Hua Harry Li, Ph.D.

March 2015

Professional Expertise

Embedded Intelligent Systems, Neural-Fuzzy Control, Pattern Recognition and Robotics, Wireless Communications, GPGPU based Computer Vision and Computer Graphics, and VLSI Design.

Work Experience

1. Professor, 1999-Present, Computer Engineering Department, San Jose State University, San Jose, California.
2. Associate Professor, 1997-1999, Computer Engineering Department, San Jose State University, San Jose, California.
3. Associate Professor and Tenure Promotion, 1994-1997, Computer Science Department, College of Engineering, Texas Tech University, Lubbock, Texas.
4. Assistant Professor, 1989-1994, Computer Science Department, College of Engineering, Texas Tech University, Lubbock, Texas.
5. Consulting: Principal Engineer in Charge of IP development in Computer Graphics Algorithm and Chip Design, S3 Inc. Santa Clara, CA, 1997.
6. Consulting: System Architect in Charge of Video Graphics Chip Design, Smedia Inc., Santa Clara, CA 1998.
7. Consulting: Senior System Architect, UTStarcom, Alameda, CA, 2000-2003, in charge of OpenIP project and lead technology development with Nortel for Global Metropolitan Area Network Wireless Communications, IPTV project with Panasonic backed by Yahoo and Softbank.
8. Consulting: Senior System Architect, Embedded Wireless Sensor Networks, in charge of wireless base station development for embedded environment water quality monitoring and water treatment plant automation, 2006.

Award and Honors

1. Award of Excellence in Teaching (by Halliburton Foundation), 1994, College of Engineering, Texas Tech University.
2. Industrial Neural Network Award, World Congress Neural Network Conference, San Diego, California, 1994.
3. Who's Who in Science and Engineering, A Marquis Who's Who Publications, pp. 683, 4th Edition, ISBN 0-8379-5756-7, New Providence, NJ 07974,1999;
4. Who is Who in America, A Marquis Who's Who Publications, 53rd Edition, Vol. 2, ISBN 0-8379-0194-4, New Providence, NJ 07974.

Courses Developed at San Jose State University In the Past 5 Years (Partia List)

1. CMPE 242 Embedded Hardware Systems, 2006. Developed a graduate level experimental course on Embedded Hardware Systems with ARM7 in 2005, converted to a permanent course in 2006, migrated to ARM9 in 2008, and ARM11 platform since 2010 till present. Taught both on-campus and off-campus including BAE Systems and others.
2. CMPE 244 Embedded Software Systems, developed experimental course in 2007, then became permanent course in 2008, utilized and optimized uCLinux (kernel 2.4.x) for small footprint platform, and Linux (kernel 2.6.x) with embedded web server, CGI and media streaming, multi-threads processes for ARM11 platforms.
3. CMEP 245 Embedded Wireless Systems, Developed a graduate level experimental course in 2007, and became a permanent course in 2008, taught Software Defined Radio techniques, CR

(Cognitive Radio), MAC layer full software implementation on ASK, FSK, CCK RF ASIC nodes.

4. CMEP 262 Embedded Multimedia Hardware Systems, Developed and revised graduate level experimental course in 2008, and become permanent course in 2009, taught embedded Vector Graphics and Pixel Graphics Techniques, 3D Stereo Vision, Integration of Vision and Virtual Reality for Smart Phone and Portable Platforms.
5. EE264 Computed Digital Imaging (formally Digital Image Processing, for off campus program), Developed graduate level course in 2010, taught at Lockheed Martin Space Systems and other Silicon Valley Companies.
6. CMPE 297 Artificial Intelligence for Big Data Applications for off campus graduate program, 2012, taught off-campus including at eBay.

