CURRICULUM VITAE

NAME Wu-Sheng LU 陆吾生

MAILING ADDRESS Professor Wu-Sheng Lu
Department of Electrical and Computer Engineering
University of Victoria
3800 Finnerty Road
Victoria, BC, V8P 5C2, Canada

E-MAIL/URL wslu@ece.uvic.ca http://www.ece.uvic.ca/~wslu

EDUCATION

Degree	Field	Institution	Year
B.Sc.	Mathematics	Fudan University, Shanghai, China	1964
M.S.	System Science	East China Normal University, China	1981
M.S.	Electrical Engineering	University of Minnesota, Minneapolis, USA	1983
Ph.D.	Control Science	University of Minnesota, Minneapolis, USA	1984

EMPLOYMENT

Position	Years	Institution
Lecturer	1964–1966	Dept. of Mathematics, Shanghai Second Polytechnic University, China
Lecturer	1966–1980	Dept. of Automation, Shanghai Second Polytechnic University, China
Research Assistant	1981–1984	Dept. of Electrical Engineering University of Minnesota, Minneapolis, MN, USA
Post-Doctoral Fellow	1984–1985	Dept. of Electrical and Computer Engineering University of Victoria, Victoria, BC, Canada
Visiting Assistant Professor	1986–1987	Dept. of Electrical Engineering University of Minnesota, Minneapolis, MN., USA
Associate Professor	1987–1991	Dept. of Electrical and Computer Engineering University of Victoria, Victoria, BC, Canada
Professor	1991–present	Dept. of Electrical and Computer Engineering University of Victoria, Victoria, BC, Canada

OFFICES in LEARNED and PROFESSIONAL SOCIETIES

1. Associate Editor Journal of Circuits, Systems, and Signal Processing, 2009 – 2012
2. Guest Editor for Special Issue of *Circuits, Systems and Signal Processing* on Computationally Efficient Digital Filters, 2006.
3. Associate Editor of the *IEEE Transactions on Circuits and Systems*, I, 1999 – 2001, and 2004 – 2005.
4. Associate Editor of the *Multidimensional Systems and Signal Processing*, 1997 – 2006.
5. Associate Editor of the *IEEE Transactions on Circuits and Systems*, II, 1993 – 1995.
6. Editor of the *Canadian Journal of Electrical and Computer Engineering*, 1990 – 1992.
7. Associate Editor of the *Canadian Journal of Electrical and Computer Engineering*, 1989 – 1990.
8. Member of IEEE Circuits and Systems Society DSP Technical Committee, 1998 –
9. Student Counselor of IEEE, University of Victoria Branch, 1995 – 2001.

CURRENT RESEARCH INTERESTS

1. Signal and image processing with a current focus on compressive sensing and sparse signal processing.
2. Analysis and design of digital filters, filter banks, and wavelets.
3. Theory and applications of numerical optimization.

HONOURS and AWARDS

1. Fellow of the IEEE, 1999. (Life Fellow of the IEEE, 2012)
2. Fellow of the Engineering Institute of Canada, 1994.
3. Best Paper Award in the 2006 IEEE Asia Pacific Conference on Circuits and Systems, Singapore, December 2006.
4. Best Paper Award (with Jie Yan) in the 2014 IEEE Asia Pacific Conference on Circuits and Systems, Okinawa, Japan, Nov. 2014.
5. University of Victoria Alumni Association Award for Excellence in Teaching, University of Victoria Alumni Association, 1991.
6. Outstanding Teacher Award, Engineering Institute of Canada, Vancouver Island Branch, 1990.
7. Outstanding Teacher Award, Engineering Institute of Canada, Vancouver Island Branch, 1988.

SELECTED PUBLICATIONS (Books and Recent Journal Publications)

A. Books

1. Lu, W.-S., and A. Antoniou. *Two-Dimensional Digital Filters*, New York: Marcel Dekker, July 1992. (416 pages).
2. Antoniou, A., and W.-S. Lu, *Optimization: Algorithms and Applications*, New York: Springer, 2007. (667 pages).
3. Hinamoto, T. and W.-S. Lu, *Digital Filter Design and Realization*, River Publishers, April 2017. (454 pages).

B. Recent Journal Publications

1. Lu, W.-S. and A. Antoniou, "Design of signal-adapted biorthogonal filter banks", *IEEE Trans. Circuits Sys.*, I, vol. 48, pp. 90 – 102, Jan. 2001.

