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Engineering Foundation Professor
Chandra Family Dept. of Electrical and
Computer Engineering
The University of Texas at Austin

Research Objectives

Our research group has had a long track record of impactful research in signal processing for communication and image/video systems. Currently, our research group focuses on signal processing for 5G/6G physical layer communication systems to increase data throughput and reliability. To achieve this, we develop mathematical models, fast algorithms, system simulations, and prototype implementations. We use simulations and prototypes to quantify communication performance vs. run-time implementation complexity tradeoffs to identify practical algorithms.

Education

- *Georgia Institute of Technology*, Atlanta, GA.
Doctor of Philosophy in Electrical Engineering, Sep. 1993.
Dissertation title: *A Knowledge-Based Environment for the Design and Analysis of Multidimensional Multirate Signal Processing Algorithms*.
- *Georgia Institute of Technology*, Atlanta, GA.
Master of Science in Electrical Engineering, Dec. 1988.
- *Rose-Hulman Institute of Technology*, Terre Haute, IN.
Double Major in Electrical Engineering and Computer Science, May 1987.

Current Projects

- Wireless Communication Systems
 - Machine Learning for 5G+ Cellular Communication Systems: developed deep reinforcement learning algorithms for downlink cellular communications for (1) joint beamforming, power control and interference coordination; (2) multicell basestation coordination; and (3) switching between sub-6 GHz bands and 5G millimeter wave bands.
 - Massive Multi-Antenna Systems for 5G+ Millimeter Wave Communications: derived mixed analog/digital signal processing methods to improve communication performance in energy-efficient hybrid analog/digital beamforming architectures: (1) uplink direction – adaptive ADC quantization, antenna selection, user selection, and coordinated multipoint when the system has low-resolution analog-to-digital converters (ADCs) (2) downlink direction – channel estimation and beam detection when the system has low-resolution and high-resolution data converters
 - Other ideas on the 6G cellular communications roadmap– adaptive algorithms and reinforcement learning for (1) reconfigurable intelligence surfaces, and (2) full duplex transmission.

Completed Projects

- Wireless Communication Systems

- Interference-aware communication system design: modeled interference in heterogeneous wireless networks, and mitigated interference using physical and medium access control (MAC) layer methods, for sensor, Wi-Fi and cellular networks.
- Multiuser OFDM resource allocation: derived linear complexity algorithms for allocation of user subcarrier frequencies and power to maximize continuous and discrete bit rates (esp. for Wimax and cellular systems) that are suitable for implementation in fixed-point arithmetic.
- Wired Communication Systems
 - Multicarrier equalization for ADSL: developed two approaches that are amenable for implementation in fixed-point arithmetic in ADSL transceivers: (1) equalizer training method realizable in software, and (2) dual-path equalizer structure in hardware, to increase achievable bit rates by 100% and by 120%, respectively, over conventional designs.
 - Two-transmitter two-receiver ADSL testbed: evaluated tradeoffs in communication performance vs. run-time complexity for algorithms for peak-to-average power reduction, echo cancellation, bit allocation, equalization, and crosstalk cancellation, and prototyped a fielded two-transmitter two-receiver system that doubles the bit rate vs. a single-transmitter single-receiver system.
 - Smart grid communications: derived transmitter/receiver algorithms to improve bit rates/reliability and built real-time testbeds to refine and validate algorithms: (1) mitigating non-Gaussian powerline interference, and (2) joint wireless/powerline transmission of the same data.
- Image and Video Processing Systems
 - Image acquisition: improving photographic composition.
 - Image hashing: fast indexing for image retrieval and image authentication.
 - Image and video display: image printing, and video display on bistable screens.
 - Video acquisition: reducing rolling shutter artifact in handheld cameras.
- Electronic Design Automation Tools
 - Models of computation for streaming data: developed scalable software framework for achieving high performance through concurrent and distributed processing.
 - Low power design: automated transformations of digital signal processing implementations from floating-point to fixed-point arithmetic and data types.

Academic Positions

- *Professor, Dept. of ECE, The University of Texas, Austin, TX, 9/05–present*

Research communications (2005–present) and image processing systems (2005–2017). Improve connection speeds for Wi-Fi, cellular and smart grid communication systems by mitigating interference. Investigate large sensor arrays to improve cellular and underwater communications. Improve visual quality when acquiring video on a smart phone by mitigating rolling shutter artifacts. Assess visual quality in computer graphics and high-dynamic range (HDR) images. Prototype ideas in testbeds.

For 5G/6G cellular communication systems, developed

- Machine Learning for 5G+ Cellular Communication Systems: developed deep reinforcement learning algorithms for downlink cellular communications for (1) joint beamforming, power control and interference coordination; (2) multicell basestation coordination; and (3) switching between sub-6 GHz bands and 5G millimeter wave bands.

- Massive Multi-Antenna Systems for 5G+ Millimeter Wave Communications: derived mixed analog/digital signal processing methods to improve communication performance in energy-efficient hybrid analog/digital beamforming architectures: (1) uplink direction – adaptive ADC quantization, antenna selection, user selection, and coordinated multipoint when the system has low-resolution analog-to-digital converters (ADCs) (2) downlink direction – channel estimation and beam detection when the system has low-resolution and high-resolution data converters
- Other ideas on the 6G cellular communications roadmap– adaptive algorithms and reinforcement learning for (1) reconfigurable intelligence surfaces, and (2) full duplex transmission.

In other communication systems, developed

- algorithms for optimal linear complexity resource allocation for orthogonal frequency division multiple access basestations (with applications to WiMax and LTE cellular communications)
- algorithms for adaptive doubly-selective channel prediction with linear complexity for multicarrier communication systems (with applications to underwater acoustic communications)
- algorithms for impulse noise modeling and mitigation in wired and wireless receivers (with applications to Wi-Fi, powerline and other communications over unlicensed bands)
- real-time testbeds for multichannel multicarrier wired communications (MIMO ADSL)
- real-time testbeds for smart grid communications (with applications to G3, PRIME, IEEE 1901.2, IEEE 802.11ac and IEEE 802.15.4g standards)
- real-time testbeds for multichannel underwater acoustic communication systems for divers.

In image processing systems, developed

- algorithms for removing rolling shutter artifacts during video acquisition by fusing inertial measurements with video analysis
- algorithms for showing images/video on micromirror displays with improved visual quality, and
- algorithms for high-resolution three-dimensional sonar beamforming and their mapping onto real-time high-performance computer architectures

Graduated 19 Ph.D. students and 7 MS report students in rank of Professor, for a total of 32 Ph.D. and 13 MS report graduates in faculty career.

Direct the Embedded Signal Processing Laboratory, which is part of the 6G@UT Research Center, Wireless Networking and Communications Group, and Center for Perceptual Systems.

Provided open courseware for spring 2014 EE 445S Real-Time Digital Signal Processing Laboratory course to facilitate self-study on the topic. Open courseware includes (1) YouTube videos of lectures, (2) lecture slides and handouts, (3) homework assignments and solutions, (4) laboratory recitation slides and assignments, and (5) current and previous midterm exams with solutions. Discussions of midterm #1 and homework solutions are on YouTube. 74,410 YouTube views as of Sep. 24, 2023.

Below are the courses taught by Prof. Evans since Fall 2009 along with the overall instructor ratings from the student course instructor surveys on a scale of 1–5 with '5' being the most favorable. UT Austin changed its course instructor survey format after Summer 2022 and change its reporting of the average Overall Instructor Rating from two to three significant digits.

Semester	Undergraduate Course	Level ##	Rating &&	Enrolled	Responses
Spring 2024	ECE445S Real-Time DSP Lab	mezzanine	5.00	45	22
Fall 2023	ECE445S Real-Time DSP Lab	mezzanine	4.90	33	30
Fall 2023	ECE313 Linear Systems & Signals	required	4.73	48	40
Spring 2023	EE445S Real-Time DSP Lab	mezzanine	4.78	44	37
Fall 2022	EE445S Real-Time DSP Lab	mezzanine	4.81	29	27
Spring 2022	EE445S Real-Time DSP Lab	required	4.7	32	24
Fall 2021	EE313 Linear Systems & Signals	required	4.8	32	12
Fall 2021	EE445S Real-Time DSP Lab	mezzanine	4.7	31	22
Spring 2021	EE445S Real-Time DSP Lab	mezzanine	4.8	34	19
Fall 2020	EE445S Real-Time DSP Lab	mezzanine	5.0	23	10
Spring 2020	EE445S Real-Time DSP Lab	mezzanine	** 5.0	30	13
Fall 2019	EE445S Real-Time DSP Lab	mezzanine	4.8	28	25
Spring 2019	EE445S Real-Time DSP Lab	mezzanine	4.9	28	18
Fall 2018	EE445S Real-Time DSP Lab	mezzanine	4.6	37	27
Fall 2018	EE313 Linear Systems & Signals	required	4.5	72	53
Spring 2018	EE445S Real-Time DSP Lab	mezzanine	5.0	24	17
Fall 2017	EE445S Real-Time DSP Lab	mezzanine	4.5	43	31
Fall 2017	EE313 Linear Systems & Signals	required	4.6	59	42
Spr 2017	EE445S Real-Time DSP Lab	mezzanine	4.9	37	32
Fall 2016	EE445S Real-Time DSP Lab	mezzanine	4.7	47	34
Spr 2016	EE445S Real-Time DSP Lab	mezzanine	4.8	52	34
Fall 2015	EE445S Real-Time DSP Lab	mezzanine	4.6	37	28
Spr 2015	EE445S Real-Time DSP Lab	mezzanine	4.4	46	32
Fall 2014	EE445S Real-Time DSP Lab	mezzanine	4.7	49	31
Spr 2014	EE445S Real-Time DSP Lab	mezzanine	4.8	43	21
Fall 2013	EE445S Real-Time DSP Lab	mezzanine	4.9	34	24
Spr 2013	EE445S Real-Time DSP Lab	mezzanine	4.8	29	25
Fall 2012	EE445S Real-Time DSP Lab	mezzanine	4.6	47	34
Spr 2012	EE445S Real-Time DSP Lab	mezzanine	4.7	53	35
Fall 2011	EE445S Real-Time DSP Lab	mezzanine	4.3	53	40
Spr 2011	EE445S Real-Time DSP Lab	mezzanine	4.6	42	32
Fall 2010	EE445S Real-Time DSP Lab	mezzanine	4.6	58	46
Fall 2010	EE313 Linear Systems & Signals	required	4.1	37	30
Spr 2010	EE345S Real-Time DSP Lab	elective	4.6	51	40
Fall 2009	EE345S Real-Time DSP Lab	elective	4.4	54	40

A mezzanine course is required by at least one undergraduate specialization; a required course is required for the BS ECE degree; and an elective is neither mezzanine nor required. The middle digit in the course number indicates the level of the course: 0 first-year undergraduate, 1 second-year undergraduate, 2–7 third- and fourth-year undergraduate, and 8–9 graduate.

&& Average “overall instructor ratings” among all undergraduate ECE courses taught in a given semester across all instructors are given below (with the standard deviation in parenthesis): 3.94 in fall 2013 (0.68), 4.07 in spring 2014 (0.62), 4.19 in fall 2014 (0.42), 4.18 in spring 2015 (0.54), 4.03 in fall 2015 (0.57), 4.14 in spring 2016 (0.58), 4.13 in fall 2016 (0.59) 4.10 in spring 2017 (0.60), 4.12 in fall 2017 (0.55), 4.22 in spring 2018 (0.55), 4.19 in fall 2018 (0.53), and 4.30 in spring 2019 (0.43).

** These results were collected during the COVID-19 crisis, when in-person instruction was suddenly

replaced with online instruction in the middle of the semester. As such, they may not reflect student views of the instructor's usual teaching methods

Taught graduate courses *Multidimensional Digital Signal Processing* and *Embedded Software Systems*.

- *Associate Professor, Dept. of ECE, The University of Texas, Austin, TX, 9/00–8/05*

Developed research and education program in embedded signal and image processing systems, esp. in multicarrier wireless and wireline communication systems, and image acquisition and rendering systems. Also conducted research in perceptual image hashing and network tomography. Graduated 10 Ph.D. students and one MS report student in rank as an Associate Professor. Chaired first major undergraduate ECE curriculum reform to take place in more than two decades.

Researched the design and real-time implementation of ADSL transceivers. Developed off-line algorithms to design single, dual, and filterbank equalizers to reach the upper bound on achievable bit rate. Developed real-time on-line algorithms for single and dual path equalizers to achieve 95% of the matched filter bound. Released freely distributable ADSL transceiver design toolbox for Matlab.

Conducted research in the design and real-time implementation of desktop printer pipelines. Made major contributions in improving the visual quality of halftoning by error diffusion in printer pipelines for both grayscale and color images. Developed still image quality measures useful for evaluating and optimizing halftoning methods. Integrated visual quality measures into the halftoning algorithms themselves. Released several versions of a image halftoning design toolbox for Matlab.

To support a research and education program in embedded signal and image processing systems, taught graduate courses *Multidimensional Digital Signal Processing* and *Embedded Software Systems* and undergraduate courses *Real-Time Digital Signal Processing Lab* and *Linear Systems and Signals*.

Directed the Embedded Signal Processing Laboratory, which is part of the Wireless Networking and Communications Group and Center for Perceptual Systems.

Offered and accepted Visiting Associate Professor positions at the American University of Beirut in summer 2005 and Cornell University in fall 2002.

- *Assistant Professor, Dept. of ECE, The University of Texas, Austin, TX, 9/96–8/00*

Developed a research and education program in embedded signal and image processing systems. Graduated three Ph.D. students and five MS report students. Introduced three new courses.

In research, developed theory, fast algorithms, embedded software, and design automation tools for signal processing, image processing, and communication systems. For communication systems, developed multicarrier equalizers and smart antennas. For signal processing systems, developed acoustic echo cancellers, dual-tone multi-frequency (touchtone) detectors, phase locked loops, and sonar beamformers. For image processing, developed image halftoning and quality assessment methods.

Taught *Linear Systems and Signals* (sophomore required course), which gives students a mathematical foundation for analyzing linear signal processing, communication, and control systems. Also, supervised senior design project students. Introduced three new courses:

- *Multidimensional Digital Signal Processing* (graduate course) presents theory, algorithms, and design tradeoffs in image, video, seismic, and tomographic processing;
- *Embedded Software Systems* (graduate course) introduces system-level design: dataflow, synchronous/reactive, and discrete-event models; cosimulation; software synthesis; and CAD tools.
- *Real-Time Digital Signal Processing Laboratory* (junior/senior elective) describes the design tradeoffs in mapping signal processing and communication algorithms onto programmable digital

signal processor architectures. In the lab component, students design, implement, and test a voiceband transceiver using digital signal processor boards and development tools.

Founded and directed the Embedded Signal Processing Laboratory, which was part of the Center for Telecommunications and Signal Processing Research and Center for Vision and Image Sciences.

- *Post-Doctoral Researcher, University of California, Berkeley, CA, 10/93–8/96*

Researched electronic design automation for signal processing and communication systems in Prof. Edward A. Lee's Ptolemy Project. Prototyped research ideas in the Ptolemy software environment, an electronic design automation tool for system specification, simulation, and synthesis, and in the Signal Processing Packages for Mathematica. Developed methods for designing two-dimensional rational decimators, rearranging operators in algorithms to optimize implementation, and optimizing pole-zero locations of analog filters. Developed seamless Ptolemy software environment interfaces to MATLAB for system simulation and numeric parameter calculations, and to Mathematica for system optimization and symbolic parameter calculations. (In 1998, the Ptolemy software environment was renamed Ptolemy Classic.) Helped develop a sophomore course *Introduction to Real-Time Digital Systems*. Wrote proposals, developed software, and directed student research.

- *Instructional Faculty, Dept. of EECS, University of California, Berkeley, CA, 1/95–5/95*

Taught senior undergraduate course entitled *Noise Analysis of Communication Systems*. Topics included signals, systems, transforms, analog modulation, probability, random processes, AM/FM noise analysis, sampling, quantization, pulse modulation, digital modulation, and digital noise analysis.

- *Teaching Assistant, School of EE, Georgia Institute of Technology, Atlanta, GA, 9/91–6/93*

Integrated symbolic algebra into signals and systems courses, and developed laboratories for *Algorithms in C*. Assisted in classes and laboratories on algorithms, C, MATLAB and signal processing. Won an Outstanding Teaching Assistant award.

- *Research Assistant, Georgia Institute of Technology, Atlanta, GA, 1/90–9/93*

Conducted doctoral research in formalizing simplification and rearrangement rules for multidimensional multirate systems and encoding the rules by computer.

- *Research Assistant, Georgia Tech Research Institute, Atlanta, GA, 6/89–12/89*

Wrote Fortran programs to automate testing for lead and asbestos content in samples. Helped port an expert system to NExpert that diagnosed coronary disease.

- *Research Assistant, Georgia Institute of Technology, Atlanta, GA, 1/89–6/89*

Coded a symbolic signal processing system in Lisp. Began a similar implementation in Mathematica.

- *Research Assistant, Georgia Tech Research Institute, Atlanta, GA, 9/87–12/88*

Applied pattern recognition and image processing to part identification using C and an image processing board. Developed an expert system for diagnosing problems in a computer network.

Other Professional Experience

- *C Programmer, Applied Computing Devices, Terre Haute, IN, 6/87–9/87*

Helped write and debug utility programs for managing telecommunications switching operations.

Honors and Awards

- 2024–2031 Engineering Foundation Professorship, Renewal, Cockrell School of Engineering, The University of Texas at Austin, which provides endowment funding to support research and teaching efforts
- 2021 Civitatis Award, The University of Texas at Austin, “in recognition of dedicated and meritorious service to the university above and beyond the regular expectations of teaching, research and service.” News Story.
- 2020 Texas Impact Award, Graduate Student Assembly. The University of Texas at Austin. Citation: “denoting exceptional service and commitment to students and the student body, dynamic vision, and significant action undertaken in support of the greater campus community at the University of Texas at Austin”
- 2019 Outstanding Professor Award, ECE Undergraduate Advisory Board, The University of Texas at Austin. Citation: “Selected by the students for a consistent display of care and excellence on and off the classroom”
- 2018 Excellence in Teaching Award from Second-Year ECE Students, ECE Undergraduate Advisory Board, The University of Texas at Austin (based on a survey of students who took second-year ECE courses in 2017-2018)
- 2017–2024 Engineering Foundation Professorship, Renewal, Cockrell School of Engineering, The University of Texas at Austin, which provides endowment funding to support research and teaching efforts
- 2015 Top 10% Paper Award, IEEE International Conference on Image Processing
- 2013 Best Paper Award, IEEE International Symposium on Power Line Communications and Its Applications
- 2012 Top 10% Paper Award, IEEE International Workshop on Multimedia Signal Processing
- 2012 Best Professor Award, HKN/IEEE Student Chapter, The University of Texas at Austin (awarded by UT Austin ECE students at the May 2012 ECE Graduation Banquet)
- 2012 Invited Paper “Cyclostationary Noise Mitigation in Narrowband Powerline Communications” in the *Proc. APSIPA Annual Summit and Conference* co-authored with J. Lin
- 2011 Texas Exes Teaching Award, The University of Texas at Austin (a university-wide teaching award given by students based on nominations by students)
- 2011 Invited Paper “Mitigating Near-Field Interference in Laptop Embedded Wireless Transceivers” in the *Journal of Signal Processing Systems* co-authored with M. Nassar, K. Gulati, M. R. DeYoung, and K. R. Tinsley.
- 2010 Invited Paper “Flicker Assessment of Low-to-Medium Frame-rate Binary Video Halftones”, in the *Proc. IEEE Southwest Symposium on Image Analysis and Interpretation*, co-authored with H. Rehman
- 2010–2017 Engineering Foundation Professorship, Cockrell School of Engineering, The University of Texas at Austin, which provides endowment funding to support research and teaching efforts
- 2009 IEEE Fellow award ”for contributions to multicarrier communications and image display”

