Curriculum Vitae

Andreas Savva Spanias, Professor and Center Director
Director SenSIP Center and NSF I/UCRC, Fellow IEEE
Senior Member National Academy of Inventors (NAI)
School of Electrical, Computer and Energy Engineering, ASU

Education
- Ph.D. 1988, Dept. of Electrical and Computer Eng., WVU.
- M.S. 1985, Dept. of Electrical and Computer Eng., WVU.
- B.S.E.E. 1983, Dept. of Electrical and Computer Eng., WVU.
- HTI Diploma, Nicosia Cyprus, 1979

Professional Continuing Education
- MIT Certificate on "Leadership Skills for Engineering and Science Faculty," Massachusetts Institute of Technology, Short Programs, June 2017.
- Harvard University, "Data Visualization: Conveying Information through Visual Representations," Harvard Continuing Education, Cambridge, June 2018.

Areas of Teaching and Research
- Teaching: Digital Signal Processing, Speech Coding, Adaptive Signal Processing, Sensors and Machine Learning.
- Research: Sensor Signal Processing, Adaptive Filters, Speech Analysis, Coding, and Enhancement, DSP Architectures.

Positions Held
- Aug. 2009-present, Director SenSIP Center and NSF I/UCRC Industry Consortium, Arizona State University.
- Aug. 2014-present, Senior Sustainability Scientist, Global Inst. of Sustainability, ASU.
- Aug. 2003-2011, Founding Associate Director of School of Arts, Media and Engineering, ASU.
- Aug. 1997-present, Professor, School of Electrical, Computer and Energy Engineering, Arizona State University.
- Aug. 1993-July 1997 Associate Professor, Department of Electrical Engineering, Arizona State University.
- Aug. 1988-July 1993 Assistant Professor, Department of Electrical Engineering, Arizona State University.
- Aug 1983-Aug. 1988 Graduate Research Assistant, Funded by Naval Research Labs, Dept. of ECE, WVU.
- July 1979-August 1981, National Guard, Army Communications Specialist on RACAL Systems, Cyprus.

Honors, Awards, Memberships, Plenary Sessions
- 2019 **Elected Senior Member of the <u>National Academy of Inventors (NAI)</u>,** August 2019
- 2019 **Induction to <u>National Academy of Inventors (NAI)</u> ASU Chapter,** April 2019.
- 2020 Top 5% faculty in teaching award recipient, IAFSE Schools of Engineering, ASU, 2020.
- 2020 Paper Award for "IRES Program in Sensors and Machine Learning for Energy Systems" in IEEE IISA 2020.
- 2019 Top 5% faculty in teaching award recipient, IAFSE Schools of Engineering, ASU, 2019.
- 2018 IEEE Region 6 (12 states) Award "For Outstanding Research and Education Contributions in Signal Processing."
- 2018 IEEE Phoenix Chapter Award "*For <u>significant innovations and patents</u>* in signal processing for sensor systems"
- **<u>IEEE Fellow</u>** (elected in 2003 for contributions in speech processing).
- 2015 Harden-Simmons Prize Paper Award on Power Amplifier Linearization Techniques.
- 2012 Premier Award for iJDSP iPhone software (Plenary 500 attendees, IEEE FIE Seattle)
- 2004 IEEE Distinguished Lecturer in signal processing (7 international invited seminars in 2004).
- 2005 IEEE Signal Processing Society Award for Meritorious Service (one of three major annual society awards).
- 2002 IEEE Donald G. Fink Prize Paper Award from Board of Directors for paper "Perceptual Coding of Digital Audio."
- 2007 Best Paper Award, G. Winchert, H. Thornburg, A. Spanias et al, CBMI 2007, France 2007
- 2002 Researcher of the Year Award, IEEE Phoenix Chapter, Phoenix - January 2002.
- 1997 Award from the Intel Advanced Personal Communications - Central Logic Engineering, "Team Recognition Award for outstanding support and leadership of the ASU Team in the Intel GSM Cellular Mobile Telephone Project."
- 1996 Award from Intel Corporation (Portland) "In Appreciation of Support for the Intel Research Program."
- <u>1993 Award from Intel for "Leadership and Contributions in the Development of the Intel 60172 SP Architecture."</u>
- 2004 Invited Opening Keynote Speech IEEE ICSPAS 04, (estimated 700 attendees), Beijing China, September 4, 2004.

Books (text books used in ASU EEE407, EEE509 and EEE510)
- Andreas Spanias, Ted Painter, Venkatraman Atti, Audio Signal Processing and Coding, Hardcover 544 pages, ISBN: 9780471791478 , Wiley, Textbook with theory, problems, and MATLAB exercises. March 2007.
- A. Spanias, Digital Signal Processing; An Interactive Approach – **2nd Edition**, 403 pages, Textbook with JAVA exercises, ISBN 978-1-4675-9892-7, Lulu Press On-demand Publishers Morrisville, NC, May 2014.

Google Scholar: https://scholar.google.com/citations?user=IyRtNy0AAAAJ&hl=en

BOOKS - Lecture Series Research Books and Monographs

- J. Foutz, A. Spanias, M. Banavar, Narrowband Direction of Arrival Estimation for Antenna Arrays, Synthesis Lectures on Antennas, Morgan & Claypool Publishers, Ed. C. Balanis, ISBN-13: 978-1598296501, Aug. 2008.
- Karthikeyan N. Ramamurthy, Andreas S. Spanias, MATLAB® Software for the Code Excited Linear Prediction Algorithm: The Federal Standard-1016, Morgan and Claypool Publishers, Synthesis Lectures on Algorithms and Software in Engineering, Vol. 2, No. 1, Pages 1-109: 1-109, ISBN 1608453847, Jan 2010.
- J. Thiagarajan, A. Spanias, Analysis of the MPEG-1 Layer III (MP3) Algorithm Using MATLAB, Morgan and Claypool Publishers, Synthesis Lectures on Algorithms and Software in Engineering, Vol. 3, No. 3, Pages 1-129, ISBN-10: 1608458016, ISBN-13: 978-1608458011, Nov. 2011.
- H. Braun, C. Tepedelenlioglu, A. Spanias, M. Banavar, et al., Signal Processing for Solar Array Monitoring, Fault Detection, and Optimization, Power Electronics, Morgan & Claypool, 111 pages, ISBN 978-1608459483, Sep. 2012.
- An Introduction to Kalman Filtering with MATLAB Examples, N. Kovvali, M.Banavar, A. Spanias Synthesis Lectures on Signal Processing, , Morgan & Claypool Publishers, Ed. J. Mura, v. 6, pp. 1-81, ISBN 13: 9781627051392, September 2013.
- J. Thiagarajan, K. Ramamurthy, P. Turaga, A. Spanias, Image Understanding Using Sparse Representations,, Synthesis Lectures on Image, Video, and Multimedia Processing, Morgan & Claypool Publishers, ISBN 978-1627053594, 118 pages, Ed. Al Bovik, April 2014.
- Steve Miller, Xue Zhang, Andreas Spanias, Multipath Effects in GPS Receivers, Synthesis Lectures on Communications, Morgan & Claypool Publishers, ISBN 978-1627059312, 70 pages, Ed. William Tranter, P. 1-70, Dec. 2015.
- Xue (Sophia) Zhang, Cihan Tepedelenlioglu, Mahesh Banavar, Andreas Spanias, Node Localization in Wireless Sensor Networks, Synthesis Lectures on Communications, Morgan & Claypool Publishers, ISBN: 9781627054850, Ed. William Tranter, 68 Pages, December 2016.
- S. Zhang, C. Tepedelenlioglu, A. Spanias, M. Banavar, Distributed Network Estimation using Consensus Methods, Synthesis Lectures on Communications, Morgan & Claypool Pub., ISBN 9781681732909, Ed. W. Tranter, Feb 2018.
- H. Braun, P. Turaga, A. Spanias, S. Jayasuriya, Reconstruction Free Compressive Vision, Morgan & Claypool, ISBN 978-1681735566, Ed. J. Mura, April 2019.

BOOKS EDITED

- I. Kyriakides, Cognitive Fusion for Target Tracking, Synthesis Lectures on Algorithms and Software in Engineering 10:1, 1-65, ISBN 978-1681736679, Ed. A. Spanias, 2019.
- Vimal Kumar, Amartya Sen, Sanjay Madria, Secure Sensor Cloud, ISBN: 9781681734705, Editor A.Spanias, Synthesis Lectures, Morgan and Claypool Publishers, 140 pages, December 2018.
- M. Stanley and Jong Ming Lee, Sensors for IoT Applications, ISBN 9781627054638, Editor A. Spanias, Synthesis Lectures, Morgan and Claypool Publishers, 113 Pages, March 2018.
- Virtual Design of an Audio Lifelogging System: Tools for IoT Systems, Brian Mears and Mohit Shah, Ed. A. Spanias, Synth. Lectures on Algorithms and Software in Engineering, Vol. 8, No. 1, Pages 1-73, June 2016.
- Despeckle Filtering for Ultrasound Imaging and Video, **Volume II**: Selected Applications, Second Edition, Christos P. Loizou, Constantinos S. Pattichis, ISBN: 978-1627058148, August 2015.
- Despeckle Filtering for Ultrasound Imaging and Video, **Volume I:** Algorithms and Software, Second Edition C. Loizou , Constantinos S. Pattichis, ISBN: 978-1627056687, April 2015.
- Latency and Distortion of EM Trackers for Augmented Reality, H. Himberg, Y. Motai, Synthesis Lectures on Algorithms, Morgan and Claypool Publishers,, Ed. A. Spanias, 189 pages, ISBN 978-1627055079, May 2014.
- Bandwidth Extension of Speech Using Perceptual Criteria, Visar Berisha, Steve Sandoval, Julie Liss, Morgan & Claypool Publishers, Ed. A. Spanias, ISBN: 9781627053136, October 2013.
- Sparse Representations for Radar, Peter Knee, Morgan & Claypool Pub., Ed. A. Spanias, October 2012.
- Theory and Applications of Gaussian Quadrature Methods, N. Kovvali, Morgan & Claypool, Ed. A. Spanias, Sep.2011
- Venkatraman Atti, Algorithms and Software for Predictive and Perceptual Modeling of Speech, Morgan & Claypool Publishers, Series Editor A. Spanias, March 2011.
- Advances in Waveform-Agile Sensing for Tracking, Sandeep Prasad Sira, Antonia Papandreou-Suppappola, Darryl Morrell, Morgan & Claypool Publishers, Series Editor A. Spanias, 2008.
- Despeckle Filtering Algorithms and Software for Ultrasound Imaging, Christos P. Loizou, Constantinos S. Pattichis, Morgan & Claypool Publishers, Ed. A. Spanias, Morgan and Claypool Publishers, 2008.
- Adaptive High-Resolution Sensor Waveform Design for Tracking, Ioannis Kyriakides, Darryl Morrell, Antonia Papandreou-Suppappola, Ed. A. Spanias, Morgan and Claypool Publishers, 2010.
- OFDM Systems for Wireless Communications, A. Narasimhamurthy, M. Banavar, C. Tepedelenliouglu, Ed. A. Spanias, Morgan and Claypool Publishers, 2010.
- Advances in Modern Blind Signal Separation Algorithms: Theory and Applications, K. Kokkinakis, P. C. Loizou, Ed. A. Spanias, Morgan and Claypool Publishers, 2010.

Patents

P.1. Split-Band Speech Compression Based On Loudness Estimation, (with Visar Berisha), ASU, Tempe, Ariz. (US), **US 8,392,198, Issued 2012.**

P.2. Method and system for determining an auditory pattern of an audio segment," (with   Krishnamoorthi V. Berisha), **US 9,055,374**, **Issued June 2015.**

P.3. Maximum Likelihood Localization in the Presence of Channel Uncertainties, (with X. Zhang, M. Banavar, C. Tepedelenlioglu), **US Patent No. 9,507,011, Patent Issued Nov. 29, 2016**.

