

Sohyung Cho, Ph.D.

Associate Professor, Industrial and Manufacturing Engineering
Southern Illinois University Edwardsville
Edwardsville, Illinois 62026
Phone: 618-650-2817, Fax: 618-650-2555, E-Mail: scho@siue.edu

HIGHER EDUCATION

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|------------------------|--|
| Ph.D. December 2000 | Industrial Engineering The Pennsylvania State University, University Park, PA |
| M.S. B.S. | Mechanical Engineering Seoul National University, Korea |

EXPERIENCE

Academic

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|---------------------------------------|--|
| Associate Professor 2011 – Present | Industrial and Manufacturing Engineering Southern Illinois University, Edwardsville, IL |
| Assistant Professor 2008 – 2011 | Industrial and Manufacturing Engineering Southern Illinois University, Edwardsville, IL |
| Assistant Professor 2003 – 2008 | Department of Industrial Engineering University of Miami, Coral Gables, FL |
| Visiting Researcher 2002 – 2003 | Department of Industrial Engineering University of Miami, Coral Gables, FL |
| Post-doctor 2001 – 2002 | Department of Industrial Engineering The Pennsylvania State University, University Park, PA |
| Research Assistant 1997 – 2000 | Department of Industrial Engineering The Pennsylvania State University, University Park, PA |

Non-Academic

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|---------------------------------|---------------------------|
| Senior Researcher 1994-1996 | Daesung R&D Center, Korea |
| Research Associate 1991-1994 | Daesung R&D Center, Korea |

PUBLICATIONS

Journal Papers

- [J1] Ohu I, Cho S, Awad M, Matthews B, Gordon C, Hubbard K (2011), Real-time assessment of surgical skill based on motion analysis of simulated minimally invasive surgery, *Surgery*, Submitted on May 2011.
- [J2] Poitier K, Cho S (2011), Estimation of true efficient frontiers of organizational performance using data envelopment analysis and support vector machine learning, *International Journal of Information and Decision Sciences*, 3(2), pp 148-172.
- [J3] Cho S, Kim J-Y (2011), Straightness and Flatness Evaluation using Data Envelopment Analysis, *International Journal of Advanced Manufacturing Technology*, Submitted on May 2011.
- [J4] Negahdaripour S, Cho S, Kim J-Y (2011), Controller design for an autonomous underwater vehicle using nonlinear observers, *International Journal of Ocean System Engineering*, 1(1), pp. 16-27.
- [J5] Lee K, Cho S, Asfour S (2011), Web-based algorithm for cylindricity evaluation using support vector machine learning, *Computers and Industrial Engineering*, 60, pp. 228-235.
- [J6] Cho S, Kim J-Y (2011), Machine learning based algorithm for circularity analysis, *International Journal of Advanced Manufacturing Technology*, Submitted on January 2011.
- [J7] Ahmed A, Erkoc M, Cho S (2011), Capacity investment, pricing, and production allocation across international markets with exchange rate uncertainty, *Special Issue of Asia Pacific Journal of Operational Research*, Accepted for Publication.
- [J8] Cho S, Lazaro A (2010), Control theoretic model using PID controller for just-in-time production scheduling, *International Journal of Advanced Manufacturing Technology*, 51(5):699-709.
- [J9] Cho S, Prabhu VV (2010), Editorial preface: special issue on information entropy models and applications, *International Journal of Information and Decision Sciences*, January 2010, In Press.
- [J10] Cho S (2010), Modeling of supply chain vulnerability using influence matrices, *Journal of Studies on Manufacturing*, 1, pp. 4-10.
- [J11] Cho S, Binsaeid S, Asfour S (2010), Design of multi-sensor fusion based tool condition monitoring system in end milling, *International Journal of Advanced Manufacturing Technology*, 46, pp. 681-694.
- [J12] Karacal C, Cho S, Yu W (2009), A novel approach to optimal cutting tool replacement, *World Academy of Science, Engineering and Technology*, 57, pp. 19-23.
- [J13] Cho S, Alamoudi R, Asfour S (2009), Interaction based complexity measure of manufacturing systems using information entropy, *International Journal of Computer Integrated Manufacturing*, 22(10), pp. 909-922.
- [J14] Alamoudi R, Cho S (2009), Entropic measure of supply chain vulnerability, *International Journal of Information and Decision Sciences*, In Press.

