

# Laurie L. Joiner

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## Work Address

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## Education

Ph.D., Electrical Engineering, Clemson University, 1998  
Thesis: *Soft-Decision Decoding of Nonbinary Cyclic and Modified Cyclic Codes*  
M.S., Electrical Engineering, Clemson University, 1994  
Thesis: *New Algorithms for Decoding Binary BCH and Reed-Solomon Codes*  
B.S., Electrical Engineering, Clemson University, 1992

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## Employment

Associate Professor, Electrical and Computer Engineering, University of Alabama in Huntsville, 2005-Present  
Principal Engineer, Division Staff, Dynetics, Inc., Huntsville, Alabama, 2008-2009.  
Sabbatical leave from UAHuntsville, radar emphasis.  
Assistant Professor, Electrical and Computer Engineering, University of Alabama in Huntsville, 1998-2005  
Research Assistant, Electrical and Computer Engineering, Clemson University, Clemson, South Carolina, 1993-1998  
Research Fellow, NASA Goddard Space Flight Center, Greenbelt, Maryland, 1994-1995  
Staff Scientist, Computer Science Corporation, NASA Goddard Space Flight Center, Greenbelt, Maryland, Summers 1993-1994.  
Teaching Assistant, Electrical and Computer Engineering, Clemson University, Clemson, South Carolina, 1992-1993  
Summer Intern, McDonnell Douglas Space Systems Company, Kennedy Space Center, Florida, Summers 1990-1992

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## Grants and Awards

- National Science Foundation  
Title: "Enhancing Undergraduate Education in Signals and Signal Processing Using Advanced Ultra Wideband Technology"  
Principal Investigator: Dr. Laurie Joiner

CO-Principal Investigators: Dr. Robert Lindquist  
Award Amount: \$199,220  
Period of Performance: 9/1/2013-8/31/2016

- Lockheed Martin  
Title: “Sense and avoid radar system for unmanned aerial systems”  
Principal Investigator: Dr. Laurie Joiner  
CO-Principal Investigators: Dr. David Coe, Dr. Jeffrey Kulick  
Award Amount: \$10,000  
Period of Performance: 8/15/2014-5/1/2015
- SAIC  
Title: “Infrastructure Foundation for a Model-based Design Focus at UAHuntsville”  
Principal Investigator: Dr. Rhonda Gaede  
CO-Principal Investigators: Dr. Jeff Kulick and Dr. Laurie Joiner  
Gift Amount: \$48,362
  - Funding gift to set up a laboratory to provide experiences in model-based design, both through coursework and through research, which will produce a workforce capable of building complete, complex systems. The laboratory will be used to develop model-based design courses using MATLAB, Simulink, and field programmable gate arrays (FPGAs) as enabling technologies.
- Time Domain / NASA STTR Phase I  
Title: “Autonomous Multi-Robotic Collaborative Sensing, Exploration, and Mapping using Pulsed-RF Ultrawideband Navigation and Radar”  
Principal Investigator: Dr. Laurie Joiner  
Award Amount: \$33,007  
Period of Performance: 5/1/2012-10/31/2012
- Dynetics, Inc.  
Title: “Assessment of Worldwide Air Defense Radar Technology”  
Principal Investigator: Dr. Laurie Joiner  
Award Amount: \$30,777  
Period of Performance: 9/1/2009-2/11/2010
- BAE Systems Analytical Solutions, Inc.  
Title: “BAE/SETAC/MATLAB Programming Support”  
Principal Investigator: Dr. Laurie Joiner  
Award Amount: \$12,000  
Period of Performance: 5/26/2004-4/23/2005
  - Laser Beam simulation of Gaussian Beam distribution from a reflected array of mirrors using Synthia Matlab GUI. The code simulates the far field properties of a laser beam to predict the results experimentally.
- Space and Missile Defense Command (SMDC-MS-01-2003)  
Title: “SMDC-MS-01-2003 for Evaluation of Software Code WIPL-D”  
Principal Investigator: Dr. Laurie Joiner

Award Amount: \$65,000

Period of Performance: 3/27/2003-10/30/2004

- Evaluated the performance of the electromagnetic computation code WIPL-DP (Wires, Plates, and Dielectrics, Parallel version). Checked the code for accuracy and determined the computational speed-up over the professional code. Evaluated the code to determine its applicability for target modeling needs for SMDC. Developed a model of a reentry vehicle with decoy and chaff.

- Alabama Space Grant Consortium

Title: "Student Satellite Initiative"

Principal Investigator: Dr. Charles Corsetti

CO-Principal Investigator: Dr. Laurie Joiner

Award Amount: \$33,788.

