Dr. Jean Jiang

Associate Professor of Electrical Engineering Technology

IEEE Senior Member

Department of Engineering Technology, College of Technology

Purdue University Northwest

jjiang@pnw.edu

EDUCATION

PhD, Electrical Engineering, University of New Mexico, 1992
MS, Electrical Engineering, Southeast University, P.R. China, 1985
BS, Electrical Engineering, Southeast University, P.R. China, 1982

TEACHING INTERESTS

Electrical circuits I & II
Digital circuits I & II
Electronic circuits
Analog and digital signal processing
Communication systems
Feedback control systems
Process control
Modeling and analysis of dynamic systems
Advanced engineering mathematics

Courses Taught

- CET 311 Analog and Digital Signal Processing with Laboratory
- ECE 201 Linear Circuit Analysis I
- ECE 202 Linear Circuit Analysis II
- ECE 255 Electronic Analysis and Design
- ECE 308 System Simulations and Control Laboratory
- ECET 304 Introduction to Communication Systems
- ECET 307 Analog Signal Processing
- ECET 372 Process Control
- ECET 305 Analytical Methods in Engineering Technology
- EE 314 Statistics and Probabilities in Electrical Engineering
- EE 340 Principles of Communication Systems
- EE 402 Modeling and Analysis of Dynamic Systems
- EE 448 Control Systems
- EET 118 Electrical Circuit Analysis I
- EET 122 Digital Circuits and Systems
- EET 125 Electrical Circuit Analysis II
- EET 220 Electronic Circuits I
- EET 240 Electronic Circuits II
- EET 320 Analog Signal Processing Systems with Laboratory
- EET 350 Applied Digital Signal Processing
- ENGR 450 Advanced Engineering Mathematics
- Math 215 Calculus I

- Math 233 Discrete Mathematics
- MATH 238 Linear Algebra
- ME 376 System Modeling and Analysis

RESEARCH INTERESTS

Analog and digital signal processing
Robotics and feedback control systems
Machine learning
Active noise control
Communication systems

PROFESSIONAL SOCIETIES

IEEE Senior Member

CURRENT PROFESSIONAL ACTIVITIES

Research Paper Reviewer:
IEEE Transactions on Signal Processing
IEEE Transactions on Audio, Speech, Language Processing
IEEE Transactions on Instrumentation and Measurement

PROFESSIONAL EXPERIENCE

Associate Professor, Electrical and Computer Engineering Technology, Purdue University Northwest, 2015-present
Assistant Professor, Electrical and Computer Engineering Technology, Purdue University North Central, 2012-2015
Continuing Lecturer, Electrical and Computer Engineering Technology, Purdue University North Central, 2010-2012
Adjunct Professor, Electrical and Computer Engineering Technology, Purdue University North Central, 2009-2010
Professor and Associate Professor, Electrical Engineering, DeVry University, Atlanta, GA, 2000-2008
Department Chair/Instructor, Interactive College of Technology, Chamblee, GA, 1995-2000
Adjunct Professor, University of New Mexico, 1993-1994

Publications/Presentations

Served as the author or co-author on over 80 refereed journal and conference publications.

PUBLISHED BOOKS:

- Tan, Li-Zhe and Jean Jiang, *Digital Signal Processing: Fundamentals and Applications*. Third Edition, Elsevier/Academic Press, 2018.
- Tan, Li-Zhe and Jean Jiang, *Analog Signal Processing and Filter Design*, Second Edition, Linus Publications, 2016.
- Tan, Li-Zhe and Jean Jiang, *Digital Signal Processing: Fundamentals and Applications*. Second Edition, Elsevier/Academic Press, 2013.

- Tan, Li-Zhe and Jean Jiang, *Analog Signal Processing and Filter Design*, Linus Publications, 2009.
- Jiang, Jean and D. M. Etter, *Student Work Book for Engineering Problem Solving with ANSI C*, Prentice Hall, 1995.