- [J15] Perez U, Cho S, Asfour S (2009), Volumetric calibration of stereo camera for visual servo based robot manipulator, *International Journal of Advanced Robotic Systems*, 6(1), pp. 35-42.
- [J16] Cho S, Erkoc M (2009), Design of predictable production scheduling model using control theoretic approach, *International Journal of Production Research*, 47(11), pp. 2975-2993.
- [J17] Binsaeid S, Asfour S, Cho S, Onar A (2009), Machine ensemble approach for simultaneous detection of transient and gradual abnormalities in end milling using multisensory fusion, *Journal of Materials Process Technology*, 209, pp. 4728-4738.
- [J18] Chakraborty P, Asfour S, Cho S, Onar A, Lynn M (2008), Prediction of tool wear progression by using mixed effects modeling technique when end milling 4340 alloy steel with coated carbide inserts under semi-dry and dry machining condition, *Journal of Materials Process Technology*, 205, pp. 190-202.
- [J19] Cho S, Prabhu VV (2007), Distributed adaptive control of production scheduling and machine capacity, *Journal of Manufacturing Systems*, Special Issue on Distributed Control of Manufacturing Systems, 26, pp. 65-74.
- [J20] Cho S (2005), Distributed time-driven simulation for modeling, analysis, and control of manufacturing shop-floor, *Computers and Industrial Engineering*, 49, pp. 572-590.
- [J21] Cho S, Fuke I, Prabhu VV (2005), Motion planning for coating process optimization in electron beam physical vapor deposition, *Surface Engineering*, 21(4), pp. 279-289.
- [J22] Cho S, Lewis S, Prabhu VV, Fuke I (2005), Intelligent automation of electron beam – physical vapor deposition (EB-PVD), *Surface Engineering*, 21(1), pp. 17-26.
- [J23] Cho S, Asfour S, Onar A, Kaundinya N (2005), Tool breakage detection using support vector machine learning in a milling process, *International Journal of Machine Tools and Manufacturing*, 45(3), pp. 241-249.
- [J24] Fuke I, Prabhu VV, Cho S, George T, Singh J (2005), Rapid manufacturing of rhenium components using EB-PVD, *Rapid Prototyping Journal*, 11(2), pp. 66-73.
- [J25] Cho S, Prabhu VV (2002), A vector space model for variance reduction in single machine scheduling, *IIE Transactions*, 34, pp. 933-952.
- [J26] Cho S, Prabhu VV (2002), Sliding mode dynamics in continuous feedback control for distributed discrete-event scheduling, *Automatica*, 38(9), pp. 1499-1515.
- [J27] Gougar H, Cho S, Prabhu VV (2002), High performance loading robot design in a tool delivery system, *International Journal of Production Research*, 40(14), pp. 3401-3424.
- [J28] Cho S, Prabhu VV (2001), Distributed control of machine capacity and production scheduling, *Transactions of NAMRI/SME*, 29, pp. 501-508.
- [J29] Prabhu VV, Cho S, Koomsap P (1999), High performance computing and communication for real-time feedback in distributed manufacturing control systems, *CIRP-Journal of Manufacturing Systems*, 29(1), pp. 79-83.