- 2008 Invited Paper “Adaptive Downlink OFDMA Resource Allocation” in *Proc. Asilomar Conf. on Signals, Systems, and Computers*, co-authored by I. C. Wong
- 2008 Gordon Lepley IV Memorial Teaching Award, Department of Electrical and Computer Engineering, The University of Texas at Austin
- 2007 National Instruments Week Virtual Instrumentation Applications Paper Finalist, Prototyping and Testing Category (Second Place)
- 2006 Invited Paper “Automatic floating-point to fixed-point transformations” in the *Proc. Asilomar Conf. on Signals, Systems, and Computers* co-authored with K. Han and A. G. Olson
- 2004 Invited Paper “Effect of Channel Estimation Error on Bit Rate Performance of Time Domain Equalizers”, in the *Proc. Asilomar Conf. on Signals, Systems, and Computers*, co-authored with M. Ding and I. C. Wong
- 2004–2010 Robert and Jane Mitchell Faculty Fellowship, College of Engineering, The University of Texas at Austin which provides endowment funding to support research and teaching efforts
- 2003 Invited Paper “Joint Space-Time Interference Cancellation and Channel Shortening” in the *Proc. Asilomar Conf. on Signals, Systems, and Computers* co-authored by R. Samanta and R. W. Heath, Jr.
- 2003 Nomination by graduate students for Graduate Engineering Council Faculty Appreciation Award at The University of Texas at Austin
- 2003 Published Invited Paper “Color Error Diffusion Halftoning” in the *IEEE Signal Processing Magazine*, with co-authors N. Damera-Venkata and V. Monga
- 2003 Invited Paper “Variations on Error Diffusion: Retrospectives and Future Trends” in the *Proc. SPIE/IS&T Conf. on Color Imaging: Processing, Hardcopy, and Applications* co-authored with V. Monga and N. Damera-Venkata
- 2002 Invited Paper “DMT Bit Rate Maximization With Optimal Time Domain Equalizer Filter Bank Architecture”, in the *Proc. Asilomar Conf. on Signals, Systems, and Computers*, co-authored with M. Milosevic, L. F. C. Pessoa, and R. Baldick,
- 2002–2003 Faculty Research Assignment, The University of Texas at Austin. Spent fall 2002 semester at Cornell University visiting Prof. C. Rick Johnson to conduct research in multicarrier communications for home Internet access via digital subscriber lines
- 2001 Invited Paper “Matrix Gain Model for Vector Color Error Diffusion” in the *Proc. IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing* co-authored with N. Damera-Venkata
- 2000–2004 Mrs. Pearlie Dashiell Henderson Centennial Faculty Fellowship, College of Engineering, The University of Texas at Austin, which provides endowment funding to support research and teaching efforts
- 2000 Invited Paper “A Signal Processing System-Level Design Course” in the *Proc. IEEE Signal Processing Education Workshop*, co-authored with G. Arslan
- 2000 IEEE Student Chapter Award for “Most Animated Class” to recognize the novel and regular use of computer animations to visualize difficult concepts in lecture

- 1999 Invited Paper “Lossy Compression of Stochastic Halftones with JBIG2” in the *Proc. IEEE Int. Conf. on Image Processing* co-authored with M. Valliappan, D. A. D. Tompkins and F. Kossentini
- 1999 Halliburton, Brown and Root Young Faculty Award, College of Engineering, The University of Texas at Austin
- 1999 Invited Paper “Raising the Level of Abstraction: A Signal Processing System Design Course”, in the *Proc. IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing*, co-authored with G. Arslan
- 1998 Invited Paper “Real-Time Sonar Beamforming on a Unix Workstation Using Process Networks and POSIX Threads” in the *Proc. Asilomar Conf. on Signals, Systems, and Computers*, co-authored with G. E. Allen and D. C. Schanbacher
- 1998 Invited Paper “Cochannel Signal Separation in Fading Channels Using a Modified Constant Modulus Array”, in the *Proc. Asilomar Conf. on Signals, Systems, and Computers* co-authored with S. Gummadi
- 1998 Invited Paper “Predictive Shape Coding Using Generic Polygon Approximation”, in the *Proc. IEEE Int. Sym. on Circuits and Systems* co-authored with J.-I. Kim
- 1997 Invited Paper “Simulation and Synthesis of Artificial Neural Networks Using Dataflow Models in Ptolemy”, in the *Proc. Seminar on Neural Network Applications in Electrical Engineering* co-authored with B. Lu and D. V. Tošić
- 1997 Institute of Electrical and Electronics Engineers Senior Membership
- 1997 National Science Foundation CAREER Award on “Scalable Software and Hardware for Image and Video Processing Systems”
- 1997 Gold CD Award, Wolfram Research Inc., Champaign, IL, to recognize the sale of more than 1000 copies of the *Signals and Systems Pack*, which had been on the market since 1995.
- 1996 Invited Paper “Real-Time DSP for Sophomores” in the *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing* co-authored with K. H. Chiang, W. T. Huang, F. Kovac, E. A. Lee, D. G. Messerschmitt, H. J. Reekie, and S. S. Sastry,
- 1995 Invited Paper “Symbolic Computation in System Simulation and Design” in the *Proc. SPIE Int. Sym. on Advanced Signal Processing Algorithms* co-authored with S. X. Gu, A. Kalavade, and E. A. Lee
- 1992 Outstanding Graduate Teaching Assistant Award, School of Electrical Engineering, Georgia Institute of Technology
- 1987 Honors Key, Rose-Hulman Institute of Technology, for cumulative extra-curricular undergraduate activities

Memberships in Professional and Honorary Societies

- Member, American Association of University Professors, 2005–present
- Fellow, Institute of Electrical and Electronics Engineers (IEEE)
- Active member in the IEEE Communications Society and IEEE Signal Processing Society

University Committee Assignments

Assignments Active Fall 2023–present: Departmental Committees

- Faculty Coordinator, ECE Partners, Dept. of ECE, Aug. 2021–present.
Faculty and peer mentoring program for newly enrolling graduate ECE students. Fall 2021 had 67 mentees, 23 peer mentors, and 23 faculty mentors (67-23-23) arranged in 23 small groups. Spring 2022 had 46-17-8 arranged in 12 small groups; Fall 2022 had 113-45-25 arranged in 22 small groups; Spring 2023 had 42-21-25 arranged in 10 small groups; Fall 2023 had 92-34-19 arranged in 17 small groups; and Spring 2024 had 25-15-6 arranged in 6 small groups. Part of a college-wide effort involving all graduate engineering programs.
- Chair, Dept. of ECE, Student Mentoring Committee, Oct. 2020–present.
- Member, Dept. of ECE, Community Well-Being and Support Committee, Oct. 2020–present
- Chair, Dept. of ECE, Curriculum Committee, Jan. 2011–Oct. 2017, and Member, Nov. 2017–present
Reform undergraduate curriculum; interview and evaluate professional faculty; assign instructors; allocate TA positions; manage \$3M annual instructional budget
- Member, Dept. of ECE, Budget Council, Sep. 2005–present.
Allocate new faculty positions from Dean's Office to research topics, and evaluate faculty members for tenure and promotion.
- Member, Graduate ECE Program, Decision, Information and Communication Engineering Track, Curriculum Committee, Nov. 2001–present.
Evaluate and update undergraduate and graduate curriculums in communications, networks and systems.
- Member, Graduate ECE Program, Decision, Information and Communication Engineering Track, Sep. 1996–present.
Evaluate and update PhD qualifying exam procedures, and propose future growth plans in faculty lines to the Budget Council.
- Member, Graduate ECE Program, Architecture, Computer Systems, and Embedded Systems Faculty Committee, Sep. 1996–present.
Evaluate and update PhD qualifying exam procedures, and propose future growth plans in faculty lines to the Budget Council.
- Member, Graduate ECE Program, Graduate Studies Committee, Sep. 1996–present

Assignments Active Fall 2023–present: Cockrell School of Engineering Committees

- Chair, Cockrell School of Engineering, Degrees and Courses Committee, Fall 2022–present, and Member, Fall 2019–present.
- Inaugural Member, 6G@UT Research Center, Jan. 2021–present.
Next-generation cellular communication systems. Launched by Wireless Networking and Communications Group, 23 faculty, 4 staff, 160 PhD students.

- Member, Cockrell School of Engineering, Advocacy Network for Graduate Students and Postdoctoral Scholars Nov. 2020–present.
“Students and postdocs can seek advice from Advocacy Network members related to challenging conversations and situations in the labs, effectively communicating with advisors and principal investigators, accessing campus-wide resources and much more. Our team of advocates is comprised of faculty with expertise and social capital that can be leveraged to help you address a specific problem.”

Assignments Active Fall 2023–present: University Committees and University System Committees

- Member, Provost Office, Advisory Committee, Sep. 2023–Aug. 2024.
- Member, University Faculty Committee of Counsel on Academic Freedom and Responsibility, Sep. 2022–Sep. 2025, Sep. 2015–Aug. 2018 and Sep. 2008–Aug. 2010, and Chair Sep. 2017–Aug. 2019, Sep. 2014–Aug. 2015, and Sep. 2010–Aug. 2013
This committee provides advice on, and investigates allegations of violations of, policies and procedures concerning tenure, promotion, annual, post-tenure, and mid-probationary faculty evaluations as well as the exercise of academic freedom in teaching, scholarship, and expression..
I co-authored a “Resolution on Academic Analytics” to recommend not using Academic Analytics– a data crawler and data aggregator– in evaluating faculty performance because its data is incomplete, unverified and decontextualized. Faculty members have no access to review, correct and ratify the data. Faculty Council passed the resolution Jan. 22, 2018, and was the subject of an article “UT-Austin Professors Join Campaign Against Faculty-Productivity Company” in The Chronicle of Higher Education. Provost formed a faculty-led Academic Analytics Task Force in Spring 2018 and accepted the recommendations in its report.
- Member, University Faculty Rules and Governance Committee, Sep. 2022–Sep. 2025
- Member, Presidential Executive Compliance Committee Jun. 2022–Sep. 2024
- Member, Faculty Council, Committee on Committees Sep. 2021–Aug. 2024 and Sep. 2018–Aug. 2019.
Advises the President on personnel, composition and responsibilities of faculty standing committees.
- Member, Well-Being in Learning Environments Ad-Hoc Committee, Counseling and Mental Health Center, Mar. 2018–present.
Contributed to resources for students, resources for instructors, a short video, and resources for graduate students.

Committee Assignments Ending Prior to Sep. 2023

- Member, Faculty Grievance Policy Reform Committee, Jan. 2020–Nov. 2022
As Faculty Council Chair, I formed and served on a joint Provost Faculty Council committee to revise faculty discipline policies as well as overhaul the Faculty Grievance Process to change it from adversarial to investigative and to streamline it. The New Grievance Process was passed by Faculty Council and adopted by President Jay Hartzell.
- Co-Chair, ECE Strategic Planning Committee, Student Success and Student Experience, May 2022–May 2023.
- Member, Steering Committee, University Academic Calendar Modification Steering Committee, Jan. 2021–Dec. 2021.
Developed a new academic calendar framework that included a week-long Thanksgiving Break.

- Executive Committee, June 2019-May 2021, and Member, Sep. 2018–Aug. 2021, Texas Council of Faculty Senates. *Organization brings together elected faculty leaders from all 39 public four-year colleges and universities in the State of Texas to discuss common issues and develop action plans for our campuses. Meetings occur twice each year.*
- Member, University Services for Students with Disabilities, Faculty Advisory Committee, Jan. 2021–Aug. 2021
- Member, The University of Texas System, Special Advisory Committee to Select the Next UT Austin President, Sept. 2020
- Chair, Task Force on Developing Community Standards for Faculty, Jan. 2020–Aug. 2023
- Member, National Council of Faculty Senates. Mar. 2019–May 2020
- Past Chair, Faculty Council, (a.k.a. Faculty Senate), Sep. 2020–Aug. 2021, Chair Sep. 2019–Aug. 2020, Chair-Elect Sep. 2018–Aug. 2019, and Member Jan. 2017–Aug. 2021, Sep. 2013–Aug. 2015 and Sep. 2008–Aug. 2012.

Faculty Council plays a vital role in shared governance at The University of Texas at Austin by

- Evaluating, monitoring, and providing recommendations on undergraduate curriculums and degree programs including educational policies; admission, honors, and degree requirements; and catalog changes
- Developing and updating University policies including
 - * Faculty evaluation, workload, compensation, academic freedom, and grievances
 - * Student services, activities, admissions, and employment
 - * Budgets, libraries, research, information technology, and other areas

As Faculty Council Chair 2019–20, my priorities were

- Promote safe, diverse, equitable, inclusive, supportive environments for all students, staff faculty
- Support mental health and counseling services for students, staff, faculty to meet demand
- Strengthen shared governance at the University for students, staff, faculty, administrators

The Faculty Council Chair leads the monthly Faculty Council meetings, which provide a communication platform for faculty, staff, students and administrators to discuss issues and develop solutions to make UT an even better place to work and study. Here are the resolutions, minutes and other actions by the 2019–20 Faculty Council. Beyond Faculty Council (110 members), I also coordinated the 27 faculty standing committees (270 members) and served on the following Provost and Presidential committees:

- Member, Advisory Committee on Ethics
- Member, Council for LGBTQ+ Access, Equity, and Inclusion
- Member, Council for Racial and Ethnic Equity and Diversity (CREED)
- Member, Executive Compliance Committee
- Chair, Faculty Council Executive Committee, which meets monthly to plan Faculty Council meetings and other actions, and which separately meets monthly with the President, Provost, Graduate School Dean, Senior Vice Provost of Faculty Affairs, Vice President of Legal Affairs, and other upper administrators.

- Member, Faculty Ombuds Search Committee
 - Member, Graduate Assembly
 - Member, Graduate Assembly Agenda Committee
 - Member, Graduate Education Task Force Implementation Committee
 - Member, Policy Office Advisory Group
 - Member, Senate Bill 212 Implementation Committee
 - Member, University Capital Planning Committee, Jan. 2020–Aug. 2020
 - Member, University Faculty Gender Equity Council, Sep. 2017–Aug. 2020, Sep. 2014–Aug. 2015.
Advises the Provost on matters related to gender issues at The University of Texas at Austin and makes recommendations for improving the equitable and inclusive environment for all faculty.
 - Member, UT System Faculty Advisory Council
 - Member, Vice President’s Council
- Member, Dept. of ECE, Teaching Assistant Recruiting Committee, Oct. 2018–Aug. 2022 and Chair Sep. 2007–Sep. 2017.
Determine allocations of graduate TA positions to admission committees, match 30–40 newly enrolling graduate students on TA offers into fall and spring TA positions, and run TA orientation sessions.
 - Chair, Dept. of ECE, Teaching Evaluation Committee, Oct. 2017–Aug. 2023 and Member Oct. 2011–Sep. 2017.
In 2018, switched from evaluative to formative process to match Provost recommendations. Pair faculty for peer teaching dialogues. 80 tenured, tenure-track, and non-tenure-track faculty are the department.
 - Member, Graduate ECE Program, Decision, Information and Communication Engineering Track, Admissions Committee, Sep. 1998–Aug. 2018, and Chair, Sep. 1999–Jan. 2007.
Evaluate 700+ applications for graduate ECE studies each year, coordinate financial support offers, and host recruiting site visit(s).
 - Faculty Advisor, Dept. ECE, Undergraduate Advisory Board, Aug. 2021–Aug. 2023.
 - Member, Dept. of ECE, Diversity, Equity and Inclusion Committee, Oct. 2020–Aug. 2023
 - Member, UT System Faculty Advisory Council, Sep. 2018–Aug. 2021
 - Chair, University Faculty Advisory Committee on Budgets, Sep. 2017–2018 and Sep. 2014–Aug. 2016, and Member Sep. 2013–Aug. 2014.
Reviews University budgets and make recommendations the President and Provost.
 - Member, University Student Life Committee, Jan. 2017–Aug. 2017.
 - Member, School of Undergraduate Studies, Digital Arts & Media Bridging Disciplines Program Committee, Jan. 2005–May 2017,
Evaluate applications for admission to this interdisciplinary certificate program (equivalent to a minor) and promote this program within the College of Engineering.
 - Member, University Tuition Policy Advisory Committee, Sep. 2015–Aug. 2016.
Recommends to the President the amount of tuition needed to fund the university’s forecast core academic budget, which includes expenses such as salaries, utilities and college programs. The committee

recommended a 3% tuition increase for 2016–2017 and again for 2017–2018, which was approved by The University of Texas Board of Regents on Monday, Feb. 29, 2016, as the first tuition increase for Texas resident undergraduates since 2011.

- Chair, Dept. of ECE, Silicon Labs Endowed Chair Search Committee, Nov. 2013–Dec. 2015.
- Member, Faculty Council Executive Committee, Sep. 2013–Aug. 2014.
Determines agenda for faculty council meetings, meets monthly with the President and Provost and gives feedback to the UT System and UT Board of Regents on proposed and existing policies. Prof. Evans focused efforts on fighting for faculty against intrusion on academic freedom and civil liberties in The University of Texas System draft policies on conflict of commitment and their implementation on the UT Austin campus.
- Member, Graduate ECE Program, Architecture, Computer Systems, and Embedded Systems Admissions, Nov. 2001–Aug. 2017. *Evaluate 500+ applications for graduate ECE studies on the computer engineering curriculum track each year, coordinate financial support offers, and host recruiting site visit.*
- Chair, Dept. of ECE, Course Scheduling Committee, Jan. 2002–Aug. 2012.
Schedule 100+ ECE lecture sections each fall/spring semester.
- Chair, Dept. of ECE, Post-Tenure Review Committee, Oct. 2010–Jan. 2011.
- Chair, Administrative Committee, Graduate Assembly, Sep. 2009–Aug. 2011.
Evaluate and propose changes to rules and regulations governing teaching assistants and assistant instructors.
- Member, Graduate Assembly, Sep. 2008–Aug. 2011.
Elected to represent engineering concerning all matters concerning graduate studies and graduate students.
- Member, Dept. of ECE, Privy Council, Sep. 2004–Oct. 2010.
Advise the Department Chair on all faculty and curriculum matters.
- Member, Dept. of ECE, Senior Design Projects Committee, Jan. 2004–Oct. 2010.
Develop content and scope for the six variations of the required capstone design project.
- Member, Cockrell School of Engineering, Ad-hoc Panel on Strategic Planning on Wireless Communications, Sep. 2009–Aug. 2010.
Help the Cockrell School of Engineering engage industry and government more deeply in funded interdisciplinary research collaboration involving wireless communications, networking and applications.
- Chair, Dept. of ECE, Faculty Search Committee, Dec. 2009–May 2010, *Evaluate candidates for a tenure-track faculty position in embedded systems, and recommend leading candidates to the ECE faculty for interviews and formal offers.*
- Member, Dept. of ECE, Faculty Search Committee, Feb. 2009–Apr. 2009.
Evaluate candidates for tenure-track faculty position recommended by faculty search subcommittees, and recommend leading candidates to the ECE Budget Council.
- Member, Dept. of ECE, Faculty Search Subcommittee, Computer Architecture. Jan. 2009–Apr. 2009.
Evaluate candidates for tenure-track faculty positions in computer architecture and recommend leading candidates to Faculty Strategic Hiring Committee.

- Member, Dept. of ECE, Curriculum Reform Focus Group, Jan. 2009–May 2009.
Formulate the raucous year-long undergraduate ECE curriculum reform discussions for the 2010–2012 catalog into a concrete proposal. Proposal approved by the ECE faculty in May 2009.
- Member, Administrative Committee, Graduate Assembly, Sep. 2008–Aug. 2009.
Evaluate and propose changes to funding and rules/regulations for TAs and AIs.
- Member, Dept. of ECE, Electromagnetics & Acoustics Faculty Search Committee, Nov. 2007–May 2008.
Evaluated faculty applications and hosted faculty candidates. As a result, Andrea Alu and Neal Hall were hired into 2008–2009 faculty positions.
- Chair, University Responsibilities, Rights, and Welfare of Graduate Student Academic Employees Committee, Sep. 2007–Aug. 2008.
Advise President on matters concerning TA, AI, and RA employment.
I co-authored a Living/Competitive Wage Motion for graduate teaching and research assistants in Spring 2010. The motion is intended to increase graduate student recruiting and retention by closing the gap in income for TAs who do not break even in income vs. expenses without reducing the number of TA positions. In Spring 2010, I brought the motion to the attention of Associate Dean John Ekerdt (Engineering) who implemented annual raises to the the minimum salaries for graduate teaching and research assistants in the college to exceed a Living Wage of \$2,178/month in fall 2020. Motion co-author Prof. Andrea Gore (Pharmacy) successfully approached her college to raise its minimum salaries to exceed a Living Wage by fall 2020. Other colleges with minimum salaries exceeding a Living Wage in fall 2020 include the Jackson School of Geosciences and the College of Natural Science.
- Member, Dept. of ECE, Curriculum and Catalog Review Committee, Jan. 2007–May 2007.
- Chair, Dept. of ECE, Embedded Systems Faculty Search Committee, Oct. 2006–May 2008.
Evaluated faculty applications and hosted faculty candidates. As a result, Andreas Gerstlauer was hired into a 2008–2009 faculty position.
- Member, Dept. of ECE, Communications, Networks, and Systems Faculty Search Committee, Oct. 2006–May 2007.
- Member, University Responsibilities, Rights, and Welfare of Graduate Student Academic Employees Committee, Sep. 2006–Aug. 2007
- Member, Provost’s Office, Signature Vision Committee, May 2006–Aug. 2006.
- Member, Dept. of ECE, Post-tenure Review Committee, Jan. 2006–May 2007.
- Member, Dept. of ECE, Faculty Incentives Committee, Jan. 2004–Aug. 2008.
Evaluate ECE faculty applications submitted to Dept. Chair.
- Inaugural Member, Wireless Networking and Communications Group, March 2003–present.
Started with 8 faculty, 3 staff, and 50 PhD students. Grown to 27 faculty, 4 staff, and 180 PhD students in 2022–2023.
- Member, Dept. of ECE, Mixed-Signal Chair Faculty Search Committee, Jan. 2002–May 2006.
Evaluate dossiers and host potential faculty candidates.
- Member, Dept. of ECE, Telecommunications Faculty Search Committee, Sep. 2001–Aug. 2002.

