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Education

Massachusetts Institute of Technology

Doctor of Philosophy, Electrical Engineering and Computer Science, June 1999
Thesis: Design of Low Power VLSI Systems Powered by Ambient Mechanical Vibration

Master of Engineering, Electrical Engineering and Computer Science, May 1994
Thesis: High Bandwidth Interchip Communication for Regular Networks

Bachelor of Science, Electrical Science and Engineering, May 1994

Experience

University of California, Davis, ECE Dept.

Professor July 2015—Present
Vice-Chair for Graduate Studies and July 2014—July 2017
Chair of the Graduate Program in Electrical and Computer Engineering
Associate Professor July 2008—July 2015
Assistant Professor July 2003—July 2008

Teaching and research in mixed-signal circuit design, VLSI, and embedded systems. Research interests include micropower systems, power electronics that convert ambient energy sources to electrical power for batteryless device operation, circuits and architectures for energy scalable signal processing of sensor data, sensor interfaces, and innovative multicore circuit and interconnect design.

Independent Consulting Oct 2002—June 2003

Consulted on low power design, hardware feasibility studies, high performance I/O design, and digital ASIC and mixed-signal circuit design for several small companies and startups including SiCortex, BlueD Technologies, OcuNET Devices, and SMaL Camera Technologies.

High Speed Solutions, an Intel Company June 1999—Oct 2002

Senior Member of Technical Staff

One of two principal contributors on an engineering staff of six who brought an early venture startup company from initiating engineering development to successful acquisition by Intel in thirteen months. Half of a two designer team responsible for innovative signaling and circuit design and implementation of a chip set for a prototype high performance memory system. Also responsible for initial electromagnetic simulation of a novel connector concept. The prototype achieved 1.6 Gbps/pair bandwidth across an 8 load multidrop bus while dissipating peak power of 40 mW/transceiver. Performed initial work to extend performance to 3.2 Gbps for 8 loads and 5 Gbps for point-to-point links. Also developed two new interconnect concepts to enable multidrop peer-to-peer communication.

Primary responsibilities included signaling theory, analysis, and design, circuit design, simulation, and custom layout, initial interconnect design and simulation, and post fabrication silicon testing. Further responsibilities involved intellectual property development, interaction with RF, mechanical, verification, and CAD engineers, test methodology development, documentation, support for technical marketing and product intercept planning, definition of R&D directions, and interviewing and training new hires.

MIT Microsystems Technology Laboratory Jan 1995—June 1999
Research Assistant
Investigated techniques for top to bottom implementation of signal processing systems which scavenge energy from vibration sources in their environment. Developed, modeled, and tested an electromagnetic vibration-to-electric energy converter based on a moving-coil transducer. Designed, implemented, and tested a custom low power DC-DC converter IC for regulating transducer output voltage based on desired load performance. Developed a detection/classification algorithm for estimating heart rate from a novel acoustic sensor's output. Designed, implemented, and tested a full custom 250K transistor low power DSP with innovative features for sensor signal processing as part of a system incorporating a MEMS vibration-to-electric energy converter and voltage regulator for energy scavenging operation of the heartbeat detection algorithm. Also designed and implemented a low power dynamic comparator incorporated in several group test chips.

MIT Department of EECS Fall 1998
Teaching Assistant, 6.374 Analysis and Design of Digital Integrated Circuits
Developed and graded problem sets, exams, labs, and design projects in addition to running one-on-one and small group tutorials.

Lockheed Sanders Corp. Summer 1997
Summer Intern
Developed and tested algorithms for detection and classification of signals for cardiac monitoring from a novel acoustic sensor.

MIT Artificial Intelligence Laboratory, Abacus Project Oct 1992—Jan 1995
Research Assistant
Designed circuits for high bandwidth interchip communication for a SIMD array.
Undergraduate Researcher
Designed and simulated the architecture of a microsequencing unit, memory controller, and i/o system for a large-scale SIMD multiprocessor. Contributed to architectural and VLSI circuit design and layout of a high performance processor chip.

IBM Thomas J. Watson Research Center, Communication Circuits Group Summer 1992
Summer Intern
Designed a low-latency phase recovery circuit that uses transition detection to accelerate initial tracking.

