

September 2018

Joseph R. Cavallaro

Professor
Rice University, MS 380
Dept. of Electrical & Computer Engineering
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(713) 348-6196, Fax

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Pearland, TX 77584
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<http://www.ece.rice.edu/~cavallar>
[Google Scholar Page](#)
[Rice Scholarship Archive](#)

Education

Cornell University, Ph.D. in Electrical Engineering, August 1988.
Thesis Title: VLSI CORDIC Processor Architectures for the Singular Value Decomposition.
Thesis Advisor: Franklin T. Luk.

Princeton University, M.S. in Electrical Engineering, June 1982.

University of Pennsylvania, B.S. in Electrical Engineering, (*magna cum laude*), May 1981.

Positions

- 2002-Present Rice University, Professor, Electrical & Computer Engineering
- 2000-Present Rice University, Courtesy appointment in Computer Science Dept.
- 2007-Present University of Oulu, Finland, Docent, (Adjunct Professor)
- 2004-2005 University of Oulu, Finland, Visiting Professor, Spring 2005
- 1994-2002 Rice University, Associate Professor (Tenured), Electrical & Computer Engineering
- 1996-1997 National Science Foundation, Program Director, Systems Prototyping and Fabrication Program, MIPS Division, CISE Directorate
- 1988-1994 Rice University, Assistant Professor, Electrical & Computer Engineering
- 1987-1988 Cornell University, IBM Graduate Fellow
- 1986-1987 Cornell University, Research Assistant
- 1983-1986 Cornell University, Teaching Assistant
- 1981-1983 AT&T Bell Laboratories, MTS, Special Business Services Lab.

Honors and Awards

- IEEE Fellow for contributions to very large-scale integration (VLSI) architectures and algorithms for signal processing and wireless communications, 2015
- IEEE Circuits and Systems Board of Governors, 2014.
- IEEE Circuits and Systems Society Distinguished Lecturer, 2012-2013
- SDR Forum Outstanding Paper Award, (with K. Amiri, C. Dick, R. Rao), 2010.

September 2018

- IEEE Great Lakes Symposium on VLSI Best Paper Award, (with Y. Sun), 2009.
- IEEE International SoC Conference, Best Paper Award, (with Y. Sun), 2008.
- IEEE Workshop on Signal Processing Systems, (SiPS), Bob Owens Memorial Paper Award, (with Y. Sun), 2008.
- Fulbright Senior Specialists Program Roster, 2004-2008
- Nokia Foundation, Visiting Professor Fellowship, 2004-2005
- IEEE Computer Society Distinguished Lecturer, 2004-2006
- IEEE Application-Specific Systems, Architectures and Processors Conference, Best Paper Award, (with B. Haller and J. Götze), 1997.
- IEEE Circuits and Systems Society Chapter of the Year Award, (accepted as Chair of the Houston Chapter), 1996
- Hershel M. Rich Invention Award, Rice Engineering Alumni, 1994
- IEEE Region 5 Award for service as Student Branch Counselor, 1992
- NSF Research Initiation Award, 1989-1992
- IBM Graduate Fellowship, 1987-1988
- AT&T Graduate Study Program, 1981-1982
- Member of Tau Beta Pi and Eta Kappa Nu
- National Merit Scholarship, 1977-1978

Research Interests

- VLSI DSP architectures and parallel algorithms for wireless communications and robotics
- VLSI systems design and microlithography
- Fault-Tolerant robotic and computer systems
- High-speed computer arithmetic

Recent Research Grants

1. "RENEW: A Reconfigurable Eco-system for Next-generation End-to-end Wireless Testbed" NSF PAWR PPO (University of Utah Subcontractor), (CoPI), (with A. Sabharwal, E. Knightly, L. Zhong, Rice University; M. Mao, University of Michigan; W. Li, X. Chen, Texas Southern University), \$6,250,000, 2018 - 2023.
2. "NeTS: Small: Collaborative Research: BRICK: Breaking the I/O and Computation Bottlenecks in Massive MIMO Base Stations," NSF CNS (PI) with. C. Studer, Cornell University, \$250,000, 2017-2020.
3. "Vertically Integrated Projects," The Leona M. Harry B. Helmsley Charitable Trust through Georgia Institute of Technology, (Co-PI), (with B. Aazhang, Rice University), \$270,000, 2015-2017.
4. "Collaborative Research: BAMM: Baseband Accelerators for Massive Multiple-Input Multiple-Output (MIMO) Technology," NSF ECCS (PI), with C. Studer, Cornell University, \$331,330, 2014-2017.
5. "EAGER: Collaborative Research: Cross-Layer Modeling and Design of Energy-Aware Cognitive Radio Networks," NSF CNS-EAGER (PI), (with M. Juntti and Olli Silven, University of Oulu, Finland; Mikko Valkama, Tampere University of Technology, Finland; S. Bhattacharyya, University of Maryland), WiFiUS program, \$150,000, 2013-2016.
6. "US-Ireland Partnership: WiPhyLoc8: Dynamic WiFi Positioning using Physical Layer Parameters for Location-based Services and Security," NSF ENG ECCS (PI), (with R.

- Woods, Queen's University Belfast; C. Bleakley, University College Dublin), \$360,000, 2012-2015.
7. "A Comprehensive Study of Wireless Network Systems: Nonlinear RF Power Amplifiers, Digital Interference Cancellation, and Antennas and RF Circuits for a Full Duplex Transceiver," Renesas Mobile Europe Inc., (Co-PI), 334,000 Euro, 2013, (with B. Aazhang (PI), A. Babakhani).
 8. "A Comprehensive Study of Wireless Network Systems: Algorithms, Architectures, and Analog Devices for Full-duplex Systems and Coding for Networks," Renesas Mobile Europe Inc., (Co-PI), 230,000 Euro, 2012, (with B. Aazhang (PI), A. Babakhani).
 9. "System Power Optimization of Mobile Systems," Samsung Telecommunications, Inc., \$75,000, 2011, (with L. Zhong).
 10. "Context Aware Wireless Networks: Algorithms, Architectures, and Applications," Renesas Mobile Europe Inc., (Co-PI), 170,000 Euro, 2011, (with B. Aazhang (PI)).
 11. "Multi-mode Receiver and Decoder Architectures for UMTS/LTE Systems," Huawei Inc. (PI), \$160,000, 2010-2011.
 12. "Leadership University Program: New Applications for DSPs in Mobile Health and Neuroengineering" Texas Instruments, Inc., (Co-PI), \$1,000,000, 2011-2013, (C. S. Burrus, B. Aazhang, J. R. Cavallaro, E. W. Knightly, R. G. Baraniuk, M. Orchard).
 13. "Collaborative Research: MRI: Development of mobileWARP - A Platform for Next-Generation Wireless Networks and Mobile Applications," NSF CNS-0923479, (Co-PI) \$1,800,000, 2009-2013, (with A. Sabharwal (PI), B. Aazhang, E. Knightly, and L. Zhong).
 14. "Development of Context Aware Wireless Networks," Nokia Corporation, (Co-PI), 320,000 Euro, 2009-2010, (with B. Aazhang (PI)).
 15. "Leadership University Program: New Applications for DSPs in Networking and Integrated Wireless Sensors" Texas Instruments, Inc., (Co-PI), \$1,000,000, 2008-2010, (C. S. Burrus, B. Aazhang, J. R. Cavallaro, E. W. Knightly, R. G. Baraniuk, M. Orchard).
 16. "Unifying Application Specific Processors for Communication Systems," NSF CCF-0541363, (PI) \$218,000, 2006-2010.
 17. "MRI: Development of WARPnet - A Platform for Programmable and Observable Deployed Wireless Networks," NSF CNS-0619767, (Co-PI) \$811,863, 2006-2010, (with A. Sabharwal (PI), B. Aazhang, J. P. Frantz, E. Knightly).
 18. "CRI: Wireless Open-Access Research Platform (WARP) - A Scalable and Extensible Testbed for High Performance Wireless Systems," NSF CNS 0551692, (Co-PI) \$1,516,000, 2006-2010, (with A. Sabharwal (PI), B. Aazhang, J. P. Frantz, E. Knightly).

Past Research Grants

19. "IHCS: Multi-Layer Integrated Resource Management for Mobile Wireless Systems" NSF ECCS-0925942, (PI) \$350,000, 2009-2013, (with L. Zhong (Co-PI)).
20. "Scalable Mesh Networks: Algorithms, Protocols, and their Implementation," Nokia Corporation, (Co-PI), 600,000 Euro, 2006-2008, (with B. Aazhang (PI), A. Sabharwal (Co-PI)).
21. "MRI: Development of a National University Wireless Testbed: Rice Configurable Baseband Architecture," NSF EIA-0321266 (PI) \$374,000, 2003-2006, (with B. Aazhang, J. P. Frantz, A. Sabharwal (Co-PIs), (with O. Takeshita, OSU, D. Goeckel, U.Mass., M. Fitz, UCLA (Collaborators)).
22. "VLSI Systems Design Education," AMD Corporation, (PI), \$61,000, 1999-2006.
23. "Research in Wireless Communication Systems," National Instruments Corporation, (PI), \$120,000, 2005-2006.

24. "Leadership University: New Applications for DSP in Multimedia Information Processing, Networking and Wireless Communications: Power Aware Wireless Communications" Texas Instruments, Inc., \$1,000,000, 2005-2007, (C. S. Burrus, B. Aazhang, J. R. Cavallaro, E. W. Knightly, R. G. Baraniuk, M. Orchard).
25. "Video Surveillance System Design Utilizing TI DaVinci Technology," Texas Instruments LU Innovation Fund, \$10,000, 2006-2007.
26. "Global Wireless Lab: A Three-Continent Collaboration (India-Finland-USA)," Rice University, (Co-PI), \$30,000, 2007, (with A. Sabharwal (PI), Behnaam Aazhang).
27. "Algorithms for Next Generation High Data Rate Wireless Systems," Nokia Corporation, (Co-PI), \$648,000, 2003-2005, (with B. Aazhang (PI), A. Sabharwal (Co-PI)).
28. "CISE Research Resources: A Comprehensive Multi-tier Wireless Network Development Platform," NSF EIA-0224458 (PI), \$187,244, 2002-2005, (with J. P. Frantz (Co-PI), A. Sabharwal (Co-PI), E. Knightly (Co-PI), B. Aazhang (Co-PI)).
29. "Leadership University: New Applications of DSPs in Networking, Wireless Communications, and Image Processing," Texas Instruments, Inc., (Co-PI), \$1,000,000, 2002-2004, (with C. S. Burrus (PI), B. Aazhang (Co-PI), E. W. Knightly (Co-PI), R. G. Baraniuk (Co-PI), R. Nowak (Co-PI), M. Orchard (Co-PI)).
30. "A Research Platform for Seamless Wireless Networks supporting Multimedia Applications," Nokia Corporation and Texas Instruments, Inc., (PI), \$555,000, 2002-2004, (with B. Aazhang (Co-PI)).
31. "Signal Processing Algorithms and Architectures for CDMA Systems," Nokia Corporation, Helsinki, Finland, (Co-PI), \$444,528, 2000-2002, (with B. Aazhang (PI)).
32. "Seamless Multi-tier Wireless Networks for Multimedia Applications," NSF ANI-9979465, (Co-PI), \$700,000, 1999-2003, (with B. Aazhang (PI), R.G. Baraniuk (Co-PI), E.W. Knightly (Co-PI), D.S. Wallach (Co-PI)).
33. "Implementation of W-CDMA Networks: Advanced Mobile and Basestation Receiver Prototyping," Texas TDTP, (PI), \$211,148, 2000-2002, (with D.H. Johnson (co-PI)).
34. "Development of a Testbed for Wireless Multiuser Communication Systems," Nokia Corporation and Texas Instruments, Inc., (PI), \$500,781, 1998-2001 (with B. Aazhang (Co-PI)).
35. "Leadership University: New Applications of DSPs in Networking and Integrated Wireless Sensors," Texas Instruments, Inc., (Co-PI), \$1,000,000, 1999-2001, (with C. S. Burrus (PI), B. Aazhang (Co-PI), E. W. Knightly (Co-PI), R. G. Baraniuk (Co-PI)).
36. "Development of a High Speed Wireless LAN," Nokia Corporation, (Co-PI), \$241,622, 1999-2000 (with B. Aazhang (PI), E. Erkip (Co-PI), R.G. Baraniuk (Co-PI)).
37. "Development of Multiuser Transceivers for Wireless CDMA Communications," Texas Technology Development and Transfer Program. TDTP 003604-044, (Co-PI), \$201,336, 1998-1999, (with B. Aazhang (PI)).
38. "A Web-Based Engineering Design Tutor," A.W. Mellon Foundation, (Co-PI), \$570,000, 1998-2000, (with M. Terk (PI), W. Zwaenepoel (Co-PI)).
39. "Development of Monitoring and Diagnostic Methods for Robots Used in Remediation of Waste Sites," DOE DE-FG07-97ER14830, (PI), \$94,944, 1997-1999, (subcontract via Foster-Miller Technologies, Inc., Latham, NY).
40. "Advanced Signal Processing for Multiuser Wireless Communications," Texas Advanced Technology Program, TATP 003604-049, (Co-PI), \$255,000, 1996-1997, (with B. Aazhang (PI)).
41. "Architectures for Multiuser Detection and Channel Estimation in CDMA Communication Systems," NSF NCR-9506681, (Co-PI), \$303,597, 1995-1999, (with B. Aazhang (PI)).
42. "Dynamic Fault Tolerance Methods for Robotics," NSF IRI-9526363, (Co-PI), \$50,000, 1995-1997, (with I. D. Walker (PI)).