2. Wang, X.F., W.-S. Lu, and A. Antoniou, "An overlapping window de-correlating multi-user detector for DS-CDMA radio channels", *IEEE Trans. Comm.*, vol. 49, pp. 1488 – 1495, Aug. 2001.
3. Lu, W.-S. "A unified approach for the design of 2-D digital filters via semidefinite programming", *IEEE Trans. Circuits Syst., I*, vol. 49, pp. 814-826, June 2002.
4. Hinamoto, T., S. Yokoyama, T. Inoue, W. Zeng and W.-S. Lu, "Analysis and minimization of L2-sensitivity for linear systems and two-dimensional state-space digital filters using general controllability and observability Gramians," *IEEE Trans. Circuits Syst., I*, vol. 49, pp. 1279-1289, Sep. 2002.
5. Hinamoto, T., H. Ohnishi, and W.-S. Lu, "Round-off noise minimization of state-space digital filters using separate and joint error feedback/coordinate transformation optimization," *IEEE Trans. Circuits and Sys., I*, vol. 50, pp. 23-33, Jan 2003.
6. Lu, W.-S. and T. Hinamoto, "Optimal design of IIR digital filters with robust stability using conic-quadratic-programming updates," *IEEE Trans. Signal Processing*, vol. 51, pp. 1581-1592, June 2003.
7. Lu, W.-S. and T. Hinamoto, "Optimal design of frequency-response-masking filters using semidefinite programming," *IEEE Trans. Circuits and Syst., I*, vol. 50, pp. 557-568, April 2003..
8. Hinamoto, T., K. Higashi, and W.-S. Lu, "Separate/joint optimization of error feedback and coordinate transformation for round-off noise minimization in two-dimensional state-space digital filters," *IEEE Trans. Signal Processing*, vol. 51, pp. 2436-2445, Sept. 2003.
9. Wang, X.M., W.-S. Lu and A. Antoniou, "A near-optimal multiuser detector for CDMA channels using semidefinite programming relaxation", *IEEE Trans. Signal Processing*, vol. 51, pp. 2446-2450, Sept. 2003.
10. Lu, W.-S. and T. Hinamoto, "Optimal design of IIR frequency-response-masking filters using second-order cone programming", *IEEE Trans. Circuits Syst. I*, vol. 50, pp. 1401-1412, Nov. 2003.
11. Lu, W.-S., T. Saramäki, and R. Bregovi, "Design of practically perfect-reconstruction cosine-modulated filter banks: A second-order cone programming approach", *IEEE Trans. Circuits Syst. I*, vol. 51, pp. 552-563, March 2004.
12. Kou, Y. J., W,-S. Lu, and A. Antoniou, "New peak-to-average power-ratio reduction algorithms for multicarrier communications", *IEEE Trans. Circuits Sys. I*, vol. 51, pp. 1790-1800, Sept. 2004.
13. Lu, W.-S., and T. Hinamoto, "Jointly optimized error-feedback and realization for roundoff noise minimization in state-space digital filters", *IEEE Trans. Signal Processing*, vol. 53 pp. 2135-2145, June 2005.
14. Wang, Xianmin, W.-S. Lu, and A. Antoniou, "Multiuser detectors for synchronous DS-CDMA systems based on a recursive p-norm convex relaxation approach", *IEEE Trans. Circuits Syst. I*, vol. 52, pp. 1021-1031, May 2005.
15. Hinamoto, T., H. Ohnishi, and W.-S. Lu, "Minimization of L2 sensitivity of one- and two-dimensional state-space digital filters subject to L2-dynamic-range-scaling constraints," *IEEE Trans. Circuits Syst. II*, vol. 52, pp. 641-645, Oct. 2005.
16. Hinamoto, T., K.-I. Iwata, and W.-S. Lu, "L2-sensitivity minimization of one- and two-dimensional state-space digital filters subject to L2-scaling constraints," *IEEE Trans. Signal Processing*, vol. 54, no. 5, pp. 1804-1812, May 2006.