Conference Proceedings

- [C1] Byun S, Sohn, K, Lee S, Cho S, Kim J (2010), Design, Implementation and Test of Manta-type Unmanned Underwater test Vehicle, *International Conference on Internet (ICONI)*, December 16-20, Philippine (Refereed).
- [C2] Cho S, Karacal C, Yu X (2010), Cutting tool replacement: an empirical approach, 2010 *Industrial Engineering Research Conference (IERC)*, June 5-9, 2010, Cancun, Mexico (Refereed).
- [C3] Cho S (2010), Linear programming formulation of form tolerance evaluation using data envelopment analysis, *Flexible Automation and Intelligent Manufacturing, FAIM2010*, July 12-14, 2010, California (Refereed).
- [C4] Youn LT, Cho S (2009), Optimal operation of energy storage using linear programming technique, *Proceedings of WCECS, 2009: 20-22 October*, pp. 480-485 (Refereed).
- [C5] Karacal C, Cho S, Yu X (2009), A Novel Approach to Optimal Cutting Tool Replacement, 2009 ICMIE 2009 *International Conference on Mechanical and Industrial Engineering*, September 23- 25 2009, Amsterdam, Netherlands (Refereed).
- [C6] Karacal C, Cho S, Yu X (2009), Sensor stream mining for tool condition monitoring, *International Conference on Computers and Industrial Engineering (C&IE39)*, Troyes, France, July 2009 (Refereed).
- [C7] Cho S, Lee HF, Hubbard K (2009), Circularity analysis using support vector machine algorithm, *Flexible Automation and Intelligent Manufacturing, FAIM2009*, Teesside, UK, July 2009 (Refereed).
- [C8] Lee HF, Cho S (2009), Reverse engineering with Unigraphics NX, *PLM World Conference 2009* (Presentation).
- [C9] Youn LT, Cho S (2009), Optimal operation of energy storage, *IMACS Multiconference on Computational Engineering in Systems Applications*, July 2009, Seoul, Korea (Refereed).
- [C10] Al-amoudi R, Cho S, Asfour S (2008), Analysis of manufacturing system complexity: effect of part mix ratios to system performance, *FAIM 2008*, Skovde, Sweden (Refereed).
- [C11] BinSaied S, Asfour S, Cho S, Eltoukhy M (2007), Performance comparison of machine learning algorithms and feature reduction techniques for tool condition classification during end milling, *International Conference on Computers and Industrial Engineering (ICC&IE 2007)*, October 2007, Alexandria, Egypt (Refereed).
- [C12] Cho S, Buitrago J, Iakovou E (2007), Design of resilient supply chains: effective use of influence matrices for disruption preparedness, *International Conference on Changeable, Agile, Reconfigurable and Virtual Production*, July 22 – 24 2007, Toronto, Canada (Refereed).
- [C13] Alfonzo L, Cho S (2006), Design of PID controller for just-in-time production scheduling, 2006 *IERC (Industrial Engineering Research Conference)*, Orlando, Florida, May 2006 (Refereed).
- [C14] Cho S, Asfour S (2005), Predictable production scheduling using control theoretic approach for adaptable manufacturing systems, *1st International Conference on Changeable,*

- Agile, Reconfigurable and Virtual Production (CARV05)*, Munchen, Germany, September 2005 (Refereed).
- [C15] Cho S, Prabhu VV (2001), Distributed control of machine capacity and production scheduling, *29th NAMRI/SME Conference*, University of Florida, FL, May 2001 (Refereed).
- [C16] Cho S, Prabhu VV (2001), First look at tomorrow's technology, *Manufacturing Engineering, Society of Manufacturing Engineers*, Vol.127, No. 1, July 2001.
- [C17] Cho S, Prabhu VV (1999), Analysis of limit cycle and scheduling performance in heterarchical manufacturing systems, *8th IERC Conference*, Phoenix, May 1999 (Refereed).
- [C18] Cho S, Prabhu VV (1998), Analytical model for synthesizing distributed arrival time controllers in heterarchical manufacturing systems, *7th IERC Conference*, Banff, Canada, May 1998 (Refereed).
- [C19] Prabhu VV, Cho S, Koomsap P (1998), High performance computing and communication for real-time feedback in distributed manufacturing control systems, *31st CIRP International Seminar on Manufacturing Systems*, Berkeley, May 1998 (Refereed).