September 2018

43. "Architectures for Multiuser Detection and Channel Estimation in CDMA Communication Systems," Nokia Corporation, Helsinki, Finland, (Co-PI), \$511,785, 1995-1999, (with B. Aazhang (PI)).
44. "Failure Mode Analyses of the Hanford Manipulator," DOE Westinghouse Hanford Company DE-AC04-94AL850, (Co-PI), \$52,743, 1994-1995, (with I. D. Walker, (PI)).
45. "Enhanced VLSI Microelectronics Manufacturability using Closed-Loop Photolithographic Simulation," NSF Materials Synthesis and Processing Initiative DDM-9202639, (PI), \$330,000, 1992-1996, (with F. K. Tittel (Co-PI), W. L. Wilson, Jr. (Co-PI)).
46. "Dynamic Fault Reconfigurable Robotic System Architectures," DOE Sandia National Laboratories Contract #18-4379A, (PI), \$309,017, 1991-1996, (with I. D. Walker (Co-PI)).
47. "VLSI CORDIC Parallel Processor Architectures for the SVD," NSF Research Initiation Award MIP-8909498, (PI), \$69,400, 1989-1992.

Proposals Recently Submitted

48. "SCH: INT: Wirelessly-powered intelligent microchips for multi-site leadless cardiac pacing," NSF (PI), 2018-2022.
49. "CSR: NeTS: Small: Programmable Architectures for Large MIMO Systems (PALMS), NSF, (PI), 2018-2020.
50. "Leadless wirelessly powered pacemaker for multi chamber pacing using miniaturized pacing and sensing nodes" NIH, (Co-PI), 2018-2020.
51. "Research on 5G and Beyond Wireless Systems, (PI), Samsung Research, 2018.

Other Support for Research and Education

52. "Performance Analysis of Wireless and Image Processing Algorithms on GPGPU Systems," Intel University Programs Office, Hillsboro, Oregon, - (3) Ivy Bridge Systems, 2014.
53. Texas Instruments, Dallas, TX. MSP430 Microcontroller Hardware and Software, 2007-Present.
54. National Instruments, Austin, TX. Programmable FPGA, IF, and RF Hardware and Software, 2003-2007.
55. "Advanced Plotting Systems for VLSI Design and Education," Hewlett-Packard Corporation, \$19,000, 2000.
56. "Parallel SVD of Arbitrary Matrices on the CM5," Army High Performance Computing Research Center, Minneapolis, MN. Access to Connection Machine 5, 1992-1995.
57. Texas Instruments, Houston, TX. TMS320 Digital Signal Processing Hardware and Software, 1991-Present.
58. Technology Modeling Associates, Palo Alto, CA. DEPICT Photolithography Simulation Software, 1991-1995.

Courses Taught

- Elec 220, Fundamentals of Computer Engineering
- Elec 422/527, VLSI Design I
- Elec 423, VLSI Design II
- Elec 437/630, Multi-tier Wireless Networks (team project course)
- Elec 522, Advanced VLSI Design
- Elec 525, Advanced Computer Architecture
- Elec 625, High Performance Processor Design (with J. K. Bennett)
- Elec 693, 694, Advanced Topics Seminars - Computer Systems

September 2018

Projects Supervised

- Elec 490, Senior Independent Projects
- Elec 491, 591, Vertically Integrated Projects Program
- Elec 492, Senior Honors Projects
- Elec 494, Senior Design Project Mentor 2009, 2012, 2013, 2016, 2017
- Elec 590, 599, Graduate Independent Projects

September 2018

Graduate Students and Theses Supervised – 19 Ph.D., 20 M.S.

[Michael Wu](#)

Ph.D. January 2017, "[Efficient detectors for LTE uplink systems: From small to large systems.](#)"

Current Address: Xilinx, San Jose, CA.

[LinkedIn](#)

[Aida Vosoughi](#)

Ph.D. May 2016, "[Robust Distributed Cooperative Spectrum Sensing for Cognitive Radio Ad Hoc Networks.](#)"

Current Address: Oracle, Inc. Redwood City, CA

[LinkedIn](#)

[Bei Yin](#)

Ph.D. January 2015, "[Low Complexity Detection and Precoding for Massive MIMO Systems: Algorithm, Architecture, and Application.](#)"

Current Address: Qualcomm, Inc., San Diego, CA.

[LinkedIn](#)

[Guohui Wang](#)

Ph.D. January 2015, "[Design Space Exploration of Parallel Algorithms and Architectures for Wireless Communication and Mobile Computing Systems.](#)"

Current Address: Snapchat, Los Angeles, CA.

[LinkedIn](#)

[Johanna Ketonen](#)

Ph.D. June 2012 (Co-Advisor with M. Juntti at University of Oulu, Finland); "[Equalization and Channel Estimation Algorithms and Implementations for Cellular MIMO-OFDM Downlink.](#)"

Current Address: Nokia, Oulu, Finland.

[Markus Myllylä](#)

Ph.D. June 2011, (Co-Advisor with M. Juntti at University of Oulu, Finland); "[Detection Algorithms and Architectures for Wireless Spatial Multiplexing in MIMO-OFDM Systems.](#)"

Current Address: Nokia, Oulu, Finland

[LinkedIn](#)

[Yang Sun](#)

Ph.D. January 2011, "[Parallel VLSI Architectures for Multi-Gbps MIMO Communication Systems.](#)"

Current Address: Qualcomm, Inc., San Diego, CA.

[LinkedIn](#)

[Kiarash Amiri](#)

Ph.D. January 2011, "[Cooperative Partial Detection for MIMO Relay Networks](#)"

M.S. May 2007, "[Architecture for Detection in MIMO Wireless Systems.](#)"

Current Address: Uber, San Francisco, CA.

September 2018

[LinkedIn](#)

[Marjan Karkooti](#)

Ph.D. May 2009, "[Distributed Partial Decoding in Cooperative Communication Systems](#),"

M.S. May 2004, "[Semi-Parallel Architectures For Real-time LDPC Coding](#),"

Current Address: Valeo, San Mateo, CA.

[LinkedIn](#)

[Predrag Radosavljevic](#)

Ph.D. May 2008, "[Sphere Detection and LDPC Decoding Algorithms and Architectures for Wireless Systems](#),"

M.S. May 2004 "[Channel Equalization Algorithms for MIMO Downlink and ASIP Architectures](#),"

Current Address: Patterson and Sheridan, LLC, Houston, TX.

[LinkedIn](#)

[Michael Brogioli](#)

Ph.D. May 2007, "[Reconfigurable Heterogeneous DSP/FPGA Based Embedded Architectures for Numerically Intensive Computing Workloads](#),"

Current Address: Polymathic Consulting, Austin, TX.

[LinkedIn](#)

[Yuanbin Guo](#)

Ph.D. May 2005, "[Advanced MIMO-CDMA Receiver for Interference Suppression: Algorithms, System-on-Chip Architectures and Design Methodology](#),"

Initial Position: Cavium, Inc., San Jose, CA.

[LinkedIn](#)

[Sridhar Rajagopal](#)

Ph.D. May 2004, "[Data-parallel Digital Signal Processors: Algorithm Mapping, Architecture Scaling and Workload Adaptation](#),"

M.S. May 2000, "[Baseband Architecture Design for Future Wireless Base-Station Receivers](#),"

Current Address: Mavenir, Inc., Richardson, TX.

[LinkedIn](#)

[Martin Leuschen](#)

Ph.D. January 2002, "[Derivation and Application of Nonlinear Analytical Redundancy Techniques with Applications to Robotics](#)," (co-supervised with I. D. Walker).

M.S. May 1997, "[Robot Reliability Through Fuzzy Markov Models](#),"

Current Address: ICx Technologies, Oklahoma City, Oklahoma.

[LinkedIn](#)

[Suman Das](#)

Ph.D. September 2000, "[Multiuser Information Processing in Wireless Communication](#)," (co-supervised with B. Aazhang).

M.S. May 1997, "[Design of Computationally Efficient Multiuser Detectors for CDMA Systems](#),"

Current Address: Huawei, Inc., New York, New York

[LinkedIn](#)

September 2018

Chaitali Sengupta

Honored by MIT Technology Review in Top 100 Young Innovators of 2004

Ph.D. December 1998, "[Algorithms and Architectures for Channel Estimation in Wireless CDMA Communication Systems](#)," (co-supervised with B. Aazhang).

M.S. May 1995, "[An Integrated CAD Framework Linking VLSI Layout Editors & Process Simulators](#),"

Current Address: Qualcomm, Dallas, TX.

[LinkedIn](#)

Kishore Kota

Ph.D. May 1996, "[Parallel Algorithms and Architectures for Near-Far Resistant CDMA Acquisition](#),"

M.S. May 1991, "[Architectural, Numerical and Implementation Issues in the VLSI Design of an Integrated CORDIC-SVD Processor](#),"

Current Address: ClariPhy Communications, Inc., Irvine, CA.

[LinkedIn](#)

Monica L. Visinsky

Ph.D. May 1994, "[Dynamic Fault Detection and Intelligent Fault Tolerance for Robotics](#)," (co-supervised with I. D. Walker)

M.S. December 1991, "[Fault Detection and Fault Tolerance Methods for Robotics](#)," (co-supervised with I. D. Walker)

Current Address: Oceaneering Space Systems, Houston, TX.

[LinkedIn](#)

Nariankadu D. Hemkumar

Ph.D. May 1994, "[Efficient VLSI Architectures for Matrix Factorizations](#),"

M.S. May 1991, "[A Systolic VLSI Architecture for Complex SVD](#),"

Current Address: Cirrus Logic, Austin, TX

[LinkedIn](#)

Chance Tarver

M.S. May 2016, "[Sub-Band Digital Predistortion for Noncontiguous Carriers: Implementation and Testing](#)"

Current Address: Rice University, Houston, TX

[LinkedIn](#)

Kaipeng Li

M.S. December 2015, "[GPU Architectures for Cognitive Radio GPU Accelerated Reconfigurable Detector and Precoder for Massive MIMO SDR Systems](#)"

Current Address: Rice University, Houston, TX

[LinkedIn](#)

Michael Wu

M.S. May 2010, "[On the Application of Graphics Processor to Wireless Receiver Design](#),"

Current Address: Xilinx, San Jose, CA.

[LinkedIn](#)

Manik Gadhiok

M.S. January 2007, "[Architectures for Synchronization in OFDM Wireless Systems](#),"

Current Address: National Instruments, Santa Clara, CA.

September 2018

[LinkedIn](#)

Mani Vaya,

M.S. January 2003, "[VITURBO: A Reconfigurable Architecture for Ubiquitous Wireless Networks,](#)"

Current Address: 2000books.com, San Diego, CA.

[LinkedIn](#)

Vikram Chandrasekhar

M.S., January 2003, "[Reducing Dynamic Power Consumption in Next Generation DS-CDMA Mobile Communication Receiver,](#)"

Current Address: Samsung Research America, San Francisco, CA.

