Curriculum Vitae – Harry Dankowicz

Date of birth:	June 19, 1968
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Education

1987-1991	Enrolled in the Engineering Physics program, Royal Institute of Technology, Stockholm, Sweden (KTH)
1991	M.Sc. in Engineering Physics, KTH Thesis title: Stochastically Forced Systems Exhibiting Nondeterministic Chaotic Behavior Advisor: Prof. Martin Lesser
1991-1995	Enrolled in doctoral program in the Dept. of Theoretical and Applied Mechanics, Cornell University, Ithaca, New York, USA
1994/95	Exchange Scholar at the Program of Applied and Computational Mathematics, Princeton University, Princeton, New Jersey, USA
1995	Ph.D. in Theoretical and Applied Mechanics, Cornell University, New York, USA Dissertation title: Chaos in Low- and High-Dimensional Systems Advisor: Prof. Philip Holmes Minors in Mathematics and Astronomy

Professional History

1995/96	Göran Gustafsson Postdoctoral Fellow in the Dept. of Mechanics, KTH
1996-1999	Research Associate in the Dept. of Mechanics, KTH
1998	Awarded the title of Docent in Mechanics by the Faculty of Engineering Physics, KTH after external review by Prof. Edwin Kreuzer, Hamburg University of Technology, Germany and Prof. Peter Olsson, Chalmers University of Technology, Sweden
1999-2005	Guest Researcher in the Dept. of Mechanics, KTH
1999-2004	Assistant Professor in the Dept. of Engineering Science and Mechanics, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, USA (Virginia Tech)
2001-2005	Affiliated faculty member in the Dept. of Mechanical Engineering, Virginia Tech
2003-2005	Affiliated faculty member in the School of Biomedical Engineering and Sciences, Virginia Tech

2004-2005	Affiliated faculty member in the Dept. of Aerospace and Ocean Engineering, Virginia Tech
2004-2005	Associate Professor in the Dept. of Engineering Science and Mechanics, Virginia Tech
2005-2011	Associate Professor in the Dept. of Mechanical Science and Engineering, UIUC
2011-present	Professor in the Dept. of Mechanical Science and Engineering, UIUC
2016-present	Associate Dean of Graduate, Online and Professional Programs, College of Engineering, UIUC

Honors

Personal awards and honorary appointments

- Fulbright Scholar, 1991-1995
- Honors Stipend and the Professor Gunnar Wallquist Medal from KTH, 1992
- A.D. White Fellowship from Cornell University, 1991
- Göran Gustafsson's Postdoctoral Fellowship from KTH, 1995/96
- Swedish Foundation for Strategic Research Junior Individual Grant, 1998-2000
- National Science Foundation CAREER award, 2003-2010
- PECASE, Presidential Early Career Award for Scientists and Engineers, 2003
- W.S. 'Pete' White Innovation in Engineering Education Award, 2004
- College of Engineering Faculty Fellow, Virginia Tech, 2004-2005
- Travel Award to attend ICTAM04, U.S. National Committee on Theoretical and Applied Mechanics, 2004
- Cannon Faculty Scholar, UIUC, 2005-2010, 2011-2014
- Visiting researcher, Complex Non-Smooth Dynamical Systems, Centre de Recerca Matematica, Universita Autonoma de Barcelona, Spain, 2007
- Travel Award to attend ICTAM08, U.S. National Committee on Theoretical and Applied Mechanics, 2008
- Visiting Professor Fellowship, Sapienza Universita di Roma, Rome, Italy, 2009
- Associate, Center for Advanced Study, UIUC, 2011-2012
- Collins Award for Innovative Teaching, College of Engineering, UIUC, 2012
- ASME Fellow, 2012
- ASEE Fred Merryfield Design Award, 2013
- William Pierson Field Visiting Lecturer, Princeton University, 2014
- Engineering Council Outstanding Advising Award, UIUC, 2016

Other awards and recognitions

- Andrew Heiskell Best International Partnership award from the Institute for International Education to INSPIRE (Illinois-Sweden Program for Educational and Research Exchange), 2016