Skills

Programming Languages: Python, HSPICE, MATLAB, C, Verilog HDL, Skill, Scheme/Lisp
CAD: Cadence, Mentor Graphics

Grants

Department of Energy (DOE), "High Energy Physics Integrated Circuit Design Apprenticeship Program," $2,700,000, 2021-26, PI: M. Horowitz, **Co-PI: R. Amirtharajah**, S. Abbaszadeh, M. Garcia-Sciveres, A. Dragone

Lawrence Livermore National Laboratory, "Inspection Robot for Main Energy Supply Modules," $10,000, 2020-Present, **PI: R. Amirtharajah**

Intel, Inc., "Visual Analytics for Yield Estimation and Early Prediction of Red-Blotch Disease in Vineyards," $25,000, 2020-Present, **PI: R. Amirtharajah**, Co-PI: V. Akella

Google, Inc., "Powering Smart Jewelry Using an Energy Harvesting Necklace," $60,000, 2014-2020, **PI: R. Amirtharajah**

Texas Instruments, Inc., "Multi Phase with Flex Power Feature Using Hybrid LC Conversion at High Speed," $120,000, 2016-20, **PI: R. Amirtharajah**

Defense Advanced Research Projects Agency (DARPA), "Ultralow Power Microsystems via an Integrated Piezoelectric MEMS-CMOS Platform," $1,857,826, 2015-17, PI: D. Horsley, **Co-PI: R. Amirtharajah**, Z. Ding, X. Liu

Texas Instruments, Inc., "RF Energy Harvesting for Ultrasonic Presence Detection," $60,000, 2015-16, **PI: R. Amirtharajah**

Texas Instruments, Inc., "Energy Harvesting Research," $60,000, 2014-15, **PI: R. Amirtharajah**

Texas Instruments, Inc., "Optical Energy Harvesting and Conversion," $60,000, 2013-14, **PI: R. Amirtharajah**

Agilent, Inc., "Dielectric Relaxation Spectroscopy Viable Yeast Sensor for Food and Biofuel Processing", $43,149, 2014-2018, PI: A. Knoesen, Co-PIs: **R. Amirtharajah**, R. Boulton

UC Davis Center for Excellence in Teaching and Learning Undergraduate Instructional Improvement Program (UIIP), "Renewable Energy and Green Engineering Laboratory Projects for ENG 6: Engineering Problem Solving," $4,800, 2011-2013, **PI: R. Amirtharajah**

Rodgers Family Foundation, "T. J. Rodgers Graduate Fellowships in Electrical and Computer Engineering," $240,000, 2010-2018, PI: A. Knoesen, Co-PIs: **R. Amirtharajah**, D. Block, R. Boulton

Texas Instruments, Inc., "Integrated Solar Energy Harvesting," $60,000, 2012-2013, **PI: R. Amirtharajah**

The MathWorks, Inc., "Renewable Energy and Green Engineering Laboratory Projects for ENG 6: Engineering Problem Solving," $39,919, 2011-2013, **PI: R. Amirtharajah**, Co-PIs: R. Boulton, A. Knoesen, A. Scaglione

National Science Foundation GOALI Supplement to Award #0547113, "Energy Scalable Signal Processing for Energy Harvesting Microsystems," $25,000, 2011-2012, **PI: R. Amirtharajah**

National Science Foundation CAREER Award #0547113, "Energy Scalable Signal Processing for Energy Harvesting Microsystems," $400,000, 2006-2011, **PI: R. Amirtharajah**

Agilent Technologies Foundation, "Low Power Sigma Delta Narrowband and Wideband Digital Signal Processing on FPGAs," $25,000, 2009-2010, **PI: R. Amirtharajah**

Intel, "The Capstone of the Curriculum: Improving Senior Design Projects at UC Davis ECE Department," $30,000, 2010, PI: S. Ghiasi, Co-PIs: **R. Amirtharajah**, A. Knoesen, S. Lewis

Focus Center Research Program Interconnect Focus Center, "Modulated Low Power Interconnect for Energy Harvesting Sensors; Circuits and Architectures for Exploiting Silicon Nanowire Interconnect," $332,513, 2005-2009, **PI: R. Amirtharajah**