[LinkedIn](#)

Bryan Jones

M.S. May 2002, "[Rapid Prototyping of Wireless Communications Systems,](#)"

Current Address: Mississippi State University, Mississippi State, MS

[LinkedIn](#)

Kanu Chadha

M.S. May 2001, "[A Reconfigurable Decoder Architecture for Wireless LAN and Cellular Systems,](#)"

Current Address: Qualcomm, Inc., San Diego, CA.

[LinkedIn](#)

Vishwas Sundaramurthy

M.S. May 1999, "[A Software Simulation Testbed for CDMA Wireless Communication Systems,](#)"

Current Address: Honeywell Technology Solutions Lab, Bangalore, India

[LinkedIn](#)

Gang Xu

M.S. May 1999, "[Implementation Issues of Multiuser Detection in CDMA Communication Systems,](#)"

Current Address: Samsung Research America, Dallas, TX.

[LinkedIn](#)

Current Graduate Students

[Kaipeng Li](#) (Ph.D student); GPU Architectures for Cognitive Radio

[LinkedIn](#)

[Chance Tarver](#) (Ph.D. student); DPD Algorithms for 5G Cognitive Radio

[LinkedIn](#)

[Sepideh Nouri](#) (Ph.D. student); Ultra-low-power Wireless Cardiac Pacemakers

[LinkedIn](#)

[Nadya Mohamed](#) (Ph.D. student); Wireless Sensor Networks for Hazardous Environments

**Other Rice Univ. Thesis Committees - Minor Member,
Ph.D.**

Ebrahim Songhori

2017, "[TinyGarble: Efficient, Scalable, and Versatile Privacy-Preserving Computation Through Sequential Garbled Circuit.](#)"

Chair: Dr. Farinaz Koushanfar

Hui Wang

2015, "[Low Complexity Detection and Precoding for Massive MIMO Systems: Algorithm, Architecture, and Application.](#)"

Chair: Dr. Peter Varman

Abhilash Krishna

2012, "[Multiphysics model of a cardiac myocyte: A voltage-clamp study.](#)"

Chair: Dr. John W. Clark

Deepa Ramachandran

2011, "[Clinical Applications of a Human Cardiovascular-Respiratory System Model: Studying Ventricular Mechanics in Disease and Treatment.](#)"

Chair: Dr. John W. Clark

Jeffrey A. Sandoval

2011 "[Foundations for Automatic, Adaptable Compilation.](#)"

Chair: Dr. Keith D. Cooper

Cherif Salama

2010 "[Static analysis for circuit families.](#)"

Chair: Dr. Walid Taha

Ricardo A. Vargas

2008 "[Iterative design of I\(p\) digital filters.](#)"

Chair: Dr. C. Sidney Burrus

Nasir Ahmed

2005 "[Performance improvements with feedback in cooperative relay networks.](#)"

Chair: Dr. Behnaam Aazhang

Krishna Kiran Mukkavilli

2003, "[Feedback in multiple antenna systems: Bounds, design criterion and construction](#)"

Chair: Dr. Behnaam Aazhang

Li Xu

2003 "[Program redundancy analysis and optimization to improve memory performance.](#)"

Chair: Dr. Keith D. Cooper

Mohammad Jaber Borran

2003 "[Non-coherent and partially coherent space-time constellations.](#)"

Chair: Dr. Behnaam Aazhang

Liang Sun

"[Motion-corrected treadmill nuclear angiography.](#)"

Chair: Dr. John W. Clark

Dinesh Rajan

2002 "[Power efficient transmission policies for multimedia traffic over wireless channels.](#)"

Chair: Dr. Behnaam Aazhang

Chu Xiang

2001 "[Experimental demonstration of wavelength shift keying in optical WDM networks.](#)"

Chair: Dr. James F. Young

Srikrishna Bhashyam

2001 "[Signal and information processing for wireless communication systems.](#)"

Chair: Dr. Behnaam Aazhang

Parthasarathy Ranganathan

2000 "[General-purpose architectures for media processing and database workloads.](#)"

September 2018

Chair: Dr. Sarita Adve

Karen D. Alfrey

2000 “[Characterizing the afferent limb of the baroreflex.](#)”

Chair: Dr. John W. Clark

Andrew Sendonaris

1999 “[Advanced techniques for next-generation wireless systems.](#)”

Chair: Dr. Behnaam Aazhang

Yile Guo

1999 “[Resource allocation in wireless CDMA multimedia networks.](#)”

Chair: Dr. Behnaam Aazhang

Juan A. Rodriguez

1999 “[ESD circuit synthesis and analysis using TCAD and SPICE.](#)”

Chair: Dr. William L. Wilson

Myrton A. Diftler

1997 “[Alignment of threaded parts using a robot hand: Theory and experiments.](#)”

Chair: Dr. Ian D. Walker

Raghavendra K. Madyastha

1997 “[Antenna arrays for wireless CDMA communication systems.](#)”

Chair: Dr. Behnaam Aazhang

Deirdre L. Hamilton

1996 “[Effectiveness and performance analysis of a class of parallel robot controllers with fault tolerance.](#)”

Chair: Dr. Ian D. Walker

Arati Deo

1995 “[Inverse kinematics and dynamic control methods for robotic systems.](#)”

Chair: Dr. Ian D. Walker

William Dawkins

1993 “[Analytical performance prediction of parallel systems.](#)”

Chair: Dr. J. Bartlett Sinclair

Richard Murphey

1991 “[Mathematical models of atrial and ventricular myocytes from the rabbit heart.](#)”

Chair: Dr. John W. Clark

**Other Rice Univ. Thesis Committees - Minor Member,
M.S.**

Qingyue Liu

2017 "[Ouroboros Wear-leveling: A Two-level Hierarchical Wear-leveling Model for NVRAM](#)"

Chair: Dr. Peter Varman

Ellis Giles

2015 "[WrAP: Hardware and Software Support for Atomic Persistence in Storage Class Memory](#)"

Chair: Dr. Peter Varman

Jose Eduardo Reyes

2014 "[Virtual Ring Buffer for Camera Application Concurrency](#)"

Chair: Dr. Lin Zhong

Ebrahim Songhori

2014 "[ShuFFLE: Automated Framework for Hardware Accelerated Iterative Big Data Analysis](#)"

Chair: Dr. Farinaz Koushanfar

Ahmed Elnably

2012 "[Reward Scheduling for QoS in Cloud Applications](#)"

Chair: Dr. Peter Varman

Hui Wang

2011 "[Nested QoS: Providing flexible SLAs in shared storage systems](#)"

Chair: Dr. Peter Varman

Ardalan Amiri Sani

2011 "[Directional Antenna Diversity for Mobile Devices: Characterizations and Solutions](#)"

Chair: Dr. Lin Zhong

Hang Yu

2011 "[Beamforming on Mobile Devices: A First Study](#)"

Chair: Dr. Lin Zhong

Justin Fritz

2010 "[Exploiting channel symmetry in two-way channels](#)"

Chair: Dr. Behnaam Aazhang

Siddhartha Gupta

2009 "[WARPnet: A platform for clean-slate deployed wireless networks](#)"

Chair: Dr. Ashutosh Sabharwal

Christopher Hunter

2008 "[Random access cooperative systems](#)"

Chair: Dr. Behnaam Aazhang

Melissa Duarte

2007 "[Beamforming in MIMO-OFDM systems: Codebook design for efficient implementation](#)"

Chair: Dr. Ashutosh Sabharwal

Jeffrey A. Sandoval

2007 "[Tuning an adaptive-compilation search space with loop unrolling](#)"

Chair: Dr. Keith D. Cooper

Arthur Nieuwoudt

2006 "[Modeling, optimization and synthesis for fully integrated spiral inductors](#)"

Chair: Dr. Yehia Massoud

Feifei Lou

2005 "[Transceiver design for efficient channel estimation in MIMO OFDM systems](#)"

Chair: Dr. Ashutosh Sabharwal

Chris Steger

2004 "[Wireless downlink schemes in a class of frequency-selective channels with uncertain channel state information](#)"

Chair: Dr. Behnaam Aazhang

Junhui Qian

2003 “[A closed-loop model of the ovine cardiovascular system](#)”
Chair: Dr. John W. Clark, Jr.

Nasir Ahmed

2001 “[Power issues in communication systems](#)”
Chair: Dr. Behnaam Aazhang

Mahsa Memarzadeh

2001 “[Code design for multiple-antenna systems](#)”
Chair: Dr. Behnaam Aazhang

Ahmad Khoshnevis

2001 “[Coding-spreading tradeoff for lattice codes](#)”
Chair: Dr. Behnaam Aazhang

Ozgur Ertug

2000 “[Real-time prefetching and buffer management for parallel multimedia I/O systems](#)”
Chair: Dr. Peter Varman

Krishna Kirin Mukavilli

2000 “[Transmitter diversity and coding schemes](#)”
Chair: Dr. Behnaam Aazhang

Tarik Muharemovic

2000 “[Information theory of transmit diversity and space-time code design](#)”
Chair: Dr. Behnaam Aazhang

Vasileios Balabanos

2000 “[EDIF netlist optimization of pipelined designs](#)”
Chair: Dr. John K. Bennett

Vinay K. Bharadwaj

2000 “[Joint source/channel coding for discrete memoryless channels: Lessons to learn](#)”
Chair: Dr. Behnaam Aazhang

Damian Dobric

2000 “[Implementing multicast in a software emulation of the virtual interface architecture](#)”
Chair: Dr. John K. Bennett

Nadeem Ahmed

2000 “[Joint detection strategies for orthogonal frequency division multiplexing](#)”
Chair: Dr. Richard G. Baraniuk

Chu Xiang

1999 “[Wavelength shift keying technique to reduce four-wave mixing crosstalk in WDM](#)”
Chair: Dr. James F. Young

Dinesh Rajan

1999 “[Spreading and power control for multiple antenna transmit diversity](#)”
Chair: Dr. Behnaam Aazhang

Fulong Zhang

1998 “[Adaptive regularization based on noise estimation and its application to the inverse problem in electrocardiography](#)”
Chair: Dr. John W. Clark, Jr.

Yile Guo

1996 “[Performance evaluation of an optical code-division multiplexing system with four-wave mixing effect](#)”
Chair: Dr. James F. Young

David Chung

1996 “[Ventricular interaction in a closed-loop model of the canine circulation](#)”
Chair: Dr. John W. Clark, Jr.

Michael G. McMahon

1995 “[An electrodiffusion model of conduction in nerve fibers](#)”
Chair: Dr. John W. Clark, Jr.

Andrew Sendonaris

1995 “[Studies on capacity and performance of digital transmission over copper loops](#)”

Chair: Dr. Behnaam Aazhang

Stephen E. Bensley

1994 “[Channel estimation for code division multiple access communication systems](#)”

Chair: Dr. Behnaam Aazhang

Juan A. Rodriguez

1994 “[Process design and circuit model development](#)”

Chair: Dr. William L. Wilson, Jr.

Jai Tang

1993 “[Performance study of parallel I/O systems](#)”

Chairs: Dr. Peter J. Varman. Dr. Bart Sinclair

Ping Tian

1992 “[Mathematical analysis of the relationship between intra- and extracellular potentials from His bundle in rabbit heart](#)”

Chair: Dr. John W. Clark, Jr.

Deirdre Hamilton

1992 “[Performance and reliability of a parallel robot controller](#)”

Committee Chairs: Dr. John K. Bennett, Dr. Ian D. Walker

Jay Greenwood

1992 “[The design of a scalable, hierarchical-bus, shared-memory multiprocessor](#)”

Chair: Dr. John K. Bennett

Samir Khushalani

1992 “[An ionic current model for neurons in the rat medial nucleus tractus solitarius receiving sensory afferent input](#)”

Chair: Dr. John W. Clark, Jr.

Vinay Pai

1991 “[Performance analysis of parallel I/O models for external mergesort](#)”

Chair: Dr. Peter J. Varman

Arati Deo

1991 “[Application of optimal damped least-squares method to inverse kinematics of robotic manipulators](#)”

Chair: Dr. Ian D. Walker

William Dawkins

1990 “[Efficient simulation of simple instruction set array processors](#)”

Chair: Dr. J. Richard Jump

External Thesis Referee:

M.S. thesis external examiner, EPFL, Lausanne, Switzerland, 2018.
Ph.D. thesis opponent, Lund University, Lund, Sweden, 2017
Ph.D. thesis external examiner, Queen's University, Belfast, N. Ireland, 2013.
Ph.D. thesis opponent, Linköping University, Linköping, Sweden, 2010.
Ph.D. thesis reviewer, Tampere University of Technology, Tampere, Finland, 2009.
Ph.D. thesis reviewer, Indian Institute of Technology, Kharagpur, 2009, 2008, 1994.
Ph.D. thesis opponent, Royal Institute of Technology, (KTH) Stockholm, Sweden, 2000.

