

CURRICULUM VITAE

Yong Chen

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EDUCATION

- Ph.D.** August 2003, Industrial and Operations Engineering, University of Michigan, Ann Arbor, MI (dissertation (co)advisors: Professor Jianjun (Jan) Shi and Professor Jionghua (Judy) Jin)
- M.A.** April 2003, Statistics, University of Michigan, Ann Arbor, MI
- M.S.** April 2000, Industrial and Operations Engineering, University of Michigan, Ann Arbor, MI
- B.E.** July 1998, Computer Science & Engineering, Tsinghua University, Beijing, China

PROFESSIONAL EXPERIENCE

- August, 2003 – present**, Assistant Professor, Industrial Engineering, University of Iowa, Iowa City, IA
- August, 1998 – August, 2003**, Research Assistant, Dept. of Industrial and Operations Engineering, University of Michigan, Ann Arbor, MI

ACADEMIC AWARDS

1. Research
 - The RSPS Faculty Award, Center for Computer-Aided Design, University of Iowa, 2005.
 - Best Paper Award, IIE Transactions on Quality and Reliability Engineering, 2003-2004.
 - Rackham Predoctoral Fellowship, University of Michigan, 2003. This is a prestigious fellowship awarded to 60 outstanding students among nearly 7000 graduate students from 130 degree programs based on their academic accomplishments and scholarly achievements.
 - College of Engineering (CoE) Distinguished Achievement Award, University of Michigan, 2002. Awarded annually to one graduate student per department in the College of Engineering based on overall academic performance.
 - Best Student Paper Award, from Quality, Statistics, and Reliability (QSR) Section of Institute for Operations Research and the Management Sciences (INFORMS), 2001.

2. Teaching

- Outstanding Educator Award, from Institute of Industrial Engineers (IIE) student chapter, The University of Iowa, 2004.
- Outstanding Graduate Student Instructor Award, from Horace H. Rackham School of Graduate Studies, University of Michigan, 2002. Awarded to twenty graduate student instructors in 130 degree programs.
- Outstanding Student Instructor Award, from the American Society for Engineering Education (ASEE) and the College of Engineering at the University of Michigan, 2002. Awarded to four student instructors in the college of engineering in 2002.

3. Awards Received by Graduate Advisees

- Qingyu Yang, University of Iowa Student Government Scholarly Presentation and Research Grants, 2006.
- Qingyu Yang, The RSPS Research Award, Center for Computer-Aided Design, University of Iowa, 2005.

TEACHING EXPERIENCE

1. Courses Taught

- Undergraduate required courses at University of Iowa:
 - 56:171 Operations Research (4 credits)
 - Fall 2003 (Enrollment: 52)—Q1*: mean=5.5/6.0; Q2*: mean=5.5/6.0
 - Fall 2004 (Enrollment: 33)—Q1: mean = 5.6/6.0; Q2: mean=5.5/6.0
 - Fall 2005 (Enrollment: 29)—Q1: mean=5.0/6.0; Q2: mean=5.4/6.0
 - Fall 2006 (Enrollment: 19) —Q1: mean=5.5/6.0; Q2: mean=5.7/6.0
 - 56:178 Digital Systems Simulation (3 credits)
 - Spring 2006 (Enrollment: 38)—Q1: mean=5.3/6.0; Q2: mean=5.4/6.0
- Graduate courses at University of Iowa:
 - 56:295 Reliability Theory and Applications (newly developed course, 3 credits)
 - Spring 2004 (Enrollment: 8)—Q1: mean=5.8/6.0; Q2: mean=6.0/6.0
 - 56:271 Nonlinear Optimization (3 credits)
 - Spring 2005 (Enrollment: 12)—Q1: mean = 6.0/6.0; Q2: mean=5.8/6.0
 - 56:295 Multivariate Analysis and Advanced Quality Control (newly developed course, 3 credits)
 - Fall 2005 (Enrollment: 13)—Q1: mean=5.6/6.0; Q2: mean=5.8/6.0
- Taught IOE 466 “Statistical Quality Control” at University of Michigan as an adjunct lecturer for two semesters and received two outstanding student instructor awards.