Additional Courses Taught in the Past Five Years
7. CMPE 127 Microprocessor Systems, Undergraduate level course with 32 bit RISC CPU, NXP ARM (LPC1769) platform, with SPI Flash Memory Interface Design, External Interrupt and RTC, wireless IrDA controller, and sensor interface etc.
8. CMPE240 Advanced Microprocessor Systems since 2014, with 32 bit RISC CPU, NXP ARM CPU, SPI Flash Data Logger Design, External Interrupt and RTC, GE (graphics processing engine) controller design and software implementation and SPI color LCD interface design etc.
9. CMPE 146 Embedded Systems.
10.   CMPE 163 Computer Graphics.

Authored Books
1. Vision Chips: Implementing Vision Algorithms with Analog VLSI, (with Christof Koch) ISBN 0-8186-6492-4, by IEEE CS Press.
2. Fuzzy Logic and Intelligent System, (with Madan Gupta) ISBN 0-7923-9575-1, by Kluwer Academic Publishers.
3. Video Data Compression for Multimedia Computing, (with S. Sun and H. Derin) ISBN 0-7923-9790-8, by Kluwer Academic Publishers.

Industry Courses Taught (Partial List)
1. Embedded Hardware Systems, off-campus course, including BAE Systems and others, since 2010.
2. Computed Digital Imaging, and Digital Image Processing, off campus program including Lockheed Martin Space Systems and other Silicon Valley Companies since 2008.
3. Artificial Intelligence for Big Data Applications, off campus graduate program, taught off-campus including at eBay since 2012.

Professional Services (Partial List)
1. Technical Committee, IEEE International Conference on CNC, 2009.
2. Technical Paper Reviewer for IEEE International Conference on CNC 2007-2009.
3. Technical Paper Reviewer for IEEE International Conference on Wireless Pervasive Computing 2008.
4. IEEE CPMT Society, Publication Subcommittee Chair, 1994-1996.
5. Technical Committee Member for the 13th, 14th, and 15th IEEE International Conference on CMPT (Components, Packaging, and Manufacturing Technology)，1994，1995，1996.

6. ACM Computer Science Conference Program Committee, Nashville, TN, Feb 28 – March 2, 1995.

IEEE Transaction Guest Editor
Guest Editor for IEEE Transactions on CPMT(1994, 1996), Special Emerging Technology Section, Vol. 17 and 19, No. 1, ISSN 1083-4400, 1994 and 1996.

Invited Contributor To Encyclopedia of Electrical and Electronics Engineering
On Neural Fuzzy Control techniques for semiconductor equipment control applications, pp. 154- 157, Vol. 8, Fr-Hi, ISBN   0-471-13946-7,   John Wiley and Sons Inc.

Invited Guest Speaker (Partial List)
1. Talk Title: Design, Development and Prototype of Fuzzy Logic Algorithm for Pattern Recognition and Robotics, Section A113, Second International Conference on Fuzzy Logic Systems, Development Tools and Applications, Town and Country Hotel, San Diego, CA, Sept. 13-15, 1994.
2. Tutorial: Fundamentals for Design Fuzzy Logic Controller, American Mathematician Annual Conference, Atlanta, GA, 1999.

Papers and Publications Collected in Books and/or As Book Chapters (Partial List)
1. Paper: Fast and Reliable Image Enhancement Using Fuzzy Relaxation Techniques, collected in the book: Fuzzy Models for Pattern Recognition – Methods that Search for Structures in Data, IEEE Press, Edited by James C. Bezdek and Sankar K. Pal, 1992.
2. Paper: Simulating a Function of Visual Peripheral Processes with an Analog VLSI Network, collected in the book: Vision Chips – Implementing Vision Algorithms with Analog VLSI Circuits, Edited by Christof Koch and H. Li, IEEE CS Press, 1994.
3. "Real Time Fuzzy Logic Controller for Balancing a Beam-and-Ball System", collected in Fuzzy Logic and Intelligent System, by Kluwer Academic Publishers, 1996.
4. "Robot Hand-Eye Coordination Based on Fuzzy Logic", collected in Fuzzy Logic and Intelligent System, by Kluwer Academic Publishers, 1996.