PROFESSIONAL

Research Projects (Awarded)

1. STEP 2011 at SIUE: Analysis of surgical motions in minimally invasive surgery (PI), \$15,200, 7/1/2011 – 6/30/2012.
2. SAGES 2011 Research Grant, Ergonomic analysis of robotic surgery (co-PI), \$30,000, 07/01/2011 – 6/30/2012.
3. Intuitive Surgical 2011 Robotics Research Grant: Ergonomic analysis of robotic surgery (co-PI), \$47,250, 07/01/2011 – 06/30/2012.
4. NSF MRI: Acquisition of major components required for constructing supply chain test-bed (PI), \$193,000, 09/01/ 2010 – 08/31/2011.
5. Excellence in Undergraduate Education (EUE) at SIUE: Curriculum renovation using product life cycle engineering (PI), \$17,771, 8/1/2009 – 7/31/2010.
6. STEP 2010 at SIUE: The use of electronic nose for on-line and real-time tool condition monitoring systems (PI), \$15,999, 7/1/2009 – 6/30/2010.
7. Ag Defense, Inc.: Development of pathogen analysis device (co-PI), \$7,207, 10/14/2008 – 11/10/2008.
8. Summer Research Fellowship (SRF) at SIUE: Circularity analysis using support vector machine learning algorithm, \$4,000, 11/01/2008 – 07/31/2009.
9. W. Lorenz Surgical, Inc.: Quality control of medical screws using automated inspection system (PI), \$41,000, 6/28/2006 – 6/1/2007.
10. GRSA (General Research Support Award) at University of Miami, Intelligent monitoring system for machining process using support vector machine (PI), \$5,000, 6/1/2003 – 5/31/2004.

Research Projects (Pending)

1. NSF CBET/BME, Analysis of complexity and ergonomic risk in minimally invasive surgery (PI), \$335,000, Submitted on February 2011, 09/01/2011 – 08/31/2014.

Research Projects (Unfunded)

1. NSF CBET/BME, CAREER: Analysis of surgical motions during minimally invasive surgery (PI), \$450,000, Submitted on July 2010, 04/01/2011 – 3/30/2016.
2. Agency for Defense Development in South Korea (ADD): Efficient algorithm for optimal surveying route for submarine hull inspection (PI), \$149K, Submitted on March 2010, 07/1/ 2010 – 06/30/2013.
3. NSF RUI: Internet based tele-operation inspection system using Gigabit Ethernet digital cameras (PI), \$151K, Submitted on February 2010, 9/1/2010 – 8/31/2012.
4. NSF (CMMI/SSS): The use of electronic nose and its sensitivity for on-line and real-time tool condition monitoring (PI), \$391,535, submitted on February 2009.

Reviewer

- Editorial board member of the International Journal of Information & Decision Sciences (since 2009)
- Guest Editor of Special Issue on Information Entropy Models and Applications in the International Journal of Information & Decision Sciences (IJIDS).
- Paper Reviewer (Adhoc):
 - IEEE Control Systems Society Conference
 - Journal of Manufacturing Systems
 - Journal of Biomechanics
 - Computers and Industrial Engineering (C&IE)
 - Robotics and Autonomous Systems
 - ASME Journal of Manufacturing Science and Engineering
 - International Journal of Machine Tool and Manufacture
 - Winter Simulation Conference
- NSF SBIR's Metrology Panelist, Arlington, VA, March 2005.
- Conference Session Chair: International Conference on Management of Technology, Miami, Florida, May 2007.

Workshops

- Potential Collaboration Meeting with School of Medicine of SIU, Springfield, January 30, 2009 (one of four faculty members from the SOE)
- EUE 2010 Workshop, MUC International Room, SIUE (December 8, 2008)
- Grant Budgeting 101, Informational Workshop for Faculty, 2202 Rendleman Hall, SIUE (November 13, 2008)

Service

- Member of Graduate Council (Substituting Dr. Zhou for fall 2009)

- Taught 2 Sessions for High School Outreach 2009 – Summer residential Program at SIUE (June 8 – 19, 2009)
- Committee Member of New Faculty Search in IME (December 08 – May 09)
- Departmental Representative for 2008 Preview (November 08)
- School of Engineering Marshall for 2008 Commencement (December 08)

Honors and Awards

- 2011 School of Engineering Research Award (1 of 2 awardees in SOE)
- 2010 School of Engineering Teaching Award for IME

Student Advising

Chair of Committee (@SIUE)