Period of Performance: August 2002-August 2004

- Grant provides for funding for students in the senior design course to build high altitude balloon payloads. Each payload has a GPS receiver and various equipments for atmospheric measurements, telemetry, and video transmission.

- AeroAstro, Inc.

Title: "UAH Ground Station"

Principal Investigator: Dr. Laurie Joiner

Award Amount: \$41,051

Period of Performance: 2/1/2001-9/10/2001

- Worked with undergraduate students to build a ground station capable of communicating with a small spacecraft, the SPASE Demonstration Vehicle, in low earth orbit. Ground station was effective in communicating with the spacecraft in the laboratory setting. Spacecraft was never launched due to failure in shakedown testing.

- National Science Foundation (DUE-9950347)

Title: "Communication Laboratory Enhancement for an Undergraduate ECE Program"

Principal Investigator: Dr. John Stensby

CO-Principal Investigators: Dr. Laurie Joiner and Dr. Robert Berinato

Award Amount: \$110,474 (\$55,237 UAH matching).

Period of Performance: 9/1/1999-8/31/2002

- Developed a communication laboratory that provides undergraduate and graduate students with hands-on experience in the area of analog and digital communications. Laboratory experiments include amplitude modulation, frequency modulation and detection, phase-locked loops, pulse code modulation, and frequency shift keying modulation and detection. The class is offered yearly with a maximum enrollment of ten students.

- University of Alabama in Huntsville Mini-grant

Title: "Airborne Base Stations for Mobile Communication Systems"

Principal Investigator: Laurie Joiner

Award Amount: \$7,520

Period of Performance: 1999-2000

- Investigated the feasibility of using undedicated, high altitude airborne platforms for cellular base stations. Determined channel quality and channel capacity for this system. Simulated system operation using OPNET network simulator.

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## Teaching Duties

University of Alabama in Huntsville  
1998-Present

EE 202 Introduction to Digital Logic Design

- Introduce students to digital logic design including number representation and base conversion, combinational and sequential logic analysis and design, and Verilog programming.

CPE 381 Fundamentals of Signals and Systems for Computer Engineers

- MATLAB examples and exercises are used to further illustrate time and frequency domain signal and system analysis in continuous and discrete time.

EE 382 Analytical Methods for Continuous Time Systems

- MATLAB examples and exercises are used to further illustrate time and frequency domain signal and system analysis.

EE 383 Analytical Methods for Multivariable and Discrete Time Systems

- MATLAB examples and exercises are used to further illustrate time and frequency domain signal and system analysis and for digital filter design. System View examples are used to illustrate undersampling and quantization effects.

EE 414 Analog and Digital Filter Design

- Incorporate Multisim simulations of analog circuits to provide students with the experience of implementing their designs and observing the performance. Use MATLAB to implement digital filter designs.

EE 424/EE 504 Introduction to Data Communication Networks

- Developed the course as an introduction to data networks with emphasis on digital modulation techniques, flow control and multiplexing. Covered packet and circuit switching networks highlighting the telephone network. Required students to research and write an explanatory paper on a current technology in the data communication networks area.

EE 601/OSE 601 Linear Signals and Systems

- Provided analysis techniques for one- and two-dimensional signals and systems.

EE 610 Special Topics: Error Control Coding

- Original special topic course introduced Galois fields, cyclic codes, Reed-Solomon codes, and convolutional codes. Material developed in this course is currently used in EE 744 Coding Theory and Spread Spectrum.

#### EE 610 Special Topics: Advanced Error Control Coding

- A second semester error control coding course. Covered topics include Viterbi decoding of convolutional codes, concatenated convolutional codes, iterative decoding, and trellis coded modulation. Student projects include sub-optimal Viterbi decoding and comparison of serial and parallel concatenated convolutional codes. Some of the material developed in this course is currently used in EE 744 Coding Theory and Spread Spectrum.

#### EE 610 Special Topics: Cellular Communications

- Original special topic course introduced digital communications over fading channels, cell design and frequency reuse, and cellular standards and protocols. Students gave bi-weekly lectures using text and journal references.

#### EE 615 Analog Circuit Design

- Revamped the existing EE 615 to cover more graduate level material on analog circuit design, including non-ideal op amp circuit analysis, active filter design, and design of signal generators and phase-locked loops. Students perform several design projects and implement designs using circuit simulation software.

#### EE 642 Data and Digital Communications

- Revised the existing EE 642 to provide a more rigorous treatment of digital modulation and demodulation including analysis of random processes in linear systems, baseband transmission of binary signals, coherent communications, and noncoherent communications. Student projects include modeling of M-ary quadrature amplitude modulation systems and simulation of binary phase shift keying with imperfect phase reference.

#### EE 726 Decision and Estimation Theory

- Course covers classical detection theory and parameter estimation.

