

David V. Anderson

January 2020

Earned Degrees

- 1999 **Ph.D. in Electrical and Computer Engineering.**
Georgia Institute of Technology
- 1994 **M.S. in Electrical Engineering.**
Brigham Young University
- 1993 **B.S. in Electrical Engineering.**
Brigham Young University

Employment

- 2012-present **Professor**, *School of Electrical & Computer Engineering*, Georgia Institute of Technology, Atlanta, Georgia.
- 2011-present **Partner**, *Ratrix Technologies, LLC*, Atlanta, Georgia.
High-tech start-up with NSF SBIR funding to develop wireless data receivers
- 2005-2012 **Associate Professor**, *School of Electrical & Computer Engineering*, Georgia Institute of Technology, Atlanta, Georgia.
- 2009 **Visiting Professor**, *Department of Computer Science*, Korea University, Seoul, South Korea.
- 1999-2005 **Assistant Professor**, *School of Electrical & Computer Engineering*, Georgia Institute of Technology, Atlanta, Georgia.
- 1999 **Education Specialist**, *Texas Instruments, Inc.*, Dallas, Texas.

Professional Service

- 2018-present Member, Georgia Tech Faculty Senate
- 2018-present Member, Georgia Tech Institute Research Faculty Promotions Committee
- 2017-present Member, ECE Graduate Student Recruiting Committee, Georgia Institute of Technology
- 2016-present Faculty Advisor for Eagles @ GT student club
- 2016-present Member, ECE Graduate Committee
- 2016-2018 Member, ECE Statutory Advisory Committee
- 2014-2015 Chair, Computer Systems and Software area in Electrical and Computer Engineering, Georgia Institute of Technology
- 2014 Treasurer, IEEE Global Conference on Signal and Information Processing (GlobalSIP)
- 2011-present ECE Advisory Board, Rose-Hulman Institute of Technology

- 2011-2014 Chair, Institute Faculty Status Grievance Committee, Georgia Institute of Technology
- 2010–present Member, Institute Faculty Status Grievance Committee, Georgia Institute of Technology
 - 2010 Technical Area Chair for the Asilomar Conference on Signals, Systems, and Computers
- 2009-2014 Member, ECE Graduate Student Recruiting Committee, Georgia Institute of Technology
- 2006–2007 Associate Director, Center for Research in Embedded Systems Technology
- 2005–2008 Member, Institute Graduate Committee, Georgia Institute of Technology
- 2005-2008 Member, Georgia Tech Faculty Senate, Georgia Institute of Technology
- 2004–2007 Associate Director over Education Outreach for the Center for Research on Embedded Systems (CREST)
 - 2003 Co-Chair for the NSF Symposium on Next Generation Automatic Speech Recognition
 - 2002 Local Arrangements Chair for the DSP Workshop
 - 2002 Local Arrangements Chair for the Signal Processing Education Workshop
- 2001–2009 Member, ECE Graduate Committee, Georgia Institute of Technology
 - 2000 Technical Co-Chair for Signal Processing Education Workshop
- 1999–2001 Member, ECE Computing Committee, Georgia Institute of Technology
- 1999–present Reviewer for numerous journals and conference publications

Consulting

- 2020–present Expert witness for St. Lawrence Communications LLC, represented by AZA Law LLC in *Saint Lawrence Communications LCC v. Amazon.com, Inc.*, No. 2:19-cv-00027-JRG (Eastern District of Texas)
- 2018–present Expert witness for MModal Services Ltd., represented by Latham & Watkins LLP in *MModal Services Ltd. v. Nuance Communications, Inc.*, No. 1:18-cv-00901-WMR (Northern District of Georgia Atlanta Division)
- 2018–present Expert witness for Motorola Solutions, Inc, represented by Kirkland and Ellis, LLC in *Hytera Communications Corp. Ltd. v. Motorola Solutions, Inc.*, No. 1:17-CV-1794 (Northern District of Ohio, Eastern Division)
 - 2017–2018 Expert witness for Analytics for Life, Inc., represented by Meunier Carlin & Curfman LLC in IPR2017-01742
 - 2017–2018 Expert witness for III Holdings, represented by Posinelli LLP in IPR2017-00930 (K/S HIMPP et al. v. III Holdings)
 - 2017–2018 Expert witness for Motorola Solutions, Inc, represented by Kirkland and Ellis, LLC in *In the Matter of Certain Two-Way Radio Equipment and Systems, Related Software and Components Thereof* before the International Trade Commission, Investigation No. 337-TA-1053

- 2017–2018 Expert witness for St. Lawrence Communications LLC, represented by AZA Law LLC in *Saint Lawrence Communications LLC v. Apple Inc., AT&T Mobility, and Cellco Partnership D/B/A Verizon Wireless Civil Action No. 2:16-cv-00082-JRG (Eastern District of Texas)*
- 2016–2017 Expert witness for Samsung Corporation, represented by Covington Burlington, LLP in *In the Matter of Certain Audio Processing Hardware, Software, and Products Containing the Same* before the International Trade Commission, Investigation No. 337-TA-1026
- 2016–2017 Expert consultant for Alston and Bird, LLC on behalf of Nokia.
- 2015–2016 Expert witness for Acer, Inc.; Acer America Corp.; ASUS TeK Computer Inc.; ASUS Computer International; Dell Inc.; Hewlett Packard Co.; Lenovo Holding Co., Inc.; Lenovo (United States) Inc.; Toshiba Corp.; and Toshiba America Information Systems, Inc. in *In the matter of certain audio processing hardware and software products contain same* before the International Trade Commission, case 337-TA-949 (deposed)
- 2015 Expert witness for Realtek Semiconductor Corporation, represented by Steptoe & Johnson, LLP in *Realtek Semiconductor Corporation v. Andrea Electronics Corporation before the United States Patent and Trademark Office Patent Trial and Appeal Board*, Case Numbers IPR2015-01392, IPR2015-01393, IPR2015-01394, IPR2015-01395, IPR2015-01396
- 2015 Expert witness for Realtek Semiconductor Corporation, represented by Chen Malin, LLP in *In the matter of certain audio processing hardware and software products contain same* before the International Trade Commission, case 337-TA-949
- 2012–2013 Expert witness for MobileMedia Ideas, LLC, represented by Proskauer in *MobileMedia Ideas LLC, v. Research in Motion Limited and Research in Motion Corporation, Civil Action No. 3:11-cv-02353-N (Northern District of Texas)* (deposed)
- 2009–2013 Expert witness for Oticon, LLC, represented by Birch, Steward, Kolasch, & Birch, L.L.P. in *Oticon, Inc. v. Sebotek Hearing systems, LLC, et al., Civil Action No. 3:08-cv-05489-FLW (District of New Jersey)* and *Sound Design Technologies, Ltd. v Oticon, Inc., Civil Action No. 2:11-cv-01375-SRB (District of Arizona)* (deposed twice, testified in Markman hearing)
- 2007–2011 Expert Consultant, Alston and Bird, LLC performing internal analysis for various Nokia Patents
- 2011 Expert consultant for Alston and Bird, LLC on behalf of Nokia in *Nokia Corporation v. Apple Inc., Civil Action No. 1:09-cv-00791-GMS (District of Delaware)*
- 2011 Expert witness for Flightcom Corporation, represented by Alston and Bird, LLC in *TechnoFirst S.A. v. Flightcom Corp., Civil Action No. 2:05-cv-00411-HCM-FBS (Eastern District of Virginia)*