Invited conference talks and keynote lectures

- Swedish Mechanics Days, 1999
- International workshop on Piecewise Smooth Dynamical Systems: Analysis, Numerics, and Applications, Bristol University, Bristol, United Kingdom, 2004
- International workshop on Advanced Algorithms and Numerical Software for the Bifurcation Analysis of Dynamical Systems, University of Montreal, Montreal, Canada, 2007
- International workshop on Applied Nonlinear Mathematics: Making it Real, Bristol University, Bristol, United Kingdom, 2007
- Symposium on Nano and Micro Resonators at the 9th Biennial ASME Conference on Engineering Systems Design and Analysis, Technion, Haifa, Israel, 2008
- Symposium on Computational Methods in Nonlinear Dynamics at the 5th European Congress on Computational Methods in Applied Sciences and Engineering, Venice, Italy, 2008
- International Symposium on Vibro-Impact Dynamics of Ocean Systems and Related Problems, Troy, Michigan, 2008
- SICON (Stability, Identification and Control in Nonlinear Structural Dynamics) Final Conference, Rome, Italy, 2009
- Research Workshop on Bifurcations in Oscillators with Elastic and Impact Constraints, Imperial College, London, United Kingdom, 2009
- IUTAM Symposium on Nonlinear Dynamics for Advanced Technologies and Engineering Design, Aberdeen, Scotland, July 2010
- Workshop on Bifurcation Analysis and its Applications, Montreal, Canada, July 2010
- 3rd Multifrequency AFM Conference, Madrid, Spain, March 2011
- Minisymposium on Modelling the Dynamics of the Atomic Force Microscope, SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, May 2011.
- Summer School on Advanced Topics in Numerical and Computational Bifurcation Analysis, Denmark Technical University, Lyngby, Denmark, June 2011
- Euromech Colloquium on Nonsmooth Contact and Impact Laws in Mechanics, Grenoble, France, July 2011
- 2012 Joint International Conference on Multibody System Dynamics, Stuttgart, Germany, May 2012
- The Central Region Conference on Numerical Analysis and Dynamical Systems, Lawrence, Kansas, May 2013
- 17th US National Congress on Theoretical & Applied Mechanics, East Lansing, Michigan, June 2014
- Investigating Dynamics in Engineering and Applied Science, A workshop celebrating Gábor Stépán's 60th birthday, Budapest, Hungary, July 2014
- 2016 New Zealand Mathematics Research Institute Summer School on Continuation Methods in Dynamical Systems, Raglan, New Zealand, January 2016
- 24th International Congress of Theoretical and Applied Mechanics, Minisymposium on Nonlinear Dynamics in Engineering Systems, Montreal, Canada, August, 2016

- IUTAM Symposium on Nonlinear and Delayed Dynamics of Mechatronic Systems, Nanjing, China, October 2016

Publications in International Refereed Journals

1. Dankowicz, H. (1994) "Some Special Orbits in the Two-Body Problem with Radiation Pressure," *Journal of Celestial Mechanics and Dynamical Astronomy* **58**, pp. 353-370.
2. Dankowicz, H., Holmes, P. (1995) "The Existence of Transverse Homoclinic Points in the Sitnikov Problem," *Journal of Differential Equations* **116(2)**, pp. 468-483.
3. Dankowicz, H. (1995) "The Two-Body Problem with Radiation Pressure in a Rotating Reference Frame," *Journal of Celestial Mechanics and Dynamical Astronomy* **61(3)**, pp. 287-313.
4. Dankowicz, H. (1996) "Looking for Chaos. An Extension and Alternative to Melnikov's Method," *International Journal of Bifurcation and Chaos* **6(3)**, pp. 485-496.
5. Dankowicz, H. (1996) "Analytical Expressions for Stable and Unstable Manifolds in Higher Degree of Freedom Systems," *International Journal of Bifurcation and Chaos* **6(11)**, pp. 1997-2013.
6. Dankowicz, H., Holmes, P., Berkooz, G., Elezgaray, J. (1996) "Local Models of Spatio-Temporally Complex Fields," *Physica D* **90**, pp. 387-407.
7. Thylwe, K.-E., Dankowicz, H. (1996) "Time-Dependent Normal Form Hamiltonian for Dynamical Equilibria," *Journal of Physics A: Mathematical and General* **29**, pp. 3707-3722.
8. Thylwe, K.-E., Dankowicz, H. (1996) "Nonlinear Phase-Integral Approximations of Stationary Waves in Nonhomogeneous Systems," *Journal of Physics A: Mathematical and General* **30**, pp. 697-710.
9. Dankowicz, H. (1997) "Escape of Particles Orbiting Asteroids in the Presence of Radiation Pressure through Separatrix Splitting," *Journal of Celestial Mechanics and Dynamical Astronomy* **67(1)**, pp. 63-85.
10. Dankowicz, H., Coller, B. D. (1999) "Evolving Control Strategies for Suppressing Heteroclinic Bursting," *Dynamics and Control* **9(2)**, pp. 149-171.
11. Dankowicz, H. (1999) "On the Modeling of Dynamic Friction Phenomena," *ZAMM* **79(6)**, pp. 399-409.
12. Dankowicz, H. (1999) "On the Successive Constraints Approach to Multibody Mechanisms," *Multibody System Dynamics* **3**, pp. 267-286.
13. Dankowicz, H., Nordmark, A.B. (2000) "On the Origin and Bifurcations of Stick-Slip Oscillations," *Physica D* **136(3-4)**, pp. 280-302.
14. Dankowicz, H., Adolfsson, J., Nordmark, A.B. (2001) "Repetitive Gait of Passive Bipedal Mechanisms in a Three-Dimensional Environment," *Journal of Biomechanical Engineering* **123**, pp. 40-46.
15. Adolfsson, J., Dankowicz, H., Nordmark, A.B. (2001) "3D Passive Walkers: Stability Analysis in the Presence of Discontinuities," *Nonlinear Dynamics* **24(2)**, pp. 205-229.
16. Piiroinen, P., Dankowicz, H., and Nordmark, A.B. (2001) "On a Normal Form Analysis for a Class of Bipedal Walkers," *International Journal of Bifurcation and Chaos* **11(9)**, pp. 2411-2425.