Conferences Publications (Partial List)
- Hua Harry Li, "Cloud Computing Enabled Web Services Techniques with Wireless Sensor Networks For Environment Monitoring Applications," Proceedings of Shanghai International Conference on Environment Pollution Monitoring, Shanghai, May 2010.
- Hua Harry Li, P. Shah, K. Odnous, Jax-WS Enabled Digital Ecosystems Approach For Coal Mining Applications, Proceedings of *IEEE* International Conference on Industrial Electronics, 35th Annual Conference of IEEE Industrial Electronics Society (IECON) Alfandega Congress Center, Porto, Portugal, November 3-5, *2009*.
- Hua Harry Li, et. al. "Solar Powered Floating WSN For Water Monitoring Applications," Proceedings of the *2009 World Lake Conference*, Wuhan, Oct. 2009.
- Hua Harry Li, et. al. "Design OLN optimized low cost wireless sensor networks" Proceedings of *IEEE* International Symposium on Wireless Pervasive Computing, 2008-5, pp. 109-115, Vol I. Santorini, Greece, May 2008.
- Hua Harry Li and T. Dao, "Embedded Remote Imaging System Design," Proceedings of IEEE International Conference on Industrial Electronics, Hong Kong, China, IEEE 0-7803-9484-4/05/, 2005.Conference on Industrial Electronics, Hong Kong, China, IEEE 0-7803-9484-4/05/.
- Hua Harry Li, Ni qingling, Zhu yanhua "Bandwidth Adaptive Multimedia Streaming for PDA

Applications over WLAN Environment" Proceedings of IEEE International Conference on Industrial Electronics, Corsica, France, IEEE 0-7803-8305-2/04/ .

- H. Li, Guangjin Chen "Wireless LAN Network Management System," Proceedings of IEEE *International Conference on Industrial Electronics, Corsica, France, IEEE 0-7803-8305-2/04/.*

- Hua Li, Balasubramanian Vaidhyanathan and Shan Sun, "Statistical Fuzzy PID Controller Design," Proceedings of the 6th IEEE International Conference on Fuzzy Systems, Vol. III, pp. 1499-1504, Barcelona, Spain, July 1-5th, 1997.

- Balasubramanian Vaidhyanathan, Hua Li, and Shan Sun, ``Comparison of Statistical and Neural-Fuzzy Approaches to Process Control Applications," Proceedings of the 19th IEEE/CPMT International Electronics Manufacturing Technology Symposium, pp. 467, IEEE Catalog Number: 96CH35997, Oct. 1996.

- H.F. Janssen and Hua Li, ``Assistive Technology Delievery to Remote Areas Using Interactive Digital Communication," The 2nd World Conference on Integrated Design and Process Technology, Austin, Texas, December 1-4, 1996.

- Hua Li and Xiaohui Meng, ``Gabor Transformations for Image Processing," Proceedings of IEEE International Conference on Signals and Systems, Shanghai, China, June 20th-25th, 1996.

- Lazlo Modolvan and Hua Li, ``A Buffered Constant Gain OpAmp with Rail-to-Rail Operating Range," Proceedings of 1996 IEEE International Symposium on Circuits and Systems, Atlanta, GA, May 12-15, 1996.

- Hua Li, Shan Sun, and Dongming Liang, ``Stochastic Temporal Prediction for Video Data Compression," the IASTED International Conference on Distributed Multimedia Systems and Applications, Stanford, CA, August 7-9, 1995.

- Sukir S. Kumaresan and Hua Li, ``A Comparative Study of Robot Manipulator Hand-Eye Calibration Based on Fuzzy Logic and Linear Interpolation," The proceedings of 1994 IEEE International Conference on Image Processing, Vol. III, pp. 221-226, Austin, TX, Nov. 13-16, 1994.

- Sukir S. Kumaresan and Hua Li, ``Hand-Eye Coordination of A Robot Manipulator Based on Fuzzy Logic," the Proceedings of the 16th IEEE/CHMT International Electronics Manufacturing Technology Symposium, pp. 315-318, La Jolla, CA, Sept. 12-14, 1994.