- Member, Dept. of ECE, Texas Telecommunications Engineering Consortium (TxTEC), Ad-hoc Committee, Oct. 1996–May 2005.
- Branch Counselor, Dept. of ECE, IEEE Student Chapter, Aug. 2001–Dec. 2004,
- Member, Dept. of ECE, Department Chair Search Committee, Spring 2001.
- Chair, Dept. of ECE, Reform of BSEE Curriculum Committee, Nov. 1999–Mar. 2001
- Member, Dept. of ECE, TxTEC Undergraduate Scholarship and Graduate Fellowship Awards Subcommittee, Sep. 1998–May 2005,
- Chair, Dept. of ECE, Undergraduate Communications Curriculum Committee, Sep. 1998–Aug. 2001 (Member, Sep. 1996–Aug. 1998)
- Member, College of Engineering, Outreach Education / Instructional Technology Committee, Aug. 1997–Aug. 1998.
Evaluate instructional technology initiatives, short courses, and Option III MS programs.
- Member, Dept. of ECE, Graduate ECE Admissions, Computer Engineering Curriculum Track Committee, Jan. 1997–Dec. 2006.
- Member, Dept. of ECE, Undergraduate Controls Curriculum Committee, Sep. 1996–Aug. 2001.
- Member, Dept. of ECE, Undergraduate Digital Systems Curriculum Committee, Sep. 1996–Aug. 2001.
- Member, Dept. of ECE, Undergraduate Software Engineering Curriculum Committee, Sep. 1996–Aug. 2001.

Professional Activities

IEEE Committee Assignments

- Technical Program Committee, IEEE Vehicular Technology Conference Workshops, Spring 2018, Porto, Portugal.
- Technical Program Committee, 2016 International Conference on Energy and Smart Grid, Cappadocia, Turkey.
- General Chair, 2015 IEEE International Symposium on Power Line Communications and Its Applications, Austin, Texas USA
- Member, IEEE Communication Society Technical Committee on Power Line Communications, 2015–present
- Technical Program Committee, Data Flow Algorithms and Architecture for Signal Processing Systems Symposium, 2014 IEEE Global Signal and Information Processing Conference
- Technical Program Committee, Signal Processing for Communications Symposium, 2014 IEEE Global Communications Conference
- General Chair, Symposium on Software Defined and Cognitive Radios, 2013 IEEE Global Conference on Signal and Information Processing, Dec. 3-5, 2013, Austin, Texas USA

- Guest Co-Editor, *IEEE Transactions on Multimedia*, Special Issue on “New Software/Hardware Paradigms for Error-tolerant Multimedia Systems” published Dec. 2012
- Technical Program Committee, 2012 *IEEE Int. Conf. on Smart Grid Communications*
- Technical Program Co-Chair, IEEE International Workshop on Signal Processing Systems, Oct. 4-7, 2011, Beirut, Lebanon
- Design and Implementation of Signal Processing Systems Technical Committee Advisory Board, IEEE Signal Processing Society (2010–present)
- Associate Editor, *IEEE Transactions on Image Processing* (2007–2009 and 1998–2002). *Coordinated reviews for 83 submitted journal papers.*
- Associate Editor, *Journal of Signal Processing Systems*, (2007–present)
- Associate Editor, *IEEE Transactions on Signal Processing* (March 2005–March 2008). *Coordinated reviews for 57 submitted journal papers.*
- Design and Implementation of Signal Processing Systems Technical Committee, IEEE Signal Processing Society (1999–2009)
- Technical Program Committee, 2009 *IEEE Int. Conf. on Distributed Smart Cameras*
- Technical Program Committee, 2008 IEEE International Symposium on System-on-Chip
- Technical Program Committee, 2008 IEEE Global Communications Conference
- Technical Program Committee, 2008 IEEE International Conference on Image Processing
- Technical Program Committee, 2008 IEEE International Conference on Communications
- Technical Program Committee, 2007 IEEE International Conference on Signal Processing and Communication
- Technical Program Committee, 2007 IEEE International Conference on Acoustics, Speech, and Signal Processing
- Technical Program Committee, 2006 IEEE International Conference on Image Processing
- Technical Program Committee, 2006 IEEE International Conference on Acoustics, Speech, and Signal Processing
- Technical Program Committee, 2005 IEEE Global Communications Conference, Signal Processing for Communications Symposium
- Technical Program Committee, 2005 IEEE International Conference on Image Processing
- Technical Program Committee, 2005 IEEE International Conference on Acoustics, Speech, and Signal Processing
- Technical Advisory Board, 2005 Texas Instruments Developer’s Conference
- Technical Program Co-Chair, 2004 IEEE Workshop on Signal Processing Systems
- Technical Program Co-Chair, 2004 IEEE Digital Signal Processing Workshop

- Technical Program Co-Chair, 2004 IEEE Signal Processing Education Workshop
- Technical Program Committee, 2004 IEEE Global Communications Conference, Signal Processing for Communications Symposium
- Technical Program Committee, 2004 IEEE International Conference on Acoustics, Speech, and Signal Processing
- Technical Advisory Board, 2004 Texas Instruments Developer's Conference
- Technical Program Committee, 2003 IEEE International Conference on Image Processing
- Technical Program Committee, 2003 IEEE International Conference on Acoustics, Speech, and Signal Processing
- Technical Program Committee, 2002 International Workshop on Digital and Computational Video
- Technical Program Committee, 2002 IEEE International Conference on Image Processing
- Technical Program Committee, 2002 International Conference on Compilers, Architecture, and Synthesis for Embedded Systems
- Technical Program Committee, 2002 IEEE Signal Processing Systems Workshop
- Technical Program Committee, 2002 IEEE International Conference on Acoustics, Speech, and Signal Processing
- General Chair, 2002 IEEE Southwest Symposium on Image Analysis and Interpretation
- Technical Program Committee, 2002 IEEE Southwest Symposium on Image Analysis and Interpretation
- Chair, Telecommunications Track, Texas Systems Day 2000
- Co-Chair, Curriculum Issues I Track, 2000 IEEE Signal Processing Education Workshop
- Technical Program Committee, 2000 IEEE International Conference on Acoustics, Speech, and Signal Processing
- Exhibits Co-Chair, 2000 IEEE International Conference on Image Processing
- Local Arrangements Chair, 2000 IEEE Southwest Symposium on Image Analysis and Interpretation
- Technical Program Committee, 1999 IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing
- Technical Program Committee, 1997 IEEE International Conference on Image Processing

IEEE Reviewer and Conference Session Chair Roles

- Reviewer for the following journals (in alphabetical order):
 - *EURASIP Journal on Applied Signal Processing* (2004–present)
 - *IEE Electronics Letters* (2004)
 - *IEEE Communication Letters* (2009, 2012)

- *IEEE Signal Processing Letters* (1997–present)
 - *IEEE Transactions on Circuits and Systems* (1993–present)
 - *IEEE Transactions on Circuits and Systems for Video Technology* (1997–present)
 - *IEEE Transactions on Education* (1999)
 - *IEEE Transactions on Signal Processing* (1991–present)
 - *IEEE Transactions on Vehicular Technology* (2006–present)
 - *Proceedings of the IEEE* (2007)
- Reviewer for the following conferences (in alphabetical order):
 - *European Conf. on Parallel Processing*: 1997
 - *IEEE Global Communications Conf.*: 2020, 2018, 2017, 2016, 2015, 2014, 2013, 2011, 2010, 2009, 2008, 2007, 2006, 2005, 2004
 - *IEEE Int. Conf. on Acoustics, Speech, and Signal Processing*: 2017, 2016, 2015, 2014, 2013, 2012, 2011, 2010, 2009, 2008, 2007, 2006, 2005, 2004, 2003, 2002, 2001, and 2000
 - *IEEE Int. Conf. on Communications*: 2018, 2017, 2012, 2011, 2010, 2009, 2008, 2007, 2006
 - *IEEE Int. Conf. on Distributed Smart Cameras*: 2009
 - *IEEE Int. Conf. on Image Processing*: 2016, 2015, 2014, 2012, 2011, 2010, 2009, 2008, 2007, 2006, 2005, 2004, 2003, 2002, 2011, 1997
 - *IEEE Int. Sym. on Circuits and Systems*: 2008, 2004, 2003
 - *IEEE Int. Sym. on Information Theory*: 2007
 - *IEEE/ACM Int. Sym. on Microarchitecture*: 2000
 - *IEEE Int. Sym. on Personal Indoor and Mobile Radio Communications*: 2005
 - *IEEE Int. Sym. on System-on a Chip*: 2009, 2008, 2007, 2006
 - *IEEE Int. Workshop on Signal Processing Systems*: 2017, 2013, 2011, 2010, 2009, 2008, 2007, 2005, 2004
 - *IEEE Vehicular Technology Conference*: 2018
 - Chaired the following conference sessions:
 - “Signal Processing for Designs Under Power and Cost Constraints”, 2014 *IEEE Global Communications Conf.*
 - “Biomedical Systems Applications”, 2011 *IEEE Int. Workshop on Signal Processing Systems*
 - “Array Processing and Source Localization”, 2008 *Asilomar Conf. on Signals, Systems, and Computers*
 - “Integrated Algorithm and Architecture Implementation”, 2007 *Asilomar Conf. on Signals, Systems, and Computers*
 - “Hardware and Software Implementations of DSP Systems”, 2007 *IEEE Int. Conf. on Acoustics, Speech, and Signal Processing*
 - “Signal Processing for MIMO Systems,” 2005 *IEEE Global Communications Conference*
 - “VLSI Communication Systems,” 2005 *Asilomar Conf. on Signals, Systems, and Computers*
 - “Signal Processing Algorithms,” 2004 *IEEE Global Communications Conference*

- “Prototyping and Design,” *2004 UT Austin Wireless Networking Symposium*
- “Multicarrier Equalization for Wireline Communications,” *2002 Asilomar Conf. on Signals, Systems, and Computers*
- “Face Detection and Recognition,” *2001 IEEE Int. Conf. on Image Processing*
- “Filter Implementation,” *2001 IEEE Int. Conf. on Acoustics, Speech, and Signal Processing*
- “Image Modeling,” *2000 IEEE Int. Conf. on Image Processing*
- “Image/Video Enhancement,” *1999 IEEE Int. Conf. on Image Processing*
- “System-Level Design Methods, Tools, and Case Studies”, *1998 Asilomar Conf. on Signals, Systems, and Computers*
- “Mapping Models of Computation to Architectures”, *1997 IEEE Int. Conf. on Application Specific Systems, Architectures, and Processors*
- “Rapid Prototyping of Digital Signal Processing Systems”, *1996 Asilomar Conf. on Signals, Systems, and Computers*
- “DSP Education”, *1996 IEEE Int. Conf. on Acoustics, Speech, and Signal Processing*
- “CAD for Design and Implementation of Signal Processing Systems”, *1994 Asilomar Conf. on Signals, Systems, and Computers*

Advocacy Organizations

- Member, American Association of University Professors (AAUP), AFT, AFL-CIO, 2005–present
 - Texas AAUP Conference
 - * President, 2024–2026
 - * Interim President, 2023–2024
 - * Vice President, 2022–2023
 - UT Austin AAUP Chapter
 - * Past President, 2023–present
 - * President, 2022–2023
 - * Convener, 2021–2022
- Member, Texas Association of College Teachers
- Member, Texas Faculty Association, NEA
- Member, Texas State Employees Union, CWA #6186, AFL-CIO

Advisory Boards

- Provost’s Advisory Board, University Promotion and Tenure Committee, American University of Beirut, Beirut, Lebanon (2017–2018 and 2018–2019)
- Department of Electrical and Computer Engineering, American University of Beirut, Beirut, Lebanon (2013–2022)
- Department of Electrical and Computer Engineering, Rose-Hulman Institute of Technology, Terre Haute, IN USA (2010–2013)

Publications As of Aug. 18, 2024, publications have garnered 16,218 citations, for an h-index of 57, per his Google scholar page.

Citation count is given below for papers with 60+ citations according to Google scholar page.

Refereed Journal and Magazine Articles

1. E. Balti, S. Akoum, I. Alfalujah, and B. L. Evans, “Hybrid Beamforming Design For Full-Duplex Millimeter Wave Massive MIMO Systems”, *IEEE Transactions on Vehicular Technology*, vol. 73, no. 11, Nov. 2024, pp. 17041–17058. DOI 10.1109/TVT.2024.3424774.
2. Y. Cho, J. Choi, and B. L. Evans, “Learning-Based One-Bit Maximum Likelihood Detection for Massive MIMO Systems: Dithering-Aided Adaptive Approach”, *IEEE Transactions on Vehicular Technology*, vol. 73, no. 8, Aug. 2024, pp. 11680–11693. DOI 10.1109/TVT.2024.3381757.
3. Y. Cho, J. Choi, and B. L. Evans, “Coordinated Per-Antenna Power Minimization for Multicell Massive MIMO Systems with Low-Resolution Data Converters”, *IEEE Transactions on Communications*, vol. 72, no. 2, Feb. 2024, pp. 1119–1134. DOI 10.1109/TCOMM.2023.3326206.
4. E. Balti and B. L. Evans, “A Unified Framework for Full-Duplex Massive MIMO Cellular Networks with Low-Resolution Data Converters”, *IEEE Open Journal of the Communications Society*, vol. 4, Jan. 2023, pp. 1–28. DOI 10.1109/OJCOMS.2022.3230327. **Among top 50 most accessed articles every month from Jan. to Aug. 2023 and Oct. 2023 among all articles published in the IEEE Open Journal of the Communications Society.**
5. J. Choi, Y. Cho, and B. L. Evans, “Quantized Massive MIMO Systems with Multicell Coordinated Beamforming and Power Control”, *IEEE Transactions on Communications*, vol. 69, no. 2, pp. 946–961, Feb. 2021, DOI 10.1109/TCOMM.2020.3036689.
6. F. B. Mismar, A. AlAmmouri, A. Alkhateeb, J. G. Andrews, and B. L. Evans, “Deep Learning Predictive Band Switching in Wireless Networks”, *IEEE Transactions on Wireless Communications*, vol. 20, no. 1, Jan. 2021, pp. 96–109, DOI 10.1109/TWC.2020.3023397.
7. J. Choi, G. Lee, A. Alkhateeb, A. Gatherer, N. Al-Dhahir, and B. L. Evans, “Advanced Receiver Architectures for Millimeter Wave Communications with Low-Resolution ADCs”, *IEEE Communications Magazine*, vol. 58, no. 8, Aug. 2020, pp. 42–48, DOI 10.1109/MCOM.001.2000122. **One of the top 50 most accessed articles in September of 2020 among all articles published in the IEEE Communications Magazine.**
8. J. Choi, J. Sung, N. Prasad, X.-F. Qi, B. L. Evans, and A. Gatherer, “Base Station Antenna Selection for Low-Resolution ADC Systems”, *IEEE Transactions on Communications*, vol. 68, no. 3, Mar. 2020, pp. 1951–1965, DOI 10.1109/TCOMM.2019.2963023.
9. F. B. Mismar, B. L. Evans, and A. Alkhateeb, “Deep Reinforcement Learning for 5G Networks: Joint Beamforming, Power Control, and Interference Coordination”, *IEEE Transactions on Communications*, vol. 68, no. 3, Mar. 2020, pp. 1581–1592, DOI 10.1109/TCOMM.2019.2961332. **236 citations. One of the top 50 most accessed articles each month in the following 37 months: January, February, March, April, May, June, July, August, September, October, November and December of 2020; January, February, May, June, July, August, September, November, and December of 2021; March, April, May, June, July, August, November and December of 2022; April, October and November 2023; and February, March, April, May, and June 2024 among all articles published in the IEEE Transactions on Communications.**

10. F. B. Mismar, J. Choi, and B. L. Evans, "A Framework for Automated Cellular Network Tuning with Reinforcement Learning", *IEEE Transactions on Communications*, vol. 67, no. 10, Oct. 2019, pp. 7152–7167, DOI 10.1109/TCOMM.2019.2926715.
11. F. B. Mismar and B. L. Evans, "Deep Learning in Downlink Coordinated Multipoint in New Radio Heterogeneous Networks", *IEEE Wireless Communication Letters*, vol. 8, no. 4, Aug. 2019, pp. 1040–1043, DOI 10.1109/LWC.2019.2904686.
12. J. Choi, G. Lee, and B. L. Evans, "Two-Stage Analog Combining in Hybrid Beamforming Systems with Low-Resolution ADCs", *IEEE Transactions on Signal Processing*, vol. 67, no. 9, May 1, 2019, pp. 2410–2425, DOI 10.1109/TSP.2019.2904931. **One of the top 50 most accessed articles in April 2019 among all articles published in the *IEEE Transactions on Signal Processing*.**
13. J. Choi, G. Lee, and B. L. Evans, "User Scheduling for Millimeter Wave Hybrid Beamforming Systems with Low-Resolution ADCs", *IEEE Transactions on Wireless Communications*, vol. 18, no. 4, Apr. 2019, pp. 2401–2414, DOI 10.1109/TWC.2019.2904030.
14. J. Choi and B. L. Evans, "Analysis of Ergodic Rate for Transmit Antenna Selection in Low-Resolution ADC Systems", *IEEE Transactions on Vehicular Technology*, vol. 68, no. 1, Jan. 2019, pp. 952–956, DOI 10.1109/TVT.2018.2878645.
15. K. D. Wesson, J. N. Gross, T. E. Humphreys, and B. L. Evans, "GNSS Signal Authentication via Power and Distortion Monitoring", *IEEE Transactions on Aerospace and Electronic Systems*, vol. 54, no. 2, Apr. 2018, pp. 739–754, DOI 10.1109/TAES.2017.2765258. **180 citations**
16. D. Kundu, L. K. Choi, A. C. Bovik and B. L. Evans, "Perceptual Quality Evaluation of Synthetic Pictures Distorted by Compression and Transmission", *Signal Processing: Image Communication*, vol. 61, Feb. 2018, pp. 54–72, DOI 10.1016/j.image.2017.11.004.
17. J. Choi, B. L. Evans and A. Gatherer, "Resolution-Adaptive Hybrid MIMO Architectures for Millimeter Wave Communications", *IEEE Transactions on Signal Processing*, vol. 65, no. 23, pp. 6201–6216, Dec. 2017, DOI 10.1109/TSP.2017.2745440. **92 citations. One of the top 50 most accessed articles in October 2017 among all articles published in the *IEEE Transactions on Signal Processing*.**
18. D. Kundu, D. Ghadiyaram, A. C. Bovik and B. L. Evans, "Large-scale Crowdsourced Study for Tone Mapped HDR Pictures", *IEEE Transactions on Image Processing*, vol. 26, no. 10, pp. 4725–4740, Oct. 2017, DOI 10.1109/TIP.2017.2713945. **78 citations.**
19. D. Kundu, D. Ghadiyaram, A. C. Bovik and B. L. Evans, "No-Reference Quality Assessment of Tone-Mapped HDR Pictures", *IEEE Transactions on Image Processing*, vol. 26, no. 6, pp. 2957–2971, Jun. 2017, DOI 10.1109/TIP.2017.2685941. **172 citations. One of the top 50 most accessed articles in May and June 2017 among all articles published in the *IEEE Transactions on Image Processing*.**
20. C. Jia and B. L. Evans, "Online Motion Smoothing for Video Stabilization via Constrained Multiple-Model Estimation", *EURASIP Journal on Image and Video Processing*, 13 pages, Mar. 27, 2017, DOI 10.1186/s13640-017-0171-8.
21. J. Choi, J. Park and B. L. Evans, "Spectral Efficiency Bounds for Interference-Limited SVD-MIMO Cellular Communication Systems", *IEEE Wireless Communication Letters*, vol. 6, no. 1, pp. 46–49, Feb. 2017, DOI 10.1109/LWC.2016.2629474.