UC Center for Information Technology Research in the Interest of Society (CITRIS), "Energy Harvesting for Biomedical Devices and Health Care Intelligent Infrastructure," $75,000, 2007-2009, **PI: R. Amirtharajah**, Co-PIs: P. Wright, J. Stewart

UC Center for Information Technology Research in the Interest of Society (CITRIS), "Ultra-high Performance Low Power, and Ubiquitous Data Centers on a Chip," $75,000, 2007-2009, PI: S.-J. . Yoo, Co-PIs: V. Akella, **R. Amirtharajah**, B. Baas, V. Carey, S. Ghiasi, S. Islam, J. Brunberg

Nokia, "Repurposing Mobile Phones for Surveillance Applications," $9,000, 2007-2008, PI: F. Chong, Co-PIs: V. Akella, **R. Amirtharajah**

Xilinx University Program, "Energy Scalable Distributed Arithmetic on FPGAs," $10,000 (software + equipment), 2004, **PI: R. Amirtharajah**

University of California, Davis - New Faculty Research Grant, "Energy Scalable Reconfigurable Logic for Energy Scavenging Microsystems," $2,500, 2004-2005, **PI: R. Amirtharajah**

Journal Publications

N. M. Ellis and R. Amirtharajah, "Large Signal Analysis on Variations of the Hybridized Dickson Switched-Capacitor Converter," *IEEE Transactions on Power Electronics*, 2022, doi: 10.1109/TPEL.2022.3193985.

N. Shrake, R. Amirtharajah, C. Brenneman, R. Boulton, and A. Knoesen. "In-line Measurement of Color and Total Phenolics During Red Wine Fermentations Using a Light-Emitting Diode Sensor," *American Journal of Enology and Viticulture*, 65(4): 463-470.

F. Maker, R. Amirtharajah, and V. Akella, "Runtime Adaptation of Applications Using Design of Experiments: A Smartphone-Based Case Study," *IEEE Embedded Systems Letters*, Vol. 6, Number 2, June 2014, pp. 25-8.

T. Zink, F. Maker, R. Geyer, R. Amirtharajah, and V. Akella, "Comparative Life Cycle Assessment of Smartphone Reuse: Repurposing vs. Refurbishment," *International Journal of Life Cycle Assessment*, Vol. 19, Number 5, May 2014, pp. 1099-1109.

K. Shaik, T. Kleeburg, and R. Amirtharajah, "Ultralow-Power Optical CDR for Integrated Photovoltaic Energy-Harvesting Sensors," *IEEE Transactions on Circuits and Systems - II: Express Briefs*, Vol. 60, No. 12, Dec. 2013, pp. 832-6.

F. Maker, R. Amirtharajah, and V. Akella, "MELOADES: Methodology for Long-Term Online Adaptation Embedded Software for Heterogeneous Devices," *Journal of Systems Architecture*, Vol. 59, Issue 8, September 2013, pp. 643-55.

E. Fong, N. Guilar, T. Kleeburg, H. Pham, D. Yankelevich, and R. Amirtharajah, "Integrated Energy-Harvesting Photodiodes With Diffractive Storage Capacitance," *IEEE Transactions on VLSI Systems*, Vol. 21, No. 3, March 2013, pp. 486-97.

J. Wenck, J. Collier, J. Siebert, and R. Amirtharajah, "Scaling Self-Timed Systems Powered by Mechanical Vibration Energy Harvesting," *ACM Journal of Emerging Technologies in Computing Systems*, Vol. 6, No. 2, Article 5, June 2010, pp. 5:1-24.

L. Zhou, S. Djordjevic, R. Proietti, D. Ding, S. Yoo, R. Amirtharajah, and V. Akella, "Design and Evaluation of an Arbitration-Free Passive Optical Crossbar for On-Chip Interconnection Networks," *Applied Physics A*, Vol. 95, No. 4, June 2009, pp. 1111-8.

N. Guilar, A. Chen, T. Kleeburg, D. Yankelevich, and R. Amirtharajah, "Integrated Solar Energy Harvesting and Storage," *IEEE Transactions on VLSI Systems*, Vol. 17, No. 5, May 2009, pp. 627-37.