17. Hinamoto, T., K.-I. Iwata, O. I. Omoifo, S. Ohno, and W.-S. Lu, “Optimal synthesis of a class of 2-D digital filters with minimum L2-sensitivity and no overflow oscillations,” *IEICE Trans. Fundamentals*, vol. E89-A, no. 7, pp. 1987-1994, July 2006.
18. Hinamoto, T., H. Ohnishi, and W.-S. Lu, "Roundoff noise minimization for 2-D state-space digital filters using joint optimization of error feedback and realization," *IEEE Trans. Signal Processing*, vol. 54, no. 11, pp. 4302-4310, Nov. 2006.
19. Chen, Y., M. D. Adams, and W.-S. Lu, “Design of optimal quincunx filter banks for image coding,” *EURASIP Journal on Advances in Signal Processing*, vol. 2007, doi: 10.1155/2007/83858, 2007 (18 pages).
20. Kou, Y. J., W.-S. Lu, and A. Antoniou, “Peak-to-Average Power-Ratio Reduction Algorithms for OFDM Systems via Constellation Extension,” *IEEE Trans. Wireless Communications*, vol. 6, pp. 1823-1832, May 2007.
21. Dong, X., W.-S. Lu, and A. C. K. Soong, “Interpolation in pilot symbol assisted channel estimation for OFDM,” *IEEE Trans. Wireless Communications*, vol. 6, pp. 1910-1920, May 2007.
22. Hinamoto, T., T. Oumi, and W.-S. Lu, “Separate/joint optimization of error feedback and realization for roundoff noise minimization in a class of 2-D state-space digital filters,” accepted for publication in *Multidimensional Systems and Signal Processing*, vol. 18, pp. 327-339, 2007.
23. Yang, H.-C., K. Wu, and W.-S. Lu, "Cross-layer path configuration for energy-efficient communication over wireless ad hoc networks," *Journal of Advances in Multimedia*, vol. 2007, Article ID: 19860, 9 pages, doi: 10.1155/2007/19860, 2007.
24. Zhang, Y. H., W.-S. Lu, and A. Gulliver, “Integer QP relaxation based algorithms for ICI reduction in OFDM systems,” *Canadian J. Electrical and Computer Engineering*, vol. 32, no.4, pp. 199-205, Fall 2007.
25. Hinamoto, T., T. Oumi, O. I. Omoifo, and W.-S. Lu, "Minimization of frequency-weighted l_2-sensitivity subject to l_2-scaling constraints for two-dimensional state-space digital filters", *IEEE Trans. Signal Processing*, vol. 56, no. 10, pp. 5157-5168, Oct. 2008.
26. Liu, T. C.-K., X. Dong, and W.-S. Lu, “Multiresolution wavelet denoising for ultra-wideband time-of-arrival estimation with regularized least squares,” *Physical Communication*, 12 pages, publication date of the electronic version: Sept. 23, 2009. (DOI: 10.1016/j. phycom.2009.09. 004.)
27. Yan, J. and W.-S. Lu, “Towards global design of orthogonal filter banks and wavelets,” *Canadian J. Electrical and Computer Engineering*, vol. 34, no. 4, pp. 15-21, 2009.
28. Shen, S., Y. Liu, and W.-S. Lu, “Monocular 3D tracking of deformable surfaces using sequential second - order cone programming”, *Pattern Recognition*, vol. 43, no. 1, pp. 244-254, 2010.
29. Sevcenco, A.-M. and W.-S. Lu, “Perfect histogram matching PCA for face recognition”, *Int. J. Multidimensional Systems and Signal Processing*, vol. 21, no. 3, pp. 213-239, 2010.
30. Xu, W., X. Dong, and W.-S. Lu, “MIMO Relaying Broadcast Channels with Linear Precoding and Quantized Channel State Information Feedback.” *IEEE Trans. Signal Processing*, vol. 58, no. 10, pp. 5233-5245, 2010.
31. Lu, W.-S. and T. Hinamoto, “Two-dimensional digital filters with sparse coefficients,” *Int. J. Multidimensional Systems and Signal Processing*, vol. 22, no. 1-3, pp. 173-189, 2011.

32. Xu, W., X. Dong, and W.-S. Lu, "Joint precoding optimization for multiuser multi-antenna relaying downlinks using quadratic programming," *IEEE Trans. Communications*, vol. 59, no. 5, pp. 1228-1235, May 2011.
33. Ramachadran, P., W.-S. Lu, and A. Antoniou, "Filter-based methodology for the location of hot spots in proteins and exons in DMA," *IEEE Trans. Biomedical Engineering*, vol. 59, no. 6, pp. 1598-1609, June 2012.
34. Hinamoto, T., A. Doi, and W.-S. Lu, "Realization of 3-D separable-denominator digital filters with very low l_2-sensitivity," *IEEE Trans. Signal Processing*, vol. 60, no. 12, pp. 6282-6293, Dec. 2012.
35. Hinamoto, T., A. Doi, and W.-S. Lu, "Jointly optimal high-order error feedback and realization for roundoff noise minimization in 1-D and 2-D state-space digital filters," *IEEE Trans. Signal Processing*, vol. 61, no. 12, pp. 5893-5904, Dec. 2013.
36. Yan, J. and W.-S. Lu, "Image denoising by generalized total variation minimization," *Multidimensional Systems and Signal Processing*, electronically published Oct. 7, 2013, DOI: 10.1007/S11045-013-0255-2.
37. Pant, J., W.-S. Lu and A. Antoniou, "New improved algorithm for compressive sensing based on l_p norm," *IEEE Trans. Circuits and Systems II*, vol. 61, no. 3, pp. 198-202, March, 2014.
38. Doi, A., T. Hinamoto, and W.-S. Lu, "Roundoff noise minimization for a class of 2-D state-space digital filters using joint optimization of high-order error feedback and realization," *IEICE Trans. Fundamentals*, vol. E97-A, no. 9, pp. 1918-1925, Sept. 2014.
39. Hinamoto, T., A. Doi, and W.-S. Lu, "Roundoff noise minimization in state-space discrete-time systems using joint optimization of high-order error feedback and realization," *IEEE Trans. Circuits and Systems I*, vol. 61, no. 12, pp. 3460-3468, Dec. 2014.
40. Herchak, S., W. Yu, W.-S, Lu, and T. Lu, "Whispering gallery micro cavity with in-line interferometer," *Biosensors Journal*, vol. 4, no. 2, pp.1-5, 2016.
41. Hinamoto, T., A. Doi, and W.-S. Lu, "Minimization of weighted pole and zero sensitivity for state-space digital filters," *IEEE Trans. Circuits and Systems I*, vol. 63, no. 1, pp. 103-113, Jan. 2016.
42. Lu, W.-S. and T. Hinamoto, "A unified approach to the design of interpolated and frequency-response-masking FIR filters," *IEEE Trans. Circuits and Systems I*, vol. 63, no. 12, pp. 103-113, Dec. 2016.