P.4. Energy-Efficient Distributed Estimation using Nonlinear Amplifiers**, (**B. Santucci, M. Banavar, C. Tepedeleioglu, A. Spanias) **Patent Issued Oct. 4, 2016**, US **9,461,676.**

P.5. Kernel Sparse Models for automated tumor segmentation, (with J. Jayaraman, K. Ramamurthy, D. Frakes) Patent Issued July 18, 2017, **US 9,710,916.**

P.6. An algorithm to estimate glomerular number from kidney magnetic resonance images, (with J. Jayaraman, K. Ramamurthy, D. Frakes,) **US 9,779,497**, Oct. 2017.

P.7. Recovering Degraded Images using Ensemble Sparse Models, [Filed with Arizona Technology Enterprises], (with Jayaraman, K. Ramamurthy and P. Sattigeri), **US 9,875,428**, January 2018.

P.8. Fast Computation of Excitation Pattern, Auditory Pattern and Loudness, A. Spanias, G. Kalyanasundaram, **US 10013992B2,** Issued July 2018.

P.9. Distributed location detection in wireless sensor networks, X. Zhang, M. Banavar, C. Tepedelenlioglu, A. Spanias, **US 10,028,085,** Issued July 2018.

P.10. Methods, Apparatuses, and Systems for Reconstruction-Free Image Recognition from Compressive Sensors, A.Spanias, H. Braun, P. Turaga, C. Tepedelenlioglu), **US 10,387,751**, August 2019.

P.11. Distributed Network Center Area Estimation, S. Zhang, Tepedelenlioglu, A. Spanias), **US 10,440,553, Issued Oct. 2019**

<u>Official Full Patent List from USPTO</u>

Provisional Patents

P.12. M17-265P Systems and Methods for Customizing Kernel Machines with Deep Neural Networks (with Huan Song, A. Spanias, J. Thiagarajan), Provisional **US 62/571,145** *(FULL patent filed)*

P.13. M18-165P, Entitled System and Methods for Cyber-Physical Photovoltaic Array Monitoring and Control, S. Katoch, A. Spanias, C. Tepedelenlioglu, P. Turaga, Provisional **US 62/685,807**, 2018. (*FULL patent filed)*

P.14. M18-209P, Triplet Network with Attention for Speaker Diarization, H.Song, V. Berisha, J. Jayaraman, A. Spanias, M. Willi, Provisional **US 62/713,727,** 2018. *(FULL patent filed)*

P.15. M19-078P. Graph Attention Models for Multi-layered Embeddings and Deep Learning Applications, U. Shanthamallu, A. Spanias, J. Thiagarajan, **Provisional US 62/790,830** (*FULL patent filed)*.

P.16. M19-041P, Time Series Analysis using Attention Models, Provisional, Huan Song, Andreas Spanias, Provisional **US 62/795,176,** 2019. *(FULL patent filed)*.

P.17. M19-149P Systems And Methods For Connection Topology Optimization In Photovoltaic Arrays Using Neural Networks, Vivek Narayanaswamy, Raja Ayyanar, Andreas Spanias, Cihan Tepedelenlioglu, **US 62/808,677**, 2019. *(FULL patent filed)*

P.18. M19-102P, Solar Array Fault Detection, Classification and Localization Using Deep Neural Nets, S. Rao, A. Spanias, C .Tepedelenlioglu, **US 62/843,821**, 11/8/2018. *(FULL patent filed)*

P.19. M19-259P, Adaptive Video Subsampling For Energy Efficient Object Detection, S. Jayasuriya, P. Turaga, A. Spanias, S. Katoch, D. Mohan, **US 62/872,902**, 2019. *(FULL patent filed)*

P.20. M20-068P Analysis and Design of Robust Max Consensus for Wireless Sensor Networks,   Gowtham Muniraju, Andreas Spanias, Cihan Tepedelenlioglu, **US Provisional 62/959,564,** 2020.

P.21. M20-093P, Systems and Methods Audio Source Separation via Multi-Scale Feature Learning,   Sameeksha Katoch, Vivek Narayanaswamy, A. Spanias, Jayaraman Thiagarajan, **US Provisional 62/947,871,** 12/13/2019

P.22. M20-210P, Systems and Methods for Fault Classification in Photo-voltaic Arrays using Graph Signal Processing   Jie Fan, Gowtham Muniraju, Sunil Rao, A. Spanias, C.Tepedelenlioglu, **US Provisional 63/023,620,** 05/12/2020

P.23. M20-218P Systems and Methods for Consensus-Based Distributed Spectral Radius Distriibution   . Gowtham Muniraju, Andreas Spanias, Cihan Tepedelenlioglu, **Provisional US 63/038,430,** 06 /12/2020

P.24. M20-254P Dropout and Pruned Neural Networks for Fault Classification in Photovoltaic Arrays   Gowtham Muniraju, Sunil Rao, Andreas Spanias, Cihan Tepedelenlioglu, **Provisional US 63/039,012**   , 06/15/2020

P.25. M20-255P Coupled Tracking and Motion Deblurring via Coded Exposure: Algorithm and FPGA Architecture, Odrika Iqbal, Suren Jayasuriya, Andreas Spanias, **Provisional US 63/039,224**, 06/2020

Disclosures to Skysong Innovations (formerly AZ Technology Enterprises (AzTE))

P.26. M8-051, H. Krishnamoorthi[+], V. Berisha[+] and A. Spanias, "Fast loudness estimation for audio" Dec. 2007.

P.27. M13-147P J. Jayaraman, K. Ramamurthy, A. Spanias, Improved Mixing Matrix Estimation for Blind Source Separation using Discriminative Clustering, Predisclosure AzTE, March 2013.

P.28. M16-089P Android Acoustic Reflection Mapping, Paul Curtis **(REU Student)**. M. Banavar, AzTE, 2015.

P.29. M18-052P Attend and Diagnose: Clinical Time Series Analysis using Attention Models, D. Rajan, H. Song, J. Jayaraman, A. Spanias, 2018.

P.30. M19-147P, Adaptive Energy Load Segmentation Algorithm using Machine Learning and Signal Processing, K. Jaskie, J. Marvin, A. Spanias, Dec 2018.

Publications

Refereed Archival Journal Papers

a. Published or Accepted for Publication

1. G. Muniraju, G. Kailkhura, J. Thiagarajan, Jayaraman J.; Bremer, Peer-Timo; Tepedelenlioglu, Cihan; Spanias, Andreas, "Coverage-Based Designs Improve Sample Mining and Hyper-Parameter Optimization" *IEEE Trans*. *NNLS-2019*-P-11125.R1, 2020.

2. G. Muniraju, C. Tepedelenlioglu, and A. Spanias, "Analysis and design of robust max consensus for wireless sensor networks," *IEEE Transactions on Signal and Information Processing over Networks*, pp. 779-791, V. 5, Dec. 2019.

3. G. Muniraju, C. Tepedelenlioglu, and A. Spanias, "Consensus Based Distributed Spectral Radius Estimation," in *Proceeding of IEEE Signal Processing Letters*, pp. 1–5, June 2020.

4. J. Lee, C. Tepedelenlioglu, A. Spanias, and G. Muniraju, "Consensus Based Distributed Quantile Estimation in Sensor Networks," Accepted In proceedings of International Journal of Smart Security Technologies (IJSST), 2020.

5. Uday Shankar Shanthamallu, Jayaraman J. Thiagarajan, Huan Song, Andreas Spanias, "GrAMME: Semi-Supervised Learning using Multi-layered Graph Attention Models," *IEEE Transactions on Neural Networks and Learning Systems*, pp. 1-12, Nov. 2019.

6. H. Braun, S. Katoch, P. Turaga, A. Spanias, and C. Tepedelenlioglu, "A MACH filter based reconstruction-free Target Detector and Tracker for Compressive Sensing Cameras", Accepted In proceedings of International Journal of Smart Security Technologies (IJSST), 2020.

7. J. Zuniga-Mejia1, R. Villalpando-Hernandez, C. Vargas-Rosales1, A. Spanias, "A Linear Systems Perspective on Intrusion Detection for Routing in Reconfigurable Wireless Networks", *IEEE Access,* Vol. 7, 1, pp. 60486-60500, Dec. 2019.

8. V. Berisha, A. Wisler, A. Hero, A. Spanias, "Data-driven estimation of density functionals using a polynomial basis" *IEEE Transactions on Signal Processing*, pp. 558-572, Vol. 66, January 2018.

9. M. Shah, M. Tu, V. Berisha, C. Chakrabarti, A. Spanias, "Articulation Constrained Learning with Application to Speech Emotion Recognition," *Computer Speech and Language*, Elsevier, 2019.

10. S. Ranganath, J. Thiagarajan, D. Rajan, M. Banavar, A. Spanias, J. Fan, K. Jaskie and C. Tepedelenlioglu, "Interactive Signal Processing Education Applications for the Android Platform," *ASEE Computers in Education Journal*, Volume 10, Issue 2 June 2019.

11. X. Zhang, C. Tepedelenlioglu, M. Banavar, A. Spanias, G. Munariju, "Location estimation and detection in wireless sensor networks in the presence of fading," *Physical Communication*, Elsevier, Vol. 32, pp. 62-74, Feb. 2019.

12. G. Muniraju, S. Rao, S. Katoch, A. Spanias, C. Tepedelenlioglu, P. Turaga, M. K Banavar, D. Srinivasan, "A Cyber-Physical Photovoltaic Array Monitoring and Control System," 24 pages, *International Journal of Monitoring and Surveillance Technologies Research (IJMSTR)*, Volume 5, Issue 3, 2018.

13. H. Song, J. Thiagarajan, P. Sattigeri, A. Spanias, "Optimizing Kernel Machines using Deep Learning" *IEEE Transactions on Neural Networks and Learning Systems*, NLS-2017-P-8053.R1, pp. 5528–5540, Feb. 2018.

14. S. Zhang, C. Tepedelenlioglu, M.K. Banavar and A. Spanias, "Distributed Node Counting in Wireless Sensor Networks in the Presence of Communication Noise," *IEEE Sensors Journal*, pp. 1175 - 1186, Vol. 17, Feb. 2017.

15. S. Zhang, C. Tepedelenlioğlu, A. Spanias, "Distributed Network Center and Size Estimation," *IEEE Sensors Journal*, Volume: 18 , Issue: 14, pp. 6033 - 6045, 2018.

16. S. Zhang, C. Tepedelenlioglu, M.K. Banavar and A. Spanias, "Max Consensus in Sensor Networks: Non-linear Bounded Transmission and Additive Noise," *IEEE Sensors Journal*, Vol.16, pp. 9089-9098, Dec. 2016.

17. V. Berisha, A. Wisler, A. Hero, A. Spanias, "Empirically Estimable Classification Bounds Based on a Nonparametric Divergence Measure," *IEEE Transactions on Signal Processing,* vol. 64, no. 3, pp.580-591, Feb. 2016.

18. H. Braun, S. T. Buddha, V. Krishnan, C. Tepedelenlioglu, A. Spanias, M. Banavar, and D. Srinivansan, "Topology reconfiguration for optimization of photovoltaic array output," *Elsevier Sustainable Energy, Grids and Networks (SEGAN),* pp. 58-69, Vol. 6, June 2016.

19. M. Shah, C. Chakrabarti and A. Spanias, "Within and cross-corpus speech emotion recognition using latent topic model-based features", *EURASIP Journal on Audio, Speech, and Music Processing*, 2015:4, January 2015.

20. S. Sandoval, R. Utianski, V. Berisha, J. Liss, A. Spanias, "Feature divergence of pathological speech," *The Journal of the Acoust. Society of America*, 134(5):4133. DOI:10.1121/1.4831182, 11/2013.

21. V. Berisha, S. Sandoval, R. Utianski, J. Liss, and A. Spanias, "Characterizing the distribution of the quadrilateral vowel space area," *J. Acoust. Soc. Am.,* pp. 421-427, Feb. 2014.