- Martin, T., Master of Science, Industrial and Manufacturing Engineering, Southern Illinois University Edwardsville, On-going (Expect to complete by May 2011).
- Ohu, I. (2011), Master of Science, Industrial and Manufacturing Engineering, Southern Illinois University Edwardsville, May 2011 (PhD Program at SIUE).
- Anderson, C. (2009), Master of Science, Industrial and Manufacturing Engineering, Southern Illinois University Edwardsville, December 2009 (Project Manager at Hoosier Inc., CA).
- Poitier, R. K. (2008), True frontiers in production performance assessment using machine learning and data envelopment analysis, Ph.D., Department of Industrial Engineering, University of Miami, May 2008, Chairman (Member of Utilities Consulting and Contracting Services Ltd. in Bahama).
- Alamoudi, R., (2008), Interaction based measure of manufacturing systems complexity and supply chain systems vulnerability using information entropy, Ph.D., Department of Industrial Engineering, University of Miami, May 2008, Chairman (Faculty member of King Abdul-Aziz University, Saudi Arabia).
- Perez, U. (2004), Intelligent stereo camera calibration and optimized visual servo control for an industrial manipulator, M.S. Thesis, Department of Industrial Engineering, University of Miami, November 2004, Chairman (Working at FP&L, Miami).
- Kaundinya, N. (2003), Development of a methodology for the on-line detection of tool breakage in end milling using support vector regression, M.S. Thesis, Department of Industrial Engineering, University of Miami, December 2003, Chairman (Working at DRMP Inc., Ft. Myers).

Committee Member (@SIUE)

- Tenboer, W. (2010), Master of Science, Industrial and Manufacturing Engineering, Southern Illinois University Edwardsville, December 2010.
- 9 PhD, 4 MS @ University of Miami

Faculty Advisor (@University of Miami)

- Faculty advisor of Robotics Club at University of Miami
- Faculty advisor of SME Student Chapter at University of Miami

- Judge student research for the 2004 Citizens Board Research & Creativity Forum at University of Miami

Membership

- American Society of Engineering Education (ASEE)
- Who's Who in Engineering Education (WWEE)
- Institute of Industrial Engineers (IIE)
- Society of Manufacturing Engineers (SME)

TEACHING

- IME370: Manufacturing Processes
- IME466: Engineering Metrology
- IME470: Manufacturing Systems
- IME477: Computer-Integrated Manufacturing (CIM)
- IME492-1: Introduction to Industrial Robots
- IME576: Advanced CIM

SERVICES

University Level

- Serve on Undergraduate Courses Committee of Curriculum Council from Fall 2010
- Serve on Program Committee of Graduate Council from Fall 2010
- Serve on Teaching Excellence Award Committee from Fall 2010
- Served on Faculty Senate, Graduate Council and ERP Committee during Fall 2009 on behalf of Dr. Zhou (Civil Engineering) for his sabbatical leave
- Served as a SIUE Commencement Marshall on December 2008

School Level

- Served on 2010 School of Engineering Alumni Hall of Fame Selection Committee
- Presented at SOE Faculty Dialog for Teaching, Scholarship, and the Teacher-Scholar Model (March 2009, March 2010)
- Attended NSF CCLI Online Workshop on November 2009 (2 sessions, 75 minute each session)
- Taught for SIUE School of Engineering Summer Outreach Program, Summers of 2008 and 2009
- Visited Lockheed Martin Facility for potential collaboration with other engineering faculty members (Drs. Sevim, Alkin, Weinberg and Karacal) on April 2009
- Attended potential collaboration meeting with School of Medicine at SIU on January 2009

Department Level

- Served on search committee for new faculty position in Industrial and Manufacturing Engineering in Spring 2009

- Presented at Schnucks, A web-based performance assessment for Schnucks stores on May 2009
- Demonstration of CNC machining to DRS Company on January 2009
- Attended EUE 2010 Workshop in MUC International Room on December 2008
- Served as a departmental (IME) representative for 2008 Preview on November 2008
- Attended Grant Budgeting 101, Informational Workshop for Faculty on November 2008