

# JIANBO LIU

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- EDUCATION**
- University of Michigan** Ann Arbor, Michigan  
*Ph.D. Mechanical Engineering*  
Dissertation: ANOMALY DETECTION IN AUTOMOTIVE APPLICATIONS  
GPA: 8.55 / 9  
**Expected September 2006**
- University of Michigan** Ann Arbor, Michigan  
*M.S.E. Mechanical Engineering*  
GPA: 8.77 / 9  
**May 2003**
- Shanghai Jiaotong University** Shanghai, China  
*M.S.E. Mechatronics Engineering*  
Thesis: SIGNATURE ANALYSIS AND TOOL CONDITION ASSESSMENT IN DRILLING  
GPA ranking top 5%  
**Expected**
- Dalian University of Technology** Dalian, China  
*B.E. Mechanical Design & Manufacturing and Its Application*  
*B.A. Japanese Literature*  
**May 2001**  
**May 2001**
- CERTIFICATE** Japanese Language Proficiency Certificate Level 1, Feb. 2000
- EXPERIENCE**
- Research Assistant* **October 2003 – Present**  
**Center for Intelligent Maintenance System** University of Michigan, Ann Arbor
- Closely worked with member companies and developed intellectual properties
  - One patent application and two invention disclosures
  - Presented twice a year at the Industrial Advisory Board meeting
- Research Assistant* **October 2003 – Present**  
**S. M. Wu Manufacturing Research Center** University of Michigan, Ann Arbor
- Developed practical approaches for dynamic system anomaly detection and fault isolation
  - Extensive experiences with modeling using simulink S-function
  - Extensive experiences with nonlinear/linear system modeling and identification
- Research Assistant* **September 2002 – September 2003**  
**Engineering Research Center for Reconfigurable Manufacturing System** University of Michigan, Ann Arbor
- Worked with major sensor company to develop, improve and commercialize drilling/turning process monitoring system
  - Extensive experiences with feature extraction based on wavelet analysis and time frequency analysis
  - Extensive experiences with Hidden Markov Model based stochastic modeling and pattern classification
  - Mentored two undergraduate students and one graduate student conducting experiments and independent research
- HONORS**
- College of Engineering Tuition Fellowship (2002-2003)  
MEKTRON Ltd. Japanese Language Study Scholarship (2001)  
JUNSAICO Japanese Language Study Scholarship (2000)  
Department Excellent Student Scholarships (1996-2001)
- LANGUAGE** English, Japanese, Chinese
- COMPUTER**
- Programming Languages:* MATLAB, Simulink, LABView, C/C++, Fortran 77, ASCET-SD  
*Operating Systems:* Windows NT/XP, Mac OS X, FreeBSD  
*Software Application:* Microsoft Office, Visual Studio .NET, L<sup>A</sup>T<sub>E</sub>X, AutoCAD
- PATENTS**
- Miller, W., Liu, J. and Djurdjanovic, D., "Method and Systems for Anomaly Detection", US Patent Serial Number 10/967-102, Oct. 2004 (pending).

**PUBLICATIONS  
AND REPORTS**

**Anomaly detection and fault diagnosis**

Djurđjanovic, D., Ni, J. and Liu, J.: Building an engineering immune system: a new paradigm for design of automotive diagnostic systems, submitted to ?.

Liu, J., Djurđjanovic, D., Marko, K., and Ni, J.: Growing structure multiple model system for anomaly detection and fault diagnosis, to be appear in the proceedings of International Symposium on Flexible Automation 2006.

Liu, J., Sun, P., Djurđjanovic, D., Marko, K. and Ni, J.: Growing structure multiple model system based anomaly detection for crankshaft monitoring, to appear in the proceedings of International Symposium on Neural Networks 2006.

Liu, J., Djurđjanovic, D., Marko, K. and Ni, J.: A novel method for anomaly detection, localization and fault isolation for dynamic control systems, Submitted to IEEE Transactions on Control System Technology, 2005

**Prognosis**

Liu, J., Djurđjanovic, D., Ni, J. and Lee, J.: Performance similarity based method for enhanced prediction of manufacturing process performance, ASME International Mechanical Engineering Congress November 13-19, 2004, Anaheim, California USA.

**Discrete event system**

Lei, Y., Liu, J., Ni, J. and Lee, J.: Production line simulation using stochastic timed Petri nets for maintenance scheduling, to appear in the proceedings of 12th IFAC Symposium on Information Control Problems in Manufacturing.

**Pattern recognition**

Assouad, P., Liu, J. and Zbigniew, J.: Performance assessment of two classification schemes for cutting tool degradation monitoring, Proceedings of the IEEE International Conference on Systems, Man and Cybernetics, Washington, DC, United States, 2003

**GRADUATE  
COURSES**

**System and control**

Automatic Control; Discrete Event Systems; Linear system theory; Linear feedback control systems; Stochastic control; Nonlinear systems and control;

**Signal processing**

Advanced signal processing; Wavelet and time frequency distributions; Estimation, filtering and detection;

**Probability and random process**

Probability theory; Discrete time random processes;

**Mechanical engineering**

Time series modeling, analysis, forecasting; Introduction to robotics: theory and practice; Design optimization; Methods of differential equations in mechanics;