#### EE 742 Wireless Communications

- Course covers advanced communications for wireless communications. Topics include channel modeling, capacity of wireless channels, diversity, advanced coding and modulation, multiple antennas and space-time communications.

#### EE 744 Coding Theory and Spread Spectrum

- Developed the course to cover finite fields, block codes including BCH and Reed-Solomon codes and decoding algorithms, convolutional codes and the Viterbi decoding algorithm, and Turbo codes and iterative decoding algorithms. Student projects include low density parity check (LDPC) codes, space-time codes, and performance of concatenated codes.

Clemson University  
1992-1993

EE 201 Digital Logic Laboratory

- Supervised laboratory experiments covering sequential circuits, flip-flops, and multiplexers.

EE 211 Circuits I Laboratory

- Supervised laboratory experiments of introductory circuit topics including resistive circuits, RLC circuits, correct operation of measurement tools, and PSPICE modeling tools.

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**Graduate Student Supervision**

Ph.D. Students

- David Moody  
Thesis title: *Aspect Angle Estimation of Roll Symmetric Ballistic Missile Objects Using Low-Range Resolution Radar Returns*, May 2015
- Eric Rives  
Dissertation title: *Bit Error Rate Locked Loops Using Log-likelihood Error Correction Decoders*, May 2011.
- Farshad Kheri  
Dissertation title: *Indoor Cooperative Robot Movement Protocol Using Impulse Ultra Wideband Communication and Localization*, December 2008.
- Peng Zhang, Siemens  
Dissertation title: *Space-time Coding with OFDM over Correlated Fading Channels*, December 2006.
- Kenneth Burst, Member of Technical Staff, Lead Network Architect for BellSouth's Voice over Network Platform, BellSouth  
Dissertation title: *Delay Based Congestion Detection and Admission Control for Deployment of IP Voice Tandems in Carrier Public Switched Telephone Networks*, December 2002.
- Vidhyacharan Bhaskar, Professor and Dean of the Department of Electronics and Communication Engineering at SRM University, Chennai, India  
Dissertation title: *Adaptive Rate Coding for Asynchronous Code Division Multiple Access Communications over Slowly Fading Channels*, May 2002.

Masters Students

- Laura Hicks  
Thesis title: *dB TASM Robustness Study*, May 2015.
- John Markow

Thesis title: *Analysis of a Radar Using a Converted Measurement Kalman Filter to Track a Hypersonic Reentry Vehicle*, May 2015.

- Aditi Singh  
Thesis title: *Downlink Coverage Probability in Multi-tier Rician Fading Heterogeneous HetNets*, December 2014.
- Leah Tracy  
Thesis title: *Error Reduction by Combining Strapdown Inertial Measurement Units in a Baseball Stitch*, December 2014.
- Dena NeSmith  
Thesis title: *Multipath Interference in a Target Track Radar*, August 2014.
- Rebecca Harness  
Thesis title: *A Study on SAR Jamming*, December 2013.
- Josh Robbins  
Thesis title: *The Design of an Anti-Ballistic Missile Track Radar*, May 2010.
- Greg Reynolds  
Thesis title: *Kalman Filter Implementation on a Low Quality GPS Aided Inertial Navigation System*, December 2009.
- Rowland Jenkins  
Thesis title: *Ultra-wideband Radar Range Enhancement through Wavelet Multi-Resolution Analysis*, December 2009.
- Chad Stevens  
Thesis title: *Radar Requirements Analysis using a US Army Systems Operational Evaluation Software Application*, December 2009.
- Jared Meadows  
Thesis title: *The Reduction of Continuous Wave Interference in Global Positioning System Coarse Acquisition Signals Using Adaptive Noise Cancellation*, December 2008.
- Janice Rock  
Thesis title: *A Study of Higher Levels of Component Integration for Electronically Steerable Phased Arrays*, May 2007
- Joel Booth  
Thesis title: *A Study of Electromagnetic Energy Propagation through Manipulated Multilayer Materials*, May 2007
- Manish Mohan  
Thesis title: *A Load Based Hybrid Routing Protocol for Ad Hoc Networks*, August 2004.  
Published Papers:
- Leif Sandstrom

Thesis title: *The Analysis of MIMO Signal Processing Techniques on Twisted Copper Pair Channels*, May 2004.