22. Y. Mortazavi, W. Jung, B. L. Evans, and A. Hassibi, "A Mostly-Digital PWM-Based Delta Sigma ADC with an Inherently Matched Multibit Quantizer/DAC", *IEEE Transactions on Circuits and Systems II*, vol. 63, no. 11, pp. 1049–1053, Nov. 2016, DOI 10.1109/TCSII.2016.2538118.
23. J. Lin, T. Pande, I.-H. Kim, A. Batra and B. L. Evans, "Time-Frequency Modulation Diversity To Combat Periodic Impulsive Noise In Narrowband Powerline Communications", *IEEE Transactions on Communications*, vol. 63, no. 5, pp. 1837–1849, May 2015, DOI: 10.1109/TCOMM.2015.2411601. **One of the top 50 most accessed articles in May of 2015 among all articles published in the *IEEE Transactions on Communications*.**
24. C. Jia and B. L. Evans, "Online Camera-Gyroscope Auto-Calibration for Cell Phones", *IEEE Transactions on Image Processing*, vol. 23, no. 12, pp. 5070–5081, Dec. 2014.
25. C. Jia and B. L. Evans, "Constrained 3D Rotation Smoothing via Global Manifold Regression for Video Stabilization", *IEEE Transactions on Signal Processing*, vol. 62, no. 13, pp. 3293–3304, Jul. 1, 2014. **One of the top 25 most accessed articles in July 2014 among all articles published in the *IEEE Transactions on Signal Processing*.**
26. M. Nassar, P. Schniter and B. L. Evans, "A Factor Graph Approach to Joint OFDM Channel Estimation and Decoding in Impulsive Noise Environments", *IEEE Transactions on Signal Processing*, vol. 62, no. 6, pp. 1576–1589, Mar. 15, 2014. **84 citations**
27. J. Lin, M. Nassar, and B. L. Evans, "Impulsive Noise Mitigation in Powerline Communications using Sparse Bayesian Learning", *IEEE Journal on Selected Areas in Communications*, vol. 31, no. 7, Jul. 2013, pp. 1172–1183. **296 citations**
28. A. Chopra and B. L. Evans, "Outage Probability for Diversity Combining in Interference-Limited Channels", *IEEE Transactions on Wireless Communications*, vol. 12, no. 2, pp. 550–560, Feb. 2013, DOI 10.1109/TWC.2012.121412.111704.
29. K. Gulati, B. L. Evans, and S. Srikanteswara, "Joint Temporal Statistics of Interference in Decentralized Wireless Networks", *IEEE Transactions on Signal Processing*, vol. 60, no. 12, pp. 6713–6718, Dec. 2012.
30. K. Gulati, R. K. Ganti, J. G. Andrews, B. L. Evans, and S. Srikanteswara, "Characterizing Decentralized Wireless Networks with Temporal Correlation in the Low Outage Regime", *IEEE Transactions on Wireless Communications*, vol. 11, no. 9, pp. 3112–3125, Sep. 2012.
31. M. Nassar, J. Lin, Y. Mortazavi, A. Dabak, I. H. Kim and B. L. Evans, "Local Utility Powerline Communications in the 3–500 kHz Band: Channel Impairments, Noise, and Standards", *IEEE Signal Processing Magazine*, Special Issue on Signal Processing Techniques for the Smart Grid, vol. 29, no. 5, pp. 116–127, Sep. 2012. **One of the top 25 most accessed articles in September 2012 among all articles published in the *IEEE Signal Processing Magazine*. 257 citations**
32. A. Chopra and B. L. Evans, "Joint Statistics of Radio Frequency Interference in Multi-Antenna Receivers", *IEEE Transactions on Signal Processing*, vol. 60, no. 7, Jul. 2012, pp. 3588–3603, DOI 10.1109/TSP.2012.2192431.
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Refereed Conference Papers

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2. N. Agah, B. L. Evans, X. Meng, and H. Xu, “A Local Machine Learning Approach for Fingerprint-Based Indoor Localization”, *IEEE SoutheastCon*, Apr. 13-16, 2023, Orlando, Florida USA.
3. E. Balti, C. Dick, and B. L. Evans, “Low Complexity Hybrid Beamforming for mmWave Full-Duplex Integrated Access and Backhaul”, *IEEE Global Communications Conf.*, Dec. 4-8, 2022, Rio de Janeiro, Brazil.
4. E. Balti and B. L. Evans, “Full-Duplex Massive MIMO Cellular Networks with Low Resolution ADC/DAC”, *IEEE Global Communications Conf.*, Dec. 4-8, 2022, Rio de Janeiro, Brazil.
5. E. Balti and B. L. Evans, “Forward Link Analysis for Full-Duplex Cellular Networks with Low Resolution ADC/DAC”, *IEEE Signal Processing Advances for Wireless Communications*, July 4-6, 2022, Oulu, Finland.
6. E. Balti and B. L. Evans, “Reverse Link Analysis for Full-Duplex Cellular Networks with Low Resolution ADC/DAC”, *IEEE Signal Processing Advances for Wireless Communications*, July 4-6, 2022, Oulu, Finland.
7. P. Nuti, E. Balti and B. L. Evans, “Spectral Efficiency Optimization for mmWave Wideband MIMO RIS-assisted Communication”, *IEEE Vehicular Technolog Conference-Spring*, June 19-22, 2022, Helsinki, Finland.
8. Y. Cho, J. Choi, and B. L. Evans, “Coordinated Beamforming in Quantized Massive MIMO Systems with Per-Antenna Constraints”, *IEEE Wireless Communications and Networking Conference*, April 10–13, 2022, Austin, Texas USA.
9. P. Nuti and B. L. Evans, “Spectral Efficiency vs Complexity in Downlink Algorithms for Reconfigurable Intelligent Surfaces”, *IEEE Int. Conf. on Communications Workshop on Reconfigurable Intelligent Surfaces for Future Wireless Communications*, Jun. 14–18, 2021, Montreal, Quebec, Canada.
10. Y. Cho, J. Choi, and B. L. Evans, “Coordinated Multicell Beamforming and Power Allocation for Massive MIMO with Low-Resolution ADC/DAC”, *IEEE Int. Conf. on Communications*, Jun. 14–18, 2021, Montreal, Quebec, Canada.
11. J. Sung and B. L. Evans, “Compressed-Sensing based Beam Detection in 5G NR Initial Access”, *IEEE International Workshop on Signal Processing Advances in Wireless Communications*, May 26–29, 2020, Atlanta, GA USA.
12. J. Sung and B. L. Evans, “Hybrid Beamformer Codebook Design and Ordering for Compressive mmWave Channel Estimation”, *IEEE International Conf. on Computing, Networking and Communications*, Feb. 17–20, 2020, Big Island, Hawaii, USA.
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14. J. Choi, Y. Cho, B. L. Evans, and A. Gatherer, "Robust Learning-Based ML Detection for Massive MIMO Systems with One-Bit Quantized Signals", *IEEE Global Communications Conf.*, Dec. 9–13, 2019, Waikoloa, HI, USA.
15. J. Choi, G. Lee, and B. L. Evans, "A Hybrid Beamforming Receiver with Two-Stage Analog Combining and Low-Resolution ADCs", *IEEE Int. Conf. on Communications*, May 20–24, 2019, Shanghai, China, 6 pages.
16. F. B. Mismar and B. L. Evans, "Deep Q-Learning for Self-Organizing Networks Fault Management and Radio Performance Improvement", *Asilomar Conf. on Signals, Systems, and Computers*, Oct. 28-31, 2018, Pacific Grove, CA, USA, 5 pages.
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26. D. Kundu, Deepti Ghadiyaram, A. C. Bovik and B. L. Evans, "No-reference Image Quality Assessment for High Dynamic Range Images", *Asilomar Conf. on Signals, Systems, and Computers*, Nov. 6–9, 2016, Pacific Grove, CA USA, 6 pages.

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28. J. Choi, B. L. Evans and A. Gatherer, "Space-Time Fronthaul Compression of Complex Baseband Uplink LTE Signals", *IEEE Int. Conf. on Communications*, May 23–27, 2016, Kuala Lumpur, Malaysia, 6 pages.
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30. M. Sayed, G. Sebaali, B. L. Evans and N. Al-Dhahir, "Efficient Diversity Technique for Hybrid Narrowband-Powerline/Wireless Smart Grid Communications", *IEEE Smart Grid Communications*, Nov. 2–5, 2015, Miami, FL USA, 6 pages.
31. D. Kundu and B. L. Evans, "Full-Reference Visual Quality Assessment for Synthetic Images: A Subjective Study", *IEEE Int. Conf. on Image Processing*, Sep. 27–30, 2015, Quebec City, Canada, 5 pages. **Won Top 10% Paper Award.**
32. J. Lin, T. Pande, I.-H. Kim, A. Batra and B. L. Evans, "Robust Transceiver to Combat Periodic Impulsive Noise in Narrowband Powerline Communications", *IEEE Int. Conf. on Communications*, June 8–12, 2015, London, UK, 6 pages.
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41. K. F. Nieman and B. L. Evans, "Time-Domain Compression of Complex-Baseband LTE Signals for Cloud Radio Access Networks", *IEEE Global Conf. on Signal and Information Processing*, Dec. 3–5, 2013, pp. 1198–1201, Austin, TX USA. **64 citations**
42. K. D. Wesson, B. L. Evans and T. E. Humphreys, "A Combined Symmetric Difference and Power Monitoring GNSS Anti-Spoofing Technique", *IEEE Global Conf. on Signal and Information Processing*, Dec. 3–5, 2013, pp. 217–220, Austin, TX USA. **78 citations**
43. K. D. Wesson, B. L. Evans and T. E. Humphreys, "A Probabilistic Framework for Global Navigation Satellite Signal Timing Assurance", *Asilomar Conf. on Signals, Systems, and Computers*, Nov. 3–6, 2013, Pacific Grove, CA.
44. M. Nassar, P. Schniter and B. L. Evans, "A Factor-Graph Approach to Joint OFDM Channel Estimation and Decoding in Impulsive Noise Channels", *Asilomar Conf. on Signals, Systems, and Computers*, Nov. 3–6, 2013, Pacific Grove, CA.
45. K. F. Nieman, M. Nassar, J. Lin and B. L. Evans, "FPGA Implementation of a Message-Passing OFDM Receiver for Impulsive Noise Channels", *Asilomar Conf. on Signals, Systems, and Computers*, Nov. 3–6, 2013, Pacific Grove, CA. **Won Best Student Paper Award for the Architecture and Implementation Track, Placed Second for the Overall Student Best Paper Award.**
46. C. Jia and B. L. Evans, "3D Rotational Video Stabilization Using Manifold Optimization", *IEEE Int. Conf. on Acoustics, Speech, and Signal Processing*, May 26–31, 2013, Vancouver, Canada.
47. K. F. Nieman, J. Lin, M. Nassar, B. L. Evans, and K. Waheed, "Cyclic Spectral Analysis of Power Line Noise in the 3-200 kHz Band", *IEEE Int. Sym. on Power Line Communications and Its Applications*, Mar. 24–27, 2013, Johannesburg, South Africa. **60 citations. Won the Best Paper Award.**
48. H. Andrade, A. Ghosal, K. Ravindran and B. L. Evans, "A Methodology for the Design of Reliable Systems on Heterogeneous Multi-Target Platforms", *Int. Conf. on ReConFigurable Computing and FPGAs*, Dec. 5–7, 2012, Cancun, Mexico.
49. J. Lin and B. L. Evans, "Cyclostationary Noise Mitigation in Narrowband Powerline Communications", *APSIPA Annual Summit and Conference*, Dec. 3–6, 2012, Hollywood, CA USA, invited paper.
50. C. Jia and B. L. Evans, "Probabilistic 3-D Motion Estimation for Rolling Shutter Video Rectification from Visual and Inertial Measurements", *IEEE Int. Workshop on Multimedia Signal Processing*, Sep. 17–20, 2012, Banff, Canada. **Won Top 10% Paper Award. 70 citations**
51. M. Park, M. Nassar, B. L. Evans, and H. Vikalo, "Adaptive Experimental Design for Drug Combinations", *IEEE Statistical Signal Processing Workshop*, Aug. 5–8, 2012, Ann Arbor, MI USA.
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2. I. C. Wong and B. L. Evans, *Resource Allocation in Multiuser Multicarrier Wireless Systems*, Springer, Nov. 2007, ISBN 978-0-387-74944-0. **64 citations.**
3. V. Monga, N. Damera-Venkata, and B. L. Evans, “Color Image Halftoning”, in *Color Image Processing: Methods and Applications*, CRC Press, Sep. 2006.
4. K. C. Slatton and B. L. Evans, “Software for Image and Video Processing”, in *Handbook of Image and Video Processing*, (ed. A. C. Bovik), Second Edition, Academic Press, 2005.
5. M. D. Lutovac, D. V. Tošić, and B. L. Evans, *Filter Design for Signal Processing*, Prentice Hall, ISBN 0-201-36130-2, 2001. (Chinese translation published in 2005.) **361 citations**
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Oral Presentations

1. May 9, 2022, “Full Duplex, Reconfigurable Surfaces, Deep Learning Hybrid Beamforming, and Future Testbeds” 6G@UT Kickoff Event, Austin, TX USA.
2. February 11, 2021, “Increasing Throughput in 5G+ Physical Layer Communication Systems”, Nvidia, San Jose, CA USA.
3. February 11, 2021, “Increasing Throughput in 5G+ Physical Layer Communication Systems”, Tektronix, Portland, OR USA.
4. December 3, 2020, “ECE Student Mentoring Committee”, ECE External Advisory Council Meeting, Austin, TX USA.
5. November 2020, Nvidia, San Jose, CA USA.
 - Part 1: “Our Recent Work and Future Directions in Cellular Communication Systems”

- Part 2: “Adaptive Self-Interference Cancellation for Full-Duplex Cellular Communications”
 - Part 3: “Rate Optimization for Reconfigurable Intelligent Surfaces (RIS)”
6. October 2020, “Our Recent Work and Future Directions in Cellular Communication Systems”, Ericsson, San Jose, CA USA.
 7. May 24, 2018, “Real-Time Testbed for Diversity in Powerline and Wireless Smart Grid Communications”, IEEE International Conference on Communications, Workshop Integrating Comm., Control, Comp. Tech. for Smart Grid, Kansas City, Missouri USA.
 8. March 22, 2018, “Massive MIMO Cost Reduction”, Futurewei Site Visit, The University of Texas at Austin, Austin, Texas USA.
 9. November 9, 2016, “No-reference Image Quality Assessment for High Dynamic Range Images”, Asilomar Conference on Signals, Systems and Computers, Pacific Grove, California USA.
 10. October 20, 2016, “Energy-Efficient Signal Processing Techniques for Smart Grid Heterogeneous Communications Networks”, Dallas, Texas USA.
 11. September 26, 2016, “Visual Attention Guided Quality Assessment of Tone-Mapped Images using Scene Statistics”, IEEE International Conference on Image Processing, Phoenix, Arizona USA.
 12. July 23, 2015, “Baseband LTE Compression”, Futurewei, Dallas, Texas USA.
 13. May 7, 2014, “Energy-Efficient Signal Processing Techniques for Smart Grid Heterogeneous Communications Networks”, Project Kickoff Talk, Semiconductor Research Corporation Review, Pittsburg, Pennsylvania USA.
 14. August 7, 2013, “Experts Panel: Future of Wireless Communications System Design”, with co-panelists Prof. Ted Rappaport, Prof. Costas Georghiadis, Mr. Mark Cudak, Prof. Robert Heath, and Mr. Matt Ettus, Invited Presentation, National Instruments Week Conference, Austin, Texas USA.
 15. August 7, 2013, “Smart Grid Communications”, Invited Talk, National Instruments Week Conference, Austin, Texas USA.
 16. June 20, 2013, “Smart Grid Communications”, Keynote Talk, International Conference on Communications and Information Technology, Beirut, Lebanon.
 17. May 6, 2013, “FPGA Implementation of a Message-Passing OFDM Receiver for Impulsive Noise Channels”, National Instruments Project Review, Austin, TX USA
 18. May 2, 2013, “Powerline Communications for Enabling Smart Grid Applications”, Semiconductor Research Corporation Annual Project Review, Intel, Portland, OR USA.
 19. December 14, 2012, “Smart Grid Communications”, Department of Electrical and Computer Engineering, The University of Texas at Dallas, Richardson, Texas USA.
 20. October 25, 2012, “Cloud Radio Access Networks”, The University of Texas at Austin, Austin, Texas USA. (With co-presenters Gustavo de Veciana, Mattan Erez and Robert W. Heath, Jr.)
 21. August 6, 2012, “FPGA Implementation of Denoising in OFDM Systems using DSP Diagram”, NI Week Conference, Austin, Texas USA.

22. July 17, 2012, "Powerline Communications for Smart Grids", Department of Electrical and Computer Engineering, American University of Beirut, Beirut, Lebanon.
23. May 10, 2012, "Interference Mitigation in Wireless OFDM Communication Systems: Application Case Studies for NI DSP Designer", National Instruments, Austin, Texas USA.
24. May 3, 2012, "Powerline Communications for Enabling Smart Grid Applications", Semiconductor Research Corporation Annual Review, Georgia Institute of Technology, Atlanta, Georgia USA.
25. November 10, 2011, "Dataflow Modeling of Signal Processing and Communication Systems", Guest Lecture for EE 382V Embedded System Design and Modeling, The University of Texas at Austin, Austin, Texas USA.
26. September 8, 2011, "Interference Mitigation in Wireless OFDM Communication Systems: Application Case Studies for NI DSP Designer", National Instruments, Austin, Texas USA.
27. August 4, 2011, "Non-Parametric Methods for Mitigating Interference in OFDM Systems", Department of Electrical and Computer Engineering, American University of Beirut, Beirut, Lebanon.
28. March 24, 2011, "Design of Interference-Aware Wireless Communication Systems", Commscope and Texas Instruments, Dallas, Texas.
29. March 8, 2011, "Powerline Communications for Enabling Smart Grid Applications", Semiconductor Research Corporation Annual Review, University of California, Los Angeles, California.
30. December 16, 2010, "Design of Interference-Aware Wireless Communication Systems", Cockrell School of Engineering, Austin, Texas.
31. December 2, 2010, "Design of Interference-Aware Wireless Communication Systems", Intel Virtual Presentation, Austin, Texas.
32. November 9, 2010, "Doppler estimation and correction for shallow underwater acoustic communications", Asilomar Conference on Signals, Systems and Computers, Pacific Gove, California.
33. October 20, 2010, "Overcoming Interference Limitations in Networked Systems", The University of Texas at Austin, Austin, Texas USA.
34. October 7, 2010, "Dataflow Modeling of Signal Processing and Communication Systems", Guest Lecture for EE 382V Embedded System Design and Modeling, The University of Texas at Austin, Austin, Texas USA.
35. July 27, 2010, "Reducing Complexity in Signal Processing Algorithms for Communication Receiver and Image Display Software", Department of Electrical and Computer Engineering, American University of Beirut, Beirut, Lebanon.
36. April 12, 2010, "Radio Frequency Interference Sensing and Mitigation in Wireless Receivers", Intel, Hillsboro, Oregon USA.
37. January 12, 2010, "Statistical Signal Processing for Sensing and Mitigating Impulsive Noise in Communication Receivers", Texas Instruments, Dallas, Texas USA.
38. October 7, 2009, "Radio Frequency Interference Sensing and Mitigation in Wireless Receivers", VLSI Seminar Series, The University of Texas at Austin, Austin, Texas USA.

39. June 23, 2009, "Radio Frequency Interference Sensing and Mitigation in Wireless Receivers", Department of Electrical and Computer Engineering, American University of Beirut, Beirut, Lebanon.
40. March 16, 2009, "Radio Frequency Interference Sensing and Mitigation in Wireless Receivers", Intel Labs, Hillsboro, Oregon USA.
41. October 29, 2008, "Adaptive Downlink OFDMA Resource Allocation", IEEE Asilomar Conference on Signals, Systems and Computers, Pacific Grove, California USA.
42. October 27, 2008, "Advanced Sonar Processing Techniques for Underwater Acoustic Multi-Input Multi-Output Communications", IEEE Asilomar Conference on Signals, Systems and Computers, Pacific Grove, California USA.
43. October 21, 2008, "Dataflow Modeling of Signal Processing and Communication Systems", Guest Lecture for EE 382V Embedded System Design and Modeling, The University of Texas at Austin, Austin, Texas USA.
44. October 16, 2008, "Improving Wireless Data Transmission Speed and Reliability to Mobile Computing Platforms", Texas Wireless Summit, Austin, Texas USA.
45. October 9, 2008, "Mitigating Computer Platform Radio Frequency Interference in Embedded Wireless Receivers", Electrical and Computer Engineering Seminar, Carnegie Mellon University, Pittsburgh, Pennsylvania USA.
46. August 26, 2008, "Embedded Signal Processing Systems", The University of Texas at Austin, Austin, Texas USA.
47. July 16, 2008, "Improving Wireless Data Transmission Speed and Reliability to Mobile Computer Platforms", American University of Beirut, Beirut, Lebanon.
48. February 25, 2008, "Mitigating Computer Platform Radio Frequency Interference in Embedded Wireless Transceivers", Intel, Portland, Oregon USA.
49. November 7, 2007, "Error Diffusion Halftoning Methods for Image Display", Qualcomm MEMS Technology, Santa Clara, California USA.
50. November 6, 2007, "Resource Allocation in Downlink Multiuser Multicarrier Wireless Systems", Intel, Santa Clara, California USA.
51. October 17, 2007, "Mitigating Computer Platform Radio Frequency Interference in Embedded Wireless Transceivers", The University of Texas at Austin, Austin, Texas USA.
52. August 8, 2007, Moderated panel discussion on "Bridging the Academic and Industry DSP Gaps". C. Sidney Burrus (Rice University), Chris H. Dick (Xilinx), Gene Frantz (TI), James H. McClellan (Georgia Institute of Technology), Ronald W. Schafer (HP Labs) and Mark A. Yoder (Rose-Hulman Institute of Technology), National Instruments Week, Austin, Texas USA.
53. April 16, 2007, "Mitigating Radio Frequency Interference from the Computer Platform to Improve Wireless Data Communications", Intel Labs, Portland, Oregon USA.
54. July 5, 2006, "Resource Allocation for Mobile Multiuser OFDM Systems", Dept. of Electrical and Computer Engineering, American University of Beirut, Beirut, Lebanon.

