JEFFREY L. STEIN

3055 Whisperwood Dr., Unit 381
Ann Arbor, Michigan 48105
(734) 663-6125
Email:stein@umich.edu
http://www-personal.umich.edu/~stein/

Dept. Of Mechanical Engineering
The University of Michigan
2292 G.G. Brown Laboratory
Ann Arbor, Michigan 48109-2125
(734) 936-3336, (734) 647-3170 Fax

EDUCATION: **Massachusetts Institute of Technology, Cambridge, MA**

Ph.D.	Mechanical Engineering, 1983
S.M.	Mechanical Engineering, 1976
S.B.	Mechanical Engineering, 1976

University of Massachusetts, Amherst, MA

B.S.	Premedical Studies with a minor in Psychology, 1973

RESEARCH AND PROFESSIONAL EXPERIENCE:

University of Michigan, Ann Arbor, MI

2012-   Professor, Design Science Program

Participating faculty member in the new Ph.D. program in Design Science.

1996-   Professor, Dept. of Mechanical Engineering (name changed 7/00).

Specializing in areas of algorithms for deducing or reducing proper dynamic system models to design and control resilient and sustainable systems. Model parameter and estimation as well as Optimal Design of Experiments. Applications across many domains some in which include; hybrid and electric vehicles, vehicle to grid integration, design for health conscious battery performance, internet-distributed hardware in-the-loop simulation and resilient and sustainable infrastructures.

1994-2009   Thurst Area Leader of the Automotive Research Center (ARC)

1994-   Leader of the ARC's Dynamics and Controls of Vehicle and Mobile Robotics Thrust Area

Research and teaching in system dynamics and control, advanced battery modeling and control, hybrid electric vehicle design, automated modeling, vehicle modeling and simulation for design, machine design and control, machine monitoring, and high speed precision spindles,

1988-1996   **University of Michigan, Ann Arbor, MI**

Associate Professor, Dept. of Mech. Engr. and Applied Mech.
Research and teaching in system dynamics, control, machine diagnostics, machine design and control, computer-assisted modeling and design and control of artificial limbs.

1983-88   **University of Michigan, Ann Arbor, MI**

Assistant Professor, Dept. of Mech. Engr. and Applied Mech.

1991-	**Independent Consultant, Ann Arbor, MI**
& 1983-1987	Design analysis of mechanical systems and manufacturing machines.
1988-1991	**Failure Analysis Associates, San Francisco, CA**
	<u>Consultant</u>
	Design analysis of mechanical systems and manufacturing machines.

SPECIALIZED PROFESSIONAL COMPETENCE:

Automated Modeling of Dynamic Systems; Proper modeling.

Modeling, analysis, design and control of mechanical systems.

Modeling and design of automatic control systems; electromechanical, hydraulic and pneumatic servosystems.

Vehicle Electrification. Design and Control of Hybrid, Plug-In Hybrid and Electric Vehicle. Batter health conscious charging.

Internet-Distributed Hardware in-the-Loop Simulation.

Vehicle (automobiles and trucks) handling, ride, mobility. Vehicle suspension and drivetrain design, modeling, control and simulation. Hybrid vehicles.

Design and control of machine tool systems; machine tool drive systems and machine tool diagnostics; sensors, signal processing, model based diagnostics techniques; gear backlash dynamics, slide friction characteristics, high speed spindle bearing design, machine guarding.

Biomechanics and modeling of human locomotion. Design and control of prosthetic devices.

AWARDS, HONORS and MEMBERSHIP:

ASME DSCC 2013 Best Student Paper, Finalist (Ph.D. student Xin Zhou) "Battery Health Diagnostics Using Retrospective-Cost System Identification: Sensitivity to Noise and Initialization Errors"

ASME DSCD Michael J. Rabins Leadership Award, 2012. "For distinguished and steadfast leadership within the Dynamics Systems and Control Division, for promoting efficiency and integrity in division governance, and for advancing the reputation of the division nationally and internationally."

ASME DSCC 2012 Semi-Plenary Talk based on paper "The evolution and future of Internet-distributed hardware-in-the-loop simulation from a dynamic systems and control perspective" selected as one of six from a total of 350 conference papers.