PUBLISHED BOOK CHAPTERS:

- L. Tan, J. Jiang, *Novel Adaptive IIR Notch Filters for Frequency Estimation and Tracking*. Chapter 20 in Streamlining Digital Signal Processing: A Tricks of the Trade Guidebook, pp. 197-205, Editor: Richard G. Lyrons, IEEE Press/ Wiley & Sons, 2012. ISBN: 978-1-118-27838-3.
- L. Tan, J. Jiang, L. Wang, *Adaptive Harmonic IIR Notch Filters for Frequency Estimation and Tracking*. Chapter 13 in Adaptive Filtering, pp. 313-332, InTech, 2011. ISBN: 978-953-307-158-9.

JOURNAL PUBLICATIONS:

- X. Guo, J. Jiang, L. Tan, S. Du, "Improved adaptive recursive even mirror Fourier nonlinear filter for nonlinear active noise control," Applied Acoustics, vol. 146, pp. 310-319, March 2019, Elsevier.
- X. Guo, Y. Li, J. Jiang, C. Dong, S. Du, L. Tan, "Adaptive function expansion 3-D diagonal-structure bilinear filter for active noise control of saturation nonlinearity," IEEE Access, vol. 6, pp. 65139-65150, October 2018.
- X. Guo, Y. Li, J. Jiang, C. Dong, S. Du, L. Tan, "Sparse modeling of nonlinear secondary path for nonlinear active noise control," IEEE Transactions on Instrumentation and Measurement, vol. 67, No. 3, pp. 482-496, March 2018.
- J. Jiang, L. Tan, "Real-Time Data Collection and Processing in Open-Loop and Closed-Loop Systems", The Technology Interface International Journal, Vol. 17, No. 2, pp. 21-27, 2017.
- L. Tan, J. Jiang, "Active Control of Impulsive Noise Using a Nonlinear Compounding Function," Mechanical Systems and Signal Processing, vol. 58-59, pp. 29-40, June 2015, Elsevier.
- L. Tan, J. Jiang, L. Wang, "Multirate Processing Technique for Obtaining Integer and Fractional Order Derivatives of Low-Frequency Signals," IEEE Transactions on Instrumentation and Measurement, Vol. 63, No. 4, pp. 904-912, April 2014.
- L. Tan, J. Jiang, L. Wang, "Pole Radius Varying IIR Notch Filter with Transient Suppression," IEEE Transactions on Instrumentation and Measurement, Vol. 61, No. 6, pp. 1684-1691, June 2012.
- L. Tan, J. Jiang, Y. Zhang, "Bit-Error Aware Lossless Compression of Waveform Data," IEEE Signal Processing Letters, vol. 17, No. 6, pp. 547-550, June 2010.
- L. Tan, J. Jiang, "Novel Adaptive IIR Notch Filter for Frequency Estimation and Tracking," IEEE Signal Processing Magazine, November issue, pp.168-189, November 2009.
- L. Tan, J. Jiang, "Adaptive Volterra Filters for Active Control of Nonlinear Noise Processes," IEEE Transactions on Signal Processing, vol. 49, No. 8, pp. 1667-1676, August 2001.

- L. Tan, J. Jiang, "An Adaptive Technique for Modeling Second-Order Volterra Systems with Sparse Kernels," IEEE Transactions on Circuits and Systems II: Analog and Digital Signal Processing, vol. 45, No. 12, pp. 1610-1615, December 1998.
- L. Tan, J. Jiang, "Filtered-X Second-Order Volterra Adaptive Algorithms," IEE Electronics Letters, vol. 33, No. 8, pp. 671-672, April 1997.
- L. Tan, J. Jiang, "Adaptive Second-Order Volterra Delay Filter," IEE Electronics Letters, Vol. 32, No.9, pp. 807-809, April 1996.
- J. Jiang, "New Techniques for Modeling Real IIR Structures and Complex FIR Systems," Ph.D. Dissertation Abstracts, IEEE Signal Processing Magazine, pp. 56-58, October 1993.
- D. Etter, J. Jiang, "An Adaptive Technique for Determining a Reduced Model for a System", IEEE Transactions on Signal Processing, vol. 39, No. 1, pp. 200-202, January 1991.