- 2011 Expert consultant for Alston and Bird, LLC on behalf of Nokia in *Nokia Corporation v. Apple Inc., Civil Action No. 1:09-cv-00791-GMS (District of Delaware)* (patent analysis)
- 2008 Technical Consultant, Sound Innovations, Inc., White River Junction, Vermont
- 2007-2008 Expert witness for Oticon, LLC and Bernafon, represented by Finnegan and Henderson in *Energy Transportation Group, Inc. v. Sonic Innovations, Inc., et al, Case 1:05-cv-00422-GMS (District of Delaware)* (non-infringement expert, deposed, testified before jury)
- 2007-2008 Technical Consultant, Personics Labs, Boca Raton, Florida
- 2005-2008 Technical Consultant and Technical Advisory Board member, GTronix, Inc., Fremont, California
- 1998-2000 Technical Consultant, ASPI, Inc., Atlanta, Georgia

Community Involvement (selected)

- 2012-2016 President, Waters Mill Home Owners Association
- 2006-2015 Judge for the Georgia FIRST Lego League State Championships robotics competition for middle school students
- 2005-present Assistant Scoutmaster, Merit Badge Counselor, and Woodbadge recipient, Boy Scouts of America
- 1987-1989 LDS Mission Service in Tempe Arizona

Honors and Awards (selected)

- 2004 Presidential Early Career Award for Scientists and Engineers (PECASE)
- 2004 NSF Faculty Early Career Development (CAREER) Award
- 2006 US Frontiers of Engineering Fellow, National Academy of Engineering
- 2006 Frontiers of Science Fellow, National Academy of Science
- 2009 Nominated by the School of Electrical and Computer Engineering for the Institute 2009 Outstanding Faculty Leadership Award for the Development of Graduate Research Assistants

Memberships

- 1991-present Senior Member IEEE (Institute of Electrical and Electronics Engineers)
 - Member IEEE Signal Processing Society
 - Member IEEE Education Society
 - Member IEEE Communications Society
- 1994-2018 Member ASA (Acoustical Society of America)

Teaching—Ph.D. Students Graduated

- 2004 **Tyson S. Hall, Ph.D.**
 - Thesis: Field-Programmable Analog Arrays: A Floating-Gate Approach
 - Current: Professor at Southern Adventist University

- 2005 **Heejong Yoo, Ph.D.**
Thesis: Low-Power Audio Input Enhancements for Portable Devices
Current: IP department at Qualcomm, Inc.
- 2005 **Venkatesh Krishnan, Ph.D.**
Thesis: A framework for low bit-rate speech coding in noisy environments
Current: Multimedia research group at Qualcomm, Inc.
- 2006 **Cenk Demiroglu, Ph.D.**
Thesis: Multisensor Segmentation-based Noise Suppression for Intelligibility Improvement in MELP Coders
Current: Assistant Professor at Özyeğin University (Turkey)
- 2006 **Rongqiang (James) Hu, Ph.D.**
Thesis: Multi-Sensor Noise Suppression and Bandwidth Extension for Enhancement of Speech
Current: Nintendo
- 2007 **Sourabh Ravindran, Ph.D.**
Thesis: Physiologically Motivated Methods for Audio Pattern Classification
Current: Director, Mobile Processor Innovation Lab at Samsung
- 2007 **Shyam Subramanian, Ph.D.**
Thesis: Methods for Synthesis of Multiple-Input Translinear Element Networks
Current: Senior Principal Design Engineer at Cadence Design Systems
- 2007 **Teahyung Lee, Ph.D.**
Thesis: Algorithm-based Efficient Approaches for Motion Estimation Systems
Current: Intel Research
- 2009 **Nikolaos Vasiloglou, Ph.D.**
Thesis: Isometry and Convexity in Dimensionality Reduction
Current: Entrepreneur and Consultant in Machine Learning
- 2009 **Haw Jing (Michael) Lo, Ph.D.**
Thesis: Design of a Reusable Distributed Arithmetic Filter and its Application to the Affine Projection Algorithm
Current: Qualcomm, Inc.
- 2009 **Ismail Faik Baskaya, Ph.D.**
Thesis: Physical Design Automation for Large Scale Field Programmable Analog Arrays
Current: Assistant Professor at Boğaziçi University, Istanbul (Turkey)

2009 **Walter Huang, Ph.D.**

Thesis: Implementation of Adaptive Digital FIR and Reprogrammable Mixed-Signal Filters using Distributed Arithmetic

Current: Qualcomm, Inc.

2009 **Jungwon Lee, Ph.D.**

Thesis: Efficient Image Compression System with a CMOS Transform Imager

Current: Senior Engineer, Samsung Electronics, Korea

2009 **Harry (Bo) Marr, Ph.D.**

Co-advisor: Jennifer Hasler

Thesis: Learning, Probabilistic, and Asynchronous Technologies for an Ultra Efficient Datapath

Current: Director of Low Power Computing Group Raytheon at Raytheon, Inc.

