Sai A, Cynthia Furse, "Enabling Wireless Communication in Aircraft Using Multiple Antenna Systems," IEEE /URSI Antennas and Propagation Symposium, Charleston, SC, June 1-5, 2009
 28. Timothy W. Turpin, Reyhan Baktur, Mike Scarpulla, Gene Siegel, Jason Saber, and Cynthia Furse, "Surface Mounted Antennas for Commercial Solar Cells," IEEE /URSI Antennas and Propagation Symposium, Charleston, SC, June 1-5, 2009
 29. Peruvemba R. Sai A, Alyssa Magleby, James R. Nagel, Cynthia Furse, "MIMO Wireless Communication for Aircraft Sensors," 12th Joint FAA/DOD/NASA Conference on Aging Aircraft, Kansas City Convention Center, May 04 - May 07, 2009
 30. (invited keynote presentation) C Furse, "Biomedical telemetry: today's opportunities and

challenges,” 2009 IEEE Workshop on Antenna Technology – Small Antennas and Novel Metamaterials, March 2-6, 2009, Santa Monica, California

31. James Stephenson, Cynthia Furse, “ Table Top Micro Fluidic Nuclear Magnetic Resonance Spectrometer,” XXIX General Assembly of URSI, Chicago, Ill, August 11-15, 2008
32. (Invited Presentation) C. Furse, “Utah’s Engineers – A Statewide Initiative for Growth,” ECEDHA meeting, March 2008, San Diego, CA
33. E. Tiffany Iskander, Paul A. Gore, Jr, Cynthia Furse , “ Historical trends in the expressed and measured engineering-related interests of college bound youth: Comparison across Genders, “2009 ASEE Annual Conference & Exposition, Austin, TX, June 14-17, 2009
34. (Keynote Presentation) C. Furse, “Aging Aircraft Wiring – Locating Hidden Hazards,” International Conference on Computers and Communication Systems, Daegu University, Korea, Nov. 7, 2008
35. Amy Bergerson, “Work in Progress: Utah’s Engineers – a Statewide Initiative for Growth,” Frontiers in Education Conference, Saratoga Springs, NY, Oct 22-25, 2008
36. C. Furse, et al., “How Many Engineers Does It Take?,” 2008 ASEE Annual Conference & Exposition in Pittsburgh, Pennsylvania, June 22-25, 2008.
37. Chet Lo, Cynthia Furse, “Use of InSitu Sensors for Wire Fault Prognostics,” Joint FAA/DOD/NASA Conference on Aging Aircraft, www.agingaircraft2008.com, April 21-24, 2008, Phoenix, Arizona
38. Dr. Paul Smith, Dr. Paul Kuhn, Michael Diamond, Dr. Cynthia Furse, Srin C. Sekar, Lynn Edmunds, Tom Kukowski, “ASIC Implementation of Live Arc Fault SSTDR Tester,” Joint FAA/DOD/NASA Conference on Aging Aircraft, www.agingaircraft2008.com, April 21-24, 2008, Phoenix, Arizona
39. C. Furse, P.Smith, P.Kuhn, “Intermittent Fault Location on Live Electrical Wiring Systems,” SAE Conference 2008
40. A. Magleby, C. Furse, “Predicted MIMO Performance in Intra-Vehicle Channels,” *IEEE Antennas and Propagation Symposium (APS)*, SanDiego, CA, July 7-11,2008
41. D. Landon, C. Furse, “The MIMO Transmission Equation,” *IEEE Antennas and Propagation Symposium (APS)*, SanDiego, CA, July 7-11,2008 (Honorable Mention, student paper contest)
42. Peruvemba R. Sai A, C. Furse, “System Level Analysis of Noise and Interference Analysis for a MIMO System,” *IEEE Antennas and Propagation Symposium (APS)*, SanDiego, CA, July 7-11,2008
43. Alex L Robinson, Cynthia Furse, Paul Kuhn, Michael Diamond, “Update on LiveWire Fault Detection, “ SAND Number : 2008-1695A, Sensors Workshop 2008, LLNL, Livermore, CA, April 1-2, 2008
44. Peruvemba R. Sai A, C. Furse, “Iterative Array Level Optimization of MIMO Antennas,” XXIX General Assembly of URSI, Chicago, Ill, August 11-15, 2008
45. A. Magleby, C. Furse, “LAB REPORT WRITING (AND TEACHING!) MADE EASY,” 2008 ASEE Annual Conference & Exposition in Pittsburgh, Pennsylvania, June 22-25, 2008.