55. July 4, 2006, "Automating Floating-point to Fixed-point Transformations For Implementing Digital Signal Processing Algorithms", Dept. of Electrical and Computer Engineering, American University of Beirut, Beirut, Lebanon.
56. March 1, 2006, "Panel on Processor Benchmarking — Measuring DSP Performance in a Meaningful Way", Texas Instruments Developer's Conference, Dallas, Texas USA.
57. February 17, 2006, "Resource Allocation for Mobile Multiuser OFDM Systems", Center for Signal and Image Processing, Georgia Institute of Technology, Atlanta, Georgia USA.
58. November 2, 2005, "Halftoning-Inspired Methods for Foveation in Variable-Acuity Superpixel Imager (VASI) Cameras", IEEE Asilomar Conf. on Signals, Systems, and Computers, Pacific Grove, California.
59. August 16, 2005, "NI at ECE at UT Austin", Signal Processing Workshop, NI Week 2005, Austin, Texas USA.
60. August 8, 2005, "Equalizer Design to Maximize Bit Rate in ADSL Transceivers", Dept. of Electrical and Computer Engineering, American University of Beirut, Beirut, Lebanon.
61. June 30, 2005, "Modem Design, Implementation, and Testing Using NI's LabVIEW", NI Academic Day, Beirut, Lebanon.
62. March 22, 2005, "Deadlock Detection for Distributed Process Networks", *IEEE Int. Conf. on Acoustics, Speech, and Signal Processing*, Philadelphia, Pennsylvania USA.
63. June 16, 2004, "Equalization for ADSL Transceivers", Dept. of Electrical and Computer Engineering, American University of Beirut, Beirut, Lebanon.
64. May 18, 2004, "Network Tomography Based on Flow Level Measurements", Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing, Montreal, Canada.
65. May 11, 2004, "High-Speed Wireline Communication Systems", The University of Texas, Austin, Texas USA.
66. February 19, 2004, "Modem Design, Implementation, and Testing Using NI's LabVIEW", *Texas Instruments Developer's Conference*, Houston, Texas USA.
67. November 21, 2003, "Embedded Signal Processing", National Instruments, Austin, Texas USA.
68. August 20, 2003, "Error Diffusion Halftoning Methods for Printing and Display", Xerox Research Labs, Webster, New York USA.
69. April 2, 2003, "The Future of DSP Engineering Panel," International Signal Processing Conference, Dallas, Texas USA.
70. March 29, 2003, "How ADSL Modems Work", Sophomore Engineering Honors Program, The University of Texas at Austin, Austin, Texas USA.
71. February 21, 2003, "Equalizer Design to Maximize Bit Rate in ADSL Transceivers", Dept. of ECE, The University of Texas at Austin, Austin, Texas USA.
72. January 24, 2003, "Variations on Error Diffusion: Retrospectives and Future Trends", SPIE/IS&T Symposium on Electronic Imaging, Santa Clara, California USA.

73. January 9, 2003, "Embedded Signal Processing Laboratory at UT Austin", National Instruments, Austin, Texas USA.
74. November 8, 2002, "Equalization for ADSL Transceivers", Dept. of ECE, University of California, Davis, California USA.
75. November 7, 2002, "Error Diffusion Halftoning Methods for High-Quality Printed and Displayed Images", California Research Center, Ricoh Innovations, Inc., Menlo Park, California USA.
76. November 6, 2002, "Error Diffusion Halftoning Methods for High-Quality Printed and Displayed Images", Apple, Inc., Cupertino, California USA.
77. November 1, 2002, "Equalization for ADSL Transceivers", Dept. of EE, Stanford University, Stanford, California USA.
78. October 31, 2002, "Error Diffusion Halftoning Methods for High-Quality Printed and Displayed Images", HP Laboratories, Palo Alto, California USA.
79. October 8, 2002, "Equalization for ADSL Transceivers", Dept. of ECE, Cornell University, Ithaca, New York USA.
80. October 2, 2002, "Error Diffusion Halftoning Methods for High-Quality Printed and Displayed Images: Part II Color Halftoning", Dept. of ECE, Cornell University, Ithaca, New York USA.
81. September 18, 2002, "Error Diffusion Halftoning Methods for High-Quality Printed and Displayed Images: Part I Grayscale Halftoning", Dept. of ECE, Cornell University, Ithaca, New York USA.
82. September 13, 2002, "Equalization for ADSL Transceivers", Dept. of ECECS, University of Cincinnati, Cincinnati, OH.
83. September 12, 2002, "Equalization for ADSL Transceivers", Dept. of ECE, Purdue University, West Lafayette, IN.
84. September 11, 2002, "Error Diffusion Halftoning Methods for High-Quality Printed and Displayed Images", Dept. of ECE, Purdue University, West Lafayette, IN.
85. June 5, 2002, "BSEE and BS Comp. Eng. Curriculum for the 2002–2004 Catalog", The University of Texas at Austin, Austin, Texas USA.
86. January 24, 2002, "Time-Domain Equalization for ADSL Transceivers", Telecommunications and Signal Processing Seminar, Dept. of ECE, The University of Texas, Austin, Texas USA.
87. October 27, 2001, "Time-Domain Equalization for ADSL Transceivers", Texas Systems Day 2001, Dept. of ECE, Texas Tech University, Lubbock, Texas USA.
88. October 26, 2001, "How to Make Printed and Displayed Images Have High Visual Quality", Center for Perceptual Systems Seminar Series, The University of Texas at Austin, Austin, Texas USA.
89. September 25, 2001, "BSEE and BS Comp. Eng. Curriculum for the 2002–2004 Catalog", The University of Texas at Austin, Austin, Texas USA.
90. September 7, 2001, "Time-Domain Equalization for ADSL Transceivers", Telecommunications and Signal Processing Seminar, Dept. of ECE, The University of Texas at Austin, Austin, Texas USA.

91. August 3, 2001, "Time-Domain Equalization for ADSL Transceivers", Dept. of ECE, University of British Columbia, Vancouver, BC Canada.
92. July 9, 2001, "Time-Domain Equalization for ADSL Transceivers", Rhodes Hall, Dept. of ECE, Cornell University, Ithaca, New York USA.
93. May 21, 2001, "Time-Domain Equalization for ADSL Transceivers", Dept. of EE, Southern Methodist University, Dallas, Texas USA.
94. April 10, 2001, "Time-Domain Equalization for ADSL Transceivers", Dept. of EE, Texas A&M University, College Station, Texas USA.
95. April 6, 2001, "Time-Domain Equalization for ADSL Transceivers", Dept. of EE, The University of Texas at Arlington, Arlington, Texas USA.
96. March 29, 2001, "Time-Domain Equalization for ADSL Transceivers", 487 Goldwater Research Center, Arizona State University, Tempe, AZ. (Slides)
97. March 27, 2001, "BSEE and BS Comp. Eng. Curriculum for the 2002–2004 Catalog", The University of Texas at Austin, Austin, Texas USA.
98. March 26, 2001, "BSEE and BS Comp. Eng. Curriculum for the 2002–2004 Catalog", The University of Texas at Austin, Austin, Texas USA.
99. February 16, 2001, "Time-Domain Equalization for ADSL Transceivers", Center for Signal and Image Processing, Georgia Institute of Technology, Atlanta, Georgia USA.
100. February 8, 2001, "Time-Domain Equalization for ADSL Transceivers", Dept. of ECE, The University of Texas at Dallas, Richardson, Texas USA.
101. February 2, 2001, "Time-Domain Equalization for ADSL Transceivers", Dept. of ECE, The University of Texas at Austin, Austin, Texas USA.
102. November 10, 2000, "Software Development in the Unix Environment", Dept. of ECE, The University of Texas at Austin, Austin, Texas USA.
103. October 24, 2000, "Summary of Faculty and Student Discussions for the BSEE Curriculum for the 2002–2004 Catalog", The University of Texas at Austin, Austin, Texas USA.
104. October 17, 2000, "A Signal Processing System Design Course", IEEE Signal Processing Education Workshop, Hunt, Texas.
105. October 17, 2000, "Fast Time-Domain Equalization for Discrete Multitone Modulation Systems", IEEE Digital Signal Processing Workshop, Hunt, Texas.
106. September 5, 2000, "BSEE and BS Comp. Eng. Degrees: Ideas for the 2002-2004 Catalog", The University of Texas at Austin, Austin, Texas USA. (PowerPoint)
107. August 25, 2000, "Telecommunications and Signal Processing at UT Austin", Motorola, Austin, Texas USA. (PowerPoint)
108. May 30, 2000, "Telecommunications and Signal Processing at UT Austin", Texas Instruments, Dallas, Texas USA. (PowerPoint)

109. May 26, 2000, "Telecommunications and Signal Processing at UT Austin", Motorola, Austin, Texas USA. (PowerPoint)
110. February 2, 2000, "Introduction to Digital Signal Processors", Guest Lecture for EE382M Application-Specific Processing, The University of Texas at Austin, Austin, Texas USA
111. January 24, 2000, "Experiences using WebCT: Empower the Students and Burden your TA", College of Engineering Brown Bag Seminar, The University of Texas at Austin, Austin, Texas USA
112. October 27, 1999, "Quality Assessment of Compression Techniques for Synthetic Aperture Radar Images," *IEEE Int. Conf. on Image Processing*
113. October 27, 1999, "Low Delay Foveated Visual Communications Over Wireless Channels," *IEEE Int. Conf. on Image Processing*
114. October 27, 1999, "Fast Rehalftoning and Interpolated Halftoning Algorithms with Flat Low-Frequency Response," *IEEE Int. Conf. on Image Processing*
115. October 26, 1999, "Motion Estimation and Compensation for Foveated Video," *IEEE Int. Conf. on Image Processing*
116. October 25, 1999, "Lossy Compression of Stochastic Halftones with JBIG2," *IEEE Int. Conf. on Image Processing*
117. August 6, 1999, "Efficient Implementation of Foveation Filtering", Texas Instruments Digital Signal Processing Systems Conference, Houston, Texas USA.
118. August 5, 1999, "A Framework for Real-time High-Throughput Signal and Image Processing on Workstations", Bellaire Technology Center, Shell Company, Houston, Texas USA.
119. April 29, 1999, "Introduction to System-Level Design", Guest Lecture for EE382C-8 Methodology for Hardware/Software Codesign, Dept. of ECE, The University of Texas at Austin, Austin, Texas USA.
120. March 31, 1999, "Introduction to System-Level Design", Guest Lecture for EE382M Application-Specific Processing, Dept. of ECE, The University of Texas at Austin, Austin, Texas USA.
121. March 26, 1999, "Software Development in the Unix Environment", Dept. of ECE, The University of Texas at Austin, Austin, Texas USA.
122. March 6, 1999, "Embedded Signal Processing Laboratory", Prospective Graduate Student Site Visit, Dept. of ECE, The University of Texas at Austin, Austin, Texas USA.
123. February 24, 1999, "Introduction to Digital Signal Processors", Guest Lecture for EE382M Application-Specific Processing, Dept. of ECE, The University of Texas at Austin, Austin, Texas USA.
124. February 22, 1999, "Introduction to Digital Signal Processors", HP Laboratories, Palo Alto, California USA.
125. February 19, 1999, "Real-Time Process Network Sonar Beamformer", Ptolemy Miniconference, University of California, Berkeley, California USA.
126. January 11, 1999, "Scalable Software and Hardware for Image and Video Processing Systems", National Science Foundation CAREER Principal Investigator Conference, Washington, District of Columbia, USA.

127. November 4, 1998, "Interpolated Halftoning, Rehalftoning, and Compression of Halftones", HP Laboratories, Palo Alto, California USA.
128. November 3, 1998, "Improved Matrix Pencil Methods", IEEE Asilomar Conf. on Signals, Systems, and Computers, Pacific Grove, California USA.
129. October 28, 1998, "Image Halftoning", Signal and Image Processing Seminar, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, Texas USA.
130. October 15, 1998, "Signal Processing for Wireless Basestations", Wireless Communications Laboratory Seminar, Texas A&M University, College Station, Texas USA.
131. August 27, 1998, "Design and Quality Assessment of Forward and Inverse Error Diffusion Image Halftoning Algorithms", Center for Signal and Image Processing Seminar, Georgia Institute of Technology, Atlanta, Georgia USA.
132. August 7, 1998, "Embedded Halftoning and Inverse Halftoning for JBIG2 Coding", Texas Instruments Digital Signal Processing Systems Fest, Houston, Texas USA.
133. August 3, 1998, "Embedded Signal Processing Laboratory", Digital Signal Processing R&D Center, Texas Instruments, Dallas, Texas USA.
134. June 9, 1998, "Embedded Signal Processing Laboratory", HP EEsof, Westlake Village, California USA.
135. June 8, 1998, "Embedded Signal Processing Laboratory", Rockwell Science Center, Thousand Oaks, California USA.
136. June 2, 1998, "Joint Optimization of Multiple Behavioral and Implementation Properties of Analog Filter Designs", IEEE Int. Sym. on Circuits and Systems, Monterey, California USA.
137. April 13, 1998, "Overview of Research in the Embedded Signal Processing Laboratory", Motorola, Austin, Texas USA
 - Overview
 - Analog IIR Filter Optimization
 - HDSL2 Modem Design
138. March 10, 1998, "Heterogeneous Modeling and Design: UT Austin Subcontract", slides by Prof. Brian L. Evans but presented by Prof. Edward A. Lee, DARPA Informal Review, University of California at Berkeley, Berkeley, California USA.
139. February 11, 1998, "Advanced Digital Signal Processing for Communications Systems", IEEE Communication Society Seminar, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, Texas USA.
140. January 23, 1998, "Software Development in the Unix Environment", Electrical and Computer Engineering Departmental Seminar, The University of Texas at Austin, Austin, Texas USA.
141. January 5, 1998, "Advanced Filter Design for Communications and Signal Processing Systems", Center for Signal and Image Processing Seminar, Georgia Institute of Technology, Atlanta, Georgia USA.

142. December 5, 1997, "Summary of Abstracts Submitted to the Texas Instruments University DSP R&D Fund", DSP R&D Center, Texas Instruments, Dallas, Texas USA.
 - "Web-Enabled Simulation of Texas Instruments DSP Processors and Boards"
 - "Design Tools to Help Map Applications into Minimum Power Implementations on TMS320C54x and TMS320C6x Processors"
 - "High-Speed Digital Subscriber Line Generation 2 (HDSL2) Modem on a Single TMS320C6x Processor"
 - "Towards a DSP Solution for Real-Time MPEG-2 Encoding "
 - "Standards-Compliant High-Quality Low-Bitrate Wireless Video Communications Using TMS320C6x and TMS320C54x Processors"
143. November 21, 1997, "Advanced Filter Design for Communications and Signal Processing Systems", Digital Signal Processing Seminar, The University of Texas at Austin, Austin, Texas USA.
144. November 10, 1997, "The Wonders of Digital Signal Processing", IEEE Brown Bag Lunch, The University of Texas at Austin, Austin, Texas USA.
145. November 4, 1997, "Generalized Coiflets", IEEE Asilomar Conf. on Signals, Systems, and Computers, Pacific Grove, California USA.
146. November 4, 1997, "Advanced Filter Design", IEEE Asilomar Conf. on Signals, Systems, and Computers, Pacific Grove, California USA.
147. November 3, 1997, "Blind Channel Estimation in CDMA Systems with Aperiodic Spreading Sequences", IEEE Asilomar Conf. on Signals, Systems, and Computers, Pacific Grove, California USA.
148. November 3, 1997, "A Fingerprint Classification Technique Using Directional Images", IEEE Asilomar Conf. on Signals, Systems, and Computers, Pacific Grove, California USA.
149. October 28, 1997, "Biorthogonal Quincunx Coifman Wavelets", IEEE Int. Conf. on Image Processing, Santa Barbara, California USA.
150. October 27, 1997, "Digital Image Halftoning As 2-D Delta-Sigma Modulation", IEEE Int. Conf. on Image Processing, Santa Barbara, California USA.
151. September 29, 1997, "Digital Image Halftoning as 2-D Delta-Sigma Modulation", Rose-Hulman Institute of Technology, Terre Haute, IN.
152. July 16, 1997, "Trends in Computer-Aided Design for Signal Processing Systems", Laboratory for Video and Image Engineering, The University of Texas at Austin, Austin, Texas USA.
153. June 12, 1997, "Delta-Sigma Analysis of Image Halftoning by Error Diffusion", Lucent Bell Laboratories, Holmdel, NJ.
154. June 10, 1997, "Signal Modeling", Guest Lecture for EE381K-9 Advanced Signal Processing, The University of Texas at Austin, Austin, Texas USA.
155. June 5, 1997, "An Introduction to Advanced Signal Processing", Guest Lecture for EE381K-9 Advanced Signal Processing, The University of Texas at Austin, Austin, Texas USA.

156. May 9, 1997, "Delta-Sigma Analysis of Image Halftoning by Error Diffusion", Georgia Institute of Technology, Atlanta, Georgia USA.
157. April 22, 1997, "Signal Processing System Design", Guest Lecture for EE382C Methodology for Hardware/Software Codesign, The University of Texas at Austin, Austin, Texas USA.
158. March 17, 1997, "Error Diffusion as Delta-Sigma Modulation for Digital Image Halftoning", HP Research Laboratories, Palo Alto, California USA.
159. March 14, 1997, "Web-Based Simulators for Embedded Software for Digital Signal Processors", Ptolemy Miniconference, University of California at Berkeley, Berkeley, California USA.
160. February 28, 1997, "Software Development in the Unix Environment", Electrical and Computer Engineering Departmental Seminar, The University of Texas at Austin, Austin, Texas USA.
161. February 20, 1997, "The Role of Symbolic Computation in Signal Processing System Design", Crystal Semiconductor, Austin, Texas USA.
162. November 19, 1996, "An Algebraic Approach to Multi-Frame Blind Deconvolution", Smart Sensors for Space & Airborne Applications Workshop, Kirkland Air Force Base, NM.
163. November 19, 1996, "AM-FM Image Analysis", Smart Sensors for Space & Airborne Applications Workshop, Kirkland Air Force Base, NM.
164. November 6, 1996, "Optimization of Signal Processing Algorithms", Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, California USA.
165. October 18, 1996, "Software Development in the Unix Environment", Electrical and Computer Engineering Department Seminar, The University of Texas at Austin, Austin, Texas USA.
166. June 25, 1996, "Highlights of the Workshop on a Common Operating Environment for Signal Processing", Ptolemy Project Group Meeting, University of California at Berkeley, Berkeley, California USA.
167. June 12, 1996, "Overview of the Ptolemy Project", Joint Services Workshop for a Common Signal Processing Operating Environment, Georgia Institute of Technology, Atlanta, Georgia USA.
168. June 10, 1996, "Overview of the Ptolemy Project", Industrial Liaison Program Conference, University of California at Berkeley, Berkeley, California USA.
169. May 8, 1996, "Real-Time DSP for Sophomores", IEEE Int. Conf. on Acoustics, Speech, and Signal Proc., Atlanta, Georgia USA.
170. April 30, 1996, "The Role of Symbolic Computation in Signal Processing System Design", MicroUnity, Mountain View, California USA.
171. April 21, 1996, "The Role of Symbolic Computation in Signal Processing System Design", University of British Columbia, Vancouver, Canada.
172. April 17, 1996, "The Role of Symbolic Computation in Signal Processing System Design", Catholic University of America, Washington, District of Columbia USA.
173. April 15, 1996, "The Role of Symbolic Computation in Signal Processing System Design", Pennsylvania State University, University Park, Pennsylvania USA.

174. April 12, 1996, “The Role of Symbolic Computation in Signal Processing System Design”, University of Maryland, College Park, Maryland USA.
175. April 11, 1996, “The Role of Symbolic Computation in Signal Processing System Design”, Virginia Polytechnic Institute and State University, Blacksburg, Virginia USA.
176. April 9, 1996, “The Role of Symbolic Computation in Signal Processing System Design”, Dartmouth College, Hanover, New Hampshire USA.
177. April 8, 1996, “Theory and Implementation of Multirate Digital Signal Processing Systems”, Dartmouth College, Hanover, NH.
178. April 4, 1996, “The Role of Symbolic Computation in Signal Processing System Design”, UCLA, Los Angeles, California USA.
179. March 29, 1996, “The Role of Symbolic Computation in Signal Processing System Design”, University of Rochester, Rochester, New York USA.
180. March 25, 1996, “The Role of Symbolic Computation in Signal Processing System Design”, The University of Texas, Austin, Texas USA.
181. January 26, 1996, “Mathematica and the Ptolemy/Mathematica Interface”, DSP Design Group Meeting, University of California at Berkeley, Berkeley, California USA.
182. November 16, 1995, “Filter Design in MATLAB and Mathematica”, DSP Design Group Meeting, University of California at Berkeley, Berkeley, California USA.
183. November 9, 1995, “MATLAB and the Ptolemy/MATLAB Interface”, DSP Design Group Meeting, University of California at Berkeley, Berkeley, California USA.
184. May 1995, “Integrating Analysis, Simulation, and Implementation Tools in Electronic Courseware for Teaching Signal Processing”, IEEE Int. Conf. on Acoustics, Speech, and Signal Proc., Detroit, MI.