2011 **Brian Gestner, Ph.D.**

Thesis: Lattice Reduction for MIMO Detection: From Theoretical Analysis to Hardware Realization

Current: Chief Technology Officer at Soneter

2012 **Jason George, Ph.D.**

Thesis: Harnessing Resilience: Biased Voltage Overscaling for Probabilistic Signal Processing

Current: Entrepreneur

2012 **Leung Kin Chui, Ph.D.**

Thesis: Efficient audio signal processing for embedded systems

Current: Design Engineer at Texas Instruments

2012 **Jorge Marin, Ph.D.**

Thesis: Robust binaural noise-reduction strategies with binaural-hearing-aid constraints: design, analysis and practical considerations

Current: Professor at Universidad del Quindío

2012 **Devangi Parikh, Ph.D.**

Thesis: Improving the quality of speech in noisy environments

Current: Biomedical Research Lab at Texas Instruments

2012 **Varinthira Duangudom, Ph.D.**

Thesis: Computational auditory saliency

Current: Homemaker

- 2013 **Irteza Syed, Ph.D.**
Thesis: Classification using Residual Vector Quantization
Current: Aero, Inc, Pakistan
- 2014 **Syed Hussain Raza, Ph.D.**
Thesis: Temporally Consistent Semantic Segmentation in Videos
Current: NVIDIA
- 2014 **Nashie Sephus, Ph.D.**
Thesis: A Framework for Exploiting Modulation Spectral Features in Music Data Mining and Other Applications
Current: CTO at Partpic, Inc.
- 2015 **Ryan Curtin, Ph.D.**
Thesis: Improving Dual-Tree Algorithms
Current: relational.ai
- 2015 **Chu Meh Chu, Ph.D.**
Thesis: Exploiting Temporal and Spatial Redundancies for Vector Quantization of Speech and Images
Current: Luxoft
- 2016 **Jinwoo Kang, Ph.D.**
Thesis: Face Recognition for Vehicle Personalization
- 2017 **Kaitlin Fair, Ph.D.**
Thesis: A Biologically Plausible Sparse Approximation Solver on Neuromorphic Hardware
Current: Air Force Research Lab
- 2017 **Muhammed Rizwan, Ph.D.**
Thesis: Adaptation of Hybrid Deep Neural Network–Hidden Markov Model Speech Recognition System using a Sub-space Approach
Current: Assistant Professor in Pakistan
- 2018 **Nathan Parrish, Ph.D.**
Thesis: System Configuration for Proportional Control of an Assistive Technology for Patients with Cervical Spinal Cord Injuries
- 2018 **Brandon Carroll**
Thesis: Characterizing Acoustic Environments with OLAF and ELSA
Current: Georgia Tech (post-doc)

- 2018 **Bradley Whitaker**
Thesis: Modifying Sparse Coding for Imbalanced Classification
Current: Assistant Professor at Montana State University
- 2018 **Babafemi Odelowo**
Thesis: Development of a Neural Network-Based Speech Enhancement System
Current: Georgia Tech Research Institute
- 2019 **Md Nazmus Sahadat**
Thesis: Design and Evaluation of a Multimodal Assistive Technology using Tongue Commands, Head Movements, and Speech Recognition for People with Tetraplegia
Current: Starkey Corporation
- 2019 **Chieh-Feng Cheng**
Thesis: Audio Classification for Small-sized and Weakly Labelled Data

Teaching—Current Ph.D. Students

- 2016–present **Lee Richert**—Passed Prelim Exam 2015. Thesis area: Sparse Signal Modeling
- 2016–present **You Wang**—Passed Prelim Exam 2016. Thesis area: Perceptually Motivated Signal Detection in Noise
- 2017–present **Chuyao Feng**—Passed Prelim Exam 2016. Thesis area: Virtual Therapist—Feedback for Voice Therapy Patients Practicing at Home
- 2018–present **Desmond Caulley**. Thesis area: Environmental Correction for i-Vector–based Speaker Identification
- 2019–present **Devon Jankey**. Thesis area: Neural Network Classifiers in Subthreshold Analog Circuits
- 2019–present **Mohamad Salut**. Thesis area: Online Tensor Decomposition

Masters Thesis Students Graduated

- 2002 **Hyung K. Choi**
Thesis: Blind Source Separation of the Audio Signals in a Real World
- 2003 **Paul Hultz**
Thesis: Backward Masking in the Human Auditory System
- 2006 **Daniel Allred**
Thesis: Evaluation and Comparison of Beamforming Algorithms for Microphone Array Speech Processing
- 2012 **Ailar Javadi**
Thesis: Bio-inspired noise robust auditory features

2012 **Guillermo Colón**

Thesis: Avian musing feature space analysis

2016 **Tushar Supe**

Thesis: Super-CORDIC: Low Delay CORDIC Architectures for Computing Complex Functions

2019 **Harish K Haresamudram**

Thesis: The Role of Representations in Human Activity Recognition

B.2.b. M.S. Students in Progress (with Thesis)

2019–present **Maham Tanveer**—Learning Distance Metrics for High-Dimensional Data

2019–present **Yufeng Yeng**—Speaker Recognition and Diarization

2019–present **Hua Wang**—Noise Suppression in Speech

Scholarly Accomplishments

Published Books

Wayne T. Padgett and David V. Anderson. *Fixed-point Signal Processing*. Synthesis Lectures on Signal Processing. Morgan & Claypool Publishers, 2009.

Published Parts of Books

J. H. McClellan, R. W. Schafer, and M. A. Yoder. *DSP First: A Multimedia Approach*. Prentice Hall, 1998. Assisted in the preparation of the multi-media CD-ROM that accompanies the text. Wrote and revised the laboratory projects included in the text.

Sheng-Yu Peng, Paul E. Hasler, and David Anderson. An analog programmable multi-dimensional radial basis function based classifier. In *IFIP WG 10.5 International Conference on Very Large Scale Integration of System-on-Chip*, pages 13–18, Atlanta, GA, October 2007.

Jorge Marin-Hurtado and David V. Anderson. *Independent Component Analysis for Audio and Biosignal applications*, chapter Preservation of Localization Cues in BSS-Based Noise Reduction: Application in Binaural Hearing Aids. InTech, 2012. Ganesh R Naik, ed.