- Thana Bunnag  
Thesis title: *Performance Comparison between DS-CDMA and Impulse Radio in an Indoor Environment*, August 2002.
- Chris Zoeller  
Thesis title: *A Passive, Coherent Radar Using Commercial FM Broadcast Signals*, May 2002.
- Narendra Patel  
Thesis title: *Improved Performance of Space-Time Coding Using Trellis Coded Modulation*, May 2002.
- Chakravarthy Devarapalli  
Thesis title: *A Simulation Study of a Mobile Ad Hoc Network*, May 2002.
- Vijay Pandiarajan  
Thesis title: *An Undedicated Airplane Based Architecture for Wireless Data Transfers*, May 2000.
- Timothy G. Mester  
Thesis title: *Quick Simulation of Parallel Concatenated Convolutional Coded Systems*, December 2000.

#### Undergraduate Honors Students

- Phillip Birkholz  
Thesis title: *Ultra Wideband Synthetic Aperture Radar*, May 2013.

#### Current PhD Students

- Janek Mroczek  
Thesis title: *Performance of Frequency Hopping D-BLAST MIMO Architecture using LDPC and BPSK*  
Expected graduation date: May 2016
- Asma Alqudah  
Thesis title: *Coded Higher Order Modulation in Faster than Nyquist Signaling*  
Expected graduation date: December 2016
- Shawn German  
Thesis title: *The Effects of an ADC on SCR Improvement when Using Band Limited Dither*  
Expected graduation date: December 2017
- Linda Mohaisen



Thesis title: *Optimized Position Based Routing Protocol for Hybrid Network of VANET-WSN Communication Architecture*

Expected graduation date: May 2017

- Eric Forrest  
Thesis title: *A Radar Waveform for a Nuclear Scintillated Environment*  
Expected graduation date: May 2017
- Brandon Dewberry  
Thesis title: *Distributed Navigation Networks Based on Ultra Wideband Peer-to-Peer Ranging and Communications*  
Expected graduation date: May 2017
- Gregory Reynolds  
Thesis title: *Dynamic Wavefront Simulation Capability for Controlled Radiation Pattern Antenna (CRPA) Electronics*  
Expected graduation date: May 2018
- Aditi Singh
- Paul Lanza
- Joshua Robbins

#### Current MS Students

- Ian Lowther  
Thesis Title: *Performance Analysis of Turbo, LDPC, and Polar Codes in a Simulated Wireless 5G Channel*  
Expected graduation date: August 2016
- Himani Gupta  
Thesis title: *Ultra Wideband SAR for use in Railroad Track Defect Detection*  
Expected graduation date: August 2016
- Joey Haddock  
Expected graduation date: May 2017
- Jonathan Andrews  
Expected graduation date: May 2017
- Mark Flemming  
Expected graduation date: May 2017

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## Publications

### Journal Articles

1. Forrest, Eric G., and Laurie L. Joiner, "A Radar Waveform for a Nuclear Scintillated Environment," *IEEE Journal of Aerospace and Electronic Systems*, in revision.
2. Moody, David, and Laurie Joiner, "Modified Viterbi Algorithm for Controlled Fidelity Reduction in HMM Aspect Angle Estimation in the Presence of Fluctuating SNR," *IEEE Journal of Aerospace and Electronic Systems*, submitted.
3. Sandstrom, L., K. Schneider, and L. Joiner. "Correlation of alien crosstalk in MIMO DSL systems," *IEEE Transactions on Communications*, vol. 57, no. 8, Aug. 2009.
4. Bhaskar, V. and L. L. Joiner. "Performance of convolutional codes in asynchronous CDMA communications under imperfect phase-tracking conditions," *IEEE Transactions on Communications*, vol. 57, no. 7, July 2009.
5. Zhang, P. and L. L. Joiner. "STF Coding for MIMO-OFDM with Four or Three Transmit Antennas," *International Journal of Pure and Applied Mathematics*, vol. 29, no. 3 pp. 405-413, May 2006.
6. Komo, J. J. and L. L. Joiner. "Upper and lower bounds on the binary input AWGN channel capacity," *Communications in Applied Analysis*, vol. 10, no. 1, Jan. 2006.
7. Burst, K., L. Joiner and G. Grimes. "Delay based congestion detection and admission control for voice quality in enterprise or carrier controlled IP networks," *IEEE eTransactions on Network and Service Management*, vol. 2, no. 1, November 2005.
8. Bhaskar, V. and L. L. Joiner. "Adaptive rate coding using convolutional codes for asynchronous code division multiple access communications over slowly fading channels," *Elsevier Journal on Computers and Electrical Engineering*, vol. 31, no. 3, pp. 217-240, May 2005.
9. Bhaskar, V. and L. L. Joiner. "Variable energy adaptation for asynchronous CDMA communications over slowly fading channels," *Elsevier Journal on Computers and Electrical Engineering*, vol. 31, no. 1, pp. 33-55, January 2005.
10. Bhaskar, V., K. H. Adjallah and L. L. Joiner. "Subspace based channel estimation for downlink W-CDMA," *International Journal on Pure and Applied Mathematics*, vol. 21, no. 2, pp. 139-149, 2005.
11. Bhaskar, V. and L. L. Joiner. "Dataflow modeling in distributed diagnostic processing systems: a closed queuing network model approach with single servers," *International Journal on Pure and Applied Mathematics*, vol. 19, no. 2, pp.137-156, 2005.
12. Bhaskar, V., K. H. Adjallah and L. L. Joiner. "Dataflow modeling in distributed diagnostic processing systems: a closed queuing network model approach with multiple servers," *International Journal on Pure and Applied Mathematics*, vol. 19, no. 1, pp. 1-19, 2005.