22. R. Santucci, M. Banavar, C. Tepedelenlioglu, A. Spanias, "Nonlinear Amplify and Forward Distributed Estimation over Non-Identical Channels," *IEEE Transactions on Vehicular Technology*, Issue: 9, 2015.

23. M. Banavar . J. Zhang , B. Chakraborty , H. Kwon, Y. Li, H. Jiang, A. Spanias, , C. Tepedelenlioglu, C. Chakrabarti A. Papandreou-Suppappola, "An overview of recent advances on distributed and agile sensing, algorithms and implementation," *Digital Signal Processing*, Elsevier, 2015.

24. M. Banavar, C. Tepedelenlioglu, A. Spanias, "Robust Consensus in the Presence of Impulsive Channel Noise," *IEEE Trans. on Signal Processing*, Vol. 63, pp. 2118-2129, March 2015.

25. Karthikeyan Natesan Ramamurthy, Linda A. Hinnov, and Andreas S. Spanias (2014) Teaching Earth Signals Analysis Using the Java-DSP Earth Systems Edition: Modern and Past Climate Change. *Journal of Geoscience Education:*, Vol. 62, No. 4, pp. 621-630, Nov. 2014

26. R. Santucci, M. K. Banavar, A. Spanias, and C. Tepedelenlioglu, "Energy-efficient distributed estimation by utilizing a nonlinear amplifier," *IEEE Transactions on Circuits and Systems – I*, vol. 61, no. 1, pp. 302-311, January 2014.

27. Jayaraman J. Thiagarajan; Karthikeyan Natesan Ramamurthy; Andreas Spanias , "Learning Stable Multilevel Dictionaries for Sparse Representations, *IEEE Transactions on Neural Networks and Learning Systems,* .Vol. 23, pp. 2905–2915, 2014.

28. B. Santucci and A. Spanias, "Java-DSP Functions for Power Amplifier Linearization Techniques," *ASEE Computers in Education Journal*, Full paper, 2014. Winner of the Harden-Simons Prize Award 2014

29. Thiagarajan, J.J., Ramamurthy, K.N.,;Spanias, A. , "Multiple Kernel Sparse Representations for Supervised and Unsupervised Learning, " *IEEE Transactions on Image Processing*, pp. 2905- 2915, 23(7), 2015.

30. Dasarathan, S. ; Tepedelenlioglu, C. ; Banavar, M. ; Spanias, "Non-Linear Distributed Average Consensus Using Bounded Transmissions," *IEEE Transactions on Signal Processing*, Issue: 23, *IEEE Trans. on Signal Processing*, vol. 61, no. 23, Dec. 2013.

31. S. Mehta, A. Spanias, J.J. Thiagarajan, M.K. Banavar, K.N. Ramamurthy, R. Santucci, C. Pattichis, P. Spanias, H. Krishnamoorthi, "An Integrated Graphical Environment for Web-based Learning," *Computers in Education Journal*, vol. 5, no. 1, Full paper, January-March 2014.

32. X Bi, S Lee, JF Ranville, P Sattigeri, A Spanias, P Herckes, P Westerhoff, "Quantitative resolution of nanoparticle sizes using single particle inductively coupled plasma mass spectrometry with the K-means clustering algorithm," *Journal of Analytical Atomic Spectrometry*, 29 (9), pp. 1630-1639, 2014.

33. S. Sandoval, V. Berisha, R. Utianski, J. Liss, A. Spanias, "Automatic assessment of vowel space area " *J. Acoust. Soc. Am.*, Vol 134, El1-El5, Nov. 2013.

34. A. Fink, A. Spanias, P. Cook, "Derivation of a new banded waveguide model topology for sound synthesis," *J. Acoust. Soc. Am.*, Volume 133, Issue 2, pp. EL76-EL81 (2013).

35. J. Jayaraman, K. Ramamurthy, A. Spanias, D. Frakes,A. Puri, D. Rajan, Ms. No. IJAIT-D-13-00030 Kernel Sparse Models for Automated Tumor Segmentation, *International Journal on Artificial Intelligence Tools*, 2014.

36. Heewan Park, Byungsik Yoon, Sangwon Kang, Andreas Spanias, "Search-Free Codebook Mapping for Artificial Bandwidth Extension, *IEICE Trans. on Communications*, Vol.E95-B No.4 pp.1479-1482, 2012

37. M. Banavar+, C. Tepedelenlioglu, A. Spanias, "Distributed SNR Estimation with Power Constrained Signaling over Gaussian Multiple-Access Channels," *IEEE Transactions on Signal Processing*, Volume: 60, Issue: 6, pp. 3289-3294, 2012.

38. M.K. Banavar+, A.D. Smith, C. Tepedelenlioglu, A. Spanias, "On the Effectiveness of Multiple Antennas in Distributed Detection over Fading MACs", *IEEE Transactions on Wireless Communications*, Volume: 11 , Issue: 5, pp. 1744-1752, May 2012.

39. J. J. Thiagarajan, K. N. Ramamurthy and A. Spanias, "Discriminative clustering for mixing matrix estimation in blind source separation," Elsevier, Digital Signal Processing, Volume 23, Issue 1, January 2013, Pages 9-18

40. Karthikeyan Natesan Ramamurthy; Jayaraman J. Thiagarajan; Andreas Spanias, "Recovering non-negative and combined sparse representations," Digital Signal Processing: A Review Journal, 26(1):pp. 21-35. 2014;

41. M. D. Shirsat, T. Sarkar, J. Kakoullis, Jr., N. V. Myung,, B. Konnanath,, A. Spanias, and A. Mulchandani, "Porphyrin-Functionalized Single-Walled Carbon Nanotube Chemiresistive Sensor Arrays for VOCs,"J. Phys. Chem. C, 2012, 116 (5), pp 3845–3850, January 11, 2012.

42. M.K. Banavar+, A.D. Smith, C. Tepedelenlioglu, A. Spanias, "On the Effectiveness of Multiple Antennas in Distributed Detection over Fading MACs", *IEEE Transactions on Wireless Communications*, Volume: 11 , Issue: 5, pp. 1744-1752, May 2012.

43. H. Kim, B. Konnanath, P. Sattigeri, J. Wang, A. Mulchandani, N. Myung, Marc A. Deshusses, A. Spanias and B. Bakkaloglu, "Electronic-nose for detecting environmental pollutants: signal processing and analog front-end design Analog Integrated," *Circuits and Signal Processing*, Volume 70, Number 1, 15-32, Jan 2012.

44. C. Tepedelenlioglu, M.K. Banavar, A. Spanias, "On the Asymptotic Efficiency of Distributed Estimation Systems With Constant Modulus Signals Over Multiple-Access Channels," *IEEE Transactions on Information Theory*, vol.57, no.10, pp.7125-7130, Oct. 2011.

45. L. Ravichandran, L.; A. Papandreou-Suppappola, A.; Spanias, A, Lacroix, Z.; Legendre, C., "Waveform Mapping and Time-Frequency Processing of DNA and Protein Sequences," *IEEE Transactions on Signal Processing*, Volume: 59 , Issue: 9, pp. 4210 – 4224, 2011.

46. K. Ahmed, C. Tepedelenlioglu, A. Spanias, M. Patwary, M. Yu, H., Error probability-based optimal training for linearly decoded orthogonal space-time block coded wireless systems, Communications, IET Volume: 5 , Issue: 11, pp. 1512-1529, 2011.

47. Ramamurthy+, K. N.; Thiagarajan+, J. J.; Sattigeri+, P.; Goryll, M.; Spanias, A.; Thornton, T.; Phillips, S. M.;, "Transform domain features for ion-channel signal classification," *Biomedical Signal Processing and Control*, Oct. 2010.

48. M. K. Banavar+, C. Tepedelenlioglu and A. Spanias, "Estimation over fading channels with limited feedback using distributed sensing," *IEEE Transactions on Signal Processing*, vol. 58, no. 1, pp. 414-425, January 2010.

49. Wichern+, G.; Jiachen Xue; Thornburg, H.; Mechtley+, B.; Spanias, A.;, "Segmentation, Indexing, and Retrieval for Environmental and Natural Sounds *IEEE Transactions on Audio, Speech, and Language Processing*, Volume: 18, Issue: 3 Publication Year: 2010 , Page(s): 688 – 707, 2010,

50. H. Krishnamoorthi+, A. Spanias and V. Berisha, "A frequency/detector pruning approach for loudness estimation,", *IEEE Signal Processing Letters*, vol. 16, no.11, pp. 997 - 1000 , Dec. 2009.

51. H. Kwon+, V. Berisha+, A. Spanias, V. Atti+, "Experiments with Sensor Motes and Java-DSP," *IEEE Transactions on Education*, vol. 52, issue 2, pp. 257-262 , 2009

52. S. Sabesan, L.B.Good, K. Tsakalis, A. Spanias, D.M. Treiman and L. D.Iasemidis, "Information flow and application to epileptogenic focus localization from intracranial EEG", *IEEE Trans. Neural Systems and Rehab. Eng., pp. 244-253, June 2009*

53. V. Berisha+ and A. Spanias, "Wideband Speech Recovery Using Psychoacoustic Criteria," *EURASIP Journal on Audio, Speech, and Music Processing*, Volume 2007, Article ID 16816, 18 pages, doi:10.1155/2007/16816, August 2007.

54. V. Atti+, A. Spanias, K. Tsakalis. C. Panayiotou+, V. Berisha+, L. Iasemidis, "Gradient projection-based channel equalization under sustained fading," *EURASIP Signal Processing, SIGPRO 3303, Signal Processing*, 88 (2), p.236-246, February 2008.

55. S. Miller and A. Spanias, "Algorithms for Quotient Control in Beamforming", *IEEE Antennas and Wireless Propagation Letters* , Volume 6, pp. 651-654, December 2007.

56. K. Ahmed+, C. Tepedelenlioglu, A. Spanias, "Performance of precoded OFDM with channel estimation error," *IEEE Transactions on Signal Processing*, Volume 54, Issue 3, pp. 1165 – 1171, March 2006.

57. A. Spanias, K. Huang+, R. Ferzli, H. Kwon+, V. Atti+, V. Berisha+, L. Iasemides, H. Krishnamoorthi+, P. Spanias, S. Misra+, M. Banavar+, K. Tsakalis, S. Haag, "Interfacing Java-DSP with a TI DSK board," *COE Journal*, Vol. XVII, No. 3, Invited, July-Sep. 2007.

58. N. Chakravarthy[+], K. Tsakalis, L. Iasemidis and A. Spanias, "A multi-dimensional scheme for controlling unstable periodic orbits in chaotic systems," *Physics Letters A*, Vol. 349, pp. 116-127, Feb. 2006.

59. A. Spanias and V. Atti[+], "Interactive On-line Undergraduate Laboratories Using J-DSP," *IEEE Trans. on Education Special Issue on Web-based Instruction*, vol. 48, no. 4, pp. 735-749, Nov. 2005.

60. T. Painter[+], A. Spanias, A., "Perceptual segmentation and component selection for sinusoidal representations of audio," *IEEE Transactions on Speech and Audio Processing*," Volume 13, Issue 2, pp. 149-162, March 2005.

61. B. Veeramani[+], B. Narayanan, A. Prasad, L.D. Iasemidis, A.S. Spanias, K. Tsakalis, "Measuring the direction and the strength of coupling in nonlinear Systems - a modeling approach in the State space," *IEEE Signal Processing Letters*, Volume 11, Issue 7, pp. 617 - 620, July 2004.

62. A. Spanias, V. Atti [+], K. Ahmed, A. Papandreou-Suppappola, M. Zaman, and T. Thrassyvoulou "On-line signal processing using J-DSP," *IEEE Signal Processing Letters*, Volume: 11 , Issue: 10 , pp. 821 – 825, Sept. 2004.

