

## Resume

### Jing Li

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#### OBJECTIVES:

Research and/or development position in advanced control system design/analysis. Research and/or development position in automation system design.

#### EDUCATION:

- Ph.D. in *Electrical Engineering* (GPA: 4.0/4.0)** *March, 2001*  
Department of Electrical and Computer Engineering, Duke University  
**Research Area:** Advanced signal processing algorithm development  
Advanced control of time-varying systems
- M.S. in *Systems Engineering* (GPA: 3.9/4.0)** *July, 1996*  
Systems Engineering Institute, Xian JiaoTong University, P.R.China  
**Thesis Title:** The Fuzzy PID Gain Conditioner: Algorithm, Architecture and ASIC Implementation
- B.S. in *Electrical Engineering* (GPA: 3.75/4.0)** *August 1993*  
Dept. of Information and Control Engineering, Xian JiaoTong Univ., P.R.China

#### WORK EXPERIENCE

- IBM Microelectronics,** *April 2001-Present*  
*Staff Engineer/Scientist*

#### RESEARCH EXPERIENCE

- Duke University,** Dept. of Electrical and Computer Engineering, *1997-2001*  
**Advanced Signal Processing for UXO Detection** (*Sept. 1998 – March 2001*)  
Completed the MURI project to develop better signal processing algorithm for UXO (unexploded object) detection. Focused on sensor fusion techniques to achieve improved reliability, extended coverage and enhanced performance. Designed a systematic approach combining pattern recognition techniques and signal processing theory. Duke team won *SEDRP Best Project of 2000*.  
**Advanced Elevator Control** (*Feb. 1997 - Sept.1998*)  
Completed elevator control project sponsored by OTIS Elevator Company to provide a controller for high-rise/high-speed elevators. Provided an advanced robust tracking control framework satisfying the stringent performance requirement. Project successfully completed in 1998 and paper invited for ACC.  
**Nonlinear Control of Time-Varying Systems** (*Sept. 1996 - Sept.1998*)  
Focused on system analysis and controller synthesis for nonlinear systems in the framework of Takagi-Sugeno model. Focused on various aspects ranging from modeling to control system synthesis. Applied LMI (linear matrix inequality) techniques in the analysis/synthesis of system performances.
- Xian JiaoTong University,** Systems Engineering Institute *1993 – 1996*  
**ASIC Design in Control System** (*Sept. 1994 – June 1996*)  
Studied ASIC design for control systems. Research highly evaluated by the Academic Sinica of China. Two journal papers published.  
**Simulation Software for Parallel Computation** (*Sept. 1994- March 1994*)

**Electrical Test Platform Design** (Fall 1994)  
 Designed electrical test platform for oil pump that is currently used in the Victory Oil Field in China.

**Xian JiaoTong University,** 1989 – 1993  
**Intelligent Measurement System Design** (1993)  
 Developed an IEEE-488-2 PC interface board together with programming interfaces. Great success achieved after commercialized.

**CAI Software Design** (1992)

**Teaching/Lab EXPERIENCE:**

**Duke University,** Dept. of Electrical and Computer Engineering Fall, 1996  
 Teaching Assistant in “Linear Control System Theory”

**Xian JiaoTong University,** System Engineering Institute 1993 – 1996  
 Assisting the establishment of National Manufacturing System Engineering Lab.

**SKILLS :**

**Programming:** C, C++, Fortran, Pascal, Perl, HTML, TCP/IP  
 Matlab, Maple, Mathematica, X-windows programming.

**CAD Tools:** Mentor Graphics, Spice, and PowerView  
 Dynamics, DSTOOL.

**Hardware Design:** PC interface design, FPGA design.

**Mathematics:** Functional Analysis, Nonlinear Dynamics, ODE, PDE,  
 Scientific Computing, Differential Geometry and Fluid Mechanics.

**Other Skills:** System Integration and Analysis, Software Design.

**SOCIAL ACTIVITIES AND AFFILIATIONS**

VP of Chinese Student Association in Duke University, 1998  
 Committee Member of Science Society Council in Xian JiaoTong Univ, 1992  
 Member of IEEE Control Systems since 1996  
 Member of SIAM since 1999  
 Sports fan of Duke Basketball Team

**AWARDS & HONORS :**

Research Fellowship, Duke University Summer 1998.  
 Team member of best SERDP project of 2000, November 2000  
 Sunshine Fellowship, Xian JiaoTong University 1996.  
 Outstanding Graduate Student Scholarship, Xian JiaoTong University 1994.  
 First Class Scholarship, Xian JiaoTong University, 1993.  
 Excellence in MCM (Mathematical Competition in Modeling) 1992.  
 Outstanding Award in Cait Computer Programming Competition 1992.  
 Scholarship 1989 - 1993

**PRESENTATIONS :**

“Advanced Motion Controller for High-rise/High-speed Elevators”, OTIS Elevator Co., March. 1998.  
 “Clustering Based Sensor Fusion in Landmine Detection”, DARPA Meeting, August 2000.