SELECTED CONFERENCE PROCEEDINGS:

- X.Guo, J. Jiang, J. Chen, L. Tan, S. Du, "Convex combination recursive even mirror Fourier nonlinear filter for nonlinear active noise control", The 22nd International Conference on Electrical Machines and Systems, Harbin, China, August, 2019.
- J. Dai, Y. Zhang, J. Hou, X. Wang, L. Tan, and J. Jiang, "Sparse wavelet decomposition and filter banks with CNN deep learning for speech recognition," 2019 IEEE International Conference on Electro/Information Technology, pp. 98-103, Brookings, South Dakota, May 2019.
- X. Peng, J. Hou, L. Tan, J. Chen, J. Jiang, and X. Guo, "Bit-error aware lossless color image compression," 2019 IEEE International Conference on Electro/Information Technology, pp. 126-131, Brookings, South Dakota, May 2019.
- X. Guo, J. Jiang, L. Tan, S. Du, "Efficient implementation of Volterra diagonal bilinear filter for nonlinear active noise control," presented. IEEE Canadian Conference on Electrical and Computer Engineering, Edmonton, Canada, May, 2019.
- J. Jiang, R. Brewer Jr., R. Jakubowski, L. Tan, "Development of A piano frequency detecting system using the Goertzel algorithm," 2018 IEEE International Conference on Electro/Information Technology, pp. 346-349, Oakland University, Rochester, Michigan, May 2018.
- V. Vijayarajan, J. Dai, L. Tan, J. Jiang, "Channel sparsity-aware diagonal structure Volterra filters for nonlinear acoustic echo cancellation," 2018 IEEE International Conference on Electro/Information Technology, pp. 420-423, Oakland University, Rochester, Michigan, May 2018.
- J. Dai, V. Vijayarajan, X. Peng, L. Tan, J. Jiang, "Speech recognition using sparse discrete wavelet decomposition feature extraction," 2018 IEEE International Conference on Electro/Information Technology, pp. 812-816, Oakland University, Rochester, Michigan, May 2018.
- J. Jiang, "Audio Processing with Channel Filtering Using DSP Techniques," 2018 IEEE 8th Annual Computing and Communication Workshop and Conference (IEEE CCWC 2018), pp. 596-601, University of Nevada, Las Vegas, Nevada, January 2018.