*Q1: the instructor was effective; Q2: I acquired a basic understanding of the subject area

2. Ph. D. Student Advising

1. Mr. Qingyu Yang, “Optimal Reliability Modeling of Linear Sensor Systems”. Expected graduation date: Dec. 2007.
2. Ms. Shan Li, “Simultaneous Monitoring of Process and Sensor Faults for Quality Control of Complex Manufacturing Systems”. Expected graduation date: Aug., 2008.
3. Ms. Ivy Donaldson, “Bayesian Methods for Sensor Fault Detection in Sensor Fusion Problems”. Third year PhD student.

RESEARCH INTERESTS

My current research interests focus on improvements of reliability and fault tolerance of large-scale sensor systems and networks through integrated applications of reliability theory, simulation techniques, combinatorics, and robust statistical methods.

- Reliability Theory: network reliability; reliability of matroid structures; reliability bounds and Monte Carlo methods; risk-sensitive maintenance decision making.
- Optimal Sensor System Reliability Modeling: sensor system reliability and fault-tolerance evaluation; sensor system design optimization.
- Sensor Fault Detection and Partially Diagnosable Systems: diagnosability analysis for partially diagnosable systems; sensor fault self-diagnosis; Bayesian methods for fixed-effects and random-effects partially diagnosable systems.

RESEARCH GRANTS

Reliability of Variation Source Sensor Systems (\$199,987, 09/2005 – 08/2008). Sponsor: NSF. (PI: Yong Chen)

Sensor Diagnostics and Failure Mode Analysis for Field Robotics (\$150,000, 11/01/2006 – 10/31/2007). Sponsor: John Deere (fund approved but not allocated yet). (PI: Nagi Gebraeel; Co-PI: Yong Chen and Geb Thomas).

Quality and Reliability Chain Modeling and Analysis for Multi-Station Sheet Metal Assembly Processes. Sponsor: Carver Scientific Research Initiative Grant. (PI: Yong Chen, \$11,452, 01/2004—12/2004)

PUBLICATIONS

Refereed Journals (papers published or accepted)

1. Chen, Y. (2006) Application of Matroid Theory for Diagnosability Study of Coordinate Sensing Systems in Discrete-Part Manufacturing Processes. *Technometrics*, vol. 48, 386-398.

2. Zantek, P., Li, S.*, and Chen, Y. (2006) Detecting Multiple Special Causes from Multivariate Data with Applications to Fault Detection in Manufacturing. Accepted by *IIE Transactions*.
3. Chen, Y. and Jin, J. (2006) Quality-Oriented-Maintenance for Multiple Interactive Components. *IEEE Transactions on Reliability*, vol. 55, 123-134.
4. Chen, Y., Ding, Y., Jin, J., and Ceglarek, D. (2006) Integration of Tolerance and Maintenance Design for Multistage Manufacturing Processes. *IEEE Transactions on Automation Science and Engineering*, vol. 3, 440-453.
5. Chen, Y. and Yang, Q. (2005) Reliability of Two-Stage Weighted-k-out-of-n Systems with Components In Common. *IEEE Transactions on Reliability*, vol. 54, 431-440.
6. Chen, Y. and Jin, J. (2005) Quality-Reliability Chain Modeling for System-Reliability Analysis of Complex Manufacturing Processes. *IEEE Transactions on Reliability*, vol. 54, 475-488.
7. Liu, Q., Ding, Y., and Chen, Y. (2005) Optimal Coordinate Sensor Placements for Estimating Mean and Variance Components of Variation Sources. *IIE Transactions*, vol. 37, 877-889.
8. Chen, Y., Jin, J. and Shi, J. (2004) Integration of Dimensional Quality and Locator Reliability in Design and Evaluation of Multi-station Body-In-White Assembly Processes. *IIE Transactions*, vol. 39, 827-839.
9. Zhou, S., Chen, Y., and Shi, J. (2004) Statistical Estimation and Testing for Variation Root Cause Determination of Multistage Manufacturing Processes. *IEEE Transactions on Automation Science and Engineering*, vol. 1, 73-83.
10. Ding, Y., Zhou, S., and Chen, Y. (2004) A Comparison of Process Variation Estimators for In-Process Dimensional Measurements and Control. *ASME Transactions, Journal of Dynamic Systems, Measurement and Control*, vol. 127, 69-79.
11. Chen, Y. and Jin, J. (2003) Cost-Variability-Sensitive Preventive Maintenance Considering Management Risk. *IIE Transactions*, vol. 35, 1091-1101. (Awarded the *Best Paper Award* for IIE Transactions on Quality and Reliability Engineering)
12. Zhou, S., Ding, Y., Chen, Y., and Shi, J. (2003) Diagnosability Study of Multistage Manufacturing Processes Based on Linear Mixed-Effects Models. *Technometrics*, vol. 45, 312-325.
13. Jin, J. and Chen, Y. (2001) Quality and Reliability Information Integration for Design Evaluation of Fixture System Reliability. *Quality and Reliability Engineering International*, vol. 17, 355-372.