PROFESSIONAL COMMITTEES

1. Member of the Program Committee for 1991 IEEE Pacific Rim Conference on Communications, Computers and Signal Processing, Victoria, B.C., May 1991.
2. Member of the Program Committee for 1993 IEEE Int. Conf. on Robotics and Automation, Atlanta, GA, USA.
3. Member of the Program Committee for 1993 IEEE Int. Symp. on Circuits and Systems, Chicago, IL, USA.
4. Member of the Program Committee for 1993 IEEE Pacific Rim Conference on Communications, Computers and Signal Processing, Victoria, B.C., May 1993.
5. Member of the Program Committee for 1993 IEEE Midwest Symposium on Circuits and Systems, Detroit, MI, USA.
6. Member of the Program Committee for 1997 IEEE Pacific Rim Conference on Communications, Computersand Signal Processing, Victoria, B.C., May 1997.

7. Publication Chair for 1998 IEEE Symposium on Advances in Digital Filtering and Signal Processing, Victoria, BC, June 1998.
8. Program Co-Chair for 1999 IEEE Pacific Rim Conference on Communications, Computers and Signal Processing, Victoria, B.C., August 1999.
9. Member of the Program Committee for 1999 IEEE International Symposium on Circuits and Systems, May 1999, Orlando, FL, USA.
10. Member of the Program Committee for 1999 Canadian Conference on Electrical and Computer Engineering, Edmonton, Alberta, May 1999.
11. Member of DSP Technical Committee for IEEE Circuits and Systems Society Since 1999.
12. Member of the Program Committee for 2000 IEEE Int. Symp. on Intelligent Signal Processing and Communication Systems, Honolulu, Hawaii, Nov. 2000.
13. Member of the Grant Selection Committee of the Natural Science and Engineering Research Council of Canada (NSERC), GSC 334, 2000 – 2003.
14. Member of the IEEE Circuits and Systems Society's Subcommittee for Guillemin-Cauer Paper Award, 2001.
15. Member of the IEEE Circuits and System Society's Subcommittee for the Education Award, 2003.
16. Publication Chair for 2004 IEEE International Symposium on Circuits and Systems, May 2004, Vancouver, Canada.
17. Co-Chair for Special Sessions, 2004 Midwest Symposium on Circuits and Systems.
18. Member of the Technical Program Committee for 2006 IEEE Asian Pacific Conference o Circuits and Systems, Singapore, December 4-7, 2006.
19. Member of the Technical Program Committee for 2007 IEEE Pacific Rim Conference on Computers, Communications and Signal Processing, Victoria, BC, August 22-24, 2007.
20. Session Chair (IIR digital filters) for ISCAS 2007.
21. Session Chair (Image Processing) for PacRim Conference 2007.
22. Session Chair (Image Processing) for PacRim Conference 2009.
23. Session Chair (Compressive Sensing) for ISCAS 2011.
24. Session Chair (Compressive Sensing) for ISCAS 2012.
25. Session Chair (Advanced DSP Algorithms and Applications) for ISCAS 2013.
26. Session Chair (Audio and Speech Processing) for ISCAS 2014.
27. Session Chair (Digital Filters) for ISCAS 2015.
28. Member of the Technical Program Committee for 2017 IEEE Pacific Rim Conference on Computers, Communications and Signal Processing, Victoria, BC, August 21-23, 2017.