63. Niranjan Chakravarti[+], Andreas Spanias, K. Tsakalis, and L. Iasemides, "AR Modeling of DNA sequences," *EURASIP JASP - Special Issue on Signal Processing Genomics*, Vol. 2003, Issue 4, pp. 15-20, January 2004.

64. G. Nair[+] and A. Spanias,"The Eigenspace Projection Algorithm," *Signal Processing*, pp. 1929-1935, Vol. 83, 2003

65. J. Foutz[+], A. Spanias, S. Bellofiore and C Balanis, " Adaptive Eigen-Projection Beamforming Algorithms for 1-D and 2-D Antenna Arrays, *IEEE Antennas and Propagation Letters*, Vol. 83, pp. 1929-1935, 2003.

66. Ted Painter[+] and Andreas Spanias, "Sinusoidal Analysis-Synthesis of Audio Using Perceptual Criteria," EURASIP JASP - Special Issue On Multimedia Signal Processing, INVITED, Vol. 2003, Issue 1, pp. 15-20, January 2003.

67. S. Bellofiore, J. Foutz[+], C. Balanis, A,S, Spanias, T, Duman, J, Capone "Smart Antennas for Mobile adhoc Networks, *IEEE Trans. on Antennas and Propagation*, pp. 571-581, Vol. 50, No. 5, May 2002

68. Ted Painter[++] and Andreas S. Spanias, "Perceptual Coding of Digital Audio," *Proceedings of the IEEE*, pp. 451-513, Vol. 88, No.4, April 2000 (**winner of field series 2002 IEEE Donald G. Fink Prize Paper Award – 947 citations**).

69. S. Bellofiore, C. Balanis, J. Foutz, and A,S, Spanias, "Smart Antennas Systems for Mobile Communications Networks: Part 1: Overview of the Antenna Design," *IEEE Antennas and Propagation Magazine*, pp. 145-154, No. 3, June 2002.

70. A. Kitsios[+,] A. Spanias, and B. Welfert, "Fast modified covariance algorithm with individual step sizes," Signal Processing 82(5), pp. 715-7120, June 2002.

71. S. Bellofiore, C. Balanis, J. Foutz, and A,S, Spanias, "Smart Antennas Systems for Mobile Communications Networks: Part 2: Algorithms," *IEEE Antennas and Propagation Magazine*, pp. 106 -114, Vol. 44, No. 4, August 2002.

72. S. Ahmadi[+] and A. Spanias, "Algorithms for Low-bit rate sinusoidal coding," *Speech Communications, 34(2001), pp. 369-390, June 2001*.

73. A. Spanias, S. Urban, A. Constantinou[+], M. Tampi[+], X. Zhang[+], M. Tampi[+], C. Stilianou[+], "Development of a Web-based Signal and Speech Processing Laboratory for Distance Learning," *ASEE Computers in Education Journal*, pp. 21-26, Vol. X, No.2, April-June 2000.

74. Min-Tau Lin[+], A. S. Spanias, and P. Loizou[+], "Speech Recognition Using Minimum Error Classification," *Speech Communication*, vol. 30, pp. 27-36, January 2000.

75. S. Ahmadi[+] and A.S. Spanias, "Cepstrum-Based Pitch Detection Using a New Statistical V/UV Classification Algorithm," *IEEE Trans. on Speech and Audio*, Vol. 7, No. 3, pp. 333-338, May 1999.

76. P. Loizou[+] and A.S. Spanias, "Improved speech recognition using a subspace projection approach," *IEEE Trans. on Speech and Audio*, vol. 7, no. 3, pp. 343-345, May 1999.

77. S. Ahmadi[+] and A.S. Spanias, "A New Phase Model for Sinusoidal Transform Coding of Speech," *IEEE Trans. on Speech and Audio*, vol. 6, no. 5, pp. 495-501, Sept. 1998.

78. M. Deisher[+] and A.S. Spanias, "Speech Enhancement using state-bases estimation and sinusoidal modeling," *Journal of Acoustical Society of America*, vol. 102(2), pp. 1141-1148, Aug. 1997.

79. P. Loizou[1] and A. Spanias, "High Performance Alphabet Recognition," *IEEE Trans. on Speech and Audio*, vol. 4, no. 6, pp. 439-445, Nov. 1996.

80. P. Loizou[+] and A. Spanias, "Improving discrimination of confusable words using the divergence measure," *Journal of Acoustical Society of America*, Vol, 101(2), pp. 1106-1111, Feb. 1997.

81. Q. Shen[+] and A. Spanias, "Adaptive Active Sound Reduction, *Noise Control Engineering Journal*, J44 (6), pp. 281-293, Nov. 1996.

82. A. Spanias and T. Painter, "An Educational Software Tool for the Study of Speech Coding Algorithms in a DSP Class," Special Issue on DSP Education, *IEEE Trans. on Education*, Vol. 39, pp. 143-152, May 1996.

83. K. Tsakalis, M. Deisher[+], and A. Spanias, "System Identification Based on Bounded Error Constraints, *IEEE Transactions on Signal Processing*, Vol. 43, No. 12, pp. 3071-3075, Dec. 1995.

84. J. Liu[+], A. Spanias, and J. Maisel,"A Real-time Adaptive Interference Canceller using the BLMS Algorithm," *American Society of Engineering Education (ASEE) J. Eng. Tech.*, Vol. 12, No. 1, pp. 34-38, Spring 1995.

85. P. Loizou[+], M. Dorman, and A. Spanias, "Automatic recognition of syllable-final nasals preceded by e," *Journal of Acoustical Society of America*, Vol. 97(3), pp. 1925-1928, March 1995.

86. A.S. Spanias, "Speech Coding: A Tutorial Review," *Proceedings of the IEEE*, Vol. 82, No. 10, pp. 1441-1582, October 1994 (600 Google citations as of 10/2015).

87. M. Deisher[+] and A.S. Spanias, "Practical Considerations in the Implementation Frequency-Domain Adaptive Noise Cancellation," *IEEE Transactions on Circuits and Systems*, Part II: Analog and Digital Signal Processing, Vol. 41, No. 2, pp. 164-168, Feb. 1994.

88. A. Spanias, M. Deisher[+], P. Loizou[+], G. Lim[+], and B. Mears, "A New Highly Integrated Architecture for Speech Processing and Communication Applications," *Intel Technology Journal - Special Issue on Computer Supported Cooperation*, pp. 41-56, Spring 1994.

89. A.S. Spanias, *IEEE Transactions on Signal Processing*, "A Block Time and Frequency Modified Covariance Algorithms for Spectral Analysis," vol. 41, No. 11, pp. 3138-3153, Nov. 1993.

90. A. Spanias, P. Loizou[+], G. Lim[+], Y. Chen[+], G. Hu[+], "Analysis/Synthesis of Speech using the Short-Time Fourier Transform and a Time-varying ARMA process," *Trans. of the Institute of Electronics, Information and Communication Engineers (IEICE)*, Vol. E76-A, No. 4, pp. 645-652, April 1993.

91. A.S. Spanias and P.C. Loizou[+], "A Mixed Fourier/Walsh Transform Scheme for Speech Coding at 4 KBPS," *Proc. IEE-Part I (Communications, Speech, and Vision)*, Vol. 139(5), pp. 473-481, Oct. 1992.

92. A.S. Spanias, "A Frequency Selective Adaptive Algorithm," *Journal of Computers EE - Special Issue on Adaptive Signal Processing*, Editors: D. Etter and M. Ahmadi, pp. 301-313, Vol. 18, No. 3/4, May/July 1992.

93. A.S. Spanias, S.B. Jonsson[+] and S.D. Stearns, "Transform Methods for Seismic Data Compression," *IEEE Trans. on Geoscience and Remote Sensing*, Vol. GARS-29, No. 3, pp. 407-417, May 1991.

94. A.S. Spanias and F.H. Wu, "Speech Coding and Recognition: A Review," *Trans. IEICE - Special Issue on Fundamentals of Next Generation Human Interface*, Ed: Sadaoki Furui, pp. 132-148, Feb. 1992.

95. A.S. Spanias, "A Hybrid Transform Method for Speech Analysis and Synthesis," *Signal Processing*, Vol. 24, pp. 217-229, Aug. 1991.

96. W.B. Mikhael and A.S. Spanias, "Accurate Representation of Time-Varying Signals using Mixed Transforms with Applications to Speech," *IEEE Trans.on Circuits and Systems*, Vol. 36, No. 2, pp. 329-331, Feb. 1989.

97. W.B. Mikhael and A.S. Spanias, "Efficient Modeling of Dominant Transform Components Representing Time-Varying Signals," *IEEE Trans. on Circuits and Systems*, Vol. 36, No. 2, pp. 331-334, Feb. 1989.

98. W.B. Mikhael and A.S. Spanias, "A Fast Frequency-Domain Adaptive Algorithm," *Proc. of the IEEE*, Vol. 76, No. 1, pp. 80-82, Jan. 1988.

99. W.B. Mikhael and A.S. Spanias, "Comparison of Several Frequency-Domain LMS Algorithms," *IEEE Trans. on Circuits and Systems*, Vol. 34, No. 5, pp. 586-588, May 1987.

[+] Names of student co-authors that have been supervised by A. Spanias

100. W.B. Mikhael, A.S. Spanias, G. Kang and L. Fransen,"A Two-Stage Pole-Zero Predictor," *IEEE Trans. on Circuits and Systems*, Vol. 33, No. 3, pp. 352-354, March 1986.

b. Submitted

101. V. Berisha, N. Shah, D. Waagen, H. Schmitt, S. Bellofiore, A. Spanias , "Sparse Manifold Learning with Applications to SAR Image Classification," *IEEE Trans. On Signal Processing, Accepted*.

Refereed Papers in National and International Conference Proceedings (>300 papers / 76 listed below – last 10 years)