Refereed Journal Publications

Paul Hasler, Abhishek Bandyopadhyay, and David V. Anderson. High fill-factor imagers for neuromorphic processing enabled by floating-gate circuits. *EURASIP Journal on Applied Signal Processing*, 2003(7):676–689, June 2003. Invited paper for special issue on neuromorphic signal processing and implementation.

Venkatesh Krishnan and David V. Anderson. Joint design of channel-optimized multistage vector quantizer. *IEEE Signal Processing Letters*, 11(1):5–7, January 2004.

Venkatesh Krishnan, David V. Anderson, and Kwan Truong. Optimal multistage vector quantization of LPC parameters over noisy channels. *IEEE Transactions on Speech and Audio Processing*, 12(1):1–8, January 2004.

Paul S. Hong, David V. Anderson, Doug B. Williams, Thomas P. Barnwell III, Joel R. Jackson, Monson H. Hayes III, Ronald W. Schafer, and John D. Echard. “DSP for practicing engineers:” A case study in internet course delivery. *IEEE Transactions on Education*, 47(3):301–310, August 2004.

Abhishek Bandyopadhyay, Paul Hasler, and David V. Anderson. A CMOS floating-gate matrix transform imager. *IEEE Sensors*, 5(3):455–462, 2005.

Paul Hasler, Paul D. Smith, Rich Ellis, David Graham, and David Anderson. Analog floating-gate, on-chip auditory sensing system interfaces. *IEEE Sensors*, 5:1027–1034, October 2005.

Sourabh Ravindran, Kristopher Schlemmer, and David V. Anderson. A physiologically inspired method for audio classification. *EURASIP Journal on Applied Signal Processing*, 2005(9):1374–1381, 2005.

Tyson S. Hall, Christopher M. Twigg, Paul Hasler, and David V. Anderson. Developing large-scale field-programmable analog arrays for rapid prototyping. *International Journal for Embedded Systems*, 1(3/4):179–192, 2005.

Sourabh Ravindran, Paul Smith, David Graham, Varinthira Duangudom, David Anderson, and Paul Hasler. Towards biologically inspired on-chip auditory processing. *EURASIP Journal on Applied Signal Processing*, 2005(7):1082–1092, 2005.

Daniel J. Allred, David V. Anderson, Walter Huang, Venkatesh Krishnan, and Heejong Yoo. LMS adaptive filters using distributed arithmetic for high throughput. *IEEE Transactions on Circuits and Systems*, 52(7):1327–1337, July 2005.

Tyson S. Hall and David V. Anderson. A framework for teaching real-time digital signal processing with field-programmable gate arrays. *IEEE Transactions on Education*, 48(3):551 – 558, August 2005.

Tyson S. Hall, Christopher M. Twigg, Jordan D. Gray, Paul Hasler, and David V. Anderson. Large-scale field-programmable analog arrays for analog signal processing. *IEEE Transactions on Circuits and Systems*, 52(11):2298 – 2307, November 2005.

Faik Baskaya, Sasank Reddy, Sung Kyu Lim, and David V. Anderson. Placement for large-scale floating-gate field programable analog arrays. *IEEE Transactions on Very Large Scale Integration Systems*, 14(8):906–910, August 2006.

Sheng-Yu Peng, Paul Hasler, and David V. Anderson. An analog programmable multi-dimensional radial basis function based classifier. *IEEE Transactions on Circuits and Systems I*, 54(10):2148–2158, October 2007.

Erhan Ozalevli, Walter Huang, Paul E. Hasler, and David V. Anderson. A reconfigurable mixed-signal VLSI implementation of distributed arithmetic used for finite-impulse response filtering. *IEEE Transactions on Circuits and Systems I*, 55(2):510–521, March 2008.

Kofi M. Odame, David V. Anderson, and Paul Hasler. A bandpass filter for inherent gain adaptation for hearing applications. *IEEE Transactions on Circuits and Systems I*, 55(3):786–795, April 2008.

Wei Zhang, Xiaoli Ma, Brian Gestner, and David V. Anderson. Designing low-complexity equalizers for wireless systems. *IEEE Communications Magazine*, 47(1):56–62, January 2009.

Faik Baskaya, David V. Anderson, and Sung Kyu Lim. Net sensitivity based optimization of large-scale field programmable analog array (FPAA) placement and routing. *IEEE Transactions on Circuits and Systems II*, 56(7):565–569, July 2009.

L.J. Karam, I. Alkamal, A. Gatherer, G.A. Frantz, D.V. Anderson, and B.L. Evans. Trends in multicore DSP platforms. *IEEE Signal Processing Magazine*, 26(6):38–49, November 2009.

Bo Marr, Jason George, Brian Degnan, David V. Anderson, and Paul E. Hasler. Error immune logic for low power probabilistic computing. *VLSI Design*, 2010. doi:10.1155/2010/460312.

Walter Huang and David V. Anderson. Modified sliding-block distributed arithmetic with offset binary coding for adaptive filters. *Journal of Signal Processing Systems*, April 2010. Available: <http://dx.doi.org/10.1007/s11265-010-0479-4>.

David V. Anderson. Storytelling—the missing art in engineering presentations. *IEEE Signal Processing Magazine*, 28(2):109–111, March 2011.

Brian Gestner, Wei Zhang, Xiaoli Ma, and David V. Anderson. Lattice reduction for MIMO detection: From theoretical analysis to hardware realization. *IEEE Transactions on Circuits and Systems I*, 58(4):813–826, April 2011.

J. Marin Hurtado and David V. Anderson. FFT-based block processing in speech enhancement: Potential artifacts and solutions. *IEEE Transactions on Audio, Speech and Language Processing*, 19(8):2527–2537, November 2011.

Brian Gestner, Xiaoli Ma, and David V. Anderson. Incremental lattice reduction: Motivation, theory, and practical implementation. *IEEE Transactions on Wireless Communications*, 11(1):188–198, January 2012.

Bo Marr, Brian Degnan, Paul Hasler, and David V. Anderson. Scaling energy per operation via an asynchronous pipeline. *IEEE Transactions on VLSI*, PP(99):1–5, 2012.