- J. Jiang, A. McCoy, E. Lee, L. Tan, "*Development of a Motion Controlled Robotic Arm*," 2017 IEEE 8th Annual Ubiquitous Computing, Electronics and Mobile Communications Conference (UEMCON 2017), pp. 145-149, Columbia University, New York City, NY, October 2017**.**
- J. Jiang, D. Seniff, D. Callahan, Y. Lee**,** "*Development of a Radiation Detecting Rover System*," 2017 IEEE 8th Annual Ubiquitous Computing, Electronics and Mobile Communication Conference (UEMCON 2017), pp. 150-152, Columbia University, New York City, NY, October 2017.
- L. Tan, V. Vijayranjan, N. Chimitt, J. Jiang, A. Togbe, "*Channel Sparsity-Aware Recursive Least Squares Algorithms for Nonlinear System Modeling and Active Noise Control*," 2017 IEEE 8th Ubiquitous Computing, Electronics and Mobile Communication Conference (UEMCON 2017), pp. 225-231, Columbia University, New York City, NY, October 2017.
- Y. Lee, J. Jiang, G. Underwood, A. Sanders, M. Osborne, "*Smart Power-Strip: Home Automation by Bringing Outlets into the IoT*," 2017 IEEE 8th Ubiquitous Computing, Electronics and Mobile Communication Conference (UEMCON 2017), pp. 198-201, Columbia University, New York City, NY, October 2017.
- N. Chimitt, W. Misch, L. Tan, A. Togbe, J. Jiang, Comparative study of simple feature extraction for single-channel EEG based classification, 2017 IEEE International Conference on Electro/Information Technology, pp. 166-170, University of Nebraska, Lincoln, Nebraska, May 2017.
- J. Jiang, L. Tan, "Real-time Data Collections and Processing in Open-loop and Closed-loop Systems," 5th IAJC/ISAM Joint International Conference, Orlando, Florida, November 2016.
- L. Tan, H. Zhang, J. Jiang, "A Complex Adaptive Harmonic IIR Notch Filter," 2015 IEEE International Conference on Electro/Information Technology, pp. 107-111, Northern Illinois University, Naperville, Illinois, May 2015.
- J. Jiang, "Teaching Digital Signal Processing Course with a Real Time Digital Crossover System for Electrical and Computer Engineering Technology Students", 2014 Proceedings of the American Society for Engineering Education, Indianapolis, Indiana, June 2014.
- L. Tan, J. Jiang, "Nonlinear Active Noise Control Using Diagonal-Channel LMS and RLS Bilinear Filters," IEEE 57th International Midwest Symposium on Circuits & Systems, pp.789-792, College Station, Texas, August 2014.
- L. Tan, J. Jiang, "Teaching System Modeling and Feedback Control Systems: A Multidisciplinary Course in Mechanical Engineering and Electrical Engineering," 2013 Proceedings of the American Society for Engineering Education, Atlanta, Georgia, June 2013.
- J. Jiang, L. Tan, "Teaching Speech and Audio Processing Implementations Using LabView Program and DAQ Boards," 2013 Proceedings of the American Society for Engineering Education, Atlanta, Georgia, June 2013.

- L. Tan, J. Jiang, L. Wang, "Obtaining Higher-Order Derivatives of Low-Frequency Signals Using Multi-rate Signal Processing," IEEE International Instrumentation and Measurement Technology Conference, pp.1277-1282, Minneapolis, MN, May 2013.
- J. Jiang, L. Tan, "Teaching Adaptive Filters and Applications in Electrical and Computer Engineering Technology Program", 2012 Proceedings of the American Society for Engineering Education, San Antonio, Texas, June 2012.
  (Received the "Best Paper Award")
- L. Tan, J. Jiang, "Teaching Digital Filter Implementations Using the 68HC12 Microcontroller," 2011 Proceedings of the American Society for Engineering Education, Vancouver, Canada, June 2011.
- L. Tan, J. Jiang, "Adaptive Second-Order Volterra RLS Algorithms with Dynamic Selection of Channel Updates," 2010 IEEE/ASME International Conference on Advanced Intelligent Mechatronics, pp.1323-1328, Montreal, Canada, July 2010.
- L. Tan, J. Jiang, "Adaptive Second-Order Volterra Filtered-x RLS Algorithms with Sequential and Partial Updates for Nonlinear Active Noise Control," IEEE 4th International Conference on Industrial Electronics and Applications, pp.1625-1630, Xi'an, China, May 2009.
- L. Tan, J. Jiang, "A Bi-level Block Coding Technique for Encoding Data Sequences with Sparse Distributions," IAJC-IJME (International Association of Journals and Conferences; International Journal of Modern Engineering) International Conference, November 2008.

INVITED TALKS:

- J. Jiang, *Linear Active Noise Control Principles and Algorithms*, Graduate School of Mechanical Engineering, Nanjing University of Science and Technology, Nanjing, China, March 2017.
- J. Jiang, *Digital Signal Processing Techniques and Applications*, Graduate School of Mechanical Engineering, Nanjing University of Science and Technology, Nanjing, China, August 2012.