13. Bhaskar, V. and L. L. Joiner. "Modeling scheduled data flow architecture - an open queuing network model approach," *International Journal on Pure and Applied Mathematics*, vol. 18, no. 3, pp. 271-283, 2005.
14. Bhaskar, V. and L. L. Joiner. "Performance of punctured convolutional codes in asynchronous code division multiple access communications under perfect phase tracking conditions," *Elsevier Journal on Computers and Electrical Engineering*, vol. 30, no. 8, pp. 573-592, November 2004.
15. Ashrafi, A., R. Adhami, L. Joiner, and P. Kaveh. "Arbitrary waveform DDFS utilizing Chebyshev polynomials interpolation," *IEEE Transactions on Circuits and Systems I: Regular Papers*, vol. 51, no. 8, pp. 1468-1475, August 2004.
16. Komo, J. J. and L. L. Joiner. "Upper and lower bounds on the binary input AWGN channel capacity," *International Journal on Pure and Applied Mathematics*, vol. 13, no. 1, pp. 31-38, 2004.
17. Joiner, L. L. and J. J. Komo. "Errors and erasures decoding of BCH and Reed-Solomon codes for reduced M-ary orthogonal signaling," *IEEE Transactions on Communications*, vol. 51, no. 1, pp. 57-62, January 2003.
18. Calhoun, P., R. Adhami, and L. L. Joiner. "Application of horizon sensor measurements in Kalman filtering techniques for on-board orbit navigation during aerobraking," *Circuits, Systems and Signal Processing: CSSP*, vol. 21, no. 4, pp. 399-413, August 2002.

### Conference Papers

1. Forrest, Eric G., and Laurie L. Joiner, "A Radar Waveform for a Nuclear Scintillated Environment," *ICRST 2016: 18<sup>th</sup> International Conference on Radar Science and Technology*.
2. Mroczek, Janek J., Michael J. Gans, and Laurie L. Joiner, "Performance of Frequency Hopping D-BLAST MIMO Architecture using LDPC and BPSK," *IEEE Military Communications Conference, MILCOM 2015*.
3. Moody, David, and Laurie Joiner, "Aspect Angle Estimation using Fixed-Rate Hidden Markov Models," *Radarcon 2014*, 2014 IEEE Radar Conference, May 2014.
4. Dewberry, B., W. Beeler, and L. Joiner, "Increased Ranging Capacity using Ultra-Wideband Direct-path Pulse Signal Strength with Dynamic Recalibration," *Proceedings of the 25th International Technical Meeting of The Satellite Division of the Institute of Navigation (ION GNSS 2012)*, Sept. 2012.
5. DeVirgilio, M., W. D. Pan, L. L. Joiner, and D. Wu, "Internet Delay Statistics: Measuring Internet Feel Using a Dichotomous Hurst Parameter," *Proc. IEEE SoutheastCon 2012*, March 2012.
6. Rives, E., L. Joiner, "Bit Error Rate Locked Loops using Log-likelihood Decoders," 8th International Conference on Information Technology: New Generations, ITNG 2011, April, 2011.