**REFERENCES (available upon request):**

#### JOURNAL PUBLICATIONS :

1. A Comparison of the Performance of Statistical and Fuzzy Algorithms for the Unexploded Ordnance Detection  
Leslie M. Collins, Yan Zhang, **Jing Li**, Hua Wang and Lawrence Carin  
*Accepted by IEEE Trans. on Fuzzy Systems, 2000.*
2. Dynamic Parallel Distributed Compensation for Takagi-Sugeno Fuzzy Models  
**J. Li**, D. Niemann, H. O. Wang and K. Tanaka,  
*Information Sciences*, No 123, pp. 201-221, 2000.
3. Using Linear Takagi-Sugeno Fuzzy Systems to Approximate Nonlinear Functions - Applications to Modeling and Control of Nonlinear Systems  
**J. Li**, D. Niemann, H. O. Wang and K. Tanaka, *Accepted by IEEE Trans. on Fuzzy Systems.*
4. Parallel Distributed Compensation for Takagi-Sugeno Fuzzy Models: New Stability Conditions and Dynamic Feedback Designs (Part 1)  
**J. Li**, D. Niemann, H. O. Wang and K. Tanaka, *submitted to Automatica.*
5. Parallel Distributed Compensation for Takagi-Sugeno Fuzzy Models: Multiobjective Controller Design (Part 2)  
**J. Li**, D. Niemann, H. O. Wang and K. Tanaka, *submitted to Automatica.*
6. A Fuzzy Logic Approach to Optimal Control of Nonlinear Systems  
**J. Li**, H. O. Wang, L. Bushnell and K. Tanaka  
*Int. J. Fuzzy Systems* Vol. 2, No. 3, pp. 153-161, 2000.
7. The ASIC Design of A High Speed PID Controller  
**J. Li** and B.S. Hu,  
*J. of Electronic Measurement and Instrument*, Vol. 10, No. 3, pp. 30-34, 1996
8. Algorithm, Architecture and FPGA Implementation for Fuzzy PID Gain Conditioner  
**J. Li** and B.S. Hu,  
*J. of Xian JiaoTong University*. Vol. 32, No.5, pp. 9-13, 1998

#### CONFERENCE PUBLICATIONS :

1. Stable fuzzy control of the nonlinear benchmark control problem: a system-theoretic approach.  
**J. Li**, H. O. Wang and K. Tanaka, *in Joint Conf. of Information Science*, North Carolina, pp. 263-266, 1997.
2. Fuzzy modeling and control of chaotic systems: regulation, synchronization and model following.  
H. O. Wang, **J. Li**, K. Tanaka and T. Ikeda, *in Proc. 7th IFSA World Congress*, Vol. 4, pp. 272-278, Prague, June, 1997.
3. Robust tracking of high rise/high speed elevators  
**J. Li**, D. Niemann and H. O. Wang, *in Proc. American Control Conference*, Philadelphia, PA, June 1998, pp. 3445-3449.
4. Parallel distributed compensation for Takagi-Sugeno fuzzy models: multi-objective controller design  
**J. Li**, D. Niemann, H. O. Wang and K. Tanaka, *in Proc. 1999 American Control Conference*, San Diego, June 1999.
5. Multiobjective dynamic feedback control of Takagi-Sugeno model via LMIs  
**J. Li**, D. Niemann, H. O. Wang and K. Tanaka, *in Proc. 6th Int. Conf. on Fuzzy Theory and Technology*, Mar. 1998, pp. 159-165.
6. Parallel Distributed Compensation for Takagi-Sugeno fuzzy models: new stability conditions and dynamic feedback designs  
D. Niemann, **J. Li**, H. O. Wang and K. Tanaka, *in Proc. IFAC 1999*, Beijing, July 1999, pp. 207-212.
7. T-S Fuzzy Model with Linear Rule Consequence and PDC Controller: A Universal Framework for Nonlinear Control Systems  
**J. Li**, H. O. Wang, D. Niemann and K. Tanaka, *in Proc. 9th IEEE Int. Conf. on Fuzzy Systems*, May 2000.
8. Synthesis of Gain-scheduled Controller for a class of LPV systems  
**J. Li**, H. O. Wang, D. Niemann and K. Tanaka, *in Proc. 38th CDC*, Phoenix, AZ, December 1999, pp. 2314-2319.
9. Improved UXO detection via sensor fusion  
Y. Zhang, **J. Li**, L. Carin, L. M. Collins, *in SPIE's 14th Annual Symposium on AeroSense*, Orlando, FL, April 2000.
10. The fuzzy PID gain conditioner: algorithm, architecture and FPGA implementation  
Bao-sheng Hu and **J. Li**, *in Proc. of the IEEE Int. Conf. on Industrial Technology*, Beijing, 1996.
11. The architecture of fuzzy PID gain conditioner and its FPGA pro-type implementation  
**J. Li** and Bao-sheng Hu, *in Proc. 2nd International Conf. on ASIC*, Shanghai, 1996.