46. (Invited paper) J. Johnson, C. Furse, "Statistical Analysis of Detuning Effects for Implantable Microstrip Antennas," North American Radio Science Conference URSI-CNC/USNC organizers. July 22-26, 2007, Ottawa, Canada
47. (Invited Paper) C. Furse, R. Harrison, F. Solzbacher, "Recent Advances in BioMedical Telemetry," International Conference on Electromagnetics in Advanced Applications (ICEAA '07), Torino, Italy, September 17-21, 2007
48. P. Smith, C. Furse, P. Kuhn, "Locating Intermittent and Static Faults in Complex Wiring Systems," (SAE Conference) AE-8 Aerospace Electrical/Electronic Distribution Systems and the AEISS Aerospace Electrical Interconnect Systems Symposium , October 22-26, 2007, Savannah, Georgia.
49. David G. Landon, and Cynthia M. Furse, "Recovering handset MIMO capacity with polarization-agile antennas," *IEEE Antennas and Propagation Symposium (APS)*, Honolulu, HI June 9-16, 2007
50. Alyssa Magleby, Cynthia Furse, "Improving Communication Skills Through Project-Based Learning," *IEEE Antennas and Propagation Symposium (APS)*, Honolulu, HI June 9-16, 2007
51. Dr. Paul Smith, Michael Walz, Dr. Cynthia Furse, "Locating Electrical Faults Using a Walk-to-Fault Probe," Joint FAA/DoD/NASA Conference on Aging Aircraft, Palm Springs, CA, April 16-19, 2007
52. Dr. Cynthia Furse, Shang Wu, Michael Diamond, David Mih, Chet Lo, Paul Smith, "Potential Prognostics for Preventative Maintenance of Electrical Wiring," Joint FAA/DoD/NASA Conference on Aging Aircraft, Palm Springs, CA, April 16-19, 2007
53. David G. Landon, and Cynthia M. Furse, "Statistical Comparison of Capacity Predictions for Realistic MIMO Channels," *IEEE Antennas and Propagation Symposium (APS)*, Albuquerque, NM, July 9-14, 2006
54. P. Kuhn, C. Furse, P. Smith "Locating Hidden Hazards on Electrical Wiring," Aged Electrical Systems Research Application Symposium, October 18-19, 2006, Chicago, Illinois
55. Cynthia Furse, Brian Stenquist, Behrouz Farhang-Boroujeny, April Kedrowitz, Stephanie Richardson, "Integrated System-Level Design in Electrical Engineering," 2006 ASEE Annual Conference & Exposition in Chicago, Illinois, June 18-22, 2006, Nominated for Best Paper Award
56. Chet Lo, Cynthia Furse, "Modeling and Simulation of Branched Wiring Network", 17th Symposium EMC-Zurich, Singapore March 2006
57. Roland Kempter, Cynthia Furse, Neil E. Cotter, Nick M. Safai and Lee Brinton, "On Undergraduate Education in Electrical Engineering across Colleges: Transfer Students and Challenges in Curriculum Adaptation," Best Paper Award (International Division) 2006 ASEE Annual Conference & Exposition in Chicago, Illinois, June 18-22, 2006,
58. Rohit Verma, Cynthia Furse, "A Multidisciplinary Approach to Teaching Technology Entrepreneurship and Product Innovation to Engineering and Business Administration Students," 2006 ASEE Annual Conference & Exposition in Chicago, Illinois, June 18-22, 2006

59. Paul Smith, Cynthia Furse, "State of the Art in LiveWire Testing," Joint FAA/DoD/NASA Conference on Aging Aircraft, Jan 31-Feb 3, 2005, Palm Springs, CA
60. Makoto Ando, Ari Sihvola, Lotfollah Shafai and Cynthia Furse, "Commission B (Fields and Waves) International Survey about EM Education," URSI General Assembly, New Delhi, India, Oct. 2005.
61. Sembiam Rengarajan, Lotfollah Shafai, Cynthia Furse, David Kelley, "Electromagnetics Education in North America," URSI General Assembly, New Delhi, India, Oct. 2005.
62. Chet Lo, Kedarnath Nagoti, Arthur Mahoney, You Chung Chung, Cynthia Furse, "Detection and Mapping of Branched Wiring Networks from Reflectometry Responses," Joint FAA/DoD/NASA Conference on Aging Aircraft, Palm Springs, CA, Jan 31-Feb 4, 2005
63. (INVITED PAPER) James Stephenson and Cynthia Furse, "Table Top Micro Fluidic Nuclear Magnetic Resonance Spectrometer," 2006 URSI National Radio Science Meeting, Boulder, CO, Jan 4-10, 2006
64. (INVITED PAPER) C. Furse, "Emerging Technologies for Live Wire Fault Location," NAVWAG Conference, San Diego, CA, Nov. 4, 2003
65. (INVITED PAPER) C. Furse, 'Microsystems for Medicine', 17th annual biological basis of Pediatric Practice Symposium, Sept 12-14, 2003, Deer Valley, Utah
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70. Pichitpong Soontornpipit, Ramadevi Bylapudi, Cynthia Furse, and You Chung Chung, "COMPARISON OF HELICAL and MICROSTRIP ANTENNAS IMBEDDED IN LOSSY DIELECTRIC USING GENETIC ALGORITHMS," International IEEE/URSI Antennas and Propagation Symposium, June 22-26, 2004, Monterey, CA
71. C. Furse, P. Smith, Y. Chung, C. Lo, "Fault Location in Aging Aircraft Wiring Networks", Aging Aircraft Conference, New Orleans, LA, Sept. 12-15, 2003
72. S.Nagaraj, C.Furse, "A Novel MAC for Sensor Networks in Aircraft," ICNP conference 2003, "Second ACM International Workshop on Wireless Sensor Networks and Applications (WSNA '03)" is in San Diego on 19th of Sept. 2003
73. You Chung Chung, Pitchitpong Soontornpipit, Kamal Vasagiri, Rama Devi, Cynthia Furse,