N. Guilar, R. Amirtharajah and P. Hurst, "A Full-Wave Rectifier With Integrated Peak Selection for Multiple Electrode Piezoelectric Energy Harvesters," *IEEE Journal of Solid-State Circuits*, Vol. 44, No. 1, Jan. 2009, pp. 240-6.

R. Amirtharajah, A. Chen, J. Loo and N. Guilar,"Nanomaterial Resistive Sensors: Noise, Power, and Circuit Interfaces," *International Journal of Nanotechnology*, Vol. 5, Nos. 4/5, 2008, pp. 497-518.

J. Oliver, R. Amirtharajah, V. Akella, R. Geyer, and F. Chong,"Life Cycle Aware Computing: Reusing Silicon Technology," *IEEE Computer*, Vol. 40, No. 12, Dec. 2007, pp. 56-61.

R. Rao, J. Wenck, D. Franklin, R. Amirtharajah, and V. Akella, "Exploiting Non-Uniform Memory Access Patterns Through Bitline Segmentation," *ACM SIGMICRO Newsletter*, Vol. 24, No. 1, 2006, [online], available: http://sigmicro-online.org/papers24_1/6.pdf.

R. Amirtharajah, J. Collier, J. Siebert, B. Zhou and, A. Chandrakasan, "DSPs for Energy Harvesting Sensors: Applications and Architectures," *IEEE Pervasive Computing Magazine*,

Vol. 4, Issue 3, July-Sep. 2005, pp. 72-9.

D. D. Thaker, R. Amirtharajah, F. Impens, I. L. Chuang and, F. T. Chong, "Recursive TMR: Scaling Fault Tolerance in the Nanoscale Era," *IEEE Design & Test of Computers*, Vol. 22, Issue 4, July-Aug. 2005, pp. 298-305.

R. Amirtharajah and A. Chandrakasan, "A Micropower Programmable DSP Using Approximate Signal Processing Based on Distributed Arithmetic," *IEEE Journal of Solid-State Circuits*, Vol. 39, No. 2, Feb. 2004, pp. 337-47.

J. R. Benham, R. Amirtharajah, J. Critchlow, T. Simon, and T. F. Knight, Jr., "An Alignment Insensitive Separable Electromagnetic Coupler for High Speed Digital Multidrop Bus Applications," *IEEE Transactions on Microwave Theory and Techniques*, Vol. 51, No. 12, Dec. 2003, pp. 2597-2603.

S. Meninger, J.-O. Mur-Miranda, R. Amirtharajah, A. Chandrakasan, and J. Lang, "Vibration-to-Electric Energy Conversion," *IEEE Transactions on VLSI Systems*, Vol. 9, No. 1, Feb. 2001, pp. 64-76.

A. Dancy, R. Amirtharajah, and A. Chandrakasan, "High-Efficiency Multiple-Output DC-DC Conversion for Low-Voltage Systems," *IEEE Transactions on VLSI Systems*, Vol. 8, No. 3, June 2000, pp. 252-63.

R. Amirtharajah and A. Chandrakasan, "Self-Powered Signal Processing Using Vibration-Based Power Generation," *IEEE Journal of Solid-State Circuits*, Vol. 33, No. 5, May 1998, pp. 687-695.

Conferences

N. M. Ellis and R. Amirtharajah, "A Resonant Dual Extended LC-tank Dickson Converter with 50% Two-Phase Operation at Odd Conversion Ratios," *2021 IEEE Applied Power Electronics Conference and Exposition (APEC)*, 2021, pp. 1282-1287, doi: 10.1109/APEC42165.2021.9487216.

S. Nguyen, C. Duong and R. Amirtharajah, "A Smart Health Tracking Ring Powered by Wireless Power Transfer," *2021 IEEE Wireless Power Transfer Conference (WPTC)*, 2021, pp. 1-4, doi: 10.1109/WPTC51349.2021.9458174.