- Hua Li and Srinivas Damalcheruvu, ``Locally Connected CMOS VLSI Design for Image Convolution," Proceedings of the SPIE International Symposium on Optical Engineering and Photonics in Aerospace Sensing, Orlando, FL, April 4-8, 1994.

- Nowell Godfrey and Hua Li, ``Real-Time Control of A Nonlinear System Based on Fuzzy Logic," Proceedings of the 5th Workshop on Neural Networks, Academic/Industrial/NASA/Defense, pp. 15-18, San Francisco, Nov. 7-10, 1993.

- Nowell Godfrey and Hua Li, ``A Prototype Beam-Balancing System Based on Fuzzy Logic Controller," Proceedings of the 1993 North American Fuzzy Information Processing Conference, pp. 195-199, Allentown, PA, August 22-26, 1993.

- Nowell Godfrey, Hua Li, and William Marcy, ``Demonstration System Based on Fuzzy Logic Control," Proceedings of the 15th IEEE International Symposium on Electronics Manufacturing, pp. 450-454, Santa Clara, CA, October 4-6, 1993.

- Hua Li, Rajesh Agarwal, William Marcy, ``Stability Concern of the Fuzzy PID Controllers,'' Proceedings of the International Fuzzy Systems and Intelligent Control Conference 93, pp. 63-72, Louisville, KY, March 14-17, 1993.

- Hua Li, ``A Neural Network Model for Solving a Class of Nonlinear Two-Point Boundary Value Problems,'' Proceedings of 1992 IEEE International Conference on Systems, Man, and Cybernetics, Chicago, IL, October, 1992.

- Hua Li and Jun Wang, ``A Recurrent Neural Network for Optical Flow Computation,'' Proceedings of the International Joint Conference on Neural Networks 1992, Vol. IV, pp. 368-373, Baltimore, MD, June 7-11, 1992.

- Kim Tor and Hua Li, ``SARM -- A Computer Graphics Simulator for Generic Robot Manipulators,'' Proceedings of 1991 International Conference on Simulation Technology, pp. 171-176, Orlando, FL, Oct. 21-23, 1991.

- Cheng-Jen Lin, Hua Li, and Yuandong Ji, ``Detecting Dimple Defects of Polished Wafer Surface,'' Proceedings of the 1991 IEEE/CHMT International Electronics Manufacturing Technology Symposium, pp. 187-191, San Francisco, CA, Sept. 16-19, 1991.

- Hua Li, Ching-Ho Chen, Gopal Lakhani, ``Solving Two-Point Boundary Value Problems in Trajectory Formation,'' Proceedings of the 1991 International Joint Conference on Neural Networks, Vol. I, pp. 165-170, Seattle, WA, July 8-12, 1991.

- Hua Li and Ching-Ho Chen, ``An Analog 2D Network for Simulating A Visual Peripheral Processes,'' Proceedings of the 2nd Workshop on Neural Network: Academic/Industrial/NASA/Defense, sponsored by NASA Headquarter and Auburn University, pp. 805-811, Auburn, AL, Feb. 11-13, 1991.

- Hua Li, ``Analog Computing Method for Solving Two-Point Boundary Value Problem,'' {\it Proceedings of 1990 IEEE International Symposium on Circuits and Systems,} Vol. 1, pp. 460-464, New Orlean, LA, May 1-3, 1990.

- Hua Li and H.S. Yang, ``Fast Image Enhancement Using Fuzzy Relaxation Technique,'' The Lecture Notes in Computer Science, edited by J. Kittler, Vol. 301, pp. 577-586, Springer-Verlag, 1988.

- Hua Li, ``Fast Iteration Algorithm for Optical Flow Computation,'' Proceedings of ASILOMAR Conference, Pacific Grove, CA, Oct. 31 -Nov. 2, 1988.