Papers Submitted

14. Chen, Y. and Yang, Q. (2006) Sensor System Reliability Modeling and Analysis for Fault Diagnosis in Multistage Manufacturing Processes. Submitted to *IIE Transactions*.
15. Yang, Q. and Chen, Y. (2006) Reliability of Coordinate Sensing Systems Under the Risk of Increasing Measurement Variance. Submitted to *Naval Research Logistics*.

* My Ph.D. students at University of Iowa are underlined

16. Li, S. and Chen, Y. (2006) Sensor Fault Detection for Manufacturing Quality Control. Submitted to *IIE Transactions*.
17. Cho, J. J., Chen, Y., and Ding, Y. (2006) On the (Co)Girth of Connected Matroids, Submitted to *Discrete Applied Mathematics*.
18. Cho, J. J., Chen, Y., and Ding, Y. (2006) On the Breakdown Point Condition of Structured Linear Models, Submitted to *Technometrics*.
19. Cho, J. J., Ding, Y., Chen, Y., and Tang, J. (2006) Robust Calibration for Localization in Clustered Wireless Sensor Networks. Submitted to *IEEE Transactions on Automation Science and Engineering*.

Papers In Preparation

20. Yang, Q. and Chen, Y. Reliability Evaluation for Linear Sensor Systems Based on Monte Carlo Methods.
21. Li, S. and Chen, Y. Bayesian Methods for Sensor Fault Identification in Linear Sensor Systems.

Conference Proceedings

22. Chen, Y., Donaldson, I. (2006) Application of Matroid Theory to Reliability Study of Coordinate Sensor Systems for Manufacturing Process Fault Diagnosis, Proceedings of 2006 NSF Design, Service, and Manufacturing Grantees and Research Conference, St. Louis, Missouri.
23. Chen, Y., Jin, J. and Shi, J. (2002) Quality and Reliability Integration in Multiple Station Autobody Assembly Processes. *Proceedings of the 5th International Conference on Frontiers of Design and Manufacturing, Dalian, China, 2002.*
24. Chen, Y., Jin, J. and Shi, J. (2001) Reliability Modeling and Analysis of Multi-station Manufacturing Processes Considering the Quality and Reliability Interaction. *Proceedings of IEEE International Conference on Systems, Man, and Cybernetics, Tucson, AZ, 2001.*

Presentations and Seminars

Invited Talks:

“Application of Matroid Theory in Diagnosability and Redundancy Analysis of Linear Sensor Systems”, Invited Seminar at Dept. of Statistics and Actuarial Science, University of Iowa, March 2006.

“Cost-Variability-Sensitive Preventive Maintenance Considering Management Risk”, *IIE Transactions Best Paper Award Presentation*, Invited by Editor-in-Chief, IERC, Atlanta, May 2005.

“Diagnosability Analysis of Multi-Station Manufacturing Systems based on Mixed Linear Models”, *Technometrics Selected Paper Presentation*, Invited by Editor, INFORMS, Atlanta, GA, October 2003

“Diagnosis and Maintenance of Complex Manufacturing Systems”, Invited Seminar at Dept. of Management Sciences, College of Business, University of Iowa, October 2003.

“Diagnosability Analysis and Maintenance Decision for In-Process Quality Improvement”, Dept. of Mechanical and Industrial Engineering, University of Iowa, March 2003.