S. H. Nguyen, H. Richardson and R. Amirtharajah, "A Bias-Flip Interface and Dual-Input DC-DC Converter for Piezoelectric and RF Energy Harvesting," *2021 IEEE International Symposium on Circuits and Systems (ISCAS)*, 2021, pp. 1-5. **Best Student Paper Award**

N. Ellis and R. Amirtharajah, "A Resonant 1:5 Cockcroft-Walton Converter Utilizing GaN FET Switches with N-Phase and Split-Phase Clocking," *2020 IEEE Applied Power Electronics Conference and Exposition (APEC 2020)*, New Orleans, LA, USA, 2020, pp. 19-25.

N. Ellis and R. Amirtharajah, "A Resonant Cockcroft-Walton Switched-Capacitor Converter Achieving Full ZCS and > 10 kW/inch^3 Power Density," *2019 IEEE Energy Conversion Congress and Exposition (ECCE 2019)* , Baltimore, MD, USA, 2019, pp. 4378-4384.

N. Martin and R. Amirtharajah, "Improving SNDR and SFDR in Capacitive DACs Using Match Enhancement," *2019 IEEE International Symposium on Circuits and Systems (ISCAS 2019)*, Sapporo, Japan, 2019, pp. 1-5.

S. Nguyen, K. Yuk, R. Amirtharajah and G. R. Branner, "Radiation Patterns of an RF Energy Harvesting Necklace on Human Body Phantom," *2018 IEEE International Symposium on Antennas and Propagation & USNC/URSI National Radio Science Meeting*, Boston, MA, 2018, pp. 2551-2552.

S. Nguyen and R. Amirtharajah, "A Hybrid RF and Vibration Energy Harvester for Wearable Devices," *2018 IEEE Applied Power Electronics Conference and Exposition (APEC 2018)*, San Antonio, TX, 2018, pp. 1060-1064.

S. Nguyen, K. Yuk and R. Amirtharajah, "Pulse Skipping Modulation Method for Mul-

tiple Input Buck Boost Converter," *2018 IEEE 19th Wireless and Microwave Technology Conference (WAMICON 2018)*, Sand Key, FL, 2018, pp. 1-4.

K. Straube, C. Nitta, R. Amirtharajah, M. Farrens and V. Akella, "Improving Execution Time of Parallel Programs on Large Scale Chip Multiprocessors with Constant Average Power Processing," *2017 IEEE International Conference on Computer Design (ICCD)*, Boston, MA, 2017, pp. 649-652.

J. Segovia-Fernandez, S. Sonmezoglu, S. Block, Y. Kusano, J. Tsai, R. Amirtharajah, and D. Horsley, "Monolithic Piezoelectric Aluminum Nitride MEMS-CMOS Microphone," *2017 19th International Conference on Solid-State Sensors, Actuators and Microsystems (TRANSDUCERS 2017)*, Kaohsiung, 2017, pp. 414-417.

S. Sonmezoglu, J. Segovia-Fernandez, S. Block, Y. Kusano, J. Tsai, R. Amirtharajah, and D. Horsley, "Passive Signal Amplification via Series-Piezoelectric Read-Out," *2017 19th International Conference on Solid-State Sensors, Actuators and Microsystems (TRANSDUCERS 2017)*, Kaohsiung, 2017, pp. 155-158.

Y. Kusano, J. Segovia-Fernandez, S. Sonmezoglu, R. Amirtharajah, and D. Horsley, "Frequency Selective MEMS Microphone Based on a Bioinspired Spiral-Shaped Acoustic Resonator," *2017 19th International Conference on Solid-State Sensors, Actuators and Microsystems (TRANSDUCERS 2017)*, Kaohsiung, 2017, pp. 71-74.

S. Block, X. Jiang, B. Harris, C. Cui, J. Segovia-Fernandez, R. Amirtharajah, D. Horsley, H. Rashtian, and X. Liu, "A 170 nW CMOS Wake-Up Receiver with -60 dBm Sensitivity Using AlN High-Q Piezoelectric Resonators," *2017 IEEE International Symposium on Circuits and Systems (ISCAS 2017)*, Baltimore, MD, 2017, pp. 1-4.

S. Nguyen, N. Ellis, and R. Amirtharajah, "Powering Smart Jewelry Using an RF Energy Harvesting Necklace," *2016 IEEE MTT-S International Microwave Symposium (IMS 2016)*, San Francisco, CA, 2016, pp. 1-4.