J.I. Marin-Hurtado, D.N. Parikh, and D.V. Anderson. Perceptually inspired noise-reduction method for binaural hearing aids. *Audio, Speech, and Language Processing, IEEE Transactions on*, 20(4):1372–1382, May 2012.

B. Gestner, Xiaoli Ma, and D.V. Anderson. Incremental lattice reduction: Motivation, theory, and practical implementation. *Wireless Communications, IEEE Transactions on*, 11(1):188–198, January 2012.

A.A. Kressner, D.V. Anderson, and C.J. Rozell. Evaluating the generalization of the hearing aid speech quality index (hasqi). *Audio, Speech, and Language Processing, IEEE Transactions on*, 21(2):407–415, February 2013.

S. Ramakrishnan, A. Basu, Leung Kin Chiu, J. Hasler, D. Anderson, and S. Brink. Speech processing on a reconfigurable analog platform. *Very Large Scale Integration (VLSI) Systems, IEEE Transactions on*, 22(2):430–433, Feb 2014.

Nashlie H Sephus, Aaron D Lanterman, and David V Anderson. Modulation spectral features: In pursuit of invariant representations of music with application to unsupervised source identification. *Journal of New Music Research*, 44(1):58–70, 2015.

Jinwoo Kang, David V. Anderson, and Monson H. Hayes. Face recognition for vehicle personalization with near infrared frame differencing. *IEEE Transactions on Consumer Electronics*, 62(3):316–324, August 2016.

Chieh-Feng Cheng, Abbas Rashidi, Mark Davenport, and David V. Anderson. Activity recognition of construction equipment using audio signals and support vector machines automation in construction. *Automation in Construction Journal*, 2016. accepted November 2016.

B. T. Carroll, B. M. Whitaker, W. Dayley, and D. V. Anderson. Outlier learning via augmented frozen dictionaries. *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, 25(6):1207–1215, June 2017.

Muhammad Rizwan and David V. Anderson. A weighted accent classification using multiple words. *Neurocomput.*, 277(C):120–128, February 2018.

Chieh-Feng Cheng, Abbas Rashidi, Mark A. Davenport, and David V. Anderson. Activity analysis of construction equipment using audio signals and support vector machines. *Automation in Construction*, June 2017.

Bradley M Whitaker, Pradyumna Byappanahalli Suresha, Chengyu Liu, Gari D Clifford, and David V Anderson. Combining sparse coding and time-domain features for heart sound classification. *Physiological Measurement*, 38:1701–1729, 08 2017.

Bradley M. Whitaker and David V. Anderson. Mixed matrix norms in sparse coding for imbalanced datasets. *IEEE Transactions on Signal Processing*. submitted November 2017.

Chris Sabillon, Abbas Rashidi, Biswanath Samanta, Mark A. Davenport, and David V. Anderson. An audio-based Bayesian model for productivity estimation of construction cyclic activities. *Journal of Computing in Civil Engineering*, 34(1), 2020.

Muhammed Rizwan, Bradley M Whitaker, and David V Anderson. AF detection from ECG recordings using feature selection, sparse coding, and ensemble learning. *Physiological measurement*, 39(12), December 2018.

M. N. Sahadat, N. Sebkhi, D. Anderson, and M. Ghovanloo. Optimization of tongue gesture processing algorithm for standalone multimodal tongue drive system. *IEEE Sensors Journal*, 19(7):2704–2712, April 2019.

Muhammad Rizwan, Sinan Hersek, Maziyar Baran Pouyan, David V. Anderson, and Omer T. Inan. Robust segmentation of knee acoustical emissions for wearable joint health assessment. *IEEE Transactions on Biomedical Engineering*, 2018. in revision.

Kaitlin L. Fair, Daniel R. Mendat, Andreas G. Andreou, Christopher J. Rozell, Justin Romberg, and David V. Anderson. Sparse coding using the locally competitive algorithm on the truenorth neurosynaptic system. *Frontiers in Neuroscience*, 13:754, 2019.

Chris Sabillon, Abbas Rashidi, Biswanath Samanta, Mark Davenport, and David Anderson. Audio-based bayesian model for productivity estimation of cyclic construction activities. *Journal of Computing in Civil Engineering*, 34:04019048, 01 2020.

Refereed Conference Publications

David V. Anderson, Richard W. Harris, and Douglas M. Chabries. Evaluation of a hearing compensation algorithm. In *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing*, volume 5, pages 3531–3533, Detroit, May 1995.

Douglas M. Chabries, David V. Anderson, Thomas G. Stockham, Jr., and Richard W. Christiansen. Application of a human auditory model to loudness perception and hearing compensation. In *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing*, volume 5, pages 3527–3530, Detroit, May 1995.

David V. Anderson. Speech analysis and coding using a multi-resolution sinusoidal transform. In *Proceedings of the IEEE International Conference on*

Acoustics, Speech, and Signal Processing, volume 2, pages 1037–1040, Atlanta, May 1996.

David V. Anderson, James H. McClellan, Ronald W. Schafer, Jeffrey B. Schodorf, and Mark A. Yoder. DSP First - a first course in ECE. In *Proceedings of the 1996 Asilomar Conference on Circuits, Systems, and Computers*, volume 1, pages 226–230, Pacific Grove, CA, May 1996.

David V. Anderson and Mark A. Clements. Audio signal noise reduction using multi-resolution sinusoidal modeling. In *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing*, pages 805–808, Phoenix, May 1999.

David V. Anderson, Lonnie Harvel, Monson H. Hayes III, Y. Ishiguro, Joel R. Jackson, and Maria Pimentel. Internet course delivery-making it easier and more effective. In *Proceedings of the IEEE International Conference on Multimedia and Expo*, volume 1, pages 84–87, New York, July 2000.

David V. Anderson, Thomas P. Barnwell, Monson H. Hayes III, and Joel R. Jackson. Effective and efficient distance learning over the internet: Implementation of an on-line DSP course. In *Proc. International Conference on Engineering Education*, Taiwan, August 2000.

Joel R. Jackson, David V. Anderson, and Monson H. Hayes III. Effective and efficient distance learning over the internet: Tools and techniques. In *Proc. International Conference on Engineering Education*, Taiwan, August 2000.