7. Gaede, R., D. Moody, M. Adderley, C. Fulks, L. Joiner, J. Kulick. "A Model-Based Design Approach to Hardware/Software Co-Design at UAHuntsville," WISH - Workshop on Infrastructures for Software/Hardware co-design, April 2010.
8. Gaede, R., D. Moody, M. Adderley, C. Fulks, L. Joiner, and J. Kulick. "A model-based design approach for realizing signal processing systems in FPGAs," WORLDCOMP'10 - The 2010 World Congress in Computer Science, Computer Engineering, and Applied Computing.
9. Jenkins, R., B. Dewberry, and L. Joiner. "Wavelet analysis of impulse ultra-wideband radar waveforms for limited-visibility altimetry," *Proc. IEEE SoutheastCon 2010*, March 2010.
10. Kheiri, F., B. Dewberry, A. Jackson, and L. Joiner. "Impulse ultrawideband ad-hoc tracking and communication network," *IEEE Military Communications Conference, MILCOM 2008*, November 2008.
11. Kheiri, F., B. Dewberry, L. Joiner, and D. Wu. "Capacity analysis of an ultrawideband active RFID system," *Proc. IEEE SoutheastCon 2008*, April 2008.
12. Zhang, P. and L. Joiner. "Linear decoding of QOSTBC in MIMO-OFDM systems with three or four transmit antennas," 9th International Symposium on Wireless Personal Multimedia Communications (WPMC2006), pp. 403-407, 2006.
13. Zhang, P. and L. Joiner. "Linear maximum likelihood decoding of MIMO-OFDM systems in non-quasi-static channels," *Proceedings of the Huntsville Simulation Conference*, 2005.
14. Joiner, L. L. and J. J. Komo. "Soft decision Reed-Solomon coding for MPSK slow frequency hop spread spectrum multiple access communications," *Proc. MILCOM 2004*, November 2004.
15. Tabet, S., L. Joiner, and M. Benincasa. "Alpha test analysis of WIPL-DP," *Proc. of Annual Review of Progress in Applied Computational Electromagnetics*, April 2004.
16. Mohan, M. and L. L. Joiner. "Solving billing issues in ad hoc networks," *Proc. ACM Southeast Regional Conference*, pp. 31-36, April 2004.
17. Komo, J.J. and L.L. Joiner. "Adaptive Reed-Solomon decoding using Gao's algorithm," *Proc. MILCOM 2002*, pp. 1340-1343, October 2002
18. Deverapalli, C., L. Joiner, and S. M. Yoo, "Performance comparison of various routing protocols in mobile ad hoc networks," *Proc. International Conference on Wireless Networks 2002 (ICWN'02)*, June 2002.
19. Patel, N. and L. L. Joiner. "Improved performance of space-time block codes on Rayleigh fading channel," *Proc. Southeastern Symposium on System Theory*, pp.128-132, March 2002.
20. Bhaskar, V. and L. L. Joiner. "Adaptive rate coding for image data transmission," *Proc. Southeastern Symposium on System Theory*, pp.251-255, March 2002.

21. Joiner, L. L. and J. J. Komo. "Soft-decision decoding of nonbinary codes," *Proc. MILCOM 2001*, vol. 2, pp. 1495-1499, November 2001.
22. Komo, J. J. and L. L. Joiner. "QPSK sequences over  $F_4$ ," *Proc. 2001 IEEE International Symposium on Information Theory*, p.95, June 2001.
23. McClure, J.H., and L.L. Joiner "Soft decision decoding of Reed-Solomon codes using the Fano sequential algorithm," *Proc. IEEE Southeastcon '01*, pp. 131-135, March 2001.
24. Pandiarajan, V., T. L. Martin, and L. L. Joiner. "Recommendations on a new cellular encryption standard using elliptic curve cryptography," *Proc. IEEE Southeastcon '01*, pp. 136-142, March 2001.
25. Joiner L. L., and J. J. Komo. "Soft decision decoding of Reed-Solomon codes using the extended erasure magnitude matrix," *Proc. MILCOM 2000*, vol. 1, pp. 392-396, October 2000.
26. Mester, T. and L. Joiner. "Quick simulation of concatenated coding systems," *Proc. Int. Symposium on Information Theory and Applications (ISITA) 2000*, pp. 786-789, November 2000.
27. Joiner, L.L. and J.J. Komo. "Nonbinary shortened cyclic codes," *Proc. Int. Symposium on Information Theory and Applications (ISITA) 2000*, pp. 442-444, November 2000.
28. Bhaskar, V. and L. Joiner. "Adaptive rate coding for wideband CDMA wireless networks," *Proc. IEEE Southeastcon '00*, pp. 471-474, April 2000.
29. Pandiarajan, V. and L. Joiner. "Undedicated HAAP based architecture for cellular data transfers," *Proc. IEEE Southeastcon '00*, pp. 23-26, April 2000.
30. Joiner, L. L. and J. J. Komo. "Improved performance of reduced M-ary orthogonal signaling using Reed-Solomon codes," *Proc. MILCOM '99*, pp. 61-64, November 1999.
31. Joiner, L. L. and J. J. Komo. "Errors and erasures decoding of Reed-Solomon codes for reduced M-ary orthogonal signaling," *Proc. 1999 IEEE Pacific Rim Conference on Communications*, pp. 416-419, August 1999.
32. Joiner, L. L. and J. J. Komo. "QPSK communications using short 4-ary codes," *Proc. IEEE Southeastcon '99*, pp. 176-179, March 1999.
33. Reid, W. J., J. J. Komo, and L. L. Joiner, "Maximum error magnitude decoding of the Golay [23,12,7] code," *Proc. 1998 IEEE International Symposium on Information Theory*, p. 219, August 1998.
34. Joiner, L. L. and J. J. Komo, "Sequential decoding of Reed-Solomon codes in an incremental redundancy system," *Proc. of the IEEE 1997 Military Communications Conference*, pp. 1-4, November 1997.
35. Reid, W. J., L. L. Joiner, and J. J. Komo, "Soft decision decoding of BCH codes using error magnitudes," *Proc. 1997 IEEE International Symposium on Information Theory*, p. 303, June 1997.