O. Rozen, S. Block, X. Mo, W. Bland, P. Hurst, J. Tsai, M. Daneman, R. Amirtharajah, and D. Horsley, "Monolithic MEMS-CMOS Ultrasonic Rangefinder Based on Dual-Electrode PMUTs," *2016 IEEE 29th International Conference on Micro Electro Mechanical Systems (MEMS 2016)*, Shanghai, 2016, pp. 115-118.

A. Edgcomb, F. Vahid, R. Lysecky, A. Knoesen, R. Amirtharajah, and M.L. Dorf, "Student Performance Improvement Using Interactive Textbooks: A Three-University Cross-Semester Analysis," *Proceedings of 122nd ASEE Annual Conference and Exposition, June 2015*, 16 pages.

H. Zhang, R. Amirtharajah, C. Nitta, M. Farrens, and V. Akella, "Burst Mode Processing: An Architectural Framework for Improving Performance in Future Chip Multiprocessors," *ACM Workshop on Managing Overprovisioned Systems (W-MOS 2014) at 19th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS 2014)*, 1 March 2014.

S. Hsu, E. Fong, V. Jain, T. Kleeburg, and R. Amirtharajah, "Switched-Capacitor Boost Converter Design and Modeling for Indoor Optical Energy Harvesting with Integrated Photodiodes," *ACM/IEEE 2013 International Symposium on Low Power Electronics and Design (ISLPED 2013)*, September 2013, pp. 169-74.

F. Maker, R. Amirtharajah, and V. Akella, "Update Rate Tradeoffs for Improving Online Power Modeling in Smartphones," *ACM/IEEE 2013 International Symposium on Low Power Electronics and Design (ISLPED 2013)*, September 2013, pp. 114-9.

C. Freed, R. Amirtharajah, R. Boulton, D. Block, C. Brenneman, and A. Knoesen, "Inline Dielectric Sensor for Real-Time Monitoring of Yeast Growth in White Wine Fermentation," *64th American Society for Enology and Viticulture (ASEV) National Conference*, 24-28 June 2013.

N. Shrake, R. Amirtharajah, R. Boulton, C. Brenneman, and A. Knoesen, "Inline Multispectral Colorimeter for Real-Time Color and Total Phenolic Analysis During Red Wine Fermentations," *64th American Society for Enology and Viticulture (ASEV) National Conference*, 24-28 June 2013.

S. Hsu, R. Amirtharajah, and A. Knoesen, "Lab and Team Project Development for Engineering Problem Solving using MATLAB, with Emphasis on Solar Power and Engineering for Sustainability," *120th ASEE Annual Conference and Exposition (ASEE 2013)*, 23-26 June 2013, pp. 1-14.

P. Mejia, R. Amirtharajah, M. Farrens, and V. Akella, "Performance Evaluation of a Multicore System with Optically Connected Memory Modules," *ACM/IEEE 2010 International Symposium on Networks-on-Chip (NOCS 2010)*, 3-6 May 2010, pp. 215-22.

T. Kleeburg, J. Loo, N. Guilar, E. Fong, and R. Amirtharajah, "Ultra-Low-Voltage Circuits for Sensor Applications Powered by Free-Space Optics," *2010 IEEE Int'l. Solid-State Circuits Conference Digest of Technical Papers (ISSCC 2010)*, 7-11 Feb. 2010, pp. 502-3, 503a.

M. Scott and R. Amirtharajah, "Pulse Width Modulation for Reduced Peak Power Full-Swing On-Chip Interconnect," *ACM/IEEE 2009 International Symposium on Low Power Electronics and Design (ISLPED 2009)*, 19-21 August 2009, pp. 213-8.

R. Amirtharajah, J. Wenck, and N. Guilar "Energy Harvesting and Limits of Low Power Mixed-Signal Circuit Design," *IEEE 2009 International Symposium on Circuits and Systems (ISCAS 2009)*, 24-29 May 2009, pp. 1425-8.