Invited Speaker, Congressional Briefing, "The Road to the New Energy Economy: Electric Cars", March 23, 2011, Rayburn Office Bldg., Washington, DC.

ASME Dedicated Service Award, 2010. For "unusual dedicated voluntary service to the ASME marked by outstanding performance, demonstrated effective leadership, prolonged and committed service, devotion, enthusiasm and faithfulness".

Invited Plenary Speaker, 2010 International Conference on Bond Graph Modeling, Orlando, FL.

Invited Panelist and Speaker for "Toward Green Mobility: Integrating Electric Drive Vehicles and Smart Grid Technology " sponsored by the American Association for the Advancement of Science, 2010.

The most downloaded article of the month, *Journal of Dynamic Systems Measurement and Control*, for the manuscript "A Review of Proper Modeling Techniques" (Oct 2008)

Guest Editor of a Special Issue, ASME Transactions: *Journal of Dynamic Systems Measurement and Control* on Physical System Modeling, 2010

ASME DSCC 2009 Best Student Paper, Finalist (Ph.D. student Scott Moura), "Control of Film Growth in Lithium Ion Battery Packs via Switches"

Associate Editor Modeling *Simulation Modeling Practice and Theory,* International Journal of the Federation of European Simulation Societies, 2009-2011

Area Editor of *Simulation*: Transactions of The Society for Modeling and Simulation International, (2007-9).

ASME – Fellow, named by the Board of Governors of ASME, September, 2005

Outstanding Teacher, Department of Mechanical Engineering Teacher Incentive Program, 1999-2000.

Invited manuscript in the Special 50th Anniversary Issue of the *Journal of Dynamic Systems Measurement and Control,* 1993

Named one of the "125 Alumni to Watch" by the University of Massachusetts, Amherst, 1988.

Presidential Young Investigator Award, National Science Foundation, 1987

Research Incentive Award, Exxon Foundation Faculty Assistance Program, 1984

Chair, Executive Committee, Dynamics Systems and Control Division of American Society of Mechanical Engineers (ASME), 2001- 2002

Past Associate Editor of the ASME *Journal of Dynamic Systems Measurement and Control* (1991- 1996)

Member of the National Society of Professional Engineers, ASME, Past Chairman of the Modeling and Identification; Biomechanical Systems; and Manufacturing Systems Technical Panels of the Dynamic Systems and Control

Division of ASME, Society of Manufacturing Engineers, Society of Automotive Engineers, American Society of Engineering Educators, The Society for Computer Simulation and honorary societies; Phi Beta Kappa, Pi Tau Sigma, Phi Kappa Phi and Sigma Xi.

PROFESSIONAL:
1990 -   Registered Professional Engineer, #36154, State of Michigan

REFERENCES:
            Available upon request

PUBLICATIONS:

Books/Chapters

1) Loucas, L.S., Rideout, D.G., Ersal T., Stein, J.L. (2011) "Energy-Based Bond Graph Model Reduction" Chapter 2 in Book *Bond Graph Modelling of Engineering Systems*, Springer Science+Business Media, LLC 2011, Ed. Wolfgang Borutzky.

Archival Journals[1]

1) Stein, J. L. and Hedrick, J. K., 1980 "Influence of Fifth Wheel Location on Truck Ride Quality", *Transportation Research Record* 774, pp. 31-39, National Academy of Sciences.

2) Stein, J. L. and Flowers, W. C., 1987 "Stance Phase Control of Above-Knee Prostheses: Knee Control Versus SACH Foot Design," Journal of Biomechanics, Vol. 20, No. 1, pp. 19-28. (Also appeared in the Proceedings of the 1987 ASME Biomechanics Symposium).

3) Stein, J. L., Colvin, D ., Clever, G. and Wang, C.-H., 1986 "Evaluation of DC Servo Machine Tool Feed Drives As Force Sensors" *Journal of Dynamic Systems Measurement and Control,* Vol. 108, No. 4., pp. 279-288, Dec. (Also appeared in the 1984 *Proceeding of the Symposium on Sensors and Controls for Automated Manufacturing and Robotics*, ASME Winter Annual Meeting).