1. Shanthamallu, Uday, JayaramanThiagarajan, and Andreas Spanias. "A Regularized Attention Mechanism for Graph Attention Networks." *ICASSP 2020-2020 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Barcelona, May 2020.
2. J. Fan, S. Rao, G. Muniraju, C. Tepedelenlioglu, and A. Spanias, "Fault Classification in Photovoltaic Arrays Using Graph Signal Processing," *in IEEE International Conference on Industrial Cyber-Physical Systems (ICPS)*, Tampere, June, 2020.
3. K. Jaskie, J. Martin, S. Rao, W. Barnard, P. Spanias, E. Kyriakides, Y.Tofis, L. Hadjidemetriou, M. Michael, T. Theocharides, S. Hadjistassou, and A. Spanias, IRES Program in Sensors and Machine Learning for Energy Systems, Proc. *IEEE IISA 2020*, Piraeus, July 2020.
4. J. Fan, C. Tepedelenlioglu, A. Spanias, "Global Optimization of Graph Filters with Multiple Shift Matrices," *IEEE Asilomar Conference on Signals, Systems and Computers*, Monterrey, Nov. 2019
5. K. Jaskie, C. Elkan, A.Spanias, A Modified Logistic Regression For Positive And Unlabeled Learning, *IEEE Asilomar Conference on Signals, Systems and Computers*, Monterrey, Nov. 2019
6. D. Mohan, S. Katoch, S. Jayasuriya, P. Turaga, A. Spanias, Adaptive Video Subsampling For Energy-Efficient Object DetectioN," *IEEE Asilomar Conference on Signals, Systems and Computers*, Monterrey, Nov. 2019
7. Gowtham Muniraju, Cihan Tepedelenlioglu, Andreas Spanias,Distributed Spectral Radius Estimation in Wireless Sensor Networks, *IEEE Asilomar Conference on Signals, Systems and Computers*, Monterrey, Nov. 2019
8. K. Jaskie and A. Spanias, "Positive and Unlabeled Learning Algorithms and Applications: A Survey," *Proc. IEEE IISA 2019,* Patras, July 2019.
9. J. J. Thiagarajan, D.Rajan, S. Katoch and A. Spanias, "Accurate Abnormal EEG Detection using Multi-scale Densenets," *Artificial Intelligence in Medicine, AIME 2019,* Submitted Jan. 2019, Poznan, Poland, June 2019.
10. Vivek Narayanaswamy, Jayaraman Thiagarajan, Andreas Spanias, "Designing An Effective Metric Learning Pipeline for Speaker Diarization," *IEEE ICASSP 2019*, Brighton, UK, May 2019.
11. U. Shanthamallu, S. Rao, A. Dixit, V. Narayanaswamy, J. Fan, A. Spanias, " Introducing Machine Learning In Undergraduate DSP Classes," *IEEE ICASSP 2019*, Brighton, UK, May 2019.
12. J. Fan, Cihan Tepedelenlioglu, A. Spanias, "Graph Filtering With Multiple Shift Matrices," *IEEE ICASSP 2019*, Brighton, UK, May 2019.
13. R. Ramakrishna, A. Scaglione, A. Spanias, C. Tepedelenlioglu, " Distributed Bayesian Estimation With Low-Rank Data: Application To Solar Array Processing," *IEEE ICASSP 2019*, Brighton, UK, May 2019.
14. Vivek Narayanaswamy, Raja Ayyanar, Andreas Spanias, Cihan Tepedelenlioglu, "Connection Topology Optimization in PV Arrays using Neural Networks'," IEEE International Conference on Industrial Cyber-Physical Systems (ICPS), Taipei, May 2019.
15. Sunil Rao, Andreas Spanias, Cihan Tepedelenliglu, "Solar Array Fault Detection using Neural Networks", IEEE International Conference on Industrial Cyber-Physical Systems (ICPS), Taipei, May 2019..
16. S. Katoch, P. Turaga, A. Spanias, C. Tepedelenlioglu, "*Fast Non-Linear Methods for Dynamic Texture Prediction,*" Paper ID: 2613, *Proc. IEEE ICIP 2018*, Athens, Oct. 2018.
17. H. Song , M. Willi, J. Thiagarajan, V. Berisha, A. Spanias, "Triplet Network with Attention for Speaker Diarization, InterSpeech 2018, India, Sept. 2018.
18. H. Song, J. Thiagarajan, D. Rajan, A Spanias, "Attend and Diagnose: Clinical Time Series Analysis using Attention Models," *Proc. AAAI Conference*, New Orleans, 2018.
19. S. Katoch, G. Muniraju, S. Rao, A. Spanias, P. Turaga, C. Tepedelenlioglu, M. Banavar, D. Srinivasan, "Shading Prediction, Fault Detection, and Consensus Estimation for Solar Array Control," *1st IEEE International Conference on Industrial Cyber-Physical Systems (ICPS 2018*), Saint Petersburg, May 2018.
20. A. Spanias and J. Blain Christen, "A STEM REU Site On The Integrated Design of Sensor Devices and Signal Processing Algorithms'," *Proc. IEEE ICASSP 2018*, Calgary, April 2018.
21. H. Song, J. J. Thiagarajan, P. Sattigeri, K. Ramamurthy, A. Spanias, 'A Deep Learning Approach To Multiple Kernel Fusion," *Proc. IEEE ICASSP 2017*, New Orleans, March 2017.
22. G. Muniraju ,S. Zhang ,C. Tepedelenlioglu,M. Banavar ,A. Spanias, C. Vargas-Rosales, R. Villalpando, , "Location Based Distributed Spectral Clustering for Wireless Sensor Networks," *IEEE SSPD 2017,* London, Dec. 2017

23. S. Rao, S. Katoch, P. Turaga, A. Spanias, C. Tepedelenlioglu, R. Ayyanar, H.Braun, J. Lee, U.Shanthamallu, M. Banavar, D. Srinivasan, "A Cyber-Physical System Approach for Photovoltaic Array Monitoring and Control," *Proceedings 8th International Conference on Information, Intelligence, Systems and Applications (IEEE IISA 2017)*, Larnaca, August 2017.

24. J. Thiagarajan, Karthikeyan Natesan Ramamurthy, Berkay Kanberoglu, David Frakes, Kevin Bennett, Andreas Spanias, "Measuring glomerular number from kidney MRI images*," Part of SPIE Medical Imaging*, March 2016.

25. S. Zhang, C. Tepedelenlioglu, J. Lee, H. Braun and A. Spanias, "Cramer-Rao Bounds for Distributed System Size Estimation Using Consensus Algorithms," IEEE/IET Sensors and Signal Processing for Defence Conference (SSPD 2016 – sponsored by UK Ministry of Defence), pp. 1-5, Edinburgh Sept. 2016.

26. J. Lee, M. Stanley, A. Spanias, C. Tepedelenlioglu, "Integrating Machine Learning in Embedded Sensor Systems for Internet-of-Things Applications," *Proc. 2016 IEEE International Symposium on Signal Processing and Information Systems (ISSPIT 2016)*, Limassol, Cyprus, Dec. 2016.

27. H. Braun, P. Turaga, A. Spanias, G. Tepedelenlioglu, 'Direct Classification from Compressively Sensed Images via Deep Boltzmann Machine," *IEEE Asilomar Conference*, Monterey, Nov. 2016.

28. S. Zhang, J. Lee, C. Tepedelenlioglu and A. Spanias, "Distributed Estimation of the Degree Distribution in Wireless Sensor Networks," *IEEE Global Communications Conference*, Dec. 2016.

29. A. Spanias, "Solar Energy Management as an Internet of Things (IoT) Application," *Proceedings 8th International Conference on Information, Intelligence, Systems and Applications (IEEE IISA 2017)*, Paper on Keynote Speech, Larnaca, August 2017.

30. U. Shanthamallu, A. Spanias, C. Tepedelenlioglu, M. Stanley, "A Brief Survey of Machine Learning Methods and their Sensor and IoT Applications," *Proceedings 8th International Conference on Information, Intelligence, Systems and Applications (IEEE IISA 2017)*, Larnaca, August 2017.

31. S. Zhang, C. Tepedelenlioglu, M.K. Banavar and A. Spanias, "Distributed Node Counting in Wireless Sensor Networks", *49th Annual Asilomar Conference on Signals, Systems, and Computers*, 2015.

32. S. Zhang, C. Tepedelenlioglu, M.K. Banavar and A. Spanias, "Max-consensus using Soft Maximum," *47th Annual Asilomar Conference on Signals, Systems, and Computers*, 2013.

33. A. Spanias, A Brief survey of time and frequency domain filters, Part of Adaptive Signal Processing Tutorial," *IEEE IISA 2016*, Halkidiki, Greece, July 13-15, 2016.

34. H. Song, J. Thiagarajan, Ramamurthy, K.N. ; Spanias, A, " Improving Delay Embedding Characterization using Statistical Regularity Features for Activity Recognition," *IEEE Asilomar Conference*, Nov. 2016.

35. H. Song, J. Thiagarajan, Ramamurthy, K.N. Spanias, A., "Auto-Context Modeling Using Multiple Kernel Learning," *2016 IEEE International Conference on Image Processing (ICIP)*, Phoenix, Sept. 2016.

36. A. Wisler, V. Berisha, K. Wei, K Ramamurthy, A. Spanias," Empirically-Estimable Multi-Class Classification Bounds ", MLSP-P5.8, *Proc. IEEE ICASSP 2016*, Shanghai China, March 2016.

37. H. Song, J. Thiagarajan,,K Ramamurthy, A. Spanias, P. Turaga, "Iterative Kernel Fusion For Image Classification", MLSP-L2.4, *IEEE ICASSP 2016*, Shanghai China, March 2016.

38. J. Thiagarajan, Ramamurthy, K.N. ; Sattigeri, P. ; Bremer, P.T. ; Spanias, A. , Automatic image annotation using inverse maps from semantic embeddings," *2014 IEEE ICIP*, pp. 3107- 3111, 2014.

39. Berisha, V. ; Liss, J. ; Sandoval, S. ; Utianski, R. ; Spanias, A., "Modeling pathological speech perception from data with similarity labels,"*2014 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, DOI: 10.1109/ICASSP.2014.6853730, pp. 915- 919, 2014 .

40. H. Braun, S. Peshin, A. Spanias, C. Tepedelenlioglu, M. Banavar, G. Kalyanasundaram, and D. Srinivansan, "Irradiance estimation for a smart PV array," *IEEE Energy Conversion Conference and Expo, Montreal*, Oct. 2015.

41. A. Wisler, V. Berisha, J. Liss, and A/ Spanias, "Domain invariant speech features using a new divergence measure," *IEEE in Spoken Language Technology Workshop (SLT)*, pp. 77–82, 2014.

42. S. Miller, X. Zhang, A. Spanias, "A New Asymmetric Correlation Kernel for GNSS Multipath Mitigations*," Proc. Sensors and Signal Processing for Defense (SSPD 2015)*, Edinburgh, Scotland, Sept. 2015.

43. G. Kalyanasundaram, M. Banavar, A. Spanias, "Audio modeling and loudness estimation with IJDSP mobile simulations," *2015 IEEE ICASSP,* pp. 5550- 5554, Brisbane, April 2015.

44. A. Wisler, V. Berisha, K. Ramamurthy, A. Spanias, J. Liss," Removing data with noisy responses in regression analysis, " Proc. 2015 *IEEE ICASSP*, pp. 2066 - 2070, Brisbane, April 2015.

45. Z. Antoniou, A. Panayides, M. Pattichis, S. Stavrou, E. Kyriacou, A. Spanias, A. G. Constantinides, C.S. Pattichis, Adaptive Emergency Scenery Video Communications using HEVC for Responsive Decision Support in Disaster Incidents, *Proc. of 37th Annual Conference of the IEEE Engineering in Medicine and Biology Society (EMBC*), pp. 173-176, Milano, Aug. 25 – 29, 2015.

46. Sattigeri, P., Thiagarajan, J. J., Shah, M., Ramamurthy, K. N. & Spanias, A. "A scalable feature learning and tag prediction framework for natural environment sounds," 2015 Conference Record - *Asilomar Conference on Signals, Systems and Computers. IEEE Computer Society*, p. 1779-1783, Nov 2015.

47. A. Spanias, "An introductory signal processing course offered across the curriculum, " *IEEE Signal Processing and Signal Processing Education Workshop (SP/SPE),* Utah, August 2015

48. Lee, J., Tepedelenlioglu, C., Banavar, M. K. & Spanias, "Nonlinear diffusion adaptation with bounded transmission over distributed networks," *IEEE ICCC.* pp. 6707-6711, London, June 2015

49. Visar Berisha; Julie Liss; Steven Sandoval; Rene Utianski; Andreas Spanias , Modeling pathological speech perception from data with similarity labels, ICASSP, *IEEE International Conference on Acoustics, Speech and Signal Processing -* Proceedings. pp. 915-919, 2014.

50. R. Santucci, M.K. Banavar, S. Zhang, A. Spanias, C. Tepedelenlioglu, "OFDM-based Distributed Estimation for Rich Scattering Environments," IEEE Sensors and Signal Processing for Defence Conference (SSPD 2014 – sponsored by UK Ministry of Defence), pp. 1-5, Edinburgh, Sep. 2014.

51. Shah, M. ; Chakrabarti, C. ; Spanias, A.,"A multi-modal approach to emotion recognition using undirected topic models." *2014 IEEE ISCAS,* pp. 754-757, 2014.

52. Braun, H. ; Turaga, P. ; Spanias, A. , Direct tracking from compressive imagers: A proof of concept," *(ICASSP 2014 ,* 2014 , pp. 8139- 8142, Florence, 2014.

53. Zhang, Xue ; Tepedelenlioglu, Cihan ; Banavar, Mahesh ; Spanias, Andreas, "CRLB for the localization error in the presence of fading. *IEEE ICASSP 2013,* 5150-5154, Vancouver, May 2013.