N. Guilar, R. Amirtharajah, P. Hurst, and S. Lewis, "An Energy-Aware Multiple-Input Power Supply with Charge Recovery for Energy Harvesting Applications," *2009 IEEE Int'l. Solid-State Circuits Conference Digest of Technical Papers (ISSCC 2009)*, 8-12 Feb. 2009, pp. 298-9, 299a.

S. Yoo, V. Akella, R. Amirtharajah, B. Baas, K. Bergman, S. Fan, J. Harris, M. Lipson, D. Miller, and J. Shalf, "Balanced Computing with Nanophotonic Interconnects," *21st Annual Meeting of the IEEE Lasers and Electro-Optics Society (LEOS 2008)*, 9-13 Nov. 2008, pp. 368-9.

A. Hadke, T. Benavides, R. Amirtharajah, M. Farrens, and V. Akella, "Design and Evaluation of an Optical CPU-DRAM Interconnect," *2008 IEEE Int'l. Conference on Computer Design (ICCD 08)*, 12-5 Oct. 2008, pp. 492-7.

A. Hadke, T. Benavides, S. Yoo, R. Amirtharajah, and V. Akella, "OCDIMM: Scaling the DRAM Memory Wall Using WDM Based Optical Interconnects," *16th IEEE Symposium on High Performance Interconnects (HOTI 08)*, 26-8 Aug. 2008, pp. 57-63.

N. Guilar, E. Fong, T. Kleeburg, D. Yankelevich, and R. Amirtharajah, "Energy Harvesting Photodiodes with Integrated 2D Diffractive Storage Capacitance," *ACM/IEEE 2008 International Symposium on Low Power Electronics and Design (ISLPED 2008)*, 11-3 Aug. 2008, pp. 63-8.

J. Oliver, R. Amirtharajah, V. Akella, and F. Chong, "Credit-Based Dynamic Reliability Management Using Online Wearout Detection," *Proceedings of the 5th ACM Conference on Computing Frontiers (CF '08)*, 5-7 May 2008, pp. 139-47.

N. Guilar, P. Hurst, R. Amirtharajah, D. Margolis, and D. Horsley, "Interface Circuits for Multiphase Piezoelectric Energy Harvesters," *23rd Annual IEEE Applied Power Electronics Conference and Exposition (APEC 08)*, 24-8 Feb. 2008, pp. 639-44.

N. Guilar, R. Amirtharajah, and P. Hurst, "A Full-Wave Rectifier for Interfacing with Multi-Phase Piezoelectric Energy Harvesters," *2008 IEEE Int'l. Solid-State Circuits Conference Digest of Technical Papers (ISSCC 2008)*, 3-7 Feb. 2008, pp. 302-3, 615.

R. Geyer, J. Oliver, R. Amirtharajah, V. Akella, and F. T. Chong, "Microchip Reuse: Environmental Rationale and Design Implications," *3rd International Conference on Life Cycle Management (LCM 2007)*, 27-29 August 2007.

J. Wenck, J. Collier, J. Siebert, and R. Amirtharajah, "AC Power Supply Circuits for Energy Harvesting," *2007 Symposium on VLSI Circuits (VLSI 2007)*, 14-16 June 2007, pp. 92-3.

N. Guilar, P. Hurst, and R. Amirtharajah, "Analysis of DC-DC Conversion for Energy Harvesting Systems Using a Mixed-Signal Sliding-Mode Controller," *38th IEEE Power Electronics Specialists Conference (PESC 07)*, 17-21 June 2007, pp. 2620-5.

L. Guo, M. Scott, and R. Amirtharajah, "An Energy Scalable Functional Unit for Sensor Signal Processing," *IEEE 2007 International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, 15-20 April 2007, Vol. II, pp. 73-6.

R. Rao, J. Wenck, D. Franklin, R. Amirtharajah, and V. Akella, "Segmented Bitline Cache: Exploiting Non-Uniform Memory Access Patterns," *13th IEEE International Conference on High Performance Computing (HiPC 2006)*, 18-21 December 2006, pp. 123-34.

J. Oliver, R. Amirtharajah, R. Geyer and F. T. Chong, "Life-Cycle Aware Computer Architecture: Reusing Silicon in the Technology Food Chain," *ACM 12th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS 2006) Wild and Crazy Ideas (WACI-4)*, 24-26 October 2006.