- Hua Li, Tavi Raz, and H.S. Yang, ``A Fuzzy Relaxation Algorithm for Image Enhancement,'' Proceedings of 1987 IEEE International Conference on Systems, Man, and Cybernetics, Vol. 2, pp. 749-753, Alexandria, VA, Oct. 20-23, 1987.

- Hua Li, ``Using Walsh-Hadamard Phase Spectrum to Generate Cardiac Activation Movies -- A Feasibility Study,'' Proceedings of 1986 IEEE International Conference on Systems, Man, and Cybernetics, Vol. 1, pp. 220-224, Atlanta, 1986.

- Hua Li, Haixiang Liang, ``VLSI NMOS PLA Implementation of Four Points Parallel Input/Output Fast Walsh-Hadamard Transform Processor,'' The 98th Session of Iowa Academy of Science, No. 108, Cedar Falls, IA, April 25-26, 1986.

Journals Papers (Partial List)

- Hua Harry Li, "GPGPU Computing to Enhance Micro CT Imaging", IEEE Spectrum (in CHN print), pp. 80, Feb., 2014.

- Hua Li, "Fuzzy Logic for Semiconductor Manufacturing," in The Encyclopedia of Electrical and Electronics Engineering, the 1999 edition, ISBN 0-471-13946-7, Editor John Webster, John Wiley & Sons, Inc., Publishers, New York.

- Laszlo Moldova and Hua Li, ``A Rail-to-Rail Constant Gain Buffered OpAmp for Real Time Video Applications,'' Vol. 32, No. 2, pp. 169-177, IEEE Journal of Solid-State Circuits, March, 1997.

- Hua Li and S. Sun, ``Spatial-Temporal Prediction for High Speed Video Data Compression,'' A book chapter (Chapter 4) in *Video Compression for Multimedia Computing*, Kluwer Academic Publishers, ISBN 0-7923-9790-8, 1997.

- Hua Li and Shan Sun, ``Solving Stochastic, Coupled Elliptical Differential Equations for Motion Prediction in Video Teleconferencing,'' A book chapter (Chapter 11) in *Video Compression for Multimedia Computing*, Kluwer Academic Publishers, ISBN 0-7923-9790-8, Kluwer Academic Publishers, 1997.

- Sukir S. Kumaresan and Hua Li, ``Robotic Hand-Eye Coordination Based on Fuzzy Logic,'' a book chapter in *Fuzzy Logic and Intelligent Systems,* ISBN 0-7923-9575-1, published by Kluwer Academic Publishers, 1995.

- Hua Li, Nowell Godfrey, Yuandong Ji, William Marcy, ``A Comparative Study of A Balancing System Based on Fuzzy Logic and Kalman Filter,''a book chapter (Chapter 6) in *Fuzzy Logic and Intelligent Systems*, ISBN 0- 7923-9575-1, Kluwer Academic Publishers, 1995.

- Hua Li and Jun Wang, ``A Recurrent Neural Network for Motion Parameter Estimation,'' to appear in *The Special Volume on Motion Detection and Temporal Pattern Recognition*, Dayhoff (Volume Editor), Omidvar (Series Editor), Ablex Publishing Co., 335 Chestnut St, Norwood, NJ.

- Hua Li and Jun Wang, ``Computing Optical Flow with a Recurrent Neural Network,'' (first published as a journal paper then collected in a book, *Advances in Pattern Recognition Systems and Using Neural Network Technologies*, edited by I. Guyon, and P. Wang, pp. 157-170, World Scientific Publishing Co. Pte. Ltd., 1993.

- Hua Li and H.S. Yang, ``Fast Image Enhancement Using Fuzzy Relaxation Technique,'' in *Fuzzy Methods in Pattern Recognition*, (first published as a IEEE Transactions paper, then collected in a book edited by Bezdek and Pal, pp. 357 - 361, *IEEE Press*, March 1992.

- Prabhu Murugan, Russell Rhinehart, and Hua Li, ``An Introduction to Fuzzy Logic Control,'' Chemical Engineering Progress, 1996.