36. Joiner, L. L. and J. J. Komo, "Time domain decoding of extended Reed-Solomon codes," *Proc. IEEE Southeastcon '96*, pp. 238-241, April 1996.
37. Komo, J. J. and L. L. Joiner, "Fast error magnitude evaluations for Reed-Solomon codes," *Proc. 1995 IEEE International Symposium on Information Theory*, p. 416, September 1995.
38. Joiner, L.L. and J.J. Komo, "Decoding binary BCH codes," *IEEE Southeastcon '95 Proceedings*, pp. 67-73, April 1995.

### Other Publications

1. Joiner, L. L. and V. Pandiarajan, "Undedicated HAAP based architecture for cellular data transfers," *2000 Young Faculty Research Proceedings*, University of Alabama in Huntsville, pp. 21-29, December 2000.
2. Joiner, L. L. *Soft-decision Decoding of Nonbinary Cyclic and Modified Cyclic Codes*, Dissertation, Clemson University, December 1998.
3. Joiner, L. L., *New Algorithms for Decoding Binary BCH and Reed-Solomon Codes*, Masters Thesis, Clemson University, May 1994.

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### Presentations

1. Gaede, R., D. Moody, M. Adderley, C. Fulks, L. Joiner, J. Kulick. "A Model-Based Design Approach to Hardware/Software Co-Design at UAHuntsville," WISH - Workshop on Infrastructures for Software/Hardware co-design, at the International Symposium on Code Generation and Optimization (CGO), Toronto, Canada, April 24-28, 2010.
2. *Soft decision Reed-Solomon coding for MPSK slow frequency hop spread spectrum multiple access communications*, 2004 IEEE Military Communications Conference (MILCOM), Monterey, CA, November 2004.
3. *Improved Performance of Space-time Block Codes on Rayleigh Fading Channel*, Southeastern Symposium on System Theory, Huntsville, AL, March 2002.
4. *QPSK Maximal Length Sequences for Spread Spectrum Multiple Access*, 2001 IEEE International Symposium on Information Theory, Washington D.C., June 2001.
5. *Nonbinary Shortened Cyclic Codes*, IEEE Symposium on Information Theory and Applications 2000, Honolulu, HI, November 2000.
6. *Improved Performance of Reduced M-ary Orthogonal Signaling Using Reed-Solomon Codes*, 1999 IEEE Military Communications Conference (MILCOM), Atlantic City, NJ, November 1999.
7. *Errors and Erasures Decoding of Reed-Solomon Codes for Reduced M-ary Orthogonal Signaling*, 1999 IEEE Pacific Rim Conference on Communications, Victoria, British Columbia, Canada, August 1999.

8. *QPSK Communications Using Short 4-ary Codes*, IEEE Southeastcon '99, Nashville, TN, March 1999.
  9. *Maximum Error Magnitude Decoding of the Golay [23,12,7] Code*, 1998 IEEE International Symposium on Information Theory, Boston, MA, August 1998.
  10. *Sequential Decoding of Reed-Solomon Codes in an Incremental Redundancy System*, 1997 IEEE Military Communications Conference (MILCOM), Monterey, CA, November 1997.
  11. *Soft Decision Decoding of BCH Codes Using Error Magnitudes*, 1997 IEEE International Symposium on Information Theory, Ulm, Germany, June 1997.
  12. *Fast Error Magnitude Evaluations for Reed-Solomon Codes*, 1995 IEEE International Symposium on Information Theory, Whistler, British Columbia, Canada, September 1995.
  13. *Decoding Binary BCH Codes*, IEEE Southeastcon '95, Raleigh, NC, April 1995.
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### **Professional Activities and Service**