University Service

- Rice FIRST Scholarship Committee, 2018-Present.
- Faculty Advisory Board of the Program in Writing and Communication, 2017-Present.
- First Year Mentoring Program, McMurtry Residential College, 2011-2012.
- Engineering School Advance Triad Junior Faculty Mentoring Program, 2010-Present.
- Engineering School Senior Design Committee, 2008-Present.
- Engineering School Curriculum Planning Committee, 2007-Present.
- Engineering School Curriculum Assessment Committee, 2007-Present.
- Engineering School Leadership Committee, 2007-Present.
- Judge, Rice Undergraduate Research Symposium, 2003.
- Faculty Contact, Undergraduate Recruiting, 2003-2003.
- Member, University Committee on Undergraduate Admissions, 1997-1999.
- Member, Faculty Council, 1991-1992.
 - Chair of Elections Committee
 - Member of Tenure and Ethics Committee
- Engineering Divisional Advisor, Lovett Residential College, 1990-1996.
- Member, University Committee on Undergraduate Teaching, 1990-1991.
- Faculty Associate, Lovett Residential College, 1989-1999.
 - Outstanding Associate, 1990-1991, 1991-1992, 1992-1993, 1993-1994, 1994-1995.
- Member, Ken Kennedy Institute, Computer Information Technology Institute, 1989-Present.

Departmental Service

- ABET Accreditation Lead Coordinator, ECE Department, 2011, 2017.
- Director, Center for Multimedia Communications, 2010-Present.
- Associate Department Chair, ECE Department, 2007-Present.
- Chair of Undergraduate Committee, 2007-Present.
- Chair of Visibility Committee, 2005-2007.
- ECE/CS Computer Systems Lab, Member, 2000-Present.
- Associate Director, Center for Multimedia Communications, 1999-2010.
- Affiliates Committee, Chair, 1999-2004.
- Member of Faculty Search Committee, 1999, 2002, 2003, 2017, 2018.
- Member of Computer Committee, 1998-1999.
- Member of Graduate Committee, 1997-2007, 1988-1992.
- Chair of Computer Engineering Area Committee, 1997-1998.
- Member of Corporate Affiliates Committee, 1995-1996.
- Member of Curriculum Committee, 1994-1995.

September 2018

- Member of Undergraduate Committee, 1994-1996.
- Chair of Library Committee, 1992-1994.
- Chair of Safety Committee, 1990-1991.
- Member of Space Committee, 1989-1990.

Community Service

- Mentor, Alliance for Graduate Education and the Professoriate (AGEP), Summer 2000.
- Faculty Mentor Program, Spring Independent School District, Spring, TX, 1990.

Professional Activities

Referee for Proposals:

2018, Review Panelist, CNS Division, CISE, National Science Foundation,
2017, Review Panelist, ECCS Division, ENG, National Science Foundation,
2016, Review Panelist, ECCS Division, ENG, National Science Foundation,
2015, Review Panelist, ECCS Division, ENG, National Science Foundation,
2014, Review Panelist, CNS Division, CISE, National Science Foundation,
2012, Review Panelist, ECCS Division, ENG, National Science Foundation,
2012, Review Panelist, IIP Division, ENG, National Science Foundation,
2011, Review Panelist, CNS Division, CISE, National Science Foundation,
2003, Committee of Visitors, C-CR Division, CISE, National Science Foundation,
2003, Review Panelist, EIA Division, CISE, National Science Foundation,
2002, Mail Reviewer, C-CR Division, CISE, National Science Foundation,
2002, Review Panelist, C-CR Division, CISE, National Science Foundation,
2001, Site Review Panelist, EIA Division, CISE, National Science Foundation,
2000, Committee of Visitors, C-CR Division, CISE, National Science Foundation,
2000, Review Panelist, EHR Directorate, National Science Foundation,
2000, Reviewer, U.S. Civilian Research and Development Foundation,
2000, Mail Reviewer, INT Division, National Science Foundation,
1999, Review Panelist, EIA Division, CISE, National Science Foundation,
1999, Review Panelist, C-CR Division, CISE, National Science Foundation,
1998, Review Panelist, EIA Division, CISE, National Science Foundation,
1994, 1996, Review Panelist, DMII Division, ENG, National Science Foundation,
1989 - Present, Mail Reviewer, MIPS and C-CR Division, CISE, National Science Foundation.

Conference Leadership and Editorial:

- Associate Editor for IEEE Transactions on Signal Processing (TSP), 2013 - 2017.
- Associate Editor for the IEEE Signal Processing Letters (SPL), 2013 - 2017.
- Associate Editor of the Springer Journal of Signal Processing Systems (JSPPS), 2013 - Present.
- Session Co-Organizer, "Implementation of Massive MIMO Transceivers," 52nd IEEE Asilomar Conference on Signal, Systems, and Computers, Pacific Grove, CA, (November 2018).
- North American Liaison, IEEE Workshop on Signal Processing Systems, SiPS, 2018, Cape Town, South Africa, (October 2018)
- Track Co-Chair, 2018 ISCAS Circuits and Systems for Communications, Florence, Italy, (May 2018).

September 2018

- Guest Co-Editor, IEEE Transactions on Circuits and Systems I (TCAS-1) Special Issue on the 2017 IEEE International Symposium on Circuits and Systems (ISCAS 2017)
- Guest Co-Editor, Journal of Signal Processing Systems (JSPS) Special Issue on Signal Processing Systems, 2017.
- Technical Program Chair, 51st IEEE Asilomar Conference on Signal, Systems, and Computers, Pacific Grove, CA, (October-November 2017).
- Track Co-Chair, 2017 ISCAS Circuits and Systems for Communications, Baltimore, MD, (May 2017).
- Session Co-Organizer, "Implementation of Full-Duplex Radio Transceivers," 50th IEEE Asilomar Conference on Signal, Systems, and Computers, Pacific Grove, CA, (November 2016).
- Technical Program Co-Chair, IEEE Workshop on Signal Processing Systems, SiPS, 2016, Dallas, TX, (October 2016).
- General Chair, Texas Workshop on Integrated System Exploration, TexasWISE, 2016, Houston, TX (May 2016).
- Track Co-Chair, 2016 ISCAS Circuits and Systems for Communications, Montreal, Canada, (May 2016).
- Track Co-Chair, 2015 ISCAS Circuits and Systems for Communications, Lisbon, Portugal, (May 2015).
- Technical Program Co-Chair, IEEE Global Conference on Signal and Information Processing GlobalSIP, Data Flow Algorithms and Architecture for Signal Processing Systems, Atlanta, CA (December 2014).
- Chair, Student Paper Contest, 48th IEEE Asilomar Conference on Signal, Systems, and Computers, Pacific Grove, CA, (November 2014).
- General Co-Chair, 2014 IEEE/ACM GLSVLSI, Houston, TX, (May 2014).
- Finance Chair, 2013 Global SIP, Austin, TX (December 2013).
- Session Co-Organizer, "Implementation Aspects for Full Duplex and Large-Scale MIMO Wireless Systems," 47th IEEE Asilomar Conference on Signal, Systems, and Computers, Pacific Grove, CA, (November 2013).
- Session Organizer, "Heterogeneous and Reconfigurable Computing," 47th IEEE Asilomar Conference on Signal, Systems, and Computers, Pacific Grove, CA, (November 2013).
- Technical Area Chair (TAC), 46th IEEE Asilomar Conference on Signal, Systems, and Computers, Pacific Grove, CA, for Area G, Architecture and Implementation.
- Technical Program Committee Member, Session Chair, for Session 9: Iterative Decoding, and Chair, Student Paper Award Committee, 2012 IEEE Workshop on Signal Processing Systems (SIPS), Quebec City, Quebec, Canada, (October 2012)
- Co-Chair, Program Committee, 2012 IEEE/ACM GLSVLSI, Salt Lake City, Utah, (May 2012).
- Guest Editor, 2011 Special Issue on Algorithm and Implementation Aspects of Channel Codes and Iterative Receivers, *EURASIP Journal on Wireless Communications and Networking*, (with A. Burg, C. Studer, H. Meyr).
- Co-Chair, Program Committee, 2011 IEEE International Conference on Application-specific Systems, Architectures and Processors (ASAP), Santa Monica, CA, (September 2011).
- Co-Chair, VLSI Design Track, 2011 IEEE/ACM GLSVLSI, Lausanne, Switzerland, (May 2011).
- Co-Chair, VLSI Design Track, 2010 IEEE/ACM GLSVLSI, Providence, RI, (May 2010).
- Chair, Student Travel Grants, 2010 IEEE International Symposium on Information Theory, Austin, TX, (June 2010)
- Guest Editor, 2007 Special Issue on Application-specific Systems, Architectures and Processors, *Journal of VLSI Signal Processing Systems*, (with L. Thiele, S. Rajopadhye, T. Noll).

September 2018

- Guest Editor, 2006 Special Issue on Reconfigurable Radio Technologies in Support of Ubiquitous Seamless Computing, Kluwer J. Mobile Networks and Applications, Volume 11 Issue 6, December 2006, (with P. Demestichas, G. Vivier).
- Co-Chair, Signal Processing for Communications Symposium, 2004 IEEE Global Communications Conference (GLOBECOM), Dallas, TX.
- General Co-Chair, 2004 IEEE 15th International Conference on Application-specific Systems, Architectures and Processors (ASAP), Galveston, TX.
- Co-Chair, Program Committee, 2003 IEEE 14th International Conference on Application-specific Systems, Architectures and Processors (ASAP), The Hague, The Netherlands.
- Area Editor, Hardware and Architecture, *Encyclopedia of Computer Science and Engineering*, Wiley Interscience, 2002-2003 Edition.
- Publicity Chair, 1997 IEEE 13th Symposium on Computer Arithmetic, Asilomar, CA.
- Publicity Chair, 1996 IEEE International Conference on Neural Networks, Washington, DC.
- Guest Editor, 1996 Special Issue on Safety of Robotics Systems, *Reliability Engineering and System Safety*, (with I. D. Walker, K. E. Petersen).
- Guest Co-Editor, 1994 Special Issue on Fault Tolerance in Robotics, *Journal of Computers and Electrical Engineering*, (with I. D. Walker, M. Jamshidi).

Program Technical Committee:

- Program Committee, 2019 Signal Processing for Communications Symposium, 2019 IEEE Global Communications Conference (GLOBECOM), Waikoloa, HI.
- Program Committee, 2018 Signal Processing for Communications Symposium, 2018 IEEE Global Communications Conference (GLOBECOM), Abu Dhabi, UAE.
- Review Committee Member, 2018 IEEE International Conference on Acoustics, Speech, and Signal Processing, (ICASSP), DiSPS Track, Calgary, Canada.
- Program Committee, 2017 IEEE International Conference on Application-specific Systems, Architectures and Processors (ASAP).
- Program Committee of the EUSIPCO Conference, 2017.
- Review Committee Member, 2017 IEEE International Conference on Acoustics, Speech, and Signal Processing, (ICASSP), DiSPS Track, New Orleans, LA.
- Program Committee, 2017 Signal Processing for Communications Symposium, 2017 IEEE Global Communications Conference (GLOBECOM), Singapore.
- Program Committee, 2016 Signal Processing for Communications Symposium, 2016 IEEE Global Communications Conference (GLOBECOM), Washington, DC.
- Program Committee, 2016 IEEE International Conference on Application-specific Systems, Architectures and Processors (ASAP).
- Review Committee Member, 2016 IEEE International Conference on Acoustics, Speech, and Signal Processing, (ICASSP), DiSPS Track, Shanghai, China.
- Program Committee, 2015 IEEE International Conference on Application-specific Systems, Architectures and Processors (ASAP).
- Program Committee, 2015 GlobalSIP Symposium on SP on GPUs and Multicores, Orlando, FL.
- Program Committee, 2015 Signal Processing for Communications Symposium, 2015 IEEE Global Communications Conference (GLOBECOM), San Diego, CA.
- Program Committee, 2015 IEEE Workshop on Signal Processing Systems.
- Review Committee Member, 2015 IEEE International Symposium on Circuits and Systems, (ISCAS), Circuits and Systems for Communications Track, Lisbon, Portugal.
- Review Committee Member, 2015 IEEE International Conference on Acoustics, Speech, and Signal Processing, (ICASSP), DiSPS Track, Brisbane, Australia.