Monson H. Hayes III, Joel R. Jackson, and David V. Anderson. Producing effective internet courses with *inFusion*. In *Proceedings Learning '00*, Madrid, Spain, October 2000.

David V. Anderson, Thomas P. Barnwell, John Echard, Monson H. Hayes III, Joel R. Jackson, Ronald W. Schafer, and Douglas B. Williams. An on-line DSP course for practicing engineers. In *Signal Processing Education Workshop*, Hunt, TX, October 2000. Web Proceedings:
<http://spib.ece.rice.edu/SPTM/DSP2000/>.

David V. Anderson and Paul Hasler. Cooperative analog/digital signal processing. In *World Conference on Systemics, Cybernetics, and Informatics*, Orlando, FL, July 2001. *Invited Paper, Best Paper Award*.

Matt Kucic, Paul Hasler, Jeff Dugger, and David V. Anderson. Programmable and adaptive analog filters using arrays of floating-gate circuits. In Erik Brunvand and Chris Myers, editors, *2001 Conference on Advanced Research in VLSI*, pages 148–162, Salt Lake City, March 2001. IEEE Computer Society.

Joel R. Jackson, Thomas P. Barnwell, Douglas B. Williams, Monson H. Hayes III, David V. Anderson, and Ronald W. Schafer. DSP for practicing engineers: an online continuing DSP education course. In *Proceedings of the IEEE*

International Conference on Acoustics, Speech, and Signal Processing, volume V, pages 2721–2724, Salt Lake City, UT, May 2001.

Joel R. Jackson, Thomas P. Barnwell, Douglas B. Williams, Monson H. Hayes III, David V. Anderson, and Ronald W. Schafer. Online DSP education: DSP for practicing engineers. In *American Society for Engineering Education Annual Conference*, Albuquerque, NM, June 2001.

Joel R. Jackson, Thomas P. Barnwell, David V. Anderson, and Monson H. Hayes III. *inFusion*: Simplifying online course creation. In *American Society for Engineering Education Annual Conference*, Albuquerque, NM, June 2001.

Paul Smith, Matt Kucic, Rich Ellis, Paul Hasler, and David V. Anderson. Cepstrum frequency encoding in analog floating-gate circuitry. In *Proceedings of the IEEE International Symposium on Circuits and Systems*, volume IV, pages 671–674, Phoenix, AZ, May 2002.

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Chieh-Feng Cheng, Abbas Rashidi, Mark A. Davenport, and David Anderson. Audio signal processing for activity recognition of construction heavy equipment. In *33rd International Symposium on Automation and Robotics in Construction (ISARC 2016)*, 2016.

K. L. Fair and D. V. Anderson. Sparse approximation on energy efficient hardware. In *2016 International Joint Conference on Neural Networks (IJCNN)*, pages 4302–4307, July 2016.

B. M. Whitaker and D. V. Anderson. Heart sound classification via sparse coding. In *2016 Computing in Cardiology Conference (CinC)*, pages 805–808, September 2016.

C. F. Cheng, A. Rashidi, M. A. Davenport, D. V. Anderson, and C. A. Sabillon. Hardware and software requirements for acoustical monitoring of construction jobsites. In *Proc. Int. Workshop on Computing in Civil Engineering 2017*, 2017.

B. O. Odelowo and D. V. Anderson. Speech enhancement using extreme learning machines. In *2017 IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA)*, pages 200–204, October 2017.

B. O. Odelowo and D. V. Anderson. A mask-based post processing approach for improving the quality and intelligibility of deep neural network enhanced speech. In *2017 16th IEEE International Conference on Machine Learning and Applications (ICMLA)*, pages 1134–1138, December 2017.

B. O. Odelowo and D. V. Anderson. A noise prediction and time-domain subtraction approach to deep neural network based speech enhancement. In *2017 16th IEEE International Conference on Machine Learning and Applications (ICMLA)*, pages 372–377, December 2017.

B. M. Whitaker, M. Rizwan, V. B. Aydemir, J. M. Rehg, and D. V. Anderson. AF classification from ECG recording using feature ensemble and sparse coding. In *2017 Computing in Cardiology (CinC)*, September 2017.

Muhammad Rizwan and David V. Anderson. Investigation on adaptive data condensation for exemplar based method in speech task. In *2017 IEEE Global Conference on Signal and Information Processing, GlobalSIP 2017*, Nov 2017.

Babafemi Odelowo and David V. Anderson. A study of training targets for deep neural network-based speech enhancement using noise prediction. In *2018 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2018.

Bradley M. Whitaker and David V. Anderson. Using block coordinate descent to learn sparse coding dictionaries with a matrix norm update. In *2018 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pages 2761–2765, April 2018.

C. A. Sabillon, A. Rashidi, B. Samanta, C. F. Cheng, M. A. Davenport, and D. V. Anderson. A productivity forecasting system for construction cyclic operations using audio signals and a Bayesian approach. In *Construction Research Congress (CRC)*, April 2018.

C. Cheng, D. V. Anderson, M. A. Davenport, and A. Rashidi. Audio classification based on weakly labeled data. In *2018 IEEE Statistical Signal Processing Workshop (SSP)*, pages 568–572, June 2018.

Babafemi O. Odelowo and David V. Anderson. Canonical ELM: Improving the performance of extreme learning machines on multivariate regression tasks using canonical correlations. In *2018 17th IEEE International Conference on Machine Learning and Applications (ICMLA)*, pages 734–740, December 2018.

Shoba S. Meera, Rahul Pawar, Kha vi Khuu, Steven Warren, Gizem Cetin, Vybhav Jagannath, Mark Clements, David Anderson, Heather Hazlett, Robert Schultz, Annette Estes, Stephen Dager, Kelly Botteron, Lonnie Zwaigenbaum, Julia Parrish-Morris, Juhi Pandey, Tanya St. John, Meghan Swanson, Linda Watson, and Joe Piven. Canonical babbling in 9-month-old infants later diagnosed with autism spectrum disorder: A naturalistic evaluation of all-day recordings. In *International Society for Autism Research (INSAR) 2019 Annual Meeting*, May 2019.