Patents

- Matthew D. Felder, James C. Mason, and Brian L. Evans, *Efficient Digital ITU-Compliant, Zero-Buffering, DTMF Detection Using the Non-Uniform Discrete Fourier Transform*, US Patent 6608896, issued Aug. 19, 2003, application number 10/021,397. Non-Confidential Specification Sheet. Patent sold to Mosaid Technologies Inc. in April 2007.
- Matthew D. Felder, James C. Mason, and Brian L. Evans, *Efficient Digital ITU-Compliant, Zero-Buffering, DTMF Detection Algorithm Using the Non-Uniform Discrete Fourier Transform*, US Patent 6370244, issued Apr. 9, 2002, application number 09/054,872. Non-Confidential Specification Sheet. Patent sold to Mosaid Technologies Inc. in April 2007.

Copyrighted Software

- E. Balti, *Low Complexity Hybrid Beamforming for mmWave Full-Duplex Integrated Access and Backhaul*, copyright © 2022–2023 by The University of Texas at Austin. MATLAB code to accompany the paper of the same name published in the *Proc. IEEE Global Communications Conference*, Dec. 4–8, 2022, Rio de Janeiro, Brazil.

- Yunseong Cho and Jinseok Choi, *Quantized Coordinated Multipoint with Per Antenna Constraints*, copyright © 2022 by The University of Texas. MATLAB code to accompany the paper “Coordinated Beamforming in Quantized Massive MIMO Systems with Per-Antenna Constraints” published in the *Proc. IEEE Wireless Communications and Networking Conference*, April 10-13, 2022, Austin, Texas USA.
- E. Balti, *Full Duplex Steepest Ascent*, copyright © 2021 by The University of Texas at Austin. MATLAB code to accompany the submitted paper “Adaptive Self-Interference Cancellation for Full-Duplex Wireless Communication Systems”. Software released on Aug. 9, 2021.
- Faris B. Mismar, *Deep Reinforcement Learning for 5G Networks*, copyright © 2019–2020 by The University of Texas. MATLAB code to accompany the paper “Deep Reinforcement Learning for 5G Networks: Joint Beamforming, Power Control, and Interference Coordination” published in the *IEEE Transactions on Wireless Communications* in Mar. 2020. Software release is version 2.1 (Dec. 15, 2020).
- Yunseong Cho and Jinseok Choi, *Coordinated Multicell Beamforming and Power Allocation for Massive MIMO with Low-Resolution ADCs/DACs*, copyright © 2020 by The University of Texas. MATLAB code to accompany the conference paper “Coordinated Multicell Beamforming and Power Allocation for Massive MIMO with Low-Resolution ADCs/DACs” published in the 2021 IEEE Int. Conf. Communications in June 2021. Software release is version 1.0 (Oct. 27, 2020).
- Faris B. Mismar, *Deep Learning Predictive Band Switching in Wireless Networks*, copyright © 2020 by The University of Texas. MATLAB code to accompany the paper “Deep Learning Predictive Band Switching in Wireless Networks” published in the *IEEE Transactions on Wireless Communications* in Jan. 2021. Software release is version 2.0 (July 1, 2020).
- Jinseok Choi and Brian L. Evans, *Two-Stage Analog Beamforming*, copyright © 2019 by The University of Texas. MATLAB code to accompany the paper “Two-Stage Analog Combining in Hybrid Beamforming Systems with Low-Resolution ADCs” published in *IEEE Transactions on Signal Processing* in May 2019. Software release is version 1.0 (July 27, 2019).
- Faris B. Mismar, *Deep Q Learning SON Perf Improvement*, copyright © 2019 by The University of Texas. MATLAB code to accompany the paper “A Framework for Automated Cellular Network Tuning with Reinforcement Learning” published in the *IEEE Transactions on Wireless Communications* in Oct. 2019. Software release is version 2.0 (July 26, 2019).
- Faris B. Mismar, *Q Learning Power Control*, copyright © 2019 by The University of Texas. MATLAB code to accompany the paper “A Framework for Automated Cellular Network Tuning with Reinforcement Learning” published in the *IEEE Transactions on Wireless Communications* in Oct. 2019. Software release is version 2.0 (May 2019).
- Jinseok Choi and B. L. Evans, *Resolution-Adaptive Hybrid MIMO Architectures for Millimeter Wave Communications*, copyright © 2017–2018 by The University of Texas. MATLAB code to accompany a paper of the same title published in the *IEEE Transactions on Signal Processing* in Dec. 2017. Software release is version 1.0 (Nov. 15, 2018).
- Jinseok Choi and B. L. Evans, *Antenna Selection for Millimeter Wave (mmWave) Cellular Systems (New Radio)*, copyright © 2017–2018 by The University of Texas. These software releases in MATLAB accompany various publications.

- *Antenna Selection for Large-Scale MIMO Systems with Low-Resolution ADCs with Online Training of the Quantizer Model*, Version 2.0 (February 16, 2018). Variation on the Version 1.0 release for the ICASSP 2018 paper below. The MMSE quantizer model is updated at each transmission and selection.
- *Antenna Selection for Large-Scale MIMO Systems with Low-Resolution ADCs with Offline Training of the Quantizer Model*, Variation on the Version 1.0 release for the ICASSP 2018 paper below. The MMSE quantizer model is updated only once for the given simulation environment.
- *Antenna Selection for Large-Scale MIMO Systems with Low-Resolution ADCs*, to accompany a paper of the same title in the 2018 IEEE International Conference on Acoustics, Speech and Signal Processing. Version 1.0 (October 27, 2017).
- *Channel Estimation for Hybrid Beamforming Millimeter Wave Communication Systems*, copyright © 2017–2019 by The University of Texas. These software releases in MATLAB accompany various publications.
 - Junmo Sung, *Hybrid Beamformer Codebook Design and Ordering for Compressive mmWave Channel Estimation*.
 - Junmo Sung, *Versatile Compressive mmWave Hybrid Beamformer Codebook Design Framework*.
 - Junmo Sung, Jinseok Choi, and Brian L. Evans, *Narrowband Channel Estimation for Hybrid Beamforming Millimeter Wave Communication Systems with One-Bit Quantization*. MATLAB code to accompany a paper of the same title in the 2018 IEEE International Conference on Acoustics, Speech, and Signal Processing. Version 1.0 (October 27, 2017).
 - Junmo Sung, Jinseok Choi, and Brian L. Evans, *Wideband Millimeter Wave Channel Estimation Algorithms*. MATLAB code for wideband channel estimation algorithms for hybrid beamforming millimeter wave communication systems with low-resolution analog-to-digital converters (ADCs). Version 1.0 (October 13, 2017).
- Yoong Fong Choo and B. L. Evans, *Complex Block Floating-Point Format with Box Encoding For Wordlength Reduction in Communication Systems*, copyright © 2017 by The University of Texas. MATLAB code to accompany a paper for the 2017 Asilomar Conference Signals, Systems and Computers. Software release is version 1.0 (October 16, 2017).
- Jinseok Choi and Brian L. Evans, *User Scheduling Algorithms for Millimeter Wave MIMO Systems* <http://users.ece.utexas.edu/~bevans/projects/mimo/software/user/UserSchedulingMIMO1.0.zip>, copyright © 2017 by The University of Texas. MATLAB code to accompany a paper of the same title in the 2018 IEEE International Conference on Communications. Software release is version 1.0 (October 13, 2017).
- Junmo Sung and Brian L. Evans, *Real-Time Testbed for Simultaneous Powerline and Wireless Smart Grid Communications*, copyright © 2017 by The University of Texas. The release includes National Instruments LabVIEW software to simultaneously transmit and receive on a powerline channel and a wireless channel to improve reliability in the received data. The software will run on a wide variety of NI hardware, and the software release includes a description of the hardware setup used in our testbed. Version 2.0 (March 29, 2017).

<http://users.ece.utexas.edu/~bevans/projects/plc/software/testbed/index.html>

- Debarati Kundu, Deepti Ghadiyaram, Alan C. Bovik and Brian L. Evans, *ESPL-LIVE High Dynamic Range Image Database*, copyright © 2016 by The University of Texas. This database contains 1811 high-dynamic range (HDR) images that have been mapped to standard dynamic range images for viewing on standard smart phone and laptop displays. HDR images represent each color value at each pixel as a floating-point number so as to provide a much wider dynamic range of color intensities. The database also contains 300,000+ visual assessment opinion scores from 5,000+ unique observers from a large-scale crowdsourced study. Version 1.0 (May 25, 2016) is available at http://signal.ece.utexas.edu/~debarati/ESPL_LIVE_HDR_Database/index.html
- Jinseok Choi and Brian L. Evans, *Space-Time Baseband LTE Compression Software*, copyright © 2016 by The University of Texas. This MATLAB release implements algorithms to compress uplink baseband cellular LTE signals received by an antenna array. Version 1.0 (April 4, 2016) is available at <http://users.ece.utexas.edu/~bevans/papers/2016/LTEcompression/BasebandLTECompression.zip>.
- Debarati Kundu and Brian L. Evans, *Full-Reference High Dynamic Range Image Quality Assessment*, copyright © 2016 by The University of Texas. This MATLAB release provides several automated visual quality evaluation methods for high-dynamic range (HDR) images. HDR images represent each color value at each pixel as a floating-point number so as to provide a much wider dynamic range of color intensities. Version 1.0 (January 20, 2016) is available at <http://signal.ece.utexas.edu/~bevans/HDRImaging>.
- Debarati Kundu and Brian L. Evans, *ESPL Synthetic Image Database*, copyright © 2014–2015 by The University of Texas. Database contains 525 computer graphics images (25 source images with 20 distorted versions of each) and 26,000 visual assessment opinion scores from a controlled study involving 60 subjects. Version 2.0 (January 30, 2015) is available at <http://signal.ece.utexas.edu/~bevans/synthetic>
- Gregory E. Allen, John F. Bridgman and Brian L. Evans, *Computational Process Networks*, copyright © 2000–2014 by The University of Texas. This C++ implementation provides a portable, high-performance, scalable framework using POSIX Threads of the Computational Process Networks model for real-time high-throughput signal and image processing. Release includes 330 files with 30,000 lines of code. Sixth major release (June 17, 2014) is available at <https://bitbucket.org/gallen/cpn>.
- Chao Jia and Brian L. Evans, *Online Calibration and Synchronization of Rolling Shutter Camera and Gyroscope Toolbox for MATLAB*. Release contains an algorithm for online calibration and synchronization of cellphone (video) camera and gyroscope. The calibration parameters include camera focal length, camera principal point, rolling shutter readout time, gyroscope bias, relative orientation between camera and gyroscope, and delay between the timestamps of video and gyroscope readings. First major release (October 15, 2013) is available at <http://users.ece.utexas.edu/~bevans/projects/dsc/software/calibration/>.
- Karl F. Nieman, Marcel Nassar, Jing Lin and Brian L. Evans, Approximate Message Passing (AMP) Receiver. Release contains an AMP algorithm for decoding complex-valued orthogonal frequency division multiplexing (OFDM) signals. The algorithm estimates the impulsive noise observed on the null tones at the receiver to subtract out an estimate of the impulsive noise in the current OFDM frame. The AMP algorithm models the impulsive noise using a two-term Gaussian mixture model. Version 1.0 (June 5, 2013) contains two components:

- LabVIEW project containing DSP Diagrams and Virtual Instruments (VIs) for mapping the GAMP transceiver onto three FPGAs (46 MB)
 - MATLAB code for converting the receiver from floating-point to fixed-point data and arithmetic (5 kB)
- Chao Jia and Brian L. Evans, *Constrained 3D Rotation Smoothing Toolbox for MATLAB* This Matlab software implements methods for stabilizing video taken by a handheld camera. First major release (April 9, 2013) is available at <http://users.ece.utexas.edu/~bevans/projects/dsc/software/motionSmoothing/>.
 - Chao Jia and Brian L. Evans, *Rolling Shutter Video Rectification Toolbox for MATLAB* This Matlab and C software implements methods for reducing rolling shutter artifacts in CMOS cameras found in smart phones and other handheld devices. First major release (October 15, 2012) is available at <http://users.ece.utexas.edu/~bevans/projects/dsc/software/rollingShutter/>.
 - Kapil Gulati, Marcel Nassar, Aditya Chopra, Nnaemeka Ben Okafor, Marcus R. DeYoung, Navid Aghasadeghi, Arvind Sujeeth, and Brian L. Evans, *Radio Frequency Interference Modeling and Mitigation Toolbox in MATLAB*, copyright © 2006–2011 by The University of Texas. This toolbox provides a simulation environment for generating radio frequency interference (RFI) and quantifying the performance of algorithms for parameter estimation and interference mitigation. Release includes 56 files with 10,280 lines and 430 kB of Matlab code. Version 1.6 (April 1, 2011) is available at <http://users.ece.utexas.edu/~bevans/projects/rfi/software>.
 - Vishal Monga, Divyanshu Vats, and Brian L. Evans, *Matlab Image Hashing Toolbox*, copyright © 1999–2006 by The University of Texas. Toolbox contains several methods for computing a hash value (on the order of 100 bits) from images (on the order of 1 MB). The distance between hash values has a perceptual meaning of closeness in image features. Applications are in image authentication and image database indexing. Version 0.1 beta (June 18, 2006) is available at <http://users.ece.utexas.edu/~bevans/projects/hashing/toolbox/index.html>.
 - Alex G. Olson, Daifeng Wang, Ian C. Wong, and Brian L. Evans, *ADSL2 Simulator*, copyright © 2005–2006 by The University of Texas. A discretized, physical layer, second-generation asymmetric digital subscriber line (ADSL) simulator for high-speed Internet access from the home and small business. Simulator is in LabVIEW, but also exists as a standalone program. ADSL is more commonly known as DSL. The structure and default parameters of the transmitter, channel model, and receiver follow the ADSL2 ITU-T G.992.3 standard. Version 1.1 (May 24, 2006) is available at <http://users.ece.utexas.edu/~bevans/projects/adsl/simulator/index.html>.
 - Kyungtae Han and Brian L. Evans, *Floating-Point to Fixed-Point Transformation Toolbox*, copyright © 2005–2006 by The University of Texas. This freely distributable toolbox automates conversion of floating-point programs to fixed-point programs and quantifies the tradeoff in signal quality vs. implementation complexity in fixed-point wordlength choices. One application of this toolbox is to reduce the power consumed by existing algorithms in an embedded software or hardware implementation. Version 1.1 (May 22, 2006) is available at <http://users.ece.utexas.edu/~bevans/projects/wordlength/converter/index.html>.
 - Vishal Monga, Niranjan Damera-Venkata, Hamood-ur Rehman, and Brian L. Evans, *Matlab Halftoning Toolbox*, copyright © 1999–2005 by The University of Texas. Collection of grayscale and color

image halftoning methods for printing and displaying images, and figures of merit for evaluation of image halftoning methods. Used by more than 60 companies and universities. Version 1.2 (July 25, 2005) is available at

<http://users.ece.utexas.edu/~bevans/projects/halftoning/toolbox/index.html>.

- Mayank Gupta and Brian L. Evans, *Rule-Of-Thirds Automation for Digital Still Cameras*, copyright © 2004 by The University of Texas. Automation of the rule-of-thirds photographic composition rule during image acquisition in C for desktop and digital signal processors. Version 0.1 beta (June 12, 2004) is available at

<http://users.ece.utexas.edu/~bevans/projects/dsc/software/RuleOfThirds0.1beta.zip>.

- Serene Banerjee and Brian L. Evans, *Smart Image Acquisition for Digital Still Cameras*, Automation of photographic composition rules during image acquisition in Matlab. Version 1.0 Beta (February 15, 2004) is available at

<http://users.ece.utexas.edu/~bevans/projects/dsc/software/SmartCamera1.0.zip>.

- Güner Arslan, Ming Ding, Biao Lu, Milos Milosevic, Zukang Shen, and Brian L. Evans, *Matlab Discrete Multitone Equalizer Toolbox*, copyright © 2000–2003 by The University of Texas. Graphical user interface and functions in Matlab to design four different multicarrier equalizer structures: conventional, dual-path, per tone, and filter bank. Dual-path and filter bank equalizers were proposed by Evans *et al.* Several training methods implemented: thirteen for conventional, two for dual-path, two for per tone, and one for filter bank equalizers. Default parameters are from the G.DMT ADSL standard for downstream transmission. Version 3.1 (May 10, 2003) is available at

<http://users.ece.utexas.edu/~bevans/projects/adsl/dmtteq/dmtteq.html>.

- Dogu Arifler, Chi Duong, Brian L. Evans, Srikanth Gummadi, Saleem K. Marwat, Chris M. Moy, and Anna Yuan, *Web-Enabled Simulation*, copyright © 1996–2001 by The University of Texas. An extensible and portable framework for Web-enabled interfaces to simulators and debuggers. The framework consists of a configurable graphical user interface (Java applets), a multithreaded TCP/IP Server written (Java application), TMS320C30 digital signal processor, MC68HC11 microcontroller, and MC58800 digital signal processor simulators (C/C++), and a debugger for a MC58800 digital signal processor board. Consists of 148 files containing 54,000 lines and 1.7 Mb of C, C++, and Java source code. Version 1.3.0 (May 18, 2001) is available at

<http://signal.ece.utexas.edu/~arifler/wetics/index.html>.

- Niranjan Damera-Venkata and Brian L. Evans, *Image Quality Assessment*, copyright © 2001 by The University of Texas. Matlab files to compute linear and nonlinear quality measures when comparing an original to a processed image. Version 1.0 (April 28, 2001) is available at

<http://signal.ece.utexas.edu/software/imageQuality/quality1.0/ImageQuality1.0.zip>

- Niranjan Damera-Venkata and Brian L. Evans, *Filter Optimization Packages for MATLAB and Mathematica*, copyright © 1993–1998 by the Regents of the University of California. Mathematica packages to generate MATLAB software to perform a joint optimization of several characteristics of analog infinite impulse response filters. Supported characteristics are magnitude response, phase response, step response, and quality factors. New characteristics can be easily added. Version 1.1 (June 23, 1998) is available at

http://users.ece.utexas.edu/~bevans/projects/filters/filter_design.html.

- Niranjan Damera-Venkata, Thomas D. Kite, and Brian L. Evans, *Fast Inverse Halftoning Algorithms*, copyright © 2001 by The University of Texas. Contains two fast inverse halftoning algorithms in C. Version 1.0 (June 21, 1998) is available at
<http://users.ece.utexas.edu/~bevans/projects/inverseHalftoning.html>.
- Joseph T. Buck, Edward A. Lee, Brian L. Evans, Soonhoi Ha, David G. Messerschmitt, Thomas Parks, José L. Pino, and others. *Ptolemy Software Environment*, a graphical block diagram environment for specifying, simulating, and synthesizing signal processing and communications systems, copyright © 1990–1998 by Regents of the University of California. Runs on 12 different Unix architectures. Version 0.7.1, the seventh major version, was released on June 12, 1998. Between August 3, 1998, and February 23, 1999, Ptolemy 0.7.1 was downloaded 3135 times from 450 different Internet domains. Consists of 2700 files containing 440,000 lines and 11.4 Mb of C, C++, Tcl/Tk, and Java source code. Releases are available at
<http://ptolemy.eecs.berkeley.edu/ptolemyclassic/pt0.7.1/>.
- Brian L. Evans and Steve X. Gu, *TMath*, a Tcl/C++ interface to Mathematica and MATLAB, copyright © by Regents of the University of California 1996. Runs on 10 different Unix architectures. Version 0.2 (released July 8, 1997) is available at
<http://users.ece.utexas.edu/~bevans/projects/tmath.html>.
- Raza Ahmed and Brian L. Evans, *Heuristic Search Packages* for Mathematica, copyright © 1996 by Regents of the University of California. A general framework for applying transformation rules to minimize the cost of implementation of algebraic expressions. Available at
<http://www.mathsource.com/cgi-bin/MathSource/Applications/ComputerScience/0208-044>.
- Brian L. Evans and John M. Novak, *Signals and Systems Pack*, Wolfram Research Inc., October 15, 1995. Contains the Signal Processing Packages (see below) plus 200 pages of documentation. More than 10,000 copies sold.
- Brian L. Evans, Steve X. Gu, Edward A. Lee, and Philip Chen, *Mathematica Notebooks to Accompany Contemporary Linear Systems Using MATLAB*, PWS Publishing Company, ISBN 0-534-93509-5 (PC) and 0-534-93507-9 (Mac), June, 1995. Interactive solution sets containing the Signal Processing Packages (see below) plus introductory electronic notebooks and a “tutoring” and a “solutions” electronic notebook for each chapter of Robert D. Strum and Donald E. Kirk, *Contemporary Linear Systems Using MATLAB*, PWS Publishing Company, ISBN 0-534-94710-7, 1995.
- Brian L. Evans, James H. McClellan, Joseph M. Winograd, Lina J. Karam, Robert H. Bamberger, Wallace B. McClure, and Kevin B. West, *Signal Processing Packages and Notebooks for Mathematica*, copyright © by Georgia Tech Research Corporation, 1989–1998. Runs in Mathematica 2.x. Version 2.9.5 is available by FTP from <ftp.eedsp.gatech.edu>. Downloaded by over 1000 sites. Packages consist of 42 files containing 1 Mb of Mathematica source code. Notebooks serve as on-line tutorials.