- Sameul H. Huang, Hong C. Zhang, Shan Sun, and Hua Li, ``Function Approximation and Neural-Fuzzy Approach to Machining Process Selection,'' IEEE Trans. on Components, Packaging, and Manufacturing Technology, Vol. 19, No. 1, pp. 9-18, January, 1996.

- Hua Li and Nowell Godfrey, ``Real Time Fuzzy Logic Controller for Balancing a Bean-and-Ball System,'' IEEE Macro, Vol. 15, No. 6, pp.64-, December, 1995.

- Maulik Parekh, Mehul Desai, Hua Li, and Rossell Rhinehart, ``In-Line Control of Nonlinear pH Neutralization Based on Fuzzy Logic,'' IEEE Trans. on Components, Hybrid, and Manufacturing Technology, Part A, Special Section on Neural Networks and Fuzzy Logic Applications to Semiconductor Manufacturing, Vol. 17, No. 2, June 1994.

- Hua Li and Yuan-Dong Ji, ``Fuzzy-Logic Tool on Tap for IC Wafers,'' IEEE Circuits and

Devices, Vol. 10, No. 2, pp. 30-35, March 1994.

- Hua Li and Cheng-Jen Lin, ``Detecting Dimple Defects of Polished Wafer Surface Based on Fuzzy Logics,'' IEEE Transactions on Industrial Applications, Vol. 30, No. 2, pp. 317-323, March/April 1994.

- Hua Li and Ching-Ho Chen, ``A Neural-Type Network for Solving Minimal Energy Path in Real Time,'' IEEE Transactions on Circuits and Systems, Part I, Vol. 40, No. 2, CAS-I, pp. 111-123, Feb., 1993.

- Jun Wang and Hua Li, ``Solving Simultaneous Linear Equations Based on a Recurrent Neural Network,'' International J. of Information Science, Vol. 76, No. 3/4, pp. 255-278, 1993, Elsvier Publishing Co., New York.

- Hua Li and Jun Wang, ``Computing Optical Flow with a Recurrent Neural Network,'' International J. of Pattern Recognition and Artificial Intelligence, Vol. 7, No. 4, 1993, World Scientific Publishing Co. Pte. Ltd.

- Hua Li, ``Three-Dimensional High Resolution Computer Graphics Using EGA/VGA Card,'' IEEE Transactions on Education, Vol. 35, No. 1, pp. 44-49, 1992.

- Hua Li and Ching-Ho Chen, ``Simulating A Function of Peripheral Processes by Analog VLSI Network,'' IEEE MACRO, Vol. 11, No. 5, pp. 8-15, 1991.

- Hua Li and Ching-Ho Chen, ``Silicon Implementation of a Function of Visual Peripheral Processes,'' IEE Electronics Letters, Vol. 26, No. 24, pp. 2013-2015, 1990.

- Hua Li, ``Two-Stage Strategy for Motion Parameter Estimation in Dynamic Images,'' International J. of Applied Artificial Intelligence, Vol. 3, No. 4, pp. 427-438, 1989, Hemisphere Publishing Corporation.

- Hua Li and H.S. Yang, ``Image Enhancement Using Fuzzy Relaxation Technique,'' IEEE Transactions on Systems, Man, and Cybernetics, Vol. 19, No. 5, pp. 1276-1281, 1989.

Educational Research Grant in the Past 5 Years

1. Embedded Systems, $10K, Graphics Functionality Design and Implementation for NXP LPC Embedded Systems, 2009.
2. Micro Processor Systems Lab Enhancement Grant, $75K, San Jose State University, 2014-2015.

Patents

Twenty Four (24) Patents in the relevant research areas since 2006.

Education

BS: Electronics Engineering, Tianjin University, Tianjiin, China, 1981;
Graduate School: Electrical Engineering, Hsinghua University, Beijing, China, 1982;
MS: Electrical and Computer Engineering, University of Iowa, 1984;
Ph.D.: Electrical and Computer Engineering, University of Iowa, 1989.

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