September 2018

- Program Committee and Session Chair, 2014 Signal Processing for Communications Symposium, 2014 IEEE Global Communications Conference (GLOBECOM), Austin, TX.
- Program Committee of the Communication Theory symposium (ICC'14 CT) of IEEE ICC 2014.
- Program Committee, 2014 IEEE International Conference on Application-specific Systems, Architectures and Processors (ASAP).
- Program Committee, 2014 IEEE Workshop on Signal Processing Systems.
- Program Committee, 2013 Signal Processing for Communications Symposium, 2013 IEEE Global Communications Conference (GLOBECOM), Atlanta, GA.
- Program Committee, 2013 IEEE International Conference on Communications (ICC), Budapest, Hungary.
- Program Committee, 2012 Signal Processing for Communications Symposium, 2012 IEEE Global Communications Conference (GLOBECOM), Anaheim, CA.
- Program Committee, 2012 IEEE 23rd International Conference on Application-specific Systems, Architectures and Processors (ASAP), Delft, The Netherlands.
- Program Committee, 2012 IEEE Workshop on Signal Processing Systems, Québec City, Canada.
- Program Committee, 2012 IEEE International Conference on Communications (ICC), Ottawa, Canada.
- Review Committee Member, 2012 IEEE International Symposium on Circuits and Systems, (ISCAS), Circuits and Systems for Communications Track, Seoul, Korea.
- Review Committee Member, 2012 IEEE International Conference on Acoustics, Speech, and Signal Processing, (ICASSP), DiSPS Track, Kyoto, Japan.
- Invited Session Organizer, “DSP Architectures for Wireless Communications” 2011, 45th Asilomar Conference on Signal, Systems, and Computers, Pacific Grove, CA.
- Program Committee, 2011 ICASSP Show & Tell Session, Prague, Czech Republic.
- Program Committee, 2011 IEEE International Conference on Communications (ICC), Kyoto, Japan.
- Program Committee, 2011 IEEE Workshop on Signal Processing Systems.
- Program Committee, 2011 Signal Processing for Communications Symposium, 2011 IEEE Global Communications Conference (GLOBECOM), Houston, TX.
- Invited Session Organizer, “Session MP6 Communication Processors and Accelerators” 2010, 44th Asilomar Conference on Signal, Systems, and Computers, Pacific Grove, CA.
- Invited Session Co-Organizer (with M. Juntti), 2010 ICASSP, Dallas, TX.
- Program Committee, 2010 IEEE International Conference on Communications (ICC), Cape Town, South Africa.
- Program Committee, 2010 Signal Processing for Communications Symposium, 2010 IEEE Global Communications Conference (GLOBECOM), Miami, FL.
- Invited Session Organizer, “Session TP7 Communication Processors and Accelerators” 2009 43th Asilomar Conference on Signal, Systems, and Computers, Pacific Grove, CA.
- Program Committee, 2009 IEEE International Conference on Communications (ICC), Dresden, Germany.
- Program Committee, 2009 Signal Processing for Communications Symposium, 2009 IEEE Global Communications Conference (GLOBECOM), Honolulu, HI.
- Invited Session Organizer, “Session TA5b Communication Architectures” 2008 42th Asilomar Conference on Signal, Systems, and Computers, Pacific Grove, CA.
- Program Committee, 2008 IEEE International Conference on Communications (ICC), Beijing, China.
- Program Committee, 2008 Signal Processing for Communications Symposium, 2008 IEEE Global Communications Conference (GLOBECOM), New Orleans, LA.

September 2018

- Invited Session Organizer, “Session WA5a Programmable and Reconfigurable Architectures” 2007 41th Asilomar Conference on Signal, Systems, and Computers, Pacific Grove, CA.
- Program Committee, 2007 IEEE Microelectronics Systems Education Conf., San Diego, CA.
- Program Committee, 2007 IEEE 18th International Conference on Application-specific Systems, Architectures and Processors (ASAP), Montreal, Canada, (July 2007).
- Program Committee, 2007 IEEE 18th Annual International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC), Athens, Greece, (September 2007).
- Program Committee, 2007 ACM/IEEE 17th Great Lakes Symposium on VLSI (GLSVLSI), Stresa-Lago Maggiore, Italy, (March 2007).
- Program Committee, 2007 IEEE International Conference on Communications (ICC), Glasgow, Scotland.
- Invited Session Organizer, “Session MA5a DSP Architectures and Implementations” 2006 40th Asilomar Conference on Signal, Systems, and Computers, Pacific Grove, CA.
- Program Committee, 2006 Signal Processing for Communications Symposium, 2006 IEEE Global Communications Conference (GLOBECOM), San Francisco, CA.
- Program Committee, 2006 IEEE 17th International Conference on Application-specific Systems, Architectures and Processors (ASAP), Steamboat Streams, CO.
- Program Committee, 2006 IEEE 17th Annual International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC), Helsinki, Finland.
- Program Committee, 2006 IEEE International Conference on Communications (ICC), Istanbul, Turkey.
- Program Committee, 2005 IEEE 16th International Conference on Application-specific Systems, Architectures and Processors (ASAP), Samos, Greece.
- Program Committee, 2005 IEEE International Conference on Communications (ICC), Seoul, Korea.
- Program Committee, 2005 IEEE Microelectronics Systems Education Conf., Anaheim, CA.
- Invited Session Organizer, “Session TA2a Wireless Implementations” 2004 38th Asilomar Conference on Signal, Systems, and Computers, Pacific Grove, CA.
- Program Committee, 2004 IEEE Signal Processing Systems Conference (SiPS), Austin, TX.
- Program Committee, 2003 IEEE Microelectronic Systems Education Conf., Anaheim, CA.
- Member, IEEE Transactions on VLSI, Editor-in-Chief Search Committee, 2002.
- Program Committee, 2002 IEEE 13th International Conference on Application-specific Systems, Architectures and Processors, San Jose, CA.
- Program Committee, 2001 IEEE Microelectronic Systems Education Conf., Las Vegas, NV.
- Session Organizer, 2001 Texas Instruments DSP Fest, Wireless Applications, Houston, TX.
- Session Chair, 2000 IEEE 12th International Conference on Application-Specific Systems, Architectures and Processors (ASAP), Boston, MA.
- Session Chair, “WA8a-Turbo Codes and Channel Simulation,” 1999 33rd Asilomar Conference on Signal, Systems, and Computers, Pacific Grove, CA.
- Program Committee, 1999 IEEE 14th Symposium on Computer Arithmetic, Adelaide, Australia.
- Program Committee, 1999 IEEE Microelectronic Systems Education Conference.
- Program Committee, 1998 SPIE Symposium on Advanced Signal Processing Algorithms, Architectures, and Implementations VIII, San Diego, CA.
- Program Committee, 1997 IEEE International Conference on Computer Design, Austin, TX.
- Program Committee, 1997 IEEE 13th Symposium on Computer Arithmetic, Asilomar, CA.
- Program Committee, 1995 IEEE 12th Symposium on Computer Arithmetic, Bath, UK.
- Session Chair, 1995 IEEE 12th Symposium on Computer Arithmetic, Bath, UK.
- Program Committee, 1994 International Symposium on Robotics and Manufacturing, Maui, HI.

September 2018

- Program Committee and Session Chair, 1992 SCS International Simulation Technology Conference, Clear Lake, TX.
- Invited Session Co-Organizer, 1992 International Symposium on Robotics and Manufacturing, Sante Fe, NM, (with I. D. Walker).
- Session Chair, 1991 SIAM Conference on Parallel Processing for Scientific Computing, Houston, TX.

Technical Committees:

- Chair, IEEE CAS Circuits & Systems for Communications Technical Committee, 2018-2020.
- Award Committee, IEEE Computer Society Technical Committee on VLSI, 2018-
- Advisory Board Member, IEEE SPS Design and Implementation Technical Committee, 2017-
- Member, IEEE Computer Society Fellow Evaluation Committee, 2016, 2017.
- Chair-Elect, IEEE CAS Circuits & Systems for Communications Technical Committee, 2016- 2018.
- Co-Chair, IEEE CAS Plagiarism Committee, 2015.
- Past-Chair, IEEE Computer Society Technical Committee on VLSI, 2014-
- Secretary, IEEE CAS Circuits & Systems for Communications Technical Committee, 2014-2016
- Member, IEEE USA R&D TC, IEEE CAS Society Representative, 2014 -
- Member, IEEE SPS Design and Implementation Technical Committee, 2010-2016
- Member, IEEE CAS Circuits & Systems for Communications Technical Committee, 2010-
- Member, IEEE ComSoc Signal Processing for Communications and Electronics Technical Committee (SPCE TC), 2016-
- Affiliate Member, IEEE SPS Design and Implementation Technical Committee, 2009-
- Student Branch Advisor, IEEE Chapter at Rice University, 1990-1994, 2010-Present.
- Chair, IEEE Computer Society Technical Committee on VLSI, 2002-2014.
- Chair, IEEE Houston Section Circuits and Systems Society, 1990-Present.

Referee for Books and Journal Articles:

IEEE Transactions on Signal Processing; IEEE Signal Processing Magazine; Journal of VLSI Signal Processing; Springer Journal of Signal Processing Systems; IEEE Transactions on Computers; IEEE Transactions on VLSI Systems; IEEE Transactions on Parallel and Distributed Systems; IEEE Computer Magazine; IEEE Journal of Solid-State Circuits; IEEE Transactions on Robotics and Automation; SIAM Journal on Matrix Analysis and Applications; Journal of Computers and Electrical Engineering; Journal of Intelligent and Robotic Systems; Society for Computer Simulation Journal; Journal of Robotics and Computer Integrated Manufacturing; Parallel Computing Journal; Journal of Parallel and Distributed Computing; Transactions on Reconfigurable Technology and Systems; Neurocomputing; Cambridge University Press; Kluwer Academic Press; Springer Press

Referee for Conference Papers:

IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP); IEEE International Symposium on Circuits and Systems (ISCAS); IEEE Vehicular Technology Conference; IEEE International Symposium on Spread Spectrum Techniques and Applications; IEEE International Conference on Computer Design; International Conference on Application-

September 2018

Specific Array Processors (ASAP); International Conference on Parallel Processing; Hawaii
International Conference on System Sciences; IEEE Symposia on Computer Arithmetic.

Consulting

- 2002-, Point of Product Broadcasting Co., Ltd., Houston, TX.
- 2001, Hewlett Packard, Fort Collins, CO.
- 1995-, Nokia Corporation, Irving, TX and Helsinki, Finland.
- 1994, Baker & Botts, L.L.P., Patent Review, Austin, TX.
- 1990, Compaq Computer Corporation, Houston, TX.

Memberships

- Association for Computing Machinery (ACM), Member
- Institute of Electrical and Electronics Engineers (IEEE), Fellow.

Journal Publications

Submitted in Review:

1. C. Jeon, K. Li, J. R. Cavallaro, and C. Studer, "Decentralized Equalization with Feedforward Architectures for Massive MU-MIMO," *IEEE Transactions on Signal Processing*, (August 2018).