Projects Funded

- Since September 1, 1996, funded projects have totaled \$6,325,735 with \$6,050,517 from external and \$275,218 from internal sources. Project funding that has gone directly to my research group totals \$4,590,127.

- The following funding is not subject to university overhead unless otherwise noted. The 6G@UT Research Center is part of the Wireless Networking and Communications Group.
- Individual Projects
 - \$ 60,000, 1/16/24 – 1/15/25, *Satellite 5G Communication Systems*, AT&T Labs, Austin, TX. Funding through the 6G@UT Research Center.
 - \$ 33,500, 9/1/23 – 8/31/24, *Communication Systems Research*, Industrial Affiliate Gift Funds, Wireless Networking and Communications Group. The University of Texas at Austin, Austin, TX.
 - \$ 60,000, 1/16/23 – 1/15/24, *Satellite 5G Communication Systems*, AT&T Labs, Austin, TX. Funding through the 6G@UT Research Center.
 - \$ 60,000, 1/16/22 – 1/15/23, *Full Duplex Communications and Reconfigurable Intelligent Surfaces*, AT&T Labs, Austin, TX. Funding through the 6G@UT Research Center.
 - \$ 42,000, 1/16/23 – 1/15/24, *Communication Systems Research*, Industrial Affiliate Gift Funds, Wireless Networking and Communications Group. The University of Texas at Austin, Austin, TX.
 - \$ 31,000, 1/16/22 – 1/15/23, *Communication Systems Research*, Industrial Affiliate Gift Funds, Wireless Networking and Communications Group. The University of Texas at Austin, Austin, TX.
 - \$ 16,000, 9/1/20 – 8/31/21, *Communication Systems Research*, Industrial Affiliate Gift Funds, Wireless Networking and Communications Group. The University of Texas at Austin, Austin, TX.
 - \$ 15,000, 9/1/19 – 8/31/20, Discretionary Funds, Provost Office, The University of Texas at Austin, Austin, TX.
 - \$ 16,000, 9/1/18 – 8/31/20, *Communication Systems Research*, Industrial Affiliate Gift Funds, Wireless Networking and Communications Group. The University of Texas at Austin, Austin, TX.
 - \$ 49,000, 9/1/17 – 8/31/24, Engineering Foundation Professorship, Renewal, Cockrell School of Engineering, The University of Texas, Austin, TX 78712.
 - \$ 16,000, 9/1/17 – 8/31/19, *Communication Systems Research*, Industrial Affiliate Gift Funds, Wireless Networking and Communications Group. The University of Texas at Austin, Austin, TX.
 - \$120,000, 6/1/18 – 5/31/19, *Massive MIMO Cost Reduction*, Futurewei, Dallas, TX. Funding through the Wireless Networking and Communications Group.
 - \$ 99,000, 11/1/16 – 10/31/17, *Mixed Resolution ADC for Massive MIMO Systems*, Huawei, Dallas, TX. Funding through the Wireless Networking and Communications Group.
 - \$ 18,000, 11/1/16 – 10/31/17, *Communication Systems Research*, a no-overhead unrestricted gift from National Instruments, Austin, TX.
 - \$ 49,000, 9/1/10 – 8/31/17, Engineering Foundation Professorship, Cockrell School of Engineering, The University of Texas, Austin, TX 78712.
 - \$ 20,000, 6/1/15 – 5/31/17, *Communication Systems Research*, Industrial Affiliate Gift Funds, Wireless Networking and Communications Group. The University of Texas at Austin, Austin, TX.

- \$ 20,000, 6/1/14 – 5/31/16, *Communication Systems Research*, Industrial Affiliate Gift Funds, Wireless Networking and Communications Group. The University of Texas at Austin, Austin, TX.
- \$ 21,000, 6/1/13 – 5/31/15, *Communication Systems Research*, Industrial Affiliate Gift Funds, Wireless Networking and Communications Group. The University of Texas at Austin, Austin, TX.
- \$300,000, 8/1/10 – 7/31/13, *Powerline Communications for Enabling Smart Grid Applications*, Task 1836.036, Global Research Collaboration, Semiconductor Research Corporation, Research Triangle Park, NC. Industrial liaisons are Freescale Semiconductor, IBM, and Texas Instruments.
- \$ 40,000, 1/1/13 – 6/30/13, *Wireless Communications Research*, a no-overhead unrestricted gift from Azimuth Systems, Boston, MA.
- \$ 35,000, 1/1/12 – 12/31/12, *Digital Video Processing Research*, a no-overhead unrestricted gift from Texas Instruments, Dallas, TX.
- \$220,000, 9/1/07 – 8/31/14, *Communication Systems Research*, a no-overhead unrestricted gift from National Instruments, Austin, TX.
- \$ 20,000, 9/1/11 – 12/31/12, *Communication Systems Research*, no-overhead funding from the NSF WiCAT Center, Wireless Networking and Communications Group. The University of Texas at Austin, Austin, TX.
- \$ 50,000, 9/1/10 – 8/31/11, *Radio Frequency Interference Sensing and Mitigation in Wireless Transceivers*, a no-overhead unrestricted gift from Intel, Portland, OR.
- \$110,000, 2/1/10 – 5/31/11, *Radio Frequency Interference Sensing and Mitigation in Wireless Transceivers*, a no-overhead unrestricted gift from Intel, Portland, OR.
- \$ 60,000, 9/1/06 – 12/31/11, *Wireless Communications Research*, Industrial Affiliate Gift Funds, Wireless Networking and Communications Group. The University of Texas at Austin, Austin, TX.
- \$110,000, 9/1/09 – 8/31/10, *Radio Frequency Interference Sensing and Mitigation in Wireless Transceivers*, a research contract from Intel, Portland, OR.
- \$150,000, 12/6/06 – 8/31/09, *In-Platform Radio Frequency Interference Mitigation for Wireless Communications*, a no-overhead unrestricted gift from Intel, Portland, OR.
- \$440,000, 10/3/06 – 8/31/10, *Communications Systems*, Sponsored Research Project, Schlumberger, Sugar Land, TX. Funding subject to university overhead.
- \$ 15,000, 1/16/08 – 5/31/08, *Image Processing Research*, a no-overhead unrestricted gift from Qualcomm MEMS Technologies, San Jose, CA.
- \$ 50,000, 1/1/05 – 12/31/05, *Embedded Real-Time Signal Processing*, a no-overhead unrestricted gift from an anonymous donor.
- \$ 55,000, 1/1/05 – 12/31/06, *Communications Systems*, a no-overhead unrestricted gift from Schlumberger, Sugar Land, TX.
- \$ 4,500, 9/1/04 – 8/31/05, Robert and Jane Mitchell Faculty Fellowship, College of Engineering, The University of Texas, Austin, TX 78712.
- \$ 16,000, 8/24/04 – 8/31/05, *Real-Time Imaging Projects*, a no-overhead unrestricted gift from Intel Academic Relations, Portland, OR.
- \$ 48,185, 3/1/04 – 12/31/04, *Real-Time Imaging Projects*, Intel Academic Relations Equipment Grant, Portland, OR.

- \$ 50,000, 1/1/04 – 12/31/04, *Embedded Real-Time Signal Processing*, a no-overhead unrestricted gift from an anonymous donor.
- \$ 60,000, 1/1/04 – 12/31/06, *Robust Perceptual Image Hashing*, a no-overhead unrestricted gift from Xerox Foundation, Webster, NY.
- \$ 2,179, 9/1/03 – 8/31/04, Mrs. Pearlie Dashiell Henderson Centennial Faculty Fellowship, College of Engineering, The University of Texas, Austin, TX 78712
- \$ 50,000, 1/1/03 – 12/31/03, *Embedded Real-Time Signal Processing*, a no-overhead unrestricted gift from an anonymous donor.
- \$ 42,000, 9/1/02 – 1/15/03, *Optimizing Communication Speed of ADSL and VDSL Modems for High-Speed Internet Access*, Faculty Research Assignment Award, The University of Texas at Austin, Austin, TX 78712.
- \$ 4,000, 9/1/02 – 8/31/03, Mrs. Pearlie Dashiell Henderson Centennial Faculty Fellowship, College of Engineering, The University of Texas, Austin, TX 78712.
- \$178,485, *Equipment Grant to Upgrade the Real-Time Digital Signal Processing Laboratory and Senior Design Courses*, University Program, Texas Instruments, Houston, TX 77251.
- \$ 35,000, 9/1/01, *ADSL/VDSL Transceiver Design*, a no-overhead unrestricted gift from Motorola, Inc., Austin, TX, 78704.
- \$ 3,000, 9/1/01, Mrs. Pearlie Dashiell Henderson Centennial Faculty Fellowship, College of Engineering, The University of Texas, Austin, TX 78712.
- \$ 9,960, 7/12/01, *Equipment Grant for a Real-Time Digital Signal Processing Laboratory and Senior Design Courses*, University Program, Texas Instruments, Houston, TX 77251.
- \$ 35,000, 9/1/00, *ADSL/VDSL Transceiver Design*, a no-overhead unrestricted gift from Motorola, Inc., Austin, TX, 78704.
- \$ 5,139, 9/1/00, Mrs. Pearlie Dashiell Henderson Centennial Faculty Fellowship, College of Engineering, The University of Texas, Austin, TX 78712.
- \$ 13,950, 7/10/00, *Equipment Grant for a Real-Time Digital Signal Processing Laboratory and Senior Design Courses*, University Program, Texas Instruments, Houston, TX 77251.
- \$ 16,600, 4/26/00, *Equipment Grant for Video Codec Development*, University Program, Texas Instruments, Houston, TX 77251.
- \$ 9,000, 9/1/99, *Curriculum Development Grant*, Texas Telecommunications Engineering Consortium, College of Engineering, The University of Texas at Austin, Austin, TX 78712.
- \$ 9,000, 11/1/99, *Color Image Halftoning Research*, a no-overhead unrestricted gift from Hewlett Packard Laboratories, Palo Alto, CA 94304, through their Imaging Technology Department.
- \$ 10,000, 9/1/99, *Neural Networks Channel Equalizer Using Altera FPGAs*, University Program, Altera, San Jose, CA 95134.
- \$ 19,450, 6/24/99, *Equipment Grant for a Real-Time Digital Signal Processing Laboratory and Senior Design Courses*, University Program, Texas Instruments, Houston, TX 77251.
- \$ 5,000, 6/1/99, *WebCT Instruction for Telecommunication Systems Courses*, Academic Development Grant, College of Engineering, The University of Texas at Austin, Austin, TX 78712.
- \$ 20,000, 6/1/99, *Modern Digital Signal Processing Architectures for Halftoning*, a no-overhead unrestricted gift from Hewlett Packard Laboratories, Palo Alto, CA 94304, through their Imaging Technology Department.

- \$ 9,500, *Curriculum Development Grant*, Texas Telecommunications Engineering Consortium, College of Engineering, The University of Texas at Austin, Austin, TX 78712.
- \$ 4,000, *Faculty Incentive Grant*, Texas Telecommunications Engineering Consortium, College of Engineering, The University of Texas at Austin, Austin, TX 78712.
- \$ 15,000, 1/1/98, *Video Processing Research*, a no-overhead unrestricted gift from Accelerix, Inc., 11000 N. Mopac Expressway, Austin, TX 78759.
- \$210,000, 9/1/97 – 8/31/01, *Scalable Software and Hardware for Image and Video Processing Systems*, NSF CAREER Award, MIP-9702707, National Science Foundation, Arlington, Virginia 22230. Funding subject to university overhead.
- \$ 84,172, 6/1/97 – 11/1/99, *Design of Distributed Adaptive Signal Processing Systems*, DARPA Composite CAD Program, Contract DAAB07-97-C-J007, Electronic Technology Office, Defense Advanced Projects Research Agency, Arlington, Virginia 22203-1714, subcontract from the Sponsored Projects Office, University of California, Berkeley, CA 94720. Funding subject to university overhead.
- \$ 20,000, 6/1/97 – 8/31/00, *Equipment Grant for a Real-Time Digital Signal Processing Laboratory Course*, University Program, Texas Instruments, Houston, TX 77251.
- \$ 14,400, 6/1/97 – 7/31/97, *Scalable Software for Image and Video Processing Systems*, Summer Research Assignment Grant, The University of Texas at Austin, Austin, TX 78712.
- \$ 10,000, 9/1/96 – 8/31/97, *Signal Processing Research*, a no-overhead unrestricted gift from the Shell Oil Company Foundation, Bellaire Technology Center, Houston, TX 77025.
- \$ 4,500, 9/1/96 – 8/31/98, *A Real-Time Digital Signal Processing Laboratory*, Academic Development Grant, College of Engineering, The University of Texas at Austin, Austin, TX 78712.
- \$ 5,000, 9/1/96 – 8/31/97, *Design and Implementation of Signal Processing Systems*, Research Initiation Award In Engineering, Bureau of Engineering Research, The University of Texas at Austin, Austin, TX 78712.
- \$ 50,000, 9/1/96 – 8/31/98, *Embedded Systems Research*, Equipment Grant, College of Engineering, The University of Texas at Austin, Austin, TX 78712.

- Joint Projects

- \$110,000, 9/1/24 – 8/31/25, *Reconfigurable Intelligent Surfaces*, Tektronix, Beaverton, OR. Non-overhead funding via 6G@UT Research Center. PI Evans' share is \$60,000.
- \$170,000, 9/1/23 – 8/31/24, *Full Duplex Communications and Reconfigurable Intelligent Surfaces*, Tektronix, Beaverton, OR. Non-overhead funding via 6G@UT Research Center. PI Evans' share is \$60,000.
- \$110,000, 9/1/23 – 8/31/24, National Instruments, Austin, TX. PI Evans wrote the proposal for NI to join the 6G@UT Research Center. PI Evans' share is \$0.
- \$ 50,000, 9/1/22 – 8/31/23, MITRE, PI Evans wrote the proposal for MITRE to join the 6G@UT Research Center. PI Evans' share is \$0.
- \$110,000, 9/1/22 – 8/31/23, VIAVI Solutions. PI Evans wrote the proposal for VIAVI Solutions to join the 6G@UT Research Center. PI Evans' share is \$0.
- \$170,000, 9/1/22 – 8/31/23, *Full Duplex Communications and Reconfigurable Intelligent Surfaces*, Tektronix, Beaverton, OR. Non-overhead funding via 6G@UT Research Center. PI Evans' share is \$60,000.

- \$199,000, 12/1/21 – present, NVIDIA DGX A100 Station, In-Kind Equipment Donation to the 6G@UT Research Center, NVIDIA, Santa Clara, CA. PI Evans. Co-PIs Jeffrey Andrews, Gustavo de Veciana, and Hyeji Kim.
- \$170,000, 6/1/21 – 5/31/22, *Reinforcement Learning for Multicell Beamforming and Reconfigurable Intelligent Surfaces*, NVIDIA, Santa Clara, CA. Funding through the 6G@UT Research Center. PI Evans' share is \$60,000.
- \$360,000, 2/1/14 – 1/31/17, *Energy-Efficient Signal Processing Techniques for Smart Grid Heterogeneous Communications Networks*, Global Research Collaboration, Semiconductor Research Corporation, Research Triangle Park, NC. Industrial liaisons are Freescale Semiconductor and Texas Instruments. Principal Investigator is Prof. Naofal Al-Dhahir at The University of Texas at Dallas.
- \$160,000, 1/1/14 – 5/31/15, *Cloud Radio Access Networks*, Huawei, Dallas, TX. Principal Investigator is Robert W. Heath, Jr..
- \$240,000, 9/1/12 – 12/31/13, *Cloud Radio Access Networks*, Huawei, Dallas, TX. Principal Investigator is Robert W. Heath, Jr.. Other Co-Investigators are Prof. Mattan Erez and Prof. Gustavo de Veciana.
- \$127,500, 1/1/02 – 12/31/03, *DSL to 802.11 Bridge: Enabling High-Speed Wireless Internet Access at Home and Small Offices*, The State of Texas Advanced Technology Program, Division of Research, Planning and Finance, Texas Higher Education Coordinating Board, P. O. Box 12788, Austin, TX 78711-2788. Co-Principal Investigator is Robert W. Heath, Jr..
- \$ 10,000, 1/15/00 – 12/31/01, *Biomedical Image Analysis*, a no-overhead unrestricted gift from Perceptive Scientific Instruments, League City, TX 77573. Co-principal investigator Prof. Alan C. Bovik.
- \$198,700, 1/15/00 – 12/31/01, *Foveated Wireless Video Communication*, The State of Texas Advanced Research Program, Division of Research, Planning and Finance, Texas Higher Education Coordinating Board, P. O. Box 12788, Austin, TX 78711-2788
Principal investigator Prof. Alan C. Bovik.
- \$198,712, 1/15/00 – 12/31/01, *Standards-Compliant High-Quality Low-Bitrate Wireless Video Communications Using TMS320C6x and TMS320C54x Processors*, Texas Instruments DSP R&D Fund, Houston, TX 77251. Principal investigator Prof. Alan C. Bovik.
- \$ 63,303, 6/1/98 – 5/31/99, *Loop Filter Development Project*, Semiconductor Products Sector Sponsored Research Project, Motorola, Inc., Austin, TX, 78704. Co-principal investigator Prof. Takis Konstantopoulos.
- \$ 25,000, 6/1/98 – 5/31/99, *Automatic Integration of Intellectual Property Cores*, a no-overhead unrestricted gift from the Rockwell Semiconductor Systems, Newport Beach, CA 92658. Co-principal investigator Prof. Margarida Jacome.
- \$250,000, 9/1/97 – 8/31/00, *Digital Video Telecommunications Research and Teaching in the Laboratory for Image and Video Engineering*, co-principal investigator with Alan C. Bovik, which was part of a \$6,000,000 university equipment infrastructure grant entitled *High-Performance Computing at the University of Texas at Austin* funded by the Utilization of Advanced Intel Based Platforms in Computationally Demanding Tasks Program, Academic Relations, Intel Corporation, Hillsboro, OR 97124-6497.
- \$ 15,000, 9/1/97, *Image Halftoning Research*, a no-overhead unrestricted gift from Hewlett Packard Laboratories, Palo Alto, CA 94304, through their Imaging Technology Department. Co-principal investigator with Alan C. Bovik.

- \$115,000, 6/1/97 – 5/31/00, *AM-FM Analysis of Images and Video*, co-principal investigator with Alan C. Bovik, Augmentation Awards for Science and Engineering Research Training, Air Force Office of Scientific Research, Bolling Air Force Base, D.C. 20332-80801.

Continuing Education

- American Association of University Professors (AAUP) Summer Institute, 2020 and 2021.
- Completed LGBTQIA+ Ally Training
 - Part 1. Affirming LGBTQIA+ People: Interpersonal Allyship (April 9, 2020)
 - Part 2. Affirming LGBTQIA+ People: Organizational Allyship (April 16, 2020)
- Completed an eight-hour Mental Health First Aid training session by Integral Care (Travis County Counseling and Mental Health Center) on the UT Austin campus in December 2019. The training is to “provide initial help to people experiencing problems such as depression, anxiety disorders, psychosis, and substance use disorders”. The program has been developed by the National Council for Behavioral Health.
- Completed The University of Texas Executive Management and Leadership Program by attending 8 of the 9 half-day sessions in Spring 2019. Sessions attended: (1) Power and Networks, (2) Leaders as Agents of Change, (3) Human Resources, (4) Negotiation Skills, (5) Finance Foundations, (6) Managing People, (7) Emotional Intelligence, and (8) Advocacy for Leaders. Connected with a cohort of 30 other campus leaders participating in the program.
- Founder and organizer (1996–2003) of a Wireless Networking and Communications Seminar in the Dept. of ECE. This seminar series was funded by the Texas Telecommunications Engineering Consortium (2000–03) and Tivoli (2002–03). Seminar announcements were posted on the Web and to an e-mail list that included more than 50 people from local industry (AMD, Analog Devices, Cicada, Cirrus, Crystal, ESS Technology, IBM, I/O Systems, Motorola, National Instruments, SBC, Schlumberger, Shell, The Silicon Group, and Tracor). 200+ talks were presented in the series.
- Presented several training sessions at The University of Texas at Austin that were open to the public:
 - “Software Development in the Unix Environment”, November 10, 2000
 - “Software Development in the Unix Environment”, March 26, 1999
 - “Software Development in the Unix Environment”, January 23, 1998
 - “Software Development in the Unix Environment”, February 28, 1997
 - “Software Development in the Unix Environment”, October 18, 1996
- Instructor at the 1992, 1993, 1994, and 1995 *NSF Workshop on Revitalizing the Engineering, Mathematics, and Science Curricula Via Symbolic Algebra*, to teach professors how to develop new types of problems that students can work using the algebraic abilities of computer algebra systems

Current Graduate Students

- Recent graduates
 - Yunseong Cho (graduated Aug. 2023)
 - Jinseok Choi (graduated Dec. 2019)

- Faris B. Mismar (graduated Dec. 2019)
- Javier Rodriguez-Fernandez (graduated Aug. 2020)
- Junmo Sung (graduated May 2020)
- Students admitted to candidacy
 - Elyes Balti
- Post M.S. students
 - Pooja Nuti
 - Alice Liu
- M.S. in progress
 - Faraz Barati
 - Vignesh Nandakumar

Graduate Students Supervised

- Ph.D. Dissertations
 1. Elyes Balti, *Advanced Signal Processing Techniques For Full-Duplex Systems*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Dec. 2024. **Currently** he is a Member of Technical Staff at Globalstar in San Diego, California USA.
 2. Yunseong Cho, *Towards Power-Efficient and Intelligent Wireless Communication Systems*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Aug. 2023. **Currently** he is a Senior Research Engineer working in cellular communications at Samsung Research America in Plano, Texas USA.
 3. Javier Rodriguez-Fernandez, *Millimeter Wave Link Configuration with Hybrid MIMO Architectures*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Aug. 2020. **Currently** he is a Senior Engineer working in cellular communication standards at Qualcomm in San Diego, California USA.
 4. Junmo Sung, *Compressed-sensing based Channel State Information Acquisition in mmWave Hybrid Beamforming Communication Systems*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, May 2020. **Currently** he is a Staff Research Engineer in cellular communication systems at Samsung Research America in Dallas, Texas USA.
 5. Faris B. Mismar, *Improving Next-Generation Wireless Network Performance and Reliability with Deep Learning*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Dec. 2019. This PhD dissertation was the sole nominee from the Graduate ECE Program to The Graduate School for an Outstanding PhD Dissertation Award. **Currently** he is a Distinguished Member of Technical Staff at Nokia Bell Labs in Dallas, Texas USA.
 6. Jinseok Choi, *Optimizing Communication Performance of Low-Resolution ADC Systems with Hybrid Beamforming*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Dec. 2019. **Currently** he is an Assistant Professor in the Dept. of Electrical Engineering at the Korea Adv. Institute of Science and Technology (KAIST), Daejeon, South Korea.

