

Education

**Doctor of Philosophy in Mechanical Engineering**

University of Michigan, 1992

**Master of Science in Engineering**

Southern Methodist University, 1987

**Master of Science in Mechanical Engineering**

University of Wisconsin, 1983

**Bachelor of Science in Mechanical Engineering**

University of Wisconsin, 1980

Professional Service Positions

American Society of Mechanical Engineers - Chair, Dynamic Systems and Control Division,  
Modeling and Identification Technical Panel

American Society of mechanical Engineers - Chair, Dynamic Systems and Control Division,  
Publicity Panel

American Society of mechanical Engineers - Chair, Dynamic Systems and Control Division,  
numerous technical conference sessions relating to dynamic system modeling

Professional Associations

American Society of Mechanical Engineers  
Institute of Electrical and Electronic Engineers  
American Society of Engineering Educators

Relevant Information

Fluent in Spanish - worked as interpreter in Cuban refugee resettlement camp; lived and worked  
in Latin America.

Areas of Concentration

Mechanical engineering  
Electromechanics  
Materials testing & analysis  
Vibrations  
Controls  
Modeling  
Controls  
Renewable energy  
Biomimicry

Mechanical design  
Analytical testing  
Hydraulics  
Pneumatics  
Virtual reality  
Computer aided engineering  
Computer animation  
Mechanical simulation

Specialized Investigation

Machine accidents  
Amusement park rides / safety  
Crane Design / failure  
Logging equipment  
Active and semi-active suspensions  
Analysis of stabilized platforms  
Playground equipment  
Exercise equipment

Consumer products  
Fasteners  
Friction testing  
Garden equipment  
Hand tools  
Portable power tools  
Toys

Professional Experience

**Institute for Products, Engineering & Construction** **1999 to Present**  
Consulting and forensic engineering services for attorneys and insurance companies. Projects involve the discipline of mechanical engineering and address the design and safety aspects of industrial, commercial and consumer products.

**Northeastern University - Assistant Professor** **1992 to Present**  
Department of Mechanical Engineering. Research areas include modeling, analysis and control of uncertain systems, vibration isolation, and active and semiactive suspensions.

**University of Michigan - Research Assistant** **1989 - 1992**  
Department of Mechanical Engineering and Applied Mechanics.

**Texas Instruments, Inc., Control systems Technology Center** **1984 - 1988**  
System Design Engineer. Responsibilities included configuring, designing, modeling, analyzing and testing control systems for precision electro-optical systems.

### Grants

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- National Science Foundation Research Initiation Award - An automated modeling program for uncertain systems. 1984
- Barry Controls Defense / Industrial, Doctoral Research Support. 1997.
- National Science Foundation GOALI Program - Assessing the potential for regenerative control in an active vibration isolation system. 1998.
- Instron Corporation Doctoral Research Support. 1999.

### Seminars

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- Improving Analysis of Uncertain Physical Systems. Given at Georgia Institute of Technology, University of Michigan, Michigan State university, University of Massachusetts, Boston University, Northeastern University.
- Modeling-Building Assistant: An Automated Modeling Tool for Machine Tool Drive Trains. Given at Case Western Reserve University, University of California, Northeastern University, University of Rhode Island.

### Publications

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#### Refereed Journal Articles

- Bruce H. Wilson and Jeffrey L. Stein. An algorithm for obtaining minimum-order models of distributed and discrete systems. *Journal of Dynamic Systems, Measurement, and Control* 117(4), pp. 534--540, 1995.
- B. H. Wilson, Shafai, B. and Eryilmaz, B. Improving control design for parametric uncertainty, *International Journal of Control*, 66(6):863--883, April 1997.
- A. Messac and B. H. Wilson. Computational control design of a benchmark problem using physical programming. *AIAA Journal*, 36(2):219--226, February, 1998.
- B. H. Wilson and J. H. Taylor. A frequency domain model-order-deduction algorithm for linear systems. *Journal of Dynamic Systems, Measurement, and Control*, 120(2):185--192, June,
- B. H. Wilson, R. Mourant, M. Li, and W. Xu. A virtual environment for training overhead crane operators:real-time implementation. *IIE Transactions Special Issue on Virtual Manufacturing*, 30(7):589--596, July, 1998.
- B. H. Wilson and B. Eryilmaz. Using bond graphs to synthesize tree-structured transfer functions: Improved frequency-domain analysis of uncertain systems. *Journal of The Franklin Institute*, 335(8):1443--1465, 1998.
- C. Erin, B. H. Wilson, and J. Zapfe. An improved model of a pneumatic vibration isolator: theory and experiment. *Journal of Sound and Vibration*. 218(1):81--101, 1998.
- B. H. Wilson, B. Eryilmaz, and B. Shafai. An adaptive angular sweep algorithm for value set construction. *IEEE Transactions on Automatic Control*, 44(3), March, 1999.
- B. H. Wilson and B. Eryilmaz. Simplified tree-structured decomposition for a class of systems. *Automatica*, 35:755-760,
- B. H. Wilson and C. Erin and A. Messac. Optimal Design of a Vibration Isolation Mount using Physical Programming. *Journal of Dynamic Systems, Measurement, and Control*, June,

1999.

- B. Shafai, B. H. Wilson, and J. Chen. Robust stability of a special class of polynomial matrices with control applications. *Computers and Electrical Engineering*. Accepted for publication.
- Bora Eryilmaz and Bruce H. Wilson. Improved control of hydraulic systems using singular perturbation theory. *Journal of Dynamic Systems, Measurement, and Control*. In review.