54. Braun, H. ; Turaga, P. ; Tepedelenlioglu, C. ; Spanias, A., "Optical flow for compressive sensing video reconstruction." *Proc. IEEE ICASSP 2013,* 2267-2271, Vancouver, May 2013.

55. Krishnamoorthi, Harish ; Spanias, Andreas, "Sinusoidal component selection based on partial loudness criteria,"*IEEE ICASSP 2013*, pp. 575-579, Vancouver, May 2013.

56. Shah, Mohit ; Miao, Lifeng ; Chakrabarti, Chaitali ; Spanias, Andreas, "A speech emotion recognition framework based on latent Dirichlet allocation: Algorithm and FPGA implementation," *Proc. IEEE Acoustics, Speech and Signal Processing (ICASSP 2013),* 2553- 2557, Vancouver, May 2013.

57. Santucci, R. ; Banavar, M.K. ; Spanias, A. ; Tepedelenlioglu, C., "Design of limiting amplifier models for nonlinear amplify-and-forward distributed estimation," *2013 18th Int. Conference o nDSP*, Thira, July 2013.

58. Berisha, Visar ; Sandoval, Steven ; Utianski, Rene ; Liss, Julie ; Spanias, Andreas, " Selecting disorder-specific features for speech pathology fingerprinting,"Proc. *IEEE ICASSP 2013,* 7562- 7566, Vancouver, May 2013.

59. Natesan Ramamurthy, Karthikeyan ; Thiagarajan, Jayaraman J. ; Spanias, Andreas ; Sattigeri, Prasanna, "Boosted dictionaries for image restoration based on sparse representations,"*Proc. IEEE Acoustics, Speech and Signal Processing (ICASSP 2013*), 1583- 1587, Vancouver, May 2013.

60. Braun, H.; Buddha, S.T.; Krishnan, V.; Spanias, A.; Tepedelenlioglu, C.; Yeider, T.; Takehara, T., "Fault detection in photovoltaic arrays,*" 2012 IEEE ICASSP,* pp. 1681- 1684, March 2012,

61. J. J. Thiagarajan, K. N. Ramamurthy, P. Sattigeri and A. Spanias, "Supervised local sparse coding of sub-image features for image retrieval," *IEEE ICIP 2012*, Orlando, Sept. 2012.

62. Buddha, S.; Braun, H.; Krishnan, V.; Tepedelenlioglu, C.; Spanias, A.; Yeider, T.; Takehara, T. "Signal processing for photovoltaic applications," *2012 IEEE International Conference on Emerging Signal Processing Applications (ESPA),* pp. 115- 118, Las Vegas, Jan. 2012.

63. A.Fink and A. Spanias, "Constrained estimation of percussive sound excitations," *2011 IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA),* New Paltz, NY, 2011, pp. 16-19.

64. Fink and A. Spanias, "Estimation of signal subspace-constrained inputs to linear systems," 2011 Conf. Rec. of the 45th *Asilomar Conf. on Signals, Systems, and Computers*, Pacific Grove, CA, 2011

65. Banavar, M.K.; Tepedelenlioglu, C.; Spanias, A, Distributed SNR estimation using constant modulus signaling over Gaussian multiple-access channels,"*IEEE DSP Workshop (DSP/SPE)*, 2011 , Page(s): 24 – 29, 2011.

66. Fink, A.; Spanias, A.; "Constrained estimation of percussive sound excitations," "*Applications of Signal Processing to Audio and Acoustics (WASPAA), 2011 IEEE WASPAA.2011*.6082338, 2011 , Page(s): 201 - 204

67. J. J. Thiagarajan and A. Spanias, "Learning dictionaries for local sparse coding in image classification," *IEEE Asilomar Conf.*, Nov. 2011 (Nominated and Finalist for the Best Student Paper award).

68. J. J. Thiagarajan, K. N. Ramamurthy, and A. Spanias, "Multilevel dictionary learning for sparse representation of images," Page(s): 271 – 276, in Proc. of *IEEE DSP Workshop*, Sedona, 2011 (Nominated and Finalist for the Best Student Paper award).

69. K. N. Ramamurthy and A. Spanias, "Optimized Measurements for Kernel Compressive Sensing," in Proc. Asilomar SSC, Monterey, Nov. 2011.

70. K. N. Ramamurthy, J. J. Thiagarajan and A. Spanias, "Improved sparse coding using manifold projections," *Proc. of IEEE International Conference on Image Processing,* Belgium, Page(s): 1237 – 1240, Oct. 2011.

71. L. Ravichandran, A. Papandreou-Suppappola, A. Spanias, and Z. Lacroix, "Multiple Protein Structure Alignment Using Time-Frequency Processing Techniques," *Proc. IEEE Biomedical Circuits and Systems Conference (BioCAS),* Cyprus, Nov. 2010.

72. M.K. Banavar, C. Tepedelenlioglu, A. Spanias, "Distributed SNR estimation using constant modulus signaling over Gaussian multiple-access channels," *DSP Workshop (DSP/SPE), 2011 IEEE* , pp.24-29, 4-7 Jan. 2011.
73. Willerton, M.; Banavar, M.; Zhang, X.; Manikas, A.; Tepedelenlioglu, C.; Spanias, A.; Thornton, T.; Yeatman, E.; Constantinides, A., "Sequential wireless sensor network discovery using wide aperture array signal processing." 2012 Proceedings of the 20th EUSIPCO, pp: 2278- 2282, Romania 2012.
74. Ravichandran, L., Papandreou-Suppappola, A., Spanias, A., Lacroix, Z., and Legendre, C. (2010). Time-frequency based biological sequence querying. *IEEE ICASSP, D*allas, March 2010.
75. Banavar, M.K., Smith, A.D., Tepedelenlioglu, C., and Spanias, A. (2010). "Distributed Detection over Fading MACs with Multiple Antennas at the Fusion Center." IEEE International Conference on Acoustics, Speech, and Signal Processing (*IEEE ICASSP 2010*), Dallas, March 2010.
76. Krishnamoorthi, H., Spanias, A., Berisha, V., Kwon, H., Thornburg, H. (2010). "An auditory-domain based speech enhancement algorithm." IEEE International Conference on Acoustics, Speech, and Signal Processing (*IEEE ICASSP 2010*), Dallas, March 2010.

Invited Contributions in Books - Book Chapters

- Andreas Spanias, Chapter 3: Speech Coding Standards, pp. 25-44, **Invited.** Academic Press, Ed: G. Gibson, ISBN 2000 0-12- 282160-2.
- Sabesan, S., K. Narayanan, A. Prasad, L.D. Iasemidis, A. Spanias and K. Tsakalis, Information flow in coupled nonlinear systems: Application to the epileptic human brain", In: Data Mining in Biomedicine, P. Pardalos, Ed., Kluwer Academic Publishers (2006).

Invited Seminars and Presentations (50+ invited – a few listed below)

- Smart Object Detection – An I/UCRC project, (with S. Jayasuriya), Qualcomm, Feb. 2020 (audience 10 and 20 via telco)
- The ASU SenSIP center sensor and machine learning activities, via Zoom, June 25, 2020 (audience 75)
- Image Processing at the SenSIP I/UCRC, Qualcomm, April 2019 (audience 30)
- SenSIP Research in Sensors and Machine Learning, TU DELFT, Delft, March 2019 (audience 18)
- The IRES Program – A collaboration with the KIOS Center, UCy, Nicosia, February 2019. (audience 40)
- The SenSIP I/UCRC, ON Semiconductor, January 2019 (audience 10)
- Solar Energy and Internet of Things, University of Cyprus, CWSPI, July 2018 (audience 30)
- Panel with presentation, "Prospects of Commercializing Scientific Research," 16th HDMS 2018, Larnaca, July 2018. (audience 25)
- "Wireless & signal processing-based technology Innovation: What does it take to bring it to the marketplace?," Panel with presentation, IEEE SPAWC 2018, Kalamata, June 2018. (audience 70)
- Proposal on Machine Learning Algorithms for Surveillance, NSF I/UCRC meeting, March 2018. (audience 40)
- Solar Energy as an IoT Application, IEEE IISA 2017, Keynote Speech, Aug. 2017 (audience 50)
- Flexible Sensors, UT Dallas, April 2017 (audience 60)
- Sensors and Machine Learning Primer, MEMS & Sensors Collaborative SensMach Event, Nov. 2016.
- The SenSIP program on speech processing, University of Chicago, April 2016 (Audience 25)
- SenSIP Activities in Machine Learning Algorithms, Imperial College, Nov 2015 (audience 30)
- Modern Speech Processing Algorithms, Cirrus Logic, June 2013. (audience 20)
- SenSIP Research on Loudness Estimation, Qualcomm, Feb. 2013
- Plenary Session at IEEE FIE 2012, Premier Award Session, Seattle, Oct 2012 (audience 400).
- A. Spanias, Signal Processing for Diesel Exhaust Monitoring, University of California- Riverside, November 18, 2009.
- SenSIP patent on audio bandwidth extension, Microsoft Research, Redmond, December 18, 2007
- SenSIP research on Defense Applications of Audio Sensors, General Dynamics, November 20, 2007
- SenSIP project on Acoustic Monitoring, Stanford CCRMA, , November 6, 2007
- SenSIP research in Noise Cancellation, Acoustic Technologies, October 2007
- SenSIP research in Audio Processing, MIT Lincoln Labs, Cambridge, September 2007
- "The AME program at ASU," Invited Seminar, Rutgers University CAIP center, Piscataway, NJ, March 2007.
- "Smart Antennas," University of ULM, Sponsored by IEEE Distinguished Lecturer Program, ULM, Feb. 2005.