4) Stein, J. L., and Shin K.-C.,1986 "Current Monitoring on Field Controlled DC Spindle Drives", *Journal of Dynamic Systems Measurement and Control,* Vol. 108, No. 4, pp. 289-295, Dec. (Also appeared in the Proceeding of the 1985 Symposium on *Sensors and Controls for Manufacturing*, ASME Winter Annual Meeting).

---

[1] It is common practice in the field of Mechanical Engineering to present and publish research results at professional meetings (conferences). Often these results are also published in archival journals as either similar or revised papers. The relationship between papers published in different venues is indicated in some but not all places in this publication list.
Updated: January 24, 2014

5) Stein, J.L. and Park, Y., 1988 "Measurement Signal Selection and a Simultaneous State and Input Observer", *Journal of Dynamic Systems Measurement and Control*. Vol. 110, No. 2, June. (Also appeared in the Proceedings *of the 1987 American Control Conference*).

6) Stein, J. L., Flowers, W. C. and Yigit, A., 1987 "Modeling Prosthetic Gait", *Journal of Biomechanics*, (accepted for publication). (Also appeared in the *Proceedings of the 1987 ASME Biomechanics Symposium*).

7) Stein, J.L., and Park, Y., 1988 "Closed Loop Simultaneous Input and State Observer", *International Journal of Control*, Vol. 48, No. 3, pp. 1121-36. (Also appeared in the Symposium on *Sensors For Manufacturing*, 1987 ASME Winter Annual Meeting.)

8) Stein, J.L. and Park, Y. "Modeling and Sensing Issues for Machine Diagnostics", *IEEE Control Systems* (accepted for publication but not published). (also appeared in the 1988 *Proceedings of the American Control Conference*).

9) Stein, J.L. and Park, Y., 1989 "Steady-State, Optimal State and Input Observer for Discrete Stochastic Systems", *Journal of Dynamic Systems Measurement and Control* Vol. 111, pp. 121-127, June. (Also appeared as "Steady-State, Optimal State and Input Observer" in the Symposium on *Expert Systems and Intelligent Control*, 1987 ASME Winter Annual Meeting).

10) Stein, J. L., Wang, C.-H., 1990 "Analysis of Power Monitoring on AC Induction Drive Systems", *Journal of Dynamic Systems, Measurement and Control*, Vol. 112, No. 2, pp. 239--248, June. (Also appeared in the 1986 Symposium on *Sensors and Controls for Manufacturing*, Proceedings of the 1986 ASME Winter Annual Meeting).

11) Stein, J.L. 1993 "Modeling And State Estimator Design Issues for Model-Based Monitoring Systems" Special 50th Anniversary Issue of the *Journal of Dynamic Systems Measurement and Control*, Vol. 115, No. 2(B) June. (This paper was solicited by the editorial board of the 50th Anniversary Issue and reviewed anonymously.)

12) Stein, J.L. and Tu, J.F. 1994 "A State Space Model for Monitoring Thermally-Induced Preload in Anti-Friction Spindle Bearings of High Speed Machine Tools" *Journal of Dynamic Systems Measurement and Control*, Vol. 11, No. 3, September, pp. 372-386. (Also appeared in the Symposium on *Control of Manufacturing Processes*, Proceedings of the 1991 ASME Winter Annual Meeting.)

13) Huh, K. and Stein J.L. 1994 "A Quantitative Performance Index for Observer-Based Monitoring Systems" *Journal of Dynamic Systems Measurement and Control*, Vol. 11, No. 3, September, pp. 487-497. (Also appeared in the *Proceedings of the 1993 American Control Conference on Automatic Control*.)

14) Tu, J.F. and Stein, J.L. 1995 "On-line Preload Monitoring for Anti-Friction Spindle Bearings of High-Speed Machine Tools" *Journal of Dynamic Systems Measurement and Control*) Vol. 117, No. 1, March, pp. 43-53. (Also appeared in the *Proceedings of the 1992 American Control Conference*. Awarded Best Paper of the Technical Session)

Updated: January 24, 2014

DOCKET ALARM

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS
Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS
Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS
Sync your system to PACER to automate legal marketing.

fastcase
Smarter legal research.