"Imbedded Microstrip and Helical Antennas as Sensors and Communicators: Sane Application of Genetic Algorithms," IEEE Antennas and Propagation International Symposium, June 2003, Columbus, OH

74. You Chung Chung, Chet Lo, John Mahoney, Jeremy Pruitt, Ryan Hanks, Santi Basava, Cynthia Furse, "Non-Destructive Fault Location on Aging Aircraft Wiring Networks, Part 1 – Cost-Optimized Solutions," IEEE Antennas and Propagation International Symposium, June 2003, Columbus, OH
75. Paul Smith, Alyssa Magelby, Deekshit Dosibhatla, Chet Lo, Cynthia Furse, Jacob Gunther, "Non-Destructive Fault Location on Aging Aircraft Wiring Networks, Part 2 – Live Wires in Flight," *IEEE Antennas and Propagation International Symposium, June 2003, Columbus, OH*
76. C.Furse, "Smart Sensors for Wiring Health Analysis," AFRL Wiring Integrity System Characterization and Evaluation Program's 1st Information Exchange and Workshop, Oct. 23-24, 2002, Dayton, OH
77. Jeff Ward, Charles Swenson, Cynthia Furse, "Finite Difference Time Domain Simulations of an Impedance Probe," AGU (American Geophysical Union) in San Fransico, Dec 6-10,2002
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79. Cynthia Furse, Deekshit Dosibhatla, Jacob Gunther, Paul Smith, Chet Lo, Sachin Chandra, Alyssa Magelby, "Spread Spectrum Communication Techniques Applied to Impedance Measurement," IEEE Antennas and Propagation International Symposium, June 16-21, 2002, San Antonio, TX, Invited Paper
80. Cynthia Furse, You Chung Chung, Jeremy Pruitt, Glen Mabey , Derek Bates, Santi Basava, Chris Griffin, Mark Schmidt, Krishna Konda, Nagendra Grandhi, Rory Buchanan, Eric Cannon, Suketu Naik, Sumeeth Nagaraj, Sachin Chandra, Clark Landeen, Paul Smith, Deekshit Dosibhatla, Jake Gunther, Chet Lo, Ravi B. Gopal, Alyssa Magelby, "In Situ Analysis System for Diagnosis of Aging Aircraft Wiring," IEEE Antennas and Propagation International Symposium, June 16-21, 2002, San Antonio, TX
81. Guy Serbin, Dani Or, Cynthia Furse, "Radar backscatter from layered wet soils with a diurnal temperature wave," Rocky Mountain Space Grant Consortium Conference, Salt Lake City, Utah April 2001
82. Brent Waddoups, Cynthia Furse, "Analysis of Reflectometry for Detection of Chafed Aircraft Wiring Insulation," Fifth Joint NASA/FAA/DoD Conference on Aging Aircraft, September 10-13, 2001, Orlando, FLA
83. Sean Field, Pall Arnason,"Smart Wire Technology for Aircraft Applications," Fifth Joint NASA/FAA/DoD Conference on Aging Aircraft, September 10-13, 2001, Orlando, FLA
84. Chad Pendley, Cynthia Furse, Alan Tripp, Vinod Rayala , "Geophysical Analysis of Cross-Borehole Propagation and Reflection Using Triaxial Sources," *IEEE Antennas and*