N. Guilar, A. Chen, T. Kleeburg, and R. Amirtharajah, "Integrated Solar Energy Harvesting and Storage," *ACM/IEEE 2006 International Symposium on Low Power Electronics and Design (ISLPED 2006)*, 4-6 October 2006, pp. 20-4.

L. Guo, M. Scott, and R. Amirtharajah, "An Energy Scalable Computational Array for Sensor Signal Processing," *IEEE 2006 Custom Integrated Circuits Conference (CICC)*, 10-13 September 2006, pp. 317-20.

R. Amirtharajah, J. Collier, J. Siebert, J. Wenck, and B. Zhou, "Circuits for Energy Harvesting Sensor Signal Processing" (invited) *2006 43rd ACM/IEEE Design Automation Conference*, 24-28 July 2006, pp. 639-44.

R. Amirtharajah, "An Energy Scalable Computational Array for Sensor Signal Processing" (invited) *2006 ISSCC Special Topic Session on Power-Aware Signal Processing*, 5 February 2006.

R. Rao, J. Wenck, D. Franklin, R. Amirtharajah, and V. Akella, "Exploiting Non-Uniform Memory Access Patterns Through Bitline Segmentation," *4th Workshop on Memory Performance Issues (WMPI-2006)*, 11 February, 2006.

R. Amirtharajah, A. Chen, D. Thaker, and F. T. Chong, "Circuit Interfaces and Optimization for Resistive Nanosensors," (invited) *Proc. of SPIE, Vol. 6008: Nanosensing: Materials and Devices II*, 23-26 October 2005, pp. 60080J1-15.

J. Siebert, J. Collier, and R. Amirtharajah, "Self-Timed Circuits for Energy Harvesting AC Power Supplies," *ACM/IEEE 2005 International Symposium on Low Power Electronics and Design (ISLPED 2005)*, August 2005, pp. 315-8.

R. Amirtharajah, "Micropower ICs for Energy Scavenging and Sensor Signal Processing," (invited) *IEEE 2005 Vail Computer Elements Workshop*, 26-29 June 2005.

D. D. Thaker, A. Chen, R. Amirtharajah, and F. T. Chong, "On Designing Self-Calibrating Nanoscale Sensors that Adaptively Invest Power for Accuracy," *Proc. of IEEE International Workshop on Design and Test of Defect-Tolerant Nanoscale Architectures (NANOARCH'05)*, May 2005, pp. 4.9-4.17.

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Professional

IEEE Solid-State Circuits Society

IEEE Computer Society

IEEE Microwave Theory and Techniques Society

Sigma Xi, The Scientific Research Society

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Book Proposal Reviewer for Cambridge University Press

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Book Reviewer for NTS Press

Paper Reviewer for IEEE *Spectrum*

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Paper Reviewer for *Pervasive and Mobile Computing*

Reviewer for 12th IEEE International Symposium on High-Performance Computer Architecture (HPCA-12), 2006

Reviewer for 17th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA 2005)

Technical Program Committee for 2004 Great Lakes Symposium on VLSI

Technical Program Committee for International Solid-State Circuits Conference (ISSCC), 2005-2009

Technical Program Committee for International Symposium on Low Power Electronics and Design (ISLPED), 2012

Technical Program Committee for Custom Integrated Circuits Conference (CICC), 2007-2014 (Member), Power Electronics Subcommittee Chair, 2011-2015

Technical Program Committee for Hot Chips Conference, 2006 (Member), 2007 and 2015 (Co-Chair)

Awards & Honors

National Science Foundation Graduate Fellowship 1994-1997

National Science Foundation CAREER Award 2006-2011

Lockheed-Martin Teaching Award for Assistant Professor 2008

Electrical and Computer Engineering Graduate Student Association Award for Graduate Teaching and Mentorship 2010

American Society for Enology and Viticulture Best Paper Award in Enology 2014

John A. Curtis Lecture Award for Best Paper in Computers in Education at 2015 American Society for Engineering Education (ASEE) Conference

American Association for the Advancement of Science (AAAS) Fellow 2020

IEEE Senior Member 2020

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Available upon request.