Chuyao Feng, Eva van Leer, and David V. Anderson. Identification of voice quality variation using i-vectors. In *2019 IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA)*, pages 105–109, October 2019.

Harish Haresamudram, David V Anderson, and Thomas Plötz. On the role of features in human activity recognition. In *Proceedings of the 23rd International Symposium on Wearable Computers*, pages 78–88, 2019.

Conference Presentations without Proceedings

David V. Anderson and Mark A. Clements. Noise suppression in speech using multi-resolution sinusoidal modeling. presented at the Fall 1998 Meeting of the Acoustical Society of America, Norfolk, VA.

David V. Anderson, Douglas Chabries, and Richard W. Christiansen. Time constants in multi-band compressive gain hearing aids. In *International Hearing Aid Research Conference*, Lake Tahoe, CA, August 2000.

David V. Anderson, Phil Spencer Whitehead, and Mark A. Clements. Acoustic noise suppression for speech enhancement. presented at the Fall 2001 Meeting of the Acoustical Society of America, Ft. Lauderdale, FL, October 2001.

David V. Anderson. Fast dynamic range compression method for multichannel hearing aids. presented at the 143rd Meeting of the Acoustical Society of America, Pittsburgh, Pennsylvania, June 2002.

I. Faik Baskaya, Sasank Reddy, Tyson Hall, David V. Anderson, Paul Hasler, and Sung Kyu Lim. Analog circuit modeling and clustering for large scale FPAA. presented at the Design Automation and Test Conference, May 2004.

Abbas Rashidi, Mark A. Davenport, David V. Anderson, Chieh-Feng Cheng, and Chris A. Sabillon. Achievements and challenges in audio-based modeling of construction job sites. *The Meeting of the Acoustical Society of America*, 141:3917–3917, May 2017.

Technical Reports

Heejong Yoo, Rich Ellis, David V. Anderson, Paul Hasler, David W. Graham, and Mat Hans. Continuous-time audio noise suppression and real-time implementation. Technical Report HPL-2002-311, HP Labs, November 2002. available at <http://www.hpl.hp.com/techreports>.

André van Schaik, David Anderson, Steven Greenberg, Malcom Slaney, et al. Final report—chapter on audio projects. Technical report, Telluride Workshop on Neuromorphic Engineering, Telluride, CO, July 2003.

Malcolm Slaney, David V. Anderson, André van Schaik, et al. Final report—chapter on audio projects. Technical report, Telluride Workshop on Neuromorphic Engineering, Telluride, CO, July 2004.

Seminar Presentations

David V. Anderson, Monson H. Hayes III, and Joel Jackson. Streaming multimedia course development. Invited seminar at Virginia Tech, December 2000.

David V. Anderson. Cooperative analog/digital signal processing. Georgia Tech Analog Consortium Industry Review, March 2001.

David V. Anderson. Analog signal processing in a digital world. Georgia Tech Analog Consortium Industry Review, March 2002.

David V. Anderson. Analog and signal processing. Georgia Tech Analog Consortium Industry Review, October 2003.

David V. Anderson. Cooperative analog/digital signal processing. Invited speaker: IEEE Georgia Tech Student Chapter meeting, March 2000.

Mat Hans and David V. Anderson. Sensor inputs for portable devices. Invited speaker: IEEE Georgia Tech Student Chapter meeting, February 2002.

David V. Anderson. Bucking the trend. Keynote speaker at HKN Honor Society induction, April 2002.

David V. Anderson. Prototyping cooperative analog-digital signal processing for auditory applications. Telluride Workshop on Neuromorphic Engineering, July 2003.

David V. Anderson. Neuro-inspired audio processing. Telluride Workshop on Neuromorphic Engineering, July 2004.

David V. Anderson. Signal processing trends. Invited speaker: Korea University, May 2005.

David V. Anderson. Low-power signal processing trends. Invited speaker: Johns Hopkins University, November 2005.

David V. Anderson. Signal processing with analog VLSI. Invited speaker: State University of New York – Stony Brook, January 2006.

David V. Anderson. Neuro-inspired signal processing. Telluride Workshop on Neuromorphic Engineering, July 2005.

David V. Anderson. Audio signal enhancement. Telluride Workshop on Neuromorphic Engineering, July 2006.

David V. Anderson. Human perception and signal processing. Telluride Workshop on Neuromorphic Engineering, July 2008.

David V. Anderson. Bayesian probability in everyday life. Presentation to Autry Mill Middle School Math Classes, May 2009.

David V. Anderson. Multimedia signal processing. Invited speaker: Korea University, July 2009.

Patents

David V. Anderson, Kwan Truong, and Stephen McGrath. Adaptive filter featuring spectral gain smoothing and variable noise multiplier for noise reduction, and methods therefor. U.S. Patent no. 6,351,731, July 1999. Issued 2002.

David V. Anderson, Kwan Truong, and Stephen McGrath. Speech activity detector for use in noise reduction system, and methods therefor. U.S. Patent no. 6,453,285, July 1999. Issued 2002.

Jeffery Dugger, Tyson S. Hall, Paul Hasler, David V. Anderson, Paul D. Smith, Matthew R. Kucic, and Abhishek Bandyopadhyay. Floating-gate analog circuit. U.S. Patent no. 6,898,097, May 2005.

Daniel J. Allred, David V. Anderson, Walter G. Huang, Venkatesh Krishnan, and Heejong Yoo. Distributed arithmetic adaptive filter and method. U.S. Patent application no. 20050201457, September 2005.

Philomena Cleopha Brady, Haw-Jing Lo, Guillermo Jose Serrano, Farhan Adil, Matthew R. Kucic, Paul Hasler, David V. Anderson, and Angelo Pereira. Floating-gate reference circuit. U.S. Patent no. 7,034,603, April 2006.

Erhan Ozalevli, Paul Hasler, David V. Anderson, and Walter G. Huang. Reconfigurable mixed-signal VLSI implementation of distributed arithmetic. U.S. Patent no. 7,348,909, March 2008.

Richard T. Ellis, Heejong Yoo, David W. Graham, Paul E. Hasler, and David V. Anderson. Analog audio signal enhancement system using a noise suppression algorithm. U.S. Patent no. 7,590,250, September 2009.