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87. Jeff Ward, Cynthia Furse, Charles Swenson, "FDTD analysis of microstrip antennas immersed in anisotropic space plasma," *IEEE Antennas and Propagation Symposium*, July 13-18, 2001, Boston, MA
88. Brent Waddoups, Cynthia Furse, "Detection of Chafed Insulation in Aging Aircraft Wiring," *IEEE Antennas and Propagation Symposium*, July 13-18, 2001, Boston, MA
89. K. Blemel, C. Furse, S. Field, " Applications of Microsystems and Signal Processing for Wiring Integrity Monitoring ," 2001 IEEE Aerospace Symposium held at Big Sky, Montana, March 2001
90. Cynthia Furse, Joseph Olakangil, Charles Swenson , "FDTD Analysis of a Short Dipole Immersed in Ionospheric Plasma," *IEEE Antennas and Propagation Symposium*, July 16-21, 2000, Salt Lake City, Utah
91. Cynthia Furse, "Analysis of Current and Field Distributions for Electrotherapy Devices," *World Congress on Medical Physics and Biomedical Engineering*, Chicago, Ill, July 23-28, 2000
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93. C. Furse, M. Long, "Optimization of Imbedded Microstrip Antenna for Communication with Implantable Medical Devices," 8th AIAA/NASA/USAF/ISSMO Symposium on Multidisciplinary Design -- Adding Value, Sept. 6-8, 2000 Long Beach, CA
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95. J. Price, C. Furse, "Making a World of Difference : A New Slide Show for Recruiting Women in Engineering", ASEE Rocky Mountain Regional Conference, Provo, Utah, April 1999
96. C. Deffendol, C. Furse, "Microstrip Antennas for Dielectric Property Measurement," 1999 IEEE Antennas and Propagation/ URSI International Symposium, Orlando, FL, July 1999
97. C. Fish, C. Furse, "Development of New Electronics for Antenna Impedance Measurements in the Ionosphere," 1999 IEEE Antennas and Propagation/ URSI International Symposium, Orlando, FL, July 1999
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100. C. Furse and J. Price, "Making a World of Difference -- Recruitment of Undergraduate Students at USU," 1999 IEEE Antennas and Propagation/ URSI International Symposium, Orlando, FL, July 1999
101. C. Furse, "Hands-on Electromagnetics -- Microstrip Circuit and Antenna Design Laboratories at USU," 1999 IEEE Antennas and Propagation/ URSI International Symposium, Orlando, FL, July 1999
102. N. Kamdar and C. Furse "An Inexpensive Distance Measuring System for Location of Robotic Vehicles," 1999 IEEE Antennas and Propagation/ URSI International Symposium, Orlando, FL, July 1999
103. C.M. Furse, "Faster than Fourier -- Ultra-Efficient Time-to-Frequency Domain Conversions for FDTD Applied to Bioelectromagnetic Dosimetry," The 14th Annual Review of Progress in Applied Computational Electromagnetics, ACES Symposium, Monterey, CA, March 16-20, 1998; IEEE AP-S International Symposium, June 21-25,1998, Atlanta, GA
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HONORS, AWARDS, TECHNICAL SOCIETIES:

2009 University of Utah Reynolds Lecturer

2009 Harriett B. Rigas award (IEEE Education Society)

2009 Women Tech Council Education Excellence

Best of Show, Innovation Showcase, Utah Engineering Experiment Station, April 2003

College of Engineering Outstanding Teaching Award, 2008, University of Utah

'Finalist', Stoel Rives Utah Innovation Awards, Computer and Electronics Division, LiveWire Test Labs, Inc., 2008

Distinguished Young Alumnus, University of Utah Electrical and Computer Engineering Department, 2008

Fellow, Institute of Electrical and Electronic Engineers (IEEE)

Utah State University Outstanding Faculty Employee, 2001

Teaching Excellence of the Year 2000 , College of Engineering, Utah State University

Outstanding Teacher of the Year 1998-99 Department of Electrical and Computer Engineering, Utah State University

Outstanding Teacher of the Year 1999-00 Department of Electrical and Computer Engineering, Utah State University

Outstanding Advisor of the Year 2000-01 Department of Electrical and Computer Engineering, Utah State University

Outstanding Advisor of the Year 2001-02 Department of Electrical and Computer Engineering, Utah State University

Outstanding Researcher of the Year 2000-01 Department of Electrical and Computer Engineering, Utah State University

IEEE nominee for the Utah Engineers Council Utah Engineering Educator of the Year 2001-2

USU Nominee, Carnegie Professor of the Year 2002

Chair, Education Committee, IEEE Antennas and Propagation Society (2003-2007 , member 2000-2003,2007-present)

Founding Editor-in-Chief, International Journal of Antennas and Propagation, 2006-present

Associate Editor, IEEE Transactions on Antennas and Propagation, 2000-2007

Associate Editor, Applied Computational Electromagnetics Society Journal, 2003-

Associate Editor, IEEE Antennas and Wireless Propagation Letters (online), 2003-2006

Member of the Founding Editorial Board, Journal of Smart Structures and Systems, 2004-pres

Member, IEEE Standards Committee, 1998-2000

Member of Eta Kappa Nu, Tau Beta Pi, and Phi Kappa Phi honor societies

Member American Society for Engineering Education

Senior Member Society of Exploratory Geophysicists

Senior Member and Faculty Advisor, Society of Women Engineers (USU and UofU) 1997-present