RESEARCH GRANTS AND CONTRACTS

External Research Grants and Contracts

1. PI: A. Spanias, Co-PI C. Tepedelenlioglu, R. Ayyanar, S. Goodnick, J. Kitchen, Q. Lei, NSF Instrumentation on Solar monitoring, Recommended July 2020-July 23, 2023. $499k.
2. PI: Spanias, Co-PI C. Tepedelenlioglu, NSF RAPID on Covid-19 Hotspot Estimation. NSF, May 2020-21, $100k.
3. PI: A. Spanias, Co-PI P. Turaga, C. Tepedelenlioglu, R. Ayyanar, NSF CPS – Solar Array Monitoring using Machine Learning, $600k, Sep. 2016-Sep. 2021.
4. PI: A. Spanias Co-PI J. Blain-Christen, NSF CNS RET Site: Sensor, Signal and Information Processing Algorithms and Software, $557k, Feb. 2020-Feb. 2023.
5. PI: A. Spanias, Co-PI W. Barnard, NSF OISE – IRES Track I: Sensors and Machine Learning for Solar Power Monitoring and Control, Award 1854273 Funded by NSF Award $300k, April 2019-April 2022.
6. PI: A. Spanias, Co-PI J. Blain-Christen, NSF CNS – A SenSIP REU Site on Devices and Algorithms, $330k, Jan. 2017-Jan. 2021.
7. PI: A. Spanias, Co-PI Turaga, NSF IUSE Program on Sensors, $480k, Sep. 2015-July 2019.
8. PI: A. Spanias, NSF I/UCRC SenSIP Center and Industry Consortium Phase 2, $336k, Sep. 2015-July 2020.
9. PI: C. Tepedelenioglu , Co-PI A. Spanias, NSF   1307982,, Arizona State University Distributed and Robust Estimation for Cyberphysical Systems, 07/17/2013-7/16/2016, $372,629.
10. PI: A. Spanias, Co-PI C. Tepedelenioglu, NSF   1308052 Arizona State University GOALI: Intelligent Networked Solar Panel Array, 09/09/2013-9/8/2016, $378,962.
11. PI: A. Spanias, Co-PI C. Tepedelenioglu, NSF Fundamental Research on Sensor Fusion Algorithms, $198k (24MOS), July 2012 - July1014.
12. PI: A. Spanias, NSF I/UCRC SenSIP Center and Industry Consortium, $336k, July 2010-July 2015.
13. PI: Andreas Spanias, Co-PI R. Ayanar, NSF Award 816701, Java-DSP Software Development for Multidisciplinary Research and Education - Phase 3, $1.2 M, Start August 2008-End August 2015.
14. PI: Andreas Spanias, Co-PI S. Goodnick, NSF Award 0730810, EXP-SA: DSP Algorithms for Silicon Ion-Channel Sensors, $400k (36 months), Start August 2007-End August 2010.
15. Co-PI A. Spanias,, NSF Award CCF-0830799, NSF Theoretical Foundations, "Biomedical Innovations Using Implementation-Aware Agile Sensing and Signal Processing," PI: Antonia Papandreou-Suppappola, Co-PI: Chaitali Chakrabarti., $375k (36 months), Start August 2008-End August 2011.
16. PI at ASU; A. Spanias,, NSF Collaborative Grant (JHU/Purdue/ASU)): J-DSP in Astronomical Time-Scale Measurements "An Astronomical-Calibrated Time Scale for the Mesozoic Era," $500k (ASU portion 184k - 36 months), NSF Award 0719714, Start October 2007-End October 2010.
17. Co-PI A. Spanias,, NIH- Collaborative Grant UC-R and ASU by NIH sponsored for $1M, May 2007 (Co-PIs: Mulchandani, Wang, Bakkaloglu, Spanias) "Wearable Nanosensor Array for Real-Time Monitoring of Diesel and Gasoline Exhaust Exposure," Start September 2007-End August 2010.
18. Co-PI A. Spanias, PI: T. Rikakis, Co-PIs: J. He, H. Sundaram, W. Sauvigne, NSF IGERT: "An Arts, Sciences and Engineering Research and Education Initiative for Experiential Media," $3M, 0504647, Sept 2005-Sept 2008.
19. PI: Andreas Spanias, Co-PIs: J. Zhang, A. Papandreou, C. Tepedelenlioglu, **NSF**, Collaborative proposal on J-DSP development, ASU leady with URI, UTD, UWB and UCF as subs, $425k (ASU share $315k), April 2005-April 2009
20. PI: Andreas Spanias, CO-PIs T. Duman, A. Papandreou, C. Tepedelenlioglu, "A CRCD in Signal Processing for Communications," **NSF CISE**, DWJ0064, $ 300,000,   Sept. 2004-August 2006
21. PI: A. Spanias, Analysis of the MXP Architecture, GemTech Systems, $12,000, Jan 2004-June 2005
22. PI: Andreas Spanias, CO-PIs T. Duman, A. Papandreou, K. Tsakalis, L. Karam, "Java DSP - Extensions to Communications Advanced DSP, Controls, Image, **NSF**, JRA-0001, $ 424,770,   Jan 2001-Jan 2004
23. CO-PI; A.S. Spanias, PI: C. Balanis and 4 other CO-PIs, **NSF**, "Smart Antennas," $458,100, Sept. 2000 - Aug. 2002.
24. PI; A.S. Spanias, **Intel Corp.**, "Distributed Voice Recognition System for the PC," $58,100, Sept. 1996 - Jan. 1998.
25. PI: A.S. Spanias and CO-PI: J. Sadowsky, Analysis and Implementation of CDMA Mobile Communications, Amount: $241,457.00, **Intel Corp.,** DWT 0011, Aug. 1996-Aug. 1997.
26. PI: A.S. Spanias, Development of Universal and Interoperable Speech and Audio Compression Algorithms for Multimedia and Teleconferencing Applications, Sponsor**: Intel Corp**., Amount: $177,354, Feb. 1995-Jan. 1998.
27. PI: A.S. Spanias and CO-PI: J. Sadowsky, Implementation and Integration of the Speech Codec, Channel Coder/Decoder, and Signaling Protocol on Prototype DSP Chips**, Intel Corp.**, Amount: $243,500.00, DWT 4630, May. 1995-Aug. 1996.
28. PI: Chaitali Chakrabarti, CO-PI: A.S. Spanias, "Special Purpose Architectures for Speech Coding Algorithms-Phase 2," Sponsor: Motorola Inc, $15,000, Aug 16, 1995- Aug 14, 1996.
29. PI: A.S. Spanias, Analysis and Implementation of Modem Algorithms on Intel DSP Architectures, Sponsor: **Intel Corp.**, Amount: $56,939.00, Aug. 1994-Feb. 1995.
30. PI: A.S. Spanias, Speech Enhancement Algorithms for Mobile Communications, Sponsor: **Intel Corp**., Amount: $37,940.00, DWT 4460, Aug. 1994-Aug. 1995.

31. PI: A.S. Spanias, CO-PI: C. Chakrabarti, Speech Coding Algorithms for Multimedia Applications, Sponsor: **Intel Corporation**, Amount: $54,728, Sept. 1993-Aug. 1994.
32. PI: Chaitali Chakrabarti, CO-PI: A.S. Spanias, "Special Purpose Architectures for Speech Coding Algorithms," Sponsor: Motorola Inc, $15,745.00., May 16, 1994- May 14, 1995.
33. PI: A.S. Spanias, Image Processing Algorithms for Teleconferencing and Multimedia Applications, Sponsor: **Motorola Inc**., Amount: $45,000, Feb. 1 1994-Jan. 31 1995.
34. PI: A.S. Spanias, Development of Speech Encoding and Recognition Algorithms for the Phoenix Architecture: Phase 2, Sponsor: **Intel Corp**., Amount: $200,229.00, Aug. 1993-Aug. 1994.
35. PI: A.S. Spanias, Speech Enhancement Algorithms for Mobile Communications, Sponsor: **Intel Corp**., Amount: $36,130.00, Aug. 1993-Aug. 1994.
36. PI: A.S. Spanias, Development of Speech Encoding, Recognition, and Data Encryption Algorithms for the Phoenix Architecture, Sponsor: **Intel Corp**., Amount: $192,781.00, CRP 92373, DWT 4473, Aug. 1992-Dec. 1993.
37. PI: A.S. Spanias, CO-PI: Jennie Si, Performance Evaluation of Voice Recognition Algorithms, Sponsor: **Motorola Inc**, $19,845.00., February 1993-July 1993.
38. PI: A.S. Spanias, Enhancement of Speech Using the Pseudocepstrum, Sponsor: **Motorola GEG,** $39,955.00., CRP 92265, DWT 4460, February 1992-February 1993.
39. PI: A.S. Spanias, Development and Evaluation of Fixed-Point Full and Half-Rate GSM Coders, Sponsor**: Intel Corp**., Amount: $233,463.00, CRP 92079, DWT 4432, Date: September 1991-December 1992
40. PI: A.S. Spanias, "Active Noise Cancellation in Ducts, "Sponsor: Active Noise and Vibration Technologies, Amount: $27,682.00, CRP 92039, DWT 8504, Date: August 1991-December 1992
41. PI: A.S. Spanias, Fixed Point Implementation of the VSELP algorithm, Sponsor: Intel Corp., Amount: $55,984.00, CRP 91289, DWT 4423, Date: May 1991-June 1992
42. PI: A.S. Spanias, "Transform Coding for Seismic Data Compression," Sponsor: Sandia National Laboratories (SNL), CRP 90009, $19,982.00, DWJ 6150, November 1989-October 1990.
43. PI: A.S. Spanias (and overall project director) and 13 other CO-PIs from four different colleges (CEAS, CLAS, COE, and CEE), "Multidisciplinary Research on Multimedia Technologies for Distributed Learning Using the Intel PC and the Internet, $67,000, **Intel Corporation**.
44. PI: A. Spanias and 15 other CO-PIs, "Multidisciplinary Research on the Next Generation Multimedia Technologies for Interactive Distributed Learning," **State of Arizona, ASU VPR Multidisciplinary Initiative Committee**, Pre-proposal already approved, $ 150,000 for three years.

SenSIP Consortium / NSF I/UCRC Industry Membership Projects – Industry Funded at Total >$1M
Andreas Spanias is the founder and director of the newly founded SenSIP Consortium (now I/UCRC site)
Several research memberships established as of December 2007. Phase 2 started Jan. 2016.

- On Semi, $70k, 2020-22
- Qualcomm, $70k, 2019-21
- Alphacore, $105k, 2018-2020.
- Resonea, $10k, 2020-21
- Lightsense Technology, $70k, 2018, 2019.
- Prime Solutions Group, (3 years), $105k, 2017-20.
- Poundra, (4 years), $140k, 2017-21.
- Aperio DSP, (2 years), $70k, 2017-19.
- Sprint, Sensors and Mobile devices, (4 year renewal), $140k, 2016-2020. (Total $260k)
- NXP, Sensors and machine learning, $70k, June 2016-2019.
- Raytheon, Radar and Vision projects, $140k, June 2016-2019.
- Freescale, machine Learning, $60k, April 2014-2016
- Applied Core Technologies, $60k, Nov. 2013-Nov2015
- Intel Corporation, $60k, Nov. 2013-Nov 2015 / signed again for $90k till 2018)
- ViaSOL Energy, $60k, June 2013-June 2015
- Interactive Flow Technologies, $60k, May 2013-May 2015.
- Raytheon Missile Systems, $240k, December 2007-December 2015.
- Intel Corporation, $50k, June 2009-June 2011
- Lockheed, $110k, December 2008-December 2012
- National Instruments, $50k, December 2007-December 2009.
- Acoustic Technologies, $50k, November 2007-November 2009

<div align="center">

Student Theses and Dissertations Supervised

</div>

Ph.D. Dissertation Supervision (33 Completed)