- Associate Editor, IEEE Transactions on Education, 2008-2015.
- Member of the Institute of Electrical and Electronics Engineers (IEEE).
- Member of Eta Kappa Nu, national electrical engineering honor society.
- Member of Tau Beta Phi, national engineering honor society.
- Member of Phi Kappa Phi, national honor society.
- Member of Omicron Delta Kappa, national leadership honor society.
- NSF Engineering Education Scholars Workshop participant, July 2000.
- Proposal reviewer for Army Research Office.
- Reviewer for *IEEE Transactions on Wireless Communications*.
- Reviewer for *IEEE Communications Letters*.
- Reviewer for *IEEE Transactions on Communications*.
- Reviewer for *IEEE Transactions on Education*.
- Reviewer for *IEEE Transactions on Industrial Electronics*.
- Reviewer for *IEEE Transactions on Vehicular Technology*.
- Reviewer for *IEEE Wireless Communications Magazine*
- Reviewer for *Journal of Systems and Software*.
- Reviewer for *IEEE Global Communications Conference (GlobeCom)*.
- Reviewer for *Southeastern Symposium on System Theory*.
- Reviewer for *2011 Military Communications Conference (MILCOM)*

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### **Community Service**

- Member of planning committee for TechTrek, 2015-2016.
- Coach, Robotic Raptors, First Technical Challenge, Meridianville Middle, 2015-2016.

- Coach, Robotic Warriors, First Lego League, Moores Mill Intermediate School, 2015-2016. Teams won Robot Design Award and Programming Award, Qualified for state tournament.
- Coach, Robotic Raptors, First Technical Challenge, Meridianville Middle, 2014-2015. Team won the Motivate award at the Alabama state qualifying tournament.
- Coach, Robotic Warriors, First Lego League, Moores Mill Intermediate School, 2014-2015
- Coach, Robotic Raptors, First Lego League, Meridianville Middle, 2013-2014. Team won the programming award at the Discovery Middle qualifying tournament and qualified for state tournament. Team took 4<sup>th</sup> place at the programming competition at the University of Alabama.
- Coach, Panther Robotics, First Lego League Team, Lynn Fanning Elementary, 2012-2013. Team won the Gracious Professionalism award at the Hampton Cove qualifying tournament and qualified for state tournament (2012).
- Advisor for IEEE UAH student branch, 2000-present
- North Alabama Science Fair Safety Judge, 2012-2015
- IEEE Southeast Conference 2008, Student Conference Co-Chairman
- IEEE 2003 Radar Conference, Publications Chairman, 2002-2003.
- IEEE 2003 Radar Conference, Session Chairman
- Technical consultant for Bob Jones High School students in the Supercomputing C programming class. Students won first place in the Alabama Supercomputing Competition, 2001-2002.
- SSST Conference Planning Committee, 2001-2002
- IEEE Southeast Conference 2001, Session Chairman
- Alabama Science and Engineering Fair Judge, 1999

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### **University Service**

- UAHuntsville Undergraduate Curriculum Committee, Chair, 2010-2011
- UAHuntsville Faculty Senate Executive Committee, 2010-2011
- UAHuntsville Faculty Senate, 2009-present, 2006-2007, Fall semester 2005.
- UAHuntsville Committee on Faculty and Student Development, 2009-2010.
- UAHuntsville Ad hoc Committee on Parental Leave, 2008.
- UAHuntsville Undergraduate Curriculum Committee, 2006-2007
- College Strategic Planning Committee, 2012-2013
- College Curriculum Committee, 2011-2013.
- Promotion, Tenure and Awards Committee (PTAC), 2011-2012.
- College Computer Resources Committee, 1998-2001.
- ECE Graduate Affairs Committee, 2014-present.
- EE Program Committee Chair, 2011-2012.
- EE Program Committee, 2001-present.
- ECE Planning Committee, 2004-present.



- Department Committee on Faculty Search, 1998-2001, 2004-2008.
  - CPE Program Committee 2001-2002.
  - Department Committee on Undergraduate Affairs, 1998-2001.
  - Department Committee on Signals and Systems, 1998-present.
  - Civil Engineering Faculty Search Committee, 2014.
  - Mechanical and Aerospace Faculty Search Committee, 2014.
  - Electrical and Computer Engineering Department Head Search Committee, 2014-2015.
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### **Awards**

- IEEE Huntsville Section Outstanding Educator Award, 2008
  - UAH College of Engineering Outstanding Assistant Professor Award, 2003
  - Barnes-Northern Telecom Fellowship, 1998
  - NASA Graduate Student Research Fellowship, 1994-1995
  - College of Engineering Dean's Fellowship, 1994-1997
  - Department of Electrical and Computer Engineering Industrial Graduate Fellowship, 1993-1994
  - Clemson University Alumni Graduate Fellowship, 1992-1993
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### **Professional Development**

- Responsible Conduct of Research: Conflicts of Interest and the Roles of the Scientist in Society, Sept. 2015
- Sexual Harassment Prevention for Faculty, 2014
- *Introduction to Radar Systems*, Dynetics University, 2008
- Responsible Conduct of Research (RCR) On-Line Training, 2011
- NSF Engineering Education Scholars Workshop, 2000