“Diagnosability Analysis and Maintenance Decision for In-Process Quality Improvement”, Dept. of Industrial Engineering and Management Sciences, Northwestern University, February 2003.

At National/International Conferences:

1. “Evaluation of Coordinate Sensor System Reliability Using Monte Carlo Methods”, INFORMS, Pittsburgh, PA, 2006
2. “Sensor Fault Detection for Manufacturing Quality Control”, INFORMS, Pittsburgh, PA, 2006
3. “Sensor System Reliability Analysis for Manufacturing Variation Control”, JRC, Knoxville, TN, 2006
4. “Monitoring of Process and Sensor Fault Based on a Fault-quality Model”, INFORMS, San Francisco, CA, 2005
5. “Multi-Component Degradation Modeling in Large Scale Systems”, INFORMS, San Francisco, CA, 2005
6. “Optimal Coordinate Sensor Redundancy Allocation”, INFORMS, San Francisco, CA, 2005
7. “Application of Matroid Theory for Diagnosability Study of Coordinate Sensing Systems in Discrete-Part Manufacturing Processes”, IERC, Atlanta, GA, 2005
8. “Reliability of Coordinate Sensing Systems Under the Risk of Increasing Measurement Variance”, IERC, Atlanta, GA, 2005
9. “Application of Matroid Theory to Reliability Study of Coordinate Sensing Systems for Automatic Fault Diagnosis”, INFORMS, Denver, CO, 2004.
10. “Reliability of Coordinate Sensing Systems Under the Risk of Increasing Measurement Variance”, INFORMS, Denver, CO, 2004.
11. “Two-Stage Weighted- k -out-of- n Models with Network Applications”, Fourth International Conference on Mathematical Methods in Reliability, Sante Fe, NM, 2004.
12. “Two-Stage Weighted- k -out-of- n Models with Components in Common”, IERC, Houston, TX, 2004.
13. “Cost-Variability-Sensitive Preventive Maintenance Considering Management Risk”, INFORMS, Atlanta, 2003.
14. “Quality-Oriented-Maintenance for Multiple Interactive Components”, INFORMS, Atlanta, 2003.
15. “Diagnosis of Variation Sources Using Linear Replicated Models”, INFORMS, San Jose, 2002.
16. “Quality and Reliability Integration in Multiple Station Autobody Assembly Processes”, the 5th International Conference on Frontiers of Design and Manufacturing, Dalian, China, 2002.
17. “Quality and Reliability Chain Modeling for System Reliability Analysis in Multi-station Manufacturing Processes”, INFORMS, Miami, 2001.

18. “Reliability Modeling and Analysis of Multi-station Manufacturing Processes Considering the Quality and Reliability Interaction”, IEEE International Conference on Systems, Man, and Cybernetics, Tucson, AZ, 2001.
19. “Quality and Reliability Information Integration in Multistage Manufacturing Processes”, the 9th Annual Industrial Engineering Research Conference, Cleveland, 2000.

SERVICE AND PROFESSIONAL ACTIVITIES

1. Society Officer Position

Secretary/Treasurer, INFORMS Section on Quality, Statistics, and Reliability, elected in 2006, term 2007-2008.

2. Editorship and Editorial Functions

- **Associate Editor**, Naval Research Logistics, 2006 - present.
- **Journal/Transaction Reviewers:**
IEEE Transactions on Systems, Man, and Cybernetics, IEEE Transactions on Automation Science and Engineering, IEEE Transactions on Reliability, Naval Research Logistics, Automatica, IIE Transactions, Journal of Flexible Manufacturing Systems, International Journal of Production Research

3. Conference Organization

- Organize a panel discussion session on “Journal Editor's Vision on Challenges and Trends in Quality, Statistics, and Reliability Research” at INFORMS 2005, San Francisco, CA.
- Organize 5 research sessions at INFORMS 2005, IERC 2005, and INFORMS 2003.

4. Service to Government Agency

Serving as a panelist/reviewer for the Manufacturing Machines and Equipment program of NSF in 2006.

PROFESSIONAL SOCIETIES

- Institute of Industrial Engineers (IIE).
- Institute for Operations Research and the Management Sciences (INFORMS)
- American Society for Quality (ASQ)