1. Huan Song, Kernels for Deep Learning, (Chair)
2. Juan Andrade Rodas, Image Deblurring, (Co-Chair with P. Turaga)
3. Jongming Lee, Consensus Estimation in Sensor Networks, (Co-Chair with C. Tepedelenlioglu).
4. Sai Zhang, Estimation of Size and Structure of Sensor Network, (Co-Chair with C. Tepedelenlioglu).
5. Henry Braun, Compressive Vision, Dec. 2016 (Co-Chair P. Turaga).
6. Xue Zhang, Sequential sensor networks, May 2016 (Co-Chair C. Tepedelenlioglu).
7. Alan Wisler, Machine Learning for Speech Pathologies, (Co-Chair V. Berisha)
8. Mohit. Shah, Audio Emotion Recognition, May, 2015 (Co-Chair C. Chakrabarti).
9. Prasanna Sattigeri, Machine Learning for Ion Channel Sensors, Dec, 2014. (chair)
10. Brandon M. Mechtley, Techniques for Soundscape Retrieval and Synthesis, November 2013. (Co-chair P. Cook)
11. Steven Miller, Multipath Mitigating Correlation Kernels for Direct Sequence Spread Spectrum Receivers, 2013 (Chair)
12. Robert Santucci+, Energy-Efficient Distributed Estimation by Utilizing a Nonlinear Amplifier, November 2013 (Chair)
13. Alex M. Fink+, Re-Sonification of Objects, Events, and Environments, March 2013. (Chair)
14. Jayaraman JThiagarajan+, Sparse Methods in Image Understanding and Computer Vision, Friday, March 2013. (Chair)
15. Karthikeyan Natesan Ramamurthy+, New Directions in Sparse Models for Image Analysis, February 2013. (Chair)
16. Incorporating Auditory Models in Speech/Audio Applications Harish Krishnamoorthi, , Ph.D., Dept. EE., May 2011.
17. Genomic Signal Processing," Lakshminarayan Ravichandran,Ph.D. + (co-chair with A. Papandreou-Suppappola)
18. Distributed Inference over Multiple-Access Channels with Wireless Sensor Networks, Mahesh Banavar, (co-advisor C. Tepededlenlioglu) with Ph.D., Dept. Electr. Eng., ASU, December 2010
19. "Acoustic Scene Analysis," Homin Kwon, Ph.D., Dept. Electr. Eng., ASU, December 2009. (Chair)
20. "Audio Content Search," Gordon Wichern, Ph.D., IGERT Fellow (co-chair with H. Thornburg)
21. "Bandwidth Extension Algorithms," Visar Berisha, Ph.D., Dept. Electr. Eng., ASU, November 2007 (Chair)
22. "DSP Algorithms for Smart Antennas," Jeff Foutz, Ph.D., Dept. Electr. Eng., ASU, March 2007 (with GE). (Chair)
23. "Perceptual Pole Estimation for Linear Prediction," V. Atti, Dept. Electr. Eng., ASU, August 2006 (Chair)
24. "Channel Equalization with Doppler Rate Measurements", G. Maalouli, Dept. Electr. Eng., ASU, May 2006 (Chair)
25. "PEP-Based Optimal Training for MIMO Systems in Wireless Channels," K. Ahmed, Dept. Electr. Eng., ASU, Aug. 2005 (co-chaired with C. Tepedelenlioglu, was with Olympus now Professor in a Bangladesh University)
26. "Adaptive Algorithms for GPS systems," B. Badke, Dept. Electr. Eng., ASU, Dec. 2002 (with Hemisphere GPS). (Chair)
27. "Perceptual Coding of Digital Audio," Ted Painter, Dept. Electr. Eng., ASU, August 2000 (Chair)
28. "Sinusoidal Modeling of Wideband Signals," Khosro Daroudi, Dept. Electr. Eng., ASU, December 1999. (Chair)
29. "Adaptive Filters Based on Eigenspace Projections," Gopal Nair, Dept. Electr. Eng., ASU, May 1998.
30. "An Improved Approach to Robust Speech Recognition Using Minimum Error Classification," Min-Tau Lin, Dept. Electr. Eng., ASU, December 1997. (M. Lin is with Solectron in San Jose) (Chair)
31. "Low Bit Rate Coding based on the Sinusoidal Model," Sassan Ahmadi, Dept. Electr. Eng., ASU, August 1997. (Chair)
32. "State-Based Noise Reduction Using the Sinusoidal Speech Model," Mike Deisher, Dept. EE, ASU, May 1996 "Robust Speaker Independent Recognition of Alphabet Symbols," Philipos Loizou, Dept. Electr. Eng., ASU, May. 1995. (<u>Philipos Loizou was Professor at the University of Texas Dallas, Passed away July 2012.</u>) (Chair)
33. "Single and Multiple Channel Block Adaptive Filters for Active Noise Cancellation," Qun Shen, Dept. Electr. Eng., ASU, Dec. 1992. (Qun Shen was with Ericsson at the Research Triangle Park) (Chair)

M.S. Theses Supervision (Last 8 listed / more than 40 advised)

1. Jayden Booth, Massive MIMO systems, Co-Chair with A. Alkhateeb, June 2020.
2. Chinmay Dharmadhikari, Multidimensional Ansdoid Audio Signal Processing Algorithm and App, May 2016. (Chair)
3. Jie Fan, Matrix Filling for Array Processing, Dec. 2016. (Chair)
4. Shwetang Peshin, Solar Panel Array Simulation, Aug. 2016. (Co-Chair C. Tepedelenlioglu).
5. Deepta Rajan, Designing m-Health Modules with Sensor Interfaces for DSP Education, Nov. 2013. (Chair)
6. Girish Kalyanasundaram, Audio Processing and Loudness Estimation with iOS Simulations, Sep. 2013 (Chair)
7. Suhas Ranganath, Signal Processing Education Applications for the Android Platform, April 2013 (Chair)
8. Henry C. Braun+, Signal Processing and Robust Statistics for Fault Detection in Photovoltaic Arrays, , (co-advisor C. Tepedelenlioglu) April 2012. (now PhD. Student)
9. Shuang Hu+, Algorithms and Software Development on iPhone/iPad, April 11, 2012

Professional and Scientific Service

Major Scientific Service in IEEE Signal Processing Society
- Vice-President Conferences, IEEE Signal Processing Society, 2000-2002.
- Member Board of Governors, IEEE Signal Processing Society, 2004-2007.
- Member Board of Governors, IEEE Signal Processing Society, 2000-2002.
-Member Executive Committee, IEEE Signal Processing Society, 2000-2002.
-Associate Editor, IEEE Signal Processing Letters, 2000-2002.
-Associate Editor, IEEE Transactions on Signal Processing, 1994-1997.
-General Conference Co-Chair, (with Dr. Cochran) 1999 IEEE International Conference on Acoustics Speech and -Signal Processing (ICASSP-99), Phoenix, March 1999.
-Founder and Chair Industry DSP Committee, IEEE Signal Processing Society, Spring 1999.

Local IEEE Activities
- IEEE Communications and Signal Processing (COMSOC/SP), Phoenix Chapter, *Chair*, 1993-97, 2016-18.

Membership in National and International Committees

- Elected Member of the IEEE Circuits and Systems Society Technical Committee on DSP, 1992-99, 2011-present
- Elected Member of the IEEE SPS Education Committee, 2015-present
- Elected Member of the IEEE Signal Processing Society Technical Committee on Statistical Signal and Array Processing (formerly Spectrum Estimation and Modeling), 1991-1997.
- Elected Member of the IEEE Signal Processing Conference Board, 1993-1999.
- Member Long Range Planning Committee, IEEE Signal Processing Society, 2005-2007.
- Member IEEE SPS Committee for Technical Committee Review, 2007.

Editorial Service
Associate Editor, IEEE Signal Processing Letters, 2000-2002.
Associate Editor, IEEE Transactions on Signal Processing, 1994-1997.
Guest Co-Editor, IEEE Signal Processing Magazine, Special Issue on Industry Applications, Jan 2000.
Guest Editor, IEEE Signal Processing Magazine, Special Issue on Industry DSP Technology, March 2000.
Lecture Series Editor, Synthesis Lectures on Algorithms & Software for Engineering, Morgan & Claypool Publ., 2006-present.

ASU Committee Service

Department Committees
- Systems Area Committee, Dept. EE, Member 1988-present Chair Spring 1995, Chair 1998-2016.
- EE Graduate Committee, Chair 1996-97,Chair 2000-2008.
- Department Personnel (Promotion and tenure) Committee, member, 1993-96, 1999-2000, 2004-2015, 2018-2021)
- Department Executive Committee, 1993-95.
- Undergraduate Committee, Dept. EE, member, 1988-89, 1989-90, 1990-91, 1991-92.
- Chaired (Spring 1990) the Systems Sub-Committee (Dr. Spanias, Dr. Crouch, Dr. Grondin) of the Undergraduate Committee responsible for the review of ECE301, EEE302, EEE303, EEE405, EEE406, EEE407, EEE480, and EEE482.
- Several Faculty Search Committees, Member and Chair

College Committees
- Deans Executive Committee, 2016-present.
- Deans Personnel Committee, member, 2000-2003
- Research Council, Member 1994-1999
- Engineering Excellence 2000 Committee, Member November 1994-95
- EE Chair Search Committee, Member 1995-96 and 2005-2006.

University Committees
- Communication Advisory Committee, Member 1993-96
- AME Personnel Committee, Member 2004-2012
- AME Search Committee, AY 2012-13.

REU/REV/RET Experiences (undergraduate research)
PI of 2017 and 2019 SenSIP Devices and Algorithms REU Site (Co-directed with J. Blain Christen). Co-mentored 8 REU Projects and reviewed and guided all 28 student reports and posters in the SenSIP REU Site..

Organized 2 industry meetings for REU reviews by industry members. Diversity of Site: 3 African Americans, 3 Hispanic, 9 Women, 2 Veterans.

PI and Mentor 1 RET Supplement for Corona Del Sol High School. Teacher A. Strom Co-authored a paper with A. Spanias and graduate students of the center.

PI and Mentor on 2 REV Supplements with David Ramirez and Vitor Weber. Both students Marine Core Veterans that co-authored papers with the PI and other graduate mentors.

PI and Mentor on 2 REU Supplements with Paul Curtis and Farib Khondoker. Paul Curtis co-authored papers and one patent pre-disclosure.

Several Senior Undergraduate Capstone Projects Advised (more than 50 students advised)

New Courses and Course Materials Developed

- Co-Developed with Jennifer Blain Christen, Sensors and Machine Learning Seminar Course, Spring 2018. (EEE517)
- Developed new online course Signal Processing for Digital Culture, Spring 2013. (EEE 394 and now EEE307)
- Developed two online courses EEE 509 (DSP Algorithms and Software)) and EEE 510 (Multimedia Signal Processing), Spring 2007. Offered several times typically in the summers for ASU GOEE.
- Developed a new course entitled Speech Recognition, taught Spring 2003 (offered once).
- Developed a new on-line course entitled MATLAB for DSP Applications for the ASU ME online program, Fall 2001 (later evolved to EEE509 and offered several times – listed above).
- Developed an on-line laboratory Java-DSP for EEE 407, Fall 1998. (offered every semester since 1998) – (software won awards - used at MIT, Johns Hopkins and disseminated to over 25 schools). Redeveloped recently in HTML 5)
- Developed and taught a 4 Credit senior-level undergraduate course in Digital Signal Processing entitled: "Digital Signal Processing," (EEE407/591). The purpose of this course is to introduce senior students to the principles and applications of Digital Signal Processing.   This course has become very popular among on-campus and off-campus students and enrollment is quite high. (offered annually)
- Developed and taught a graduate level special topics course entitled: "Adaptive Filter Theory," (EEE 598 now established as EEE 606). The purpose of this course is to introduce to graduate students the principles and applications of adaptive filtering. (offered several times – last offered 2019)

- Developed and supervised an advanced level independent study course entitled: "Signal Processing Using Higher Order Statistics" (EEE 790, four Ph.D. students, Spring-92). Andreas Spanias introduced the subject during several lecture sessions and students took turns presenting the results of research papers in Higher Order Statistics. (offered once)

CONTRIBUTIONS TO EDUCATION RESEARCH & EDUCATION SCHOLARLY ACTIVITIES AT:
http://spanias.faculty.asu.edu/wp-content/uploads/2017/10/Education-Activities2-web-2017-10-17.pdf

INSTRUCTOR EVALUATIONS (last 5 years)   (G – Graduate / UG –Undergraduate) – last 5 years

SEMESTER	COURSE	INSTRUCTOR SCORE OUT OF 5
Fall 2019	EEE407 Digital Signal Processing	4.64
Spring 2019	EEE 598 Sensors & Machine Learning	4.8
Fall 2018	EEE407 Digital Signal Processing	4.56
Summer 2018	EEE407 Digital Signal Processing	4.78 (G)
Summer 2018	EEE 598 Sensors & Machine Learm	5
Spring 2018	EEE 407 Digital Signal Processing	4.65 (UG)/4.74 (G)
Spring 2018	EEE 510 Multimedia Sign. Proc.	4.68
Spring 2018	EEE 598 Sensors & Machine Learm	4.7
Summer 2017	EEE 509 DSP Algorithms & Soft.	4.83
Spring 2017	EEE 606 Adaptive Sign. Proc.	4.78
Spring 2017	EEE 307 DSP for Sig. Cult (AME)	4.17 (EEE307 was AME EEE394 UG)
Fall 2017	EEE407 Digital Signal Processing	4.39 (UG)/4.57(G)
Fall 2016	EEE407 Digital Signal Processing	4.79 (UG)/4.75(G)
Fall 2016	EEE407 Digital Signal Processing	4.50 (UG)/4.22(G) (EdPlus online class)
Spring 2016	EEE 407 Digital Signal Processing	4.89 (UG)/4.69 (G)
2015 Fall	EEE 407 Digital Signal Processing	3.76/4.81
2015 Fall	EEE 407 Digital Signal Processing	4.52/4.76 Online
2015 Summer	EEE 407 Digital Signal Processing	4.38/4.56 (grad)
2015 Summer	EEE 510 Multimedia SP	4.83
2015 Spring	EEE 606 Adaptive Sign. Proc.	4.03