Appeared:

1. K. Li, R. R. Sharan, Y. Chen, T. Goldstein, J. R. Cavallaro and C. Studer, "Decentralized Baseband Processing for Massive MU-MIMO Systems," *IEEE Journal on Emerging and Selected Topics in Circuits and Systems*, vol. 7, no. 4, pp. 491-507, (December 2017), doi: 10.1109/JETCAS.2017.2775151.
2. M. Wu, B. Yin, K. Li, C. Dick, J. R. Cavallaro, and C. Studer, " Implicit vs. Explicit Approximate Matrix Inversion for Wideband Massive MU-MIMO Data Detection," *Springer Journal of Signal Processing Systems*, (First Online: December 2017), <https://doi.org/10.1007/s11265-017-1313-z>
3. K. Li, A. Ghazi, C. Tarver, J. Boutellier, M. Abdelaziz, L. Anttila, M. Juntti, M. Valkama, and J. R. Cavallaro, " Parallel Digital Predistortion Design on Mobile GPU and Embedded Multicore CPU for Mobile Transmitters," *Springer Journal of Signal Processing Systems*, vol. 89, no. 3, pp 417–430, (December 2017), <https://doi.org/10.1007/s11265-017-1233-y>
4. C. Tarver, M. Abdelaziz, L. Anttila, M. Valkama, and J.R. Cavallaro, " Low-complexity, Multi Sub-band Digital Predistortion: Novel Algorithms and SDR Verification," *Springer Journal of Signal Processing Systems*, (First Online: November 2017), <https://doi.org/10.1007/s11265-017-1303-1>

5. A. Vosoughi, J. Cavallaro, and A. Marshall, "A Context-aware Trust Framework for Resilient Distributed Cooperative Spectrum Sensing in Dynamic Settings," *IEEE Transactions on Vehicular Technology*, vol. 66, no. 10, pp. 9177-9191, (October 2017), doi: 10.1109/TVT.2017.2716361
6. M. Wu, C. Dick, J.R. Cavallaro, and C. Studer, "High-Throughput Data Detection for Massive MU-MIMO-OFDM using Coordinate Descent," *IEEE Transactions on Circuits and Systems I, Regular Papers*, vol. 63, no. 12, pp. 2357 - 2367, (December 2016), doi: 10.1109/TCSI.2016.2611645.
7. A. Vosoughi, J. R. Cavallaro and A. Marshall, "Trust-aware Consensus-inspired Distributed Cooperative Spectrum Sensing for Cognitive Radio Ad Hoc Networks," *IEEE Transactions on Cognitive Communications and Networking*, vol. 2, no. 1, pp. 2437, (March 2016) doi: 10.1109/TCCN.2016.2584080.
8. A. Makki, A. Siddig, M. Saad, J. R. Cavallaro, and C. Bleakley, "Indoor Localization Using 802.11 Time Differences of Arrival," *IEEE Transactions on Instrumentation & Measurement*, vol. 65, no. 3, pp. 614623, (March 2016) doi: 10.1109/TIM.2015.2506239
9. M. Abdelaziz, L. Anttila, C. Tarver, K. Li, J.R. Cavallaro, and M. Valkama, "Low-Complexity Sub-band Digital Predistortion for Spurious Emission Suppression in Noncontiguous Spectrum Access," *IEEE Transactions on Microwave Theory and Techniques*, vol. 64, no. 11, pp. 3501-3517, (November 2016), doi: 10.1109/TMTT.2016.2602208.
10. S. Lin, L.-H.Wang, A. Vosoughi, J. R. Cavallaro, M. Juntti, J. Boutellier, O. Silvén, M. Valkama, and S. S. Bhattacharyya, "Parameterized Sets of Dataflow Modes And Their Application to Implementation of Cognitive Radio Systems," *Journal of Signal Processing Systems*, Volume 10, Issue 1, pp.3-18, (July 2015). 10.1007/s11265-014-0938-4
11. M. Wu, B. Yin, G. Wang, C. Dick, J. R. Cavallaro, and C. Studer, "Large-Scale MIMO Detection for 3GPP LTE: Algorithm and FPGA Implementation," *IEEE Journal of Selected Topics in Signal Processing, Special Issue on Signal Processing for Large-Scale MIMO Communications*, Volume 8, Issue 5, pp.916-929, (October 2014). 10.1109/JSTSP.2014.2313021
12. G. Wang, Y. Xiong, J. Yun, and J. R. Cavallaro, "Computer Vision Accelerators for Mobile Systems based on OpenCL GPGPU Co-Processing," *Springer Journal of Signal Processing Systems, Special Issue on ICASSP 2014 – DISPS*, Volume 76, Issue 3, pp.283-299, (September 2014). 10.1007/s11265-014-0878-z
13. M. Wu, B. Yin, G. Wang, C. Studer, and J. R. Cavallaro, "GPU Acceleration of a Configurable N-Way MIMO Detector for Wireless Systems," *Springer Journal of Signal Processing Systems*, Volume 76, Issue 2, pp.95-108, (August 2014). 10.1007/s11265-014-0877-0
14. G. Wang, H. Shen, Y. Sun, J.R. Cavallaro, A. Vosoughi, and Y. Guo, "Parallel Interleaver Design for a High Throughput HSPA + /LTE Multi-Standard Turbo Decoder," *IEEE Transactions on Circuits and Systems I: Regular Papers*, Volume 61, Number 5, pp.1376,1389, (May 2014), DOI: 10.1109/TCSI.2014.2309810.

15. Y. Sun and J. R. Cavallaro, "VLSI Architecture for Layered Decoding of QC-LDPC Codes with High Circulant-Weight", *IEEE Transactions on VLSI Systems*, Volume 21, Number 10 pp. [1960-1964](#), (October 2013), DOI: 10.1109/TVLSI.2012.2220388.
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9. S. Das, S. Rajagopal, C. Sengupta, J. R. Cavallaro, "Arithmetic Acceleration Techniques for Wireless Communication Receivers," *33rd IEEE Asilomar Conference on Signal, Systems, and Computers*, pp. [1469-1474](#), Pacific Grove, CA (October 1999).

September 2018

10. G. Xu, J. R. Cavallaro, "Real-Time Implementation of the Multistage Algorithm for Next-Generation Wideband CDMA Systems," *Proc. SPIE Conference on Advanced Signal Processing Algorithms, Architectures, and Implementations IX*, Volume 3807, pp. [62-73](#), Denver, CO (July 1999).
11. M. L. Leuschen, J. R. Cavallaro, I. D. Walker, "[Monitoring and Diagnostics for a Hydraulic Robot in Hazardous Environments](#)," *Proc. Eighth ANS Topical Meeting on Robotics and Remote Systems*, Pittsburgh, PA (April 1999).
12. B. Haller, J. Götze, J. R. Cavallaro, "Efficient Implementation of Rotation Operations for High-Performance QRD-RLS Filtering," *Proc. IEEE International Conference on Application-specific Systems, Architectures, and Processors, (ASAP)*, pp. [162-174](#), Zurich, Switzerland (July 1997), Awarded Best Paper Award.
13. J. R. Cavallaro, I. D. Walker, "Failure Mode Analysis of a Proposed Manipulator-based Hazardous Material Retrieval System," *Proc. American Nuclear Society 7th Topical Meeting on Robotics and Remote Systems*, Vol. 2, pp. [1096-1102](#), Augusta, GA (April 1997).
14. J. R. Cavallaro, C. Sengupta, F. K. Tittel, W. L. Wilson, Jr., "Automated Evaluation of Critical Features in VLSI Layouts Based on Photolithographic Simulations," *Proc. of the NSF Design and Manufacturing Grantees Conference*, SME Press, pp. [345-346](#), Albuquerque, NM (January 1996).
15. J. R. Cavallaro, F. K. Tittel, W. L. Wilson, Jr., "Submicron Optical Microlithography Based on Interferometric Phase Shifting," *Proc. of the NSF Design, Manufacturing and Industrial Innovation Grantees Conference*, SME Press, pp. [395-396](#), San Diego, CA (January 1995).
16. D. L. Hamilton, M. L. Visinsky, J. K. Bennett, J. R. Cavallaro, I. D. Walker, "Fault Tolerant Algorithms and Architectures for Robotics," *Proc. IEEE Mediterranean Electrotechnical Conference*, pp. [1034-1036](#), Antalya, Turkey (April 1994).
17. J. R. Cavallaro, I. D. Walker, "A Survey of NASA and Military Standards on Fault Tolerance and Reliability Applied to Robotics," *Proc. AIAA/NASA Conference on Intelligent Robots in Field, Factory, Service, and Space (CIRFFSS'94)*, pp. [282-286](#), Houston, TX (March 1994).
18. H. M. Fossati, F. K. Tittel, W. L. Wilson, J. R. Cavallaro, "Enhanced VLSI Manufacturability using an Integrated CAD Framework," *Proc. of the NSF Design and Manufacturing Grantees Conference*, SME Press, pp. [549-550](#), Boston, MA (January 1994).
19. M. Kido, J. R. Cavallaro, G. Szabó, W. L. Wilson, F. K. Tittel, "A New Phase Shifting Method for High Resolution Microlithography," *Proc. of the NSF Design and Manufacturing Grantees Conference*, SME Press, pp. [577-578](#), Boston, MA (January 1994).
20. M. L. Visinsky, J. R. Cavallaro, I. D. Walker, "Expert System Framework of Fault Detection and Fault Tolerance for Robots," *Proc. Fourth International Symposium on Robotics and Manufacturing*, ASME Press Series on Robotics and Manufacturing, Volume 4, pp. [793-799](#), Sante Fe, NM (November 1992).

Invited Lectures, Tutorials, Short Courses and Visits

September 2018

1. Invited Lecture, "Algorithms, Architectures, and Testbeds for Advanced Wireless Communication Systems," Texas A&M University, ECE Department, College Station, TX (April 20, 2018).
2. Invited Lecture, "Algorithms, Architectures, and Testbeds for 5G Wireless Communication Systems," Samsung Research America, Mountain View, CA (November 1, 2017).
3. Invited Lecture, "Algorithms, Architectures, and Testbeds for 5G Wireless Communication Systems," National Instruments Innovate Faster Workshop, Austin, TX (May 23, 2017).
4. Invited Lecture, "Algorithms, Architectures, and Testbeds for 5G Wireless Communication Systems," Lund University, Lund Sweden, (March 23, 2017).
5. Keynote Presentations, "Algorithms, Architectures, and Testbeds for 5G Wireless Communication Systems," DT5G: Symposium on Transceivers and Signal Processing for 5G Wireless and mm-Wave Systems, 2016 IEEE Global Conference on Signal and Information Processing (GlobalSIP), Washington, DC, (December 8, 2016).
6. Invited Lecture, "Algorithms, Architectures, and Testbeds for 5G Wireless Communication Systems," Samsung Telecommunications, Richardson, TX (October 26, 2016).
7. Invited Lecture, "FPGA-based wireless communications" IEEE Signal Processing Society's High Performance DSP and FPGA implementation of Signal Processing Systems Summer School 2012, Queen's University Belfast (QUB), Belfast, Northern Ireland, (August 20-24, 2012).
8. Keynote Presentation, "WARP - A Testbed for Wireless Algorithm Design and Experimentation: The Rice University Wireless Open-Access Research Platform," 8th Workshop on Optimizations for DSP and Embedded Systems (ODES-8), in conjunction with IEEE/ACM International Symposium on Code Generation and Optimization (CGO), Toronto, Canada, (April 25, 2010).
9. Panelist, "Programming High Performance Signal Processing Systems in High Level Languages," 18th ACM/SIGDA International Symposium on Field-Programmable Gate Arrays, Monterey, CA, (February 22, 2010).
10. M. Juntti, J. R. Cavallaro, "Tutorial on Signal Processing in Wireless Systems," International Symposium on System-On-Chip Tutorial, Tampere, Finland, (October 5, 2009).
11. Short Course, "Topics in Wireless Systems Architecture," Center for Wireless Communication, University of Oulu, Finland, (August 17-18, 2009)
12. M. Juntti, J. R. Cavallaro, "Baseband Algorithms and Architectures for Cooperative MIMO Systems with Applications to Evolving System Standards," IEEE Wireless VITAE Tutorial, Aalborg, Denmark, (May 17, 2009).
13. M. Juntti, J. R. Cavallaro, "Baseband Algorithms and Architectures for Cooperative MIMO Systems with Applications to Evolving System Standards," 2009 WCNC Tutorial, Budapest, Hungary, (April 5, 2009).