David Verl Anderson, Brian Gestner, and Xiaoli Ma. Incremental lattice reduction systems and methods. U.S. Patent no. 8,948,318 B2, February 2015.

Other Scholarly and Teaching Activities

Undergraduate Research

- Supervised over 100 undergraduate research projects.

Graduate Course Development

- Human Perception and Signal Processing: Advanced Topics in Signal Processing, ECE 7252. The objective of this course is to explore human-centric applications of signal processing. Students learn about compression standards such as MPEG audio and video, perceptually relevant error measures, subjective and objective quality measures, hearing impairments and compensation, signal enhancement, and current research topics in signal processing and human perception.

Short Course Development

- “Digital Signal Processing for Practicing Engineers” - a 12-week on-line course delivered: February 2000, ongoing approximately twice per year.
- “Streaming Multi-Media Production” One-day course delivered: May 2000
- “Finite-Precision Signal Processing” Four-day course delivered: Spring 2007, Summer 2007, Spring 2009.
- “Applications of Psychoacoustics to Signal Processing” One-day tutorial delivered: Spring 2009

Grants and Contracts

Foundation Gifts

	Sponsor	Title	Dates	\$ Funded
1.	Google	Fast Analysis of High-dimensional Data	10/07	\$75,000
		With Alex Gray in CoC		
2.	Google	Audio Saliency	10/07	\$100,000
		With Alex Gray in CoC		
3.	National Semiconductor	Sound Classification Circuits Research	9/05–	\$125,000
4.	IDT Corporation	FFT Circuits Research	10/06	\$30,000

As Principal and Co-principal Investigator

	Sponsor	Title	Dates	\$ Funded	Contribution
1.	NSF	High Density Analog Computing Arrays	9/00–8/04	\$443,000	40%
		CoPI — PI: P. Hasler			
2.	Georgia Tech Broadband Institute	Blind Source Separation for Audio	7/01–6/02	\$26,000	100%
3.	Georgia Tech Broadband Institute	Audio Classification	7/02–6/03	\$26,000	100%
4.	Georgia Tech Broadband Institute	Audio Classification	7/03–6/04	\$20,000	100%
5.	GVU Center	Auditory Scene Analysis	7/02–6/03	\$16,170	100%
6.	DARPA	Focal-Plane Image Enhancement	8/02–2/04	\$375,000	40%
		CoPI — PI: P. Hasler			
7.	DARPA	Focal-Plane Image Processing	7/04–7/06	\$900,000	40%

		CoPI — PI: P. Hasler			
8.	DARPA	Improved Speech Analysis, Coding, and Enhancement using Microradars	10/02–3/06	\$2,275,955	40%
		CoPI — PI: M. Clements, other CoPI's: T. Barnwell, G. Whitley			
9.	NSF	CAREER: Ultra-Low Power Programmable Analog Signal Processing Systems	6/04–5/09	\$400,000	100%
10.	CIA	Low-power Array Processing	6/04–7/05	\$383,200	100%
11.	NSF	Bringing Low Power Reconfigurable Analog Signal Processing to Embedded Systems	9/04–9/07	\$240,000	20%
		CoPI — PI: S. K. Lim, other CoPI: P. Hasler			
12.	NSF	Probabilistic CMOS Computing and Applications	8/07–8/10	\$762,000	100%
13.	Raytheon	Machine Learning of Visual Features	5/09–5/10	\$85,000	50%
		PI — CoPI: A. Gray			
14.	National Semiconductor	Hearing Aid Audio Processing	5/09–6/12	\$150,000	100%
15.	National Semiconductor	Speaker Driver Sound Enhancement	11/09–12/10	\$50,000	100%
16.	Army Research Office	Realizing Lattice-Reduction-Based Detectors for High-Rate Wireless Communications	8/11–6/12	\$50,000	50%
		CoPI — PI: X. Ma			
17.	NSF	I-CORPS	7/12–6/13	\$50,000	100%
18.	Walmart Foundation	Craft with Pride: Development and Deployment of Disruptive Manufacturing	9/14–8/16	\$2,959,656	10%
		CoPI — PI: S. Jayaraman			

As Investigator

	Sponsor	Title	Dates	\$ Funded	Contribution
1.	Yamacraw	Embedded DSP Processing	8/99–6/03	—	Support for three students
2.	Georgia Electronic Design Center	Embedded DSP Processing	7/03–6/09	\$70,000	100%
3.	Hewlett Packard	GT & HP Research Project Y2001	1/01–12/01	\$275,000	30%
	Fellow Investigators: R. Schafer, J. Jackson, M. Hans				
4.	Yamacraw	Education–Short Course	1/01–6/01	\$300,000	20%
	Fellow Investigator: T. Barnwell				
5.	Hewlett Packard	GT & HP Research Project Y2002	1/02–12/02	\$275,000	30%
	Fellow Investigators: R. Schafer, J. Jackson, M. Hans				
6.	Hewlett Packard	GT & HP Research Project Y2003	1/03–12/03	\$105,000	100%
7.	Hewlett Packard	GT & HP Research Project Y2004	1/04–12/04	\$93,000	100%
8.	Hewlett Packard	GT & HP Research Project Y2005	1/05–12/05	\$93,000	100%
9.	Georgia Tech Analog Consortium	Texas Instruments Fellows Program	8/01–12/02	—	Support for three students
10.	Georgia Tech Analog Consortium	Texas Instruments Fellows Program	1/03–present	—	Support for two students
11.	Texas Instruments	TI Leadership University	8/04–present		Support for one student

12.	Aware Home Research Initiative	Speaker Identification	7/01–12/01	—	Support for one student
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Other Funding

- Received Georgia Tech Technology Fee Grant for class laboratory development: \$29,490 (Fall 2002).
- Procured a donation of FPGA boards for use by twenty students in DSP Systems class (Summer 2002).
- Procured a donation of forty TI MSP430 development systems for use in senior design and research (Fall 2002).
- Institute for Neuromorphic Engineering Research Collaboration Network travel grant (funded by the NSF): \$3,500 (Fall 2003)
- Institute for Neuromorphic Engineering Research Collaboration Network travel grant (funded by the NSF): \$5,400 (Summer 2004)