7. Debarati Kundu, *Subjective and Objective Quality Evaluation of Synthetic and High Dynamic Range Images*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, May 2016. **Currently** she is a Staff Engineer at Qualcomm in San Diego, California.
8. Yousof Mortazavi, *Analog-to-Digital Converter Circuit and System Design to Improve with CMOS Scaling*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, May 2015. **Currently** he is working as a Principal Research Engineer at at Ambiq Micro in Austin, Texas USA.
9. Karl F. Nieman, *Space-Time-Frequency Methods for Interference-Limited Communication Systems*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Dec. 2014. **Currently** he is working as a Principal Member of Technical Staff at AT&T Labs in Austin, Texas USA.
10. Chao Jia, *Video Stabilization and Rectification for Handheld Cameras*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, May 2014. **Currently** he is working as a Staff Software Engineer at Google Cloud AI in Mountain View, California USA.
11. Jing Lin, *Robust Transceivers for Combating Impulsive Noise in Powerline Communications*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, May 2014. **Currently** she is working as a Senior System Engineer at Qualcomm in Santa Clara, California USA.
12. Kyle D. Wesson, *Secure Navigation and Timing Without Local Storage of Secret Keys*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, May 2014. **Currently** he is working as a Senior Regulatory Engineer at Starlink at SpaceX in Mountain View, California USA.
13. Marcel Nassar, *Graphical Models and Message Passing Receivers for Interference Limited Communication Systems*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Aug. 2013. **Currently** he is working as a Senior Machine Learning Scientist Altos Labs in San Diego, California USA.
14. Aditya Chopra, *Modeling and Mitigation of Interference in Wireless Receivers with Multiple Antennae*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Dec. 2011. **Currently** he is working as a Senior Communication Systems Engineer at Amazon Project Kuiper in Austin, Texas USA.
15. Kapil Gulati, *Radio Frequency Interference Modeling and Mitigation in Wireless Receivers*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Aug. 2011. **Currently** he is working as a Senior Staff Engineer at Qualcomm Corporate R&D in Bridgewater, New Jersey USA.
16. Gregory E. Allen, *Computational Process Networks: A Model and Framework for High-Throughput Signal Processing*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, Texas 78712, May 2011. **Currently** he is working as an Senior Engineering Scientist at the Applied Research Laboratories at The University of Texas in Austin, Texas USA.
17. Hamood-ur Rehman, *Artifact Assessment, Generation, And Enhancement Of Video Halftones*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, December 2010. **Currently** he is working as a Design Engineer at Avvasi in Waterloo, Ontario, Canada.

18. Ian C. Wong, *A Unified Framework for Optimal Resource Allocation in Multiuser Multicarrier Wireless Systems*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, May 2007. **Currently** he is working as Director of RF and Wireless Architecture at VIAVI Solutions in Austin, Texas USA.
19. Kyungtae Han, *Automating Transformations from Floating-point to Fixed-point for Implementing Digital Signal Processing Algorithms*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, August 2006. **Currently** he is working as a Principal Researcher at the Toyota InfoTech Labs in Mountain View, California USA.
20. Zukang Shen, *Multiuser Resource Allocation in Multichannel Wireless Communication Systems*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, May 2006. **Currently** he is working as a Senior Expert at Huawei in Beijing, China.
21. Vishal Monga, *Perceptually Based Methods for Robust Image Hashing*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Aug. 2005. **Currently** he holds the rank Professor in the Department of Electrical Engineering at the main campus of The Pennsylvania State University.
22. Serene Banerjee, *Composition-Guided Image Acquisition*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Aug. 2004. **Currently** she is a Master Researcher at Ericsson Research in Bengaluru, India.
23. Ming Ding, *Channel Equalization to Achieve High Bit Rates In Discrete Multitone Systems*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Aug. 2004. **Currently** he is a Principal DSP Engineer at Broadcom in San Jose, California USA.
24. Dogu Arifler, *Network Tomography Based on Flow Level Measurements*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, May 2004. **Currently** he is an Professor in the Dept. of Computer Engineering, at Eastern Mediterranean University in Famagusta, Cyprus.
25. Milos Milosevic, *Maximizing Data Rate of Discrete Multitone Systems using Time Domain Equalization Design*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, May 2003. Technical Report WNCG-TR-2003-05-02. **Currently** he is Head of Integrated Digital Well Construction in Halliburton Project Management at Halliburton in Houston, Texas USA.
26. Wade C. Schwartzkopf, *Maximum Likelihood Techniques for Joint Segmentation-Classification of Multi-spectral Chromosome Images*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Dec. 2002. Technical report WNCG-TR-2002-12-06. **Currently** he is a Research Scientist at Integrity Applications Inc. in Chantilly, Virginia USA.
27. K. Clint Slatton, *Adaptive Multiscale Estimation for Fusing Image Data*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Dec. 2001. He was a tenured Associate Professor in the Department of Electrical and Computer Engineering at the University of Florida in Gainesville, Florida USA. Prof. Slatton won a 2007 Presidential Early Career Award in Science and Engineering (PECASE). Prof. Slatton passed away on March 30, 2010.
28. Güner Arslan, *Equalization for Discrete Multitone Transceivers*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Dec. 2000. **Currently** he is a Distinguished Engineer at Silicon Labs in Austin, Texas USA.

29. Niranjana Damera-Venkata, *Analysis and Design of Vector Error Diffusion Systems for Image Halftoning*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Dec. 2000. **Currently** he is a Distinguished Technologist/Director and Head of AI and Machine Learning Transformation at HP, Chennai, Tamil Nadu, India.
 30. Biao Lu, *Wireline Channel Estimation and Equalization*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Dec. 2000. **Currently** she is a Senior Software Engineer at OpenSpirit Corp. in Sugar Land, Texas USA.
 31. Murat Torlak, *Estimation and Capacity of Channels in Smart Antenna Wireless Communication Systems*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Aug. 1999. **Currently** he holds the rank of Professor in the Dept. of Electrical Engineering, at The University of Texas at Dallas, Richardson, Texas USA.
 32. Thomas D. Kite, *Design and Quality Assessment of Forward and Inverse Error Diffusion Halftoning Algorithms*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Aug. 1998. His last position was as the Vice President of Engineering at Audio Precision in Beaverton, Oregon USA. Dr. Kite passed away on September 5, 2015.
 33. Dong Wei, *Coiflet-Type Wavelets: Theory, Design, and Applications*, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Aug. 1998. **Currently** he was a Member of Technical Staff at at&t Research Labs in Austin, Texas USA.
- MS Reports & Theses
 1. Yeong F. Choo, *Complex Block Floating-Point Format with Box Encoding in Communication Systems*, MSEE Report, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, May 2018. **Currently** he is a Member of Technical Staff at Fujitsu Network Communications, Plano, TX USA.
 2. Matthew W. DeKoning, *Embedded Sensor Speed and Width Estimation*, MSEE Report, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Dec. 2017. **Currently** he is a Member of Technical Staff at Sandia National Laboratories in Albuquerque, NM USA.
 3. Jeremy Gin, *Evaluation of Open-Source Intrusion Detection Systems for IPv6 Vulnerabilities in Realistic Test Network*, MSEE Report, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, May 2017. **Currently** he is a Member of Technical Staff at Sandia National Laboratories in Albuquerque, NM USA.
 4. Ghadi Sebaali, *Performance Evaluation of Coexistence within Wireless Personal Area Networks*, MSEE Report, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, May 2016. **Currently** she is a Senior Consultant at Capgemini, San Francisco, TX USA.
 5. Kenneth A. Perrine, *Design and Implementation of an Underwater Acoustic Transponder*, MSEE Report, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, May 2011. **Currently** he is a Research Associate in the Center for Transportation Research at The University of Texas at Austin in Austin, Texas USA.
 6. Thomas P. Higdon, *The Implementation of a Sonar Beamformer on the Cell Broadband Engine*, MSEE Report, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, May 2008. **Currently** he works Software Engineer at Akamai Technologies in Boston, Massachusetts USA.

7. Jeffrey B. Livingston, *Time-Scale Modification of Audio Signals Using the Dual-Tree Complex Wavelet Transform*, MSEE Report, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, December 2006. **Currently** he works as a Design Engineer for Cirrus Logic in Austin, Texas USA.
8. Young H. Cho, *Implementation of a 3-D Sonar Beamformer Using the Computational Process Network Model on a Synergy Quad PowerPC G4 with Altivec Board*, MSEE Report, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, May 2001. **Currently** Senior Research Scientist at the Information Sciences Institute and Adjunct Faculty Member at the University of Southern California.
9. Norman K. James, *PLL Modelling Using Software Tools*, MSEE Report, Option III Executive Software Engineering Program, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Dec. 1999. **Currently** he works as a Phase Locked Loop Designer for Microprocessors at IBM in Austin, Texas USA.
10. Srikanth Gummadi, *Space-Time Processing for Wireless Base Stations*, MSEE Report, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Dec. 1998. **Currently** he is Vice President at Broadcom in Bangalore, India.
11. Gregory E. Allen, *Real-Time Sonar Beamforming on a Symmetric Multiprocessing Unix Workstations Using Process Networks and POSIX Pthreads*, MSEE Report, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, Aug. 1998. **Currently** he works as a Senior Engineering Scientist in the Advanced Technology Laboratory for the UT Applied Research Laboratories in Austin, Texas USA, and also finished a Ph.D.E.E. degree at UT Austin.
12. Amey A. Deosthali, *Embedded Signal Processing on Microcontrollers*, MSEE Report, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, May 1998. **Currently** he works as a Manager for Embedded Printing and Imaging Products at AMD in Austin, Texas USA.
13. Charles R. Powers, *A Review of Performance Analysis (Benchmarking) Approaches for Embedded Microprocessors and Microcontrollers*, MSEE Report, Option III Executive Software Engineering Program, Dept. of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX 78712, May 1998. **Currently** he works as Director of Engineering and Technology Policy at Motorola Solutions in Washington, DC USA.

Other Research Supervision

- Ph.D. Defense Committees (64): Taner Akkin, Dogu Arifler, Gregory E. Allen, Alberto Arredondo, Güner Arslan, Elyes Balti, Serene Banerjee, Ramya Bhagavatula, Yunseong Cho, Gwangwoo “Johnny” Choe, Eun Ho Choi, Jinseok Choi, Aditya Chopra, Thayne R. Coffman, Niranjan Damera-Venkata, Ming Ding, Kurt A. Feiste, Kapil Gulati, Kyungtae Han, Chao Jia, Adnan Kavak, Ivy Kelly, Youngchun Kim, Youngok Kim, Thomas D. Kite, Hoojin Lee, Sanghoon Lee, Jing Lin, Shizhong Liu, Biao Lu, Anderson Mills, Milos Milosevic, Faris B. Mismar, Bishwarup Mondal, Vishal Monga, Yousof Mortazavi, Marcel Nassar, Richard Naething, Karl F. Nieman, Hung-ta Pai, Ali Y. Panah, Sri Priya Ponnappalli, Hamood-ur Rehman, Ian P. Roberts, Javier Rodriguez-Fernandez, Jeffrey T. Russell, Michele Saad, Koichi Sato, Wade C. Schwartzkopf, K. C. Slatton, Zukang Shen, Junmo Sung, Deependra Talla, Murat Torlak, Kien Truong, Ehsan Vatankhah, Yuanxun Wang, Zhou Wang, Karen Watkins, Dong Wei, Kyle D. Wesson, Ian C. Wong, Johnathan York, and Shi Zhong.
- Ph.D. Qualifying Committees (74): Taner Akkin, Gregory E. Allen, Dogu Arifler, Güner Arslan, Alberto Arredondo, Elyes Balti, Serene Banerjee, Ramya Bhagavatula, Yunseong Cho, Gwangwoo

“Johnny” Choe, Eun Ho Choi, Jinseok Choi, Aditya Chopra, Thayne R. Coffman, Niranjan Damera-Venkata, Ming Ding, Kurt A. Feiste, Kapil Gulati, Kyungtae Han, Ethan (Yuqiang) Heng, Chao Jia, Zak Kassas, Adnan Kavak, Ivy Kelly, Jaekwon Kim, Youngchun Kim, Youngok Kim, Thomas D. Kite, Hoojin Lee, Sanghoon Lee, Dawei Liang, Jinyang Liang, Jing Lin, Shizhong Liu, Biao Lu, Anderson Mills, Milos Milosevic, Faris B. Mismar, Jianhua Mo, Bishwarup Mondal, Vishal Monga, Yousof Mortazavi, Marcel Nassar, Richard Naething, Karl F. Nieman, Behrang Nosrat-Makouei, Hung-ta Pai, Ali Y. Panah, CheolHee Park, Sri Priya Ponnappalli, Hamood-ur Rehman, Ian P. Roberts, Jeffrey T. Russell, Michele Saad, Koichi Sato, Wade C. Schwartzkopf, K. C. Slatton, Zukang Shen, Junmo Sung, Deependra Talla, Vijay A. Tadiapatri, Murat Torlak, Joel Tropp, Kien Truong, Yuanxun Wang, Zhou Wang, Karen Watkins, Jeff Wehnes, Dong Wei, Kyle D. Wesson, Ian C. Wong, Johnathan York, Aron Yu, and Shi Zhong.

- M.S. Thesis Committees (3): Anjum Ali, Mike Kuei-che Cheng, and Hamid R. Sheikh.
- M.S. Report Committees (17): Gregory E. Allen, John R. W. Ammerman, Tai-Wu Chiang, Young Cho, Yeong Foong Choo, Amey A. Deosthali, Srikanth Gummadi, Thomas P. Higdon, Norman James, Kevin Jinho Joe, Michael Kardonik, Jeff Livingston, Benjamin Marrou, Kenneth A. Perrine, Charles R. Powers, Roopsha Samanta, Ghadi Sebaali, Mahalakshmi Venkataraman, and Wenxiao Yu.
- Visiting graduate students (2): Lina Al-Kanj (American University of Beirut) 2009–2010 and Gilbert Badaro (American University of Beirut) 2015–2016
- Undergraduate thesis students (2)
- Undergraduate senior design students (200) including the following:
 - An image processing project won the 2006 University Co-op/George H. Mitchell Award for Academic Excellence. Member: Divyanshu Vats.
 - Augmented reality project won first place among all ECE senior design projects in fall 2011. Member: Arthur Ishiguro
 - *Sound Shield* won second place among honors/entrepreneurship senior design projects in spring 2016. Members: Yeong Foong Choo, Jun-Qi Lau, Dung Le, Mark Leatherman, Sung Park, Negin Raof, Brandon Williams
 - *Pocket Beagle* won third place among the 17 Company-Sponsored Projects in spring 2021. Software Release. Members: Jaelyn Bethea, Andrew Brown, Joshua Iwe, Bibartan Jha, Eeshan Sarmah, Darius Zinolabedini.
- Other undergraduate supervision (13): Nora Agah (indoor localization), Babar Ahmed, Navid Aghasadeghi, Angela Chan, Brian Fernandes (conference course), Ricardo R. Garcia, Mohamed Gzara (exchange student), Jiwon Jeong (exchange student), Jaxter Kim (electroacoustic instrument design), Robert Mullenix, Nnaemeka Ben Okafor, Negin Raof (Relief of tinnitus symptoms), Arvind Sujeeth, and Divyanshu Vats.
- Ph.D. Defense Committees at the American University of Beirut (4): Nadine Abbas, Jihad Fahs, Reem Mahmoud, and Sireen Taleb.

Computer Skills

- Assembly languages: Texas Instruments TMS320C3000/C5000 DSP, Texas Instruments TMS320C6000 VLIW DSP, Motorola 56000 DSP, Motorola 68000, Vax, PDP 11

- Scripting languages: csh, ksh, Perl, sed, sh, Tcl/Tk
- High-level languages: C, C++, Java, Lisp, Pascal, Fortran, APL
- Algorithm development environments: Khoros, LabVIEW, Maple, Mathematica, Matlab
- Electronic design automation tools: LabVIEW, Ptolemy, SIMULINK, Spice
- Knowledge-based environments: NExpert (expert system) and Integrated Process and Understanding of Signals (blackboard architecture)
- Software development tools: makefiles, source code control, Purify, debuggers, class browsers, gnats
- Developed large software systems portable to Unix and Windows NT operating systems

Consulting

- Mar. and Apr. 2019, Office of the Provost, American University of Beirut, Beirut, Lebanon
- Nov. 2017 and Feb./Mar. 2018, Provost Office, American University of Beirut, Beirut, Lebanon
- Aug. 2011, Jul. 2012, Jun. 2013, Jul. 2014, and Jul. 2016. Dept. of Electrical and Computer Engineering, American University of Beirut, Beirut, Lebanon

Vita

Dr. Brian L. Evans is the Engineering Foundation Professor of Electrical and Computer Engineering at The University of Texas at Austin. He earned his B.S.E.E.C.S. (1987) degree from the Rose-Hulman Institute of Technology, and his M.S.E.E. (1988) and Ph.D.E.E. (1993) degrees from the Georgia Institute of Technology. From 1993 to 1996, he was a post-doctoral researcher at the University of California, Berkeley. In 1996, he joined the faculty at UT Austin.

His current research and teaching interests are in the processing of signals to increase connection speeds and reliability in communication systems. More specifically, his research group develops signal processing and machine learning algorithms with implementation constraints in mind, and translates algorithms into design methods and prototypes. His current research effort is focused on multiantenna communication systems. His past research efforts have also included improving visual quality in image/video processing systems and improving simulation and synthesis in system-level design tools.

Prof. Evans was elevated to IEEE Fellow "for contributions to multicarrier communications and image display". In multicarrier communications, his group developed the first linear complexity algorithm that allocates resources to optimize bit rates in multiuser OFDM basestations (for cellular and WiMax) and is realizable in fixed-point hardware/software. His group also developed the first ADSL equalizer training method that maximizes a measure of bit rate and is realizable in real-time fixed-point software. In image display, his group's primary contribution is in the design, analysis, and quality assessment of image halftoning by error diffusion for real-time processing by printer pipelines.

Prof. Evans has published more than 280 refereed conference and journal papers, and graduated 32 PhD and 13 MS students. He has received six teaching awards and three top/best paper awards. He received a 1997 US National Science Foundation CAREER Award.

In departmental service, he led the 2000-02 ECE undergraduate curriculum reform that changed 60 of 90 courses, added electives, reduced the degree by five hours, and made graduation in four years realistic. From 2002-2017, he chaired the departmental curriculum committee to implement curriculum reforms, monitor student course surveys, assign instructors, and manage the \$3M annual instructional budget. Since 2017, he has been coordinating teaching quality and student mentoring in the department.

As Chair of the University Faculty Council (Faculty Senate) 2019-20, he guided university-wide efforts in faculty affairs, student affairs, and resource allocation. Faculty Council plays a vital role in shared governance by evaluating, monitoring, and providing recommendations on undergraduate curriculums and degree programs, and by developing and updating university policies affecting faculty, staff, and students. Policies include those on faculty evaluation, workload, compensation, academic freedom, and grievances; student services, activities, admissions, and employment; and budgets, libraries, research, and IT.