September 2018

14. "Algorithm and Architecture Design and Evaluation on the Rice University Wireless Open-Access Research Platform (WARP)", Univ. of Texas, Dallas, Electrical Engineering Seminar Series & Dallas Chapter of IEEE Signal Processing Society, Dallas, TX, (November 17, 2008).
15. "M. Juntti, J. R. Cavallaro, "MIMO Baseband Algorithms & Architectures with Applications to 3G LTE & WiMAX Systems," IEEE Intl. Symposium on Circuits and Systems (ISCAS) Tutorial, Seattle, WA, (May 18, 2008).
16. "Algorithm and Architecture Design and Evaluation on the Rice University Wireless Open-Access Research Platform," IEEE Galveston Bay Section, NASA JSC, Houston, TX, (March 28, 2008).
17. "Algorithm and Architecture Design on the Rice Univ. Wireless Open-Access Research Platform (WARP)," IEEE Globecom Design and Developers Forum Panel on Current and Future Trends in Software Designed Radio/Cognitive Radio (SDR/CR) Design & Development, Washington, DC, (November 28, 2007).
18. "A Software Simulation Testbed for Third Generation CDMA Wireless Systems," National Instruments NI-Week, Austin, TX (August 17, 2005).
19. "Architectures, Algorithms, and Research Platforms for Wireless Communication," Nokia Research Center, Helsinki, Finland (June 3, 2005).
20. "Architectures, Algorithms, and Research Platforms for Wireless Communication," Tampere Univ. of Technology, Finland (May 2x, 2005).
21. "A Software Simulation Testbed for Third Generation CDMA Wireless Systems," National Instruments NI-Week, Austin, TX (August 17, 2004).
22. "Architectures, Algorithms, and Research Platforms for Wireless Communication," Univ. of Oulu, Finland (June 15, 2004).
23. "Advanced Algorithms, Architectures, and Implementations for W-CDMA and WLAN Communication Systems," (Short Course with B. Aazhang), Univ. of Oulu, Finland (August 12-14, 2002).
24. "Reconfigurable VLSI Communication Processor Architectures" Workshop on Future Wireless Communication Systems and Algorithms, University of Oulu, Oulu, Finland (August 12, 2002).
25. "Architectures for Heterogeneous Multi-tier Wireless Networks," Panelist, Third Strategic Workshop on Wireless Communications, Rebild, Denmark (September 9, 2001).
26. "Scheduling of Advanced Communication Receiver Algorithms on Custom VLSI Architectures," Hewlett Packard VLSI Laboratory, Fort Collins, CO (July 19, 2001).
27. "VLSI Architectures for Multi-tier Wireless Networks," Hewlett Packard VLSI Laboratory, Fort Collins, CO (July 18, 2001).
28. "Rice Everywhere Network (RENE)" University of Oulu, Oulu, Finland (June 15, 2001).

September 2018

29. "VLSI Architectures for Multi-tier Wireless Systems." University of Queensland, Brisbane, Australia (May 14, 2001).
30. "VLSI Architectures for Multi-tier Wireless Systems," Lulea University of Technology, Lulea, Sweden (August 20, 2000).
31. "VLSI Architectures for Multi-tier Wireless Systems," University of Michigan, EECS Dept., Ann Arbor, MI (November 9, 1999).
32. "Overview of Implementation Issues for Multi-tier Networks on DSPs," Berkeley Wireless Research Center, Berkeley, CA (October 22, 1999).
33. "Overview of Implementation Issues for Multi-tier Networks on DSPs," KTH Royal Institute of Technology, Stockholm, Sweden (August 19, 1999).
34. "Overview of Implementation Issues for Multi-tier Networks on DSPs," Helsinki University of Technology, Helsinki, Finland, (August 18, 1999).
35. "Overview of Implementation Issues for Multi-tier Networks on DSPs," University of Oulu, Oulu, Finland (August 16, 1999).
36. "Multiuser Techniques for Channel Estimation and Detection for CDMA Systems," Texas Instruments TMS320 Educators Conference, Houston, TX (with C. Sengupta, J. R. Cavallaro, B. Aazhang, et al., August 1998).
37. "Architectures and Signal Processing Algorithms for CDMA Communications," Nokia Corporation, San Diego, CA (Short Course with B. Aazhang, September 26-27, 1996).
38. "Architectures and Signal Processing Algorithms for CDMA Communications," Nokia Research Center, Helsinki, Finland (Short Course with B. Aazhang, August 28-29, 1996).
39. "Parallel VLSI/DSP Architectures for CDMA Communication Systems," Department of Electrical Engineering, Swiss Federal Institute of Technology (ETH), Zürich, Switzerland (July 18, 1995).
40. "VLSI CORDIC Co-Processors for DSP," Texas Instruments, Houston, TX (January 26, 1993).
41. "CORDIC Parallel Processor Architectures for an SVD Processor," IBM Almaden Research Center, San Jose, CA (July 21, 1989).
42. "CORDIC Algorithms for Digital Signal Processing," Texas Instruments, Houston, TX (July 7, 1989).
43. "VLSI Implementation of a CORDIC SVD Processor," Mitre Corporation, Bedford, MA (June 14, 1989).

Reviewed Conference Publications - From Full Paper

1. M. Tonnemacher, C. Tarver, V. Chandrasekhar, H. Chen, P. Huang, B. L. Ng, J.R. Cavallaro, J. Camp, " Opportunistic Channel Access Using Reinforcement Learning in Tiered CBRS Networks," 2018 IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN), Seoul, South Korea, (October 2018), (Accepted to Appear).
2. Y. Lin and J. R. Cavallaro, " Energy-efficient Convolutional Neural Networks via Statistical Error Compensated Near Threshold Computing," 2018 IEEE International Symposium on Circuits and Systems (ISCAS), Florence, Italy, (May 2018), pp. 1-5. doi: 10.1109/ISCAS.2018.8351679
3. C. Jeon, K. Li, J. R. Cavallaro and C. Studer, "On the achievable rates of decentralized equalization in massive MU-MIMO systems," 2017 IEEE International Symposium on Information Theory (ISIT), Aachen, Germany, (June 2017), pp. 1102-1106. doi: 10.1109/ISIT.2017.8006699
4. C. Tarver, M. Abdelaziz, and J. R. Cavallaro, "Multi Component Carrier, Sub-Band DPD and GNURadio Implementation," 2017 IEEE International Symposium on Circuits and Systems (ISCAS), Baltimore, MD, (May 2017), doi: 10.1109/ISCAS.2017.8050455
5. K. Li, R. Skaran, Y. Chen, J. R. Cavallaro, T. Goldstein and C. Studer, "Decentralized beamforming for massive MU-MIMO on a GPU cluster," 2016 IEEE Global Conference on Signal and Information Processing (GlobalSIP), Washington, DC, (December 2016), pp. 590-594. doi: 10.1109/GlobalSIP.2016.7905910
6. C. Tarver, M. Abdelaziz, L. Anttila, M. Valkama and J. R. Cavallaro, "Low-Complexity, Sub-Band DPD with Sequential Learning: Novel Algorithms and WARPLab Implementation," 2016 IEEE International Workshop on Signal Processing Systems (SiPS), Dallas, TX, (October 2016), pp. 303-308. doi: 10.1109/SiPS.2016.60
7. M. Wu, C. Dick, J. R. Cavallaro and C. Studer, "FPGA design of a coordinate descent data detector for large-scale MU-MIMO," 2016 IEEE International Symposium on Circuits and Systems (ISCAS), Montreal, QC, Canada, (May 2016), pp. 1894-1897. doi: 10.1109/ISCAS.2016.7538942
8. K. Li, A. Ghaziy, J. Boutellier, M. Abdelaziz, L. Anttila, M. Juntti, M. Valkama, J. R. Cavallaro, "Mobile GPU Accelerated Digital Predistortion on a Software-defined Mobile Transmitter," in IEEE GlobalSIP, Orlando, FL, (December 2015), pp. 756-760, doi: 10.1109/GlobalSIP.2015.7418298
9. A. Vosoughi, J.R. Cavallaro, A. Marshall, "Robust Consensus-based Cooperative Spectrum Sensing under Insistent Spectrum Sensing Data Falsification Attacks," in IEEE Global Communications Conference (GLOBECOM), San Diego, CA, (December 2015), pp. 1-6, doi: 10.1109/GLOCOM.2015.7417492.
10. K. Li, B. Yin, M. Wu, J. R. Cavallaro and C. Studer, "Accelerating massive MIMO uplink detection on GPU for SDR systems," 2015 IEEE Dallas Circuits and Systems Conference (DCAS), Dallas, TX, (September 2015), pp. 1-4. doi: 10.1109/DCAS.2015.7356600
11. B. Yin, M. Wu, J.R. Cavallaro, and C. Studer, "VLSI Design of Large-Scale Soft-Output MIMO Detection Using Conjugate Gradients," in IEEE International Symposium on Circuits

and Systems (ISCAS), (Lisbon, Portugal), pp. 1498-1501, (May 2015), doi: 10.1109/ISCAS.2015.7168929

12. B. Yin, M. Wu, J. R. Cavallaro, and C. Studer, "Conjugate Gradient-based Soft-Output Detection and Precoding in Massive MIMO Systems," in *IEEE Global Communications Conference (GLOBECOM)*, (Austin, TX), (December 2014), pp. [3696 - 3701](#), doi: 10.1109/GLOCOM.2014.7037382
13. A. Vosoughi, J. R. Cavallaro and A. Marshall, "A cooperative spectrum sensing scheme for cognitive radio ad hoc networks based on gossip and trust," *Signal and Information Processing (GlobalSIP)*, 2014 IEEE Global Conference on, Atlanta, GA, (December 2014), pp. 1175-1179, doi: 10.1109/GlobalSIP.2014.7032307
14. M. Abdelaziz, L. Anttila, J. R. Cavallaro, S. S. Bhattacharyya, A. Mohammadi, F. Ghannouchi, M. Juntti, and M. Valkama, "Low-Complexity Digital Predistortion For Reducing Power Amplifier Spurious Emissions in Spectrally-Agile Flexible Radio," in *Proceedings of the International Conference on Cognitive Radio Oriented Wireless Networks*, (Oulu, Finland), pp. [323-328](#), (June 2014).
15. B. Yin, M. Wu, G. Wang, C. Dick, J. R. Cavallaro, and C. Studer, "A 3.8 Gb/s Large-Scale MIMO Detector for 3GPP LTE-Advanced," in *Proceedings of the International Conference on Acoustics, Speech, and Signal Processing*, (Florence, Italy), 2014, pp. [1258-61](#) (May 2014).
16. A. Ghazi, J. Boutellier, M. Abdelaziz, X. Lu, L. Anttila, J. R. Cavallaro, S. S. Bhattacharyya, M. Valkama, and M. Juntti, "Low Power Implementation of Digital Predistortion Filter on a Heterogeneous Application Specific Multiprocessor," in *Proceedings of the International Conference on Acoustics, Speech, and Signal Processing*, (Florence, Italy), 2014, pp. [8391-8395](#) (May 2014).
17. G. Wang, B. Yin, I. Cho, J. R. Cavallaro, S. Bhattacharyya, and J. Takala, "Efficient Architecture Mapping of FFT/IFFT for Cognitive Radio Networks," in *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing*, (Florence, Italy), pp. [3961-3965](#) (May 2014).
18. B. Rister, P. Jaaskelainen, O. Silven, J. Hannuksela, and J. R. Cavallaro, "Parallel Programming of a Symmetric Transport-Triggered Architecture with Applications in Flexible LDPC Encoding," in *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing*, (Florence, Italy), pp. [8435-8439](#) (May 2014).
19. G. Wang, M. Wu, B. Yin, J. R. Cavallaro, "High Throughput Low Latency LDPC Decoding on GPU for SDR Systems," in *IEEE GlobalSIP 2013*, (Austin, TX), pp. [1258-61](#) (December 2013).
20. X. Lu, M. Juntti, J. Janhunen, J. Boutellier, M. Valkama, J. R. Cavallaro, S. S. Bhattacharyya, "Subcarrier Allocation and Power Control with LTE-A Carrier Aggregation," *IEEE GlobalSIP 2013*, (Austin, TX), pp. [1214-17](#), (December 2013).
21. G. Wang, B. Rister, J. R. Cavallaro, "Workload Analysis and Efficient OpenCL-based Implementation of SIFT Algorithm on a Smartphone," in *IEEE GlobalSIP 2013*, (Austin, TX), pp. [759-62](#) (December 2013).