#### Refereed Conference Articles

- Bruce H. Wilson and Jeffrey L. Stein. A algorithm for obtaining minimum-order models of distributed and discrete systems. In Brian Falkenhainer and Jeffrey L. Stein, editors, *Automated Modeling, DSC-Vol. 41*, pp. 47--58. Anaheim, CA, 1992. American Society of Mechanical Engineers.
- Bruce H. Wilson and Jeffrey L. Stein. Model-building assistant: An automated modeling tool for machine-tool drive systems. In Jose J. Granda and Francois E. Cellier, editors, *Proceedings of the 1993 SCS Western Multiconference*, pp. 169--178, San Diego, CA, 1993. Society for Computer Simulation
- Bruce H. Wilson and James H. Taylor. Model-order deduction algorithm for nonlinear systems. *Automated Modeling for Design, DSC-Vol. 47*, pp. 15--32. New Orleans, LA, 1993. American Society of Mechanical Engineers.
- Bruce H. Wilson and Gao Jizhong. Applications of continuum-based models of spindle drive shafts. In *Proceedings of the American Control Conference*, pp. 3318--3322, Baltimore, MD, June 1994.
- Taylor, J. H. and Wilson, B. H. A frequency domain model-order-deduction algorithm for nonlinear systems, *Proceedings of IEEE Conference on Control Applications*, pp. 1053--1058, Albany, NY, 1995.
- Wilson, B. H., Taylor, J. H., and Eryilmaz, B. A frequency-domain model-order deduction algorithm for linear systems. In T. E. Alberts, editor, *Proceedings of the ASME Dynamic Systems and Control Division*, Vol. 1, pages 401--410, San Francisco, CA. ASME International Mechanical Engineering Congress and Exposition, 1995.
- Wilson, B. H. An algorithm for synthesizing interval plant models of uncertain systems, in T. E. Alberts, ed., *Proceedings of the ASME Dynamic Systems and Control Division*, Vol. 1, pp. 411--420. ASME International Mechanical Engineering Congress --> --and Exposition,
- Messac, A. and Wilson, B. H. Computational control design of a benchmark problem using physical programming, *ALAA Dynamics Specialist Conference*, pp. 107--117, Salt Lake City, UT, --> --April 18--19, 1996.
- Mourant, R., M., Wilson, B. H., Qui, N. and Sweeney, J. A virtual environment for training overhead crane operators, *Proceedings of the Symposium on Virtual Reality in Manufacturing, Research, and Education*, The Industrial Virtual Reality Institute, The University of Illinois at Chicago, pp. 98--107,
- Wilson, B. H. and Eryilmaz, B. Automated modeling to support robust controller design, *ASME International Mechanical Engineering Congress and Exposition*, DSC-Vol. 58, pp. 683--690, Atlanta, GA,
- B. H. Wilson and C. Erin. Robust performance analysis of vibration isolation tables using tree-structured transfer functions. *Proceedings of the ASME Dynamic Systems and Control*

*Division*, pp. 605--614. Dallas, TX. ASME International Mechanical Engineering Congress and Exposition, 1997

- B. H. Wilson, B. Shafai, and V. Uddin. A structurally based approach to model order reduction using bond graphs. *Proceedings of the American Control Conference*, Philadelphia, PA, 1998.
- B. H. Wilson and B. Eryilmaz. Improved Uncertain Transfer Function Synthesis and Analysis using Bond Graphs and Transmission Matrices. In *Proceedings of ASME Dynamic Systems and Control Division -- 1998*, DSC-Vol. 64, pp.~331--338. ASME International Mechanical Engineering Congress and Exposition. Anaheim, CA.
- Bruce H. Wilson and Bora Eryilmaz. Bond graphs to facilitate robust analysis of an active suspension. *Proceedings of the 1999 International Conference on Bond Graph Modeling and Simulation*, San Francisco, CA,
- Bruce H. Wilson and Cem Erin. A mechanical analogue of a pneumatic vibration isolator. *Proceedings of the 1999 International Conference on Bond Graph Modeling and Simulation*, San Francisco, CA, 1999.
- Bora Eryilmaz and Bruce H. Wilson. A unified model of a proportional valve *Proceedings of ASME FPST*, 1999 ASME International Mechanical Engineering Congress and Exposition, Nashville, TN. To appear.

#### Other conference articles

- Gao Jizhong and Bruce H. Wilson. The development of continuum-based models of spindle drive shafts. In R. E. DeVor and D. A. Dranfeld, editors, *The First S. M. Wu Symposium on Manufacturing Science -- U. S. A. Venue*, pp. 107--114, Northwestern University, Evanston, IL, May 25-28 1994. North American Manufacturing Research Council.
- Wilson, B. H., Shafai, B. and Eryilmaz, B. Nonconservative QFT templates for plants with general parametric uncertainty, *Proceedings of World Automation Conference*, Volume 4, pp. 755--762, Montpellier, France,
- B. H. Wilson, B. Eryilmaz, and B. Shafai. An adaptive angular sweep algorithm for polynomial value set construction. *Proceedings of the World Automation Conference*, Anchorage, AK, 1998.

#### Book chapters

- Bruce H. Wilson. Virtual reality in material handling and facilities layout. In *McGraw-Hill 2000 Yearbook of Science & Technology*, McGraw-Hill. To appear.