22. B. Yin, S. Abu-Surra, G. Xu, T. Henige, E. Pisek, Z. Pi, and J. R. Cavallaro, "High-Throughput Beamforming Receiver for Millimeter Wave Mobile Communication," *IEEE Global Communications Conference (GLOBECOM 2013)*, (Atlanta, GA), pp. [369-3702](#), (December 2013).
23. M. Wu, B. Yin, G. Wang, C. Studer, and J. R. Cavallaro, "HSPA/LTE-A turbo decoder on GPU and multicore CPU," in *Proceedings of the IEEE Asilomar Conference on Signals, Systems, and Computers*, (Pacific Grove, CA), pp. [824-828](#), (November 2013).
24. M. Abdelaziz, A. Ghazi, L. Anttila, J. Boutellier, T. Lahteensuo, X. Lu, J. Cavallaro, S. Bhattacharyya, M. Juntti, and M. Valkama, "Mobile Transmitter Digital Predistortion: Feasibility Analysis, Algorithms and Design Exploration," in *Proceedings of the IEEE Asilomar Conference on Signals, Systems, and Computers*, (Pacific Grove, CA), pp. [2046-2053](#), (November 2013).
25. B. Yin, M. Wu, C. Studer, J.R. Cavallaro, and J. Lilleberg, "Full-duplex in Large-scale Wireless Systems," in *Proceedings of the IEEE Asilomar Conference on Signals, Systems, and Computers*, (Pacific Grove, CA), pp. [1623-27](#), (November, 2013).
26. L.-H. Wang, S. S. Bhattacharyya, A. Vosoughi, J. R. Cavallaro, M. Juntti, J. Boutellier, O. Silven, M. Valkama, "Dataflow Modeling and Design for Cognitive Radio Networks," in *8th International Conference on Cognitive Radio Oriented Wireless Networks (CROWNCOM), "Special Session on WiFiUS"*, pp. [196-201](#), Washington DC, (July 2013).
27. A. Vosoughi, G. Wang, H. Shen, J. R. Cavallaro, and Y. Guo, "Highly Scalable On-the-Fly Interleaved Address Generation for UMTS/HSPA+ Parallel Turbo Decoder," in *24th IEEE International Conference on Application-specific Systems, Architectures and Processors (ASAP 2013)*, pp.[356-362](#), Washington, D.C., (June 2013)
28. B. Rister, G. Wang, M. Wu and J. R. Cavallaro, "A Fast and Efficient Sift Detector Using the Mobile GPU," in *2013 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, (Vancouver, Canada), pp. [2674-78](#), (May 2013)
29. G. Wang, Y. Xiong, J. Yun, and J. R. Cavallaro, "Accelerating Computer Vision Algorithms Using OpenCL Framework on Mobile Devices - A Case Study," in *2013 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, pp. [2629-2633](#), Vancouver, Canada (May 2013)
30. B. Yin, M. Wu, C. Studer, J. R. Cavallaro, and C. Dick, "Implementation Trade-Offs For Linear Detection In Large-Scale MIMO Systems," *2013 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, pp. [2679-2683](#), May 26-31, 2013, Vancouver, Canada (December 2012, Submitted, February 2013, Accepted, May 2013, Published).
31. B. Rister, G. Wang, M. Wu and J. R. Cavallaro, "A Fast and Efficient Sift Detector Using The Mobile GPU," *2013 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, pp. [2674-2678](#), May 26-31, 2013, Vancouver, Canada (December 2012, Submitted, February 2013, Accepted, June 2013, Published).

September 2018

32. G. Wang, A. Vosoughi, H. Shen, J. R. Cavallaro and Y. Guo, "Parallel Interleaver Architecture with New Scheduling Scheme for High Throughput Configurable Turbo Decoder," *IEEE International Symposium on Circuits and Systems (ISCAS 2013)*, pp. [1340-1343](#), Beijing, China, (May 2013).
33. M. Wu, B. Yin, A. Vosoughi, C. Studer, J. R. Cavallaro and C. Dick, "Approximate Matrix Inversion for High-Throughput Data Detection in Large-Scale MIMO Uplink," *IEEE International Symposium on Circuits and Systems (ISCAS 2013)*, pp. [2155-2158](#), Beijing, China, (May 2013).
34. A. Vosoughi, M. Wu, and J. R. Cavallaro, "Baseband Signal Compression in Wireless Base Stations," *IEEE Global Communications Conference (GLOBECOM)*, pp. [4505 – 4511](#), Anaheim, CA, (December 2012).
35. M. Wu, B. Yin, and J. R. Cavallaro, "Flexible N-Way MIMO Detector on GPU," *IEEE Workshop on Signal Processing Systems (SiPS 2012)*, pp. [318-323](#), Québec City, Québec, Canada, (October 2012).
36. B. Yin, K. Amiri, J. R. Cavallaro, and Y. Guo, "Reconfigurable Multi-Standard Uplink MIMO Receiver with Partial Interference Cancellation," *IEEE International Conference on Communications (ICC)*, pp. [6282-6286](#), Ottawa, Canada, (June 2012).
37. M. Wu, C. Dick, J. R. Cavallaro, "Improving MIMO Sphere Detection Through Antenna Detection Order Scheduling," *Software Defined Radio Forum 2011*, pp. [280-284](#), Washington, DC, (November-December 2011), (June 2012).
38. B. Yin, J. R. Cavallaro, "Low complexity MMSE based interference cancellation for LTE uplink MIMO receiver," *Software Defined Radio Forum 2011*, pp. [18-22](#), Washington, DC, (November-December 2011), (June 2012).
39. G. Wang, M. Wu, Y. Sun, J. R. Cavallaro, "High-Throughput Contention-Free Concurrent Interleaver Architecture for Multi-Standard Turbo Decoder," *IEEE International Conference on Application-specific System, Architectures and Processors (ASAP'11)*, pp. [113-121](#), Santa Monica, CA (September 2011).
40. G. Wang, M. Wu, Y. Sun, J. R. Cavallaro, "A Massively Parallel Implementation of QC-LDPC Decoder on GPU," *IEEE Symposium on Application Specific Processors (SASP)*, pp. [82-85](#), San Diego, CA, (June 2011).
41. K. Amiri, C. Dick, R. Rao, J. R. Cavallaro, "Reduced Complexity Soft MMSE MIMO Detector Architecture," *Software Defined Radio Forum 2010, (Outstanding Paper Award)*, pp. [716-720](#), Washington, DC, (November-December 2010).
42. M. Wu, Y. Sun, J. R. Cavallaro, "Implementation of a 3GPP LTE Turbo Decoder Accelerator on GPU," *IEEE Workshop on Signal Processing Systems (SiPS)*, pp. [192-197](#), San Francisco, CA, (October 2010).
43. K. Amiri, M. Wu, M. Duarte, J. R. Cavallaro, "Physical Layer Algorithm and Hardware Verification of MIMO Relays Using Cooperative Partial Detection," *IEEE ICASSP*, pp. [5614-5617](#), Dallas, TX, (March 2010).

September 2018

44. Y. Sun, J. R. Cavallaro, "Low-Complexity and High-Performance Soft MIMO Detection Based on Distributed M-Algorithm through Trellis-Diagram," *IEEE ICASSP*, pp. [3398-3401](#), Dallas, TX, (March 2010).
45. M. Wu, S. Gupta, Y. Sun, J. R. Cavallaro, "A GPU Implementation of a Real-Time MIMO Detector," *IEEE Workshop on Signal Processing Systems (SiPS)*, pp. [303-308](#), Tampere, Finland, (October 2009).
46. Y. Sun, J. R. Cavallaro, T. Ly, "Scalable and Low Power LDPC Decoder Design Using High Level Algorithmic Synthesis," *22nd IEEE International SOC Conference*, pp. [267-270](#), Belfast, Northern Ireland, (September 2009).
47. Y. Sun, J. R. Cavallaro, "High Throughput VLSI Architecture for Soft-Output MIMO Detection Based on a Greedy Graph Algorithm", *ACM/IEEE Great Lakes Symposium on VLSI, (Best Student Paper Award)*, pp. [445-450](#), Boston, MA, (May 2009).
48. M. Myllylä, M. Juntti, J. R. Cavallaro "Architecture Design and Implementation of the Increasing Radius - List Sphere Detector Algorithm," *IEEE ICASSP*, pp. [553.556](#), Taipei, Taiwan, (April 2009).
49. K. Amiri, J. R. Cavallaro, "Partial Detection for Multiple Antenna Cooperation", *CISS*, pp. [669-674](#), Baltimore, MD, (March 2009).
50. K. Amiri, C. Dick, R. Rao, J. R. Cavallaro, "Novel Sort-Free Detector with Modified Real-valued Decomposition Ordering in MIMO Systems," *IEEE Global Communications Conference (GLOBECOM)*, pp. [1-5](#), New Orleans, LA, (Nov.-Dec. 2008).
51. P. Radosavljevic, K. J. Kim, J. R. Cavallaro, "QRD-QLD searching based sphere detection for emerging MIMO downlink OFDM receivers", *IEEE Global Communications Conference (GLOBECOM)*, pp. [1-5](#), New Orleans, LA, (Nov.-Dec. 2008).
52. K. Amiri, C. Dick, R. Rao, J. R. Cavallaro, "[Flex-Sphere: An FPGA Configurable Sort-Free Sphere Detector for Multi-user MIMO Wireless Systems](#)," *Software Defined Radio Forum 2008*, Washington, DC, (October 2008).
53. Y. Sun, J. R. Cavallaro, "Unified Decoder Architecture for LDPC/Turbo Codes," *2008 IEEE Workshop on Signal Processing Systems, (SiPS)*, pp. [13-18](#), Washington, DC, (**Awarded "Bob Owens Memorial Paper Award."**), (October 2008).
54. Y. Sun, J. R. Cavallaro, "A Low Power 1-Gbps Reconfigurable LDPC Decoder Design for Multiple 4G Wireless Standards," *IEEE International SoC Conference (SOCC'08)*, pp. [367-370](#), Newport Beach, CA, (**Best Paper Award**), (September 2008).
55. M. Myllylä, M. Juntti, J. R. Cavallaro, "[The Effect of Preprocessing to the Complexity of List Sphere Detector Algorithms](#)," *2008 WPMC*, Lapland, Finland, (September 2008).
56. Y. Sun, Y. Zhu, M. Goel, J. R. Cavallaro, "Configurable and Scalable High Throughput Turbo Decoder Architecture for Multiple 4G Wireless Standards," *IEEE International Conference on Application-specific System, Architectures and Processors (ASAP'08)*, pp. [209-214](#), Leuven, Belgium (July 2008).

57. K. Amiri, Y. Sun, P. Murphy, C. Hunter, J. R. Cavallaro, A. Sabharwal, "WARP, a Unified Wireless Network Testbed for Education and Research," *IEEE International Conference on Microelectronic Systems Education (MSE)*, pp. [53-54](#), San Diego, CA, (June 2007).
58. Y. Sun, M. Karkooti, J. R. Cavallaro, "VLSI Decoder Architecture for High Throughput, Variable Block-size and Multi-rate LDPC Codes," *IEEE International Symposium on Circuits and Systems (ISCAS)*, pp. [2104-2107](#), New Orleans, LA, (May 2007).
59. M. Karkooti, P. Radosavljevic, J. R. Cavallaro, "Configurable, High Throughput, Irregular LDPC Decoder Architecture: Tradeoff Analysis and Implementation," *Proc. IEEE 17th International Conference on Application-specific Systems, Architectures and Processors (ASAP)*, pp. [360-367](#), Steamboat Springs, CO (September 2006).
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September 2018

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2. M. Brogioli, M. Gadhik, J. R. Cavallaro, "Design and Analysis of Heterogeneous DSP/FPGA Based Architectures for 3GPP Wireless Systems," IEEE Real-Time and

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3. J. R. Cavallaro, M. C. Brogioli, A. de Baynast, P. Radosavljevic, "[Reconfigurable Architectures for Wireless Systems: Design Exploration and Integration Challenge](#)," Wireless World Research Forum (WWRF-12), Toronto, Canada (November 2004).
 4. J. R. Cavallaro, P. Radosavljevic, "[ASIP Architecture for Future Wireless Systems: Flexibility and Customization](#)," Wireless World Research Forum (WWRF-11), Oslo, Norway (June 2004).
 5. M. L. Leuschen, J. R. Cavallaro, I. D. Walker, "Testing on the Curve: Nonlinear Analytical Redundancy for Fault Detection," *Proc. Ninth ANS Topical Meeting on Robotics and Remote Systems*, Session 22, Paper [F131](#), Seattle, WA (March 2001).
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September 2018

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September 2018

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September 2018

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September 2018

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September 2018

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September 2018

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