17. Dankowicz, H. (2002) "Slow Diffusion and Effective Stability of Dust Particles Orbiting Asteroids," *Celestial Mechanics and Dynamical Astronomy* **84(1)**, pp. 1-25.
18. Dankowicz, H., Piiroinen, P., and Nordmark, A.B. (2002) "Low-Velocity Impacts of Quasi-Periodic Oscillations," *Chaos, Solitons, and Fractals* **14(2)**, pp. 241-255.
19. Dankowicz, H., Piiroinen, P. (2002) "Exploiting Discontinuities for Stabilization of Recurrent Motions," *Dynamical Systems* **17(4)**, pp. 317-342.
20. Piiroinen, P., Dankowicz, H., and Nordmark, A.B. (2003) "Breaking Symmetries and Constraint: Transitions from 2D to 3D in Passive Walkers," *Multibody System Dynamics* **10(2)**, pp. 147-176.
21. Zhao, X., Dankowicz, H., Reddy, C.K., and Nayfeh, A.H. (2004) "Modeling and Simulation Methodology for Impact Microactuators," *Journal of Micromechanics and Microengineering* **14**, pp. 775-784.
22. Piiroinen, P., Dankowicz, H. (2005) "Low-Cost Control of Repetitive Gait in Passive Bipedal Walkers," *International Journal of Bifurcation and Chaos* **15(6)**, pp. 1959-1973.
23. Dankowicz, H., Zhao, X. (2005) "Local analysis of co-dimension-one and co-dimension-two grazing bifurcations in impact microactuators," *Physica D* **202**, pp. 238-257.
24. Dankowicz, H., Jerrelind, J. (2005) "Control of Near-grazing Dynamics in Impact Oscillators," *Proceedings of the Royal Society of London, series A* **461(2063)**, pp. 3365-3380.
25. Thota, P., Dankowicz, H. (2006) "Continuous and Discontinuous Grazing Bifurcations in Impacting Oscillators," *Physica D* **214**, pp. 187-197.
26. Zhao, X., Dankowicz H. (2006) "Unfolding Degenerate Grazing Dynamics in Impact Actuators," *Nonlinearity* **19**, pp. 399-418.
27. Zhao, X., Dankowicz, H. (2006) "Control of Impact Microactuators for Precise Positioning," ASME *Journal of Computational and Nonlinear Dynamics* **1(1)**, pp. 65-70.
28. Zhao, X., Dankowicz, H. (2006) "Characterization of Intermittent Contact in Tapping Mode Atomic Force Microscopy," *ASME Journal of Computational and Nonlinear Dynamics* **1(2)**, pp. 1-8. Paper presented at the ASME 2005 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (DETC2005-84741).
29. Jerrelind, J, Dankowicz, H. (2006) "A Global Control Strategy for Efficient Control of a Braille Impact Hammer," *Journal of Vibration and Acoustics* **128**, pp. 184-189.
30. Dankowicz, H. Thakur, G. (2006) "A Newton Method for Locating Invariant Tori of Maps," *International Journal of Bifurcation and Chaos* **16(5)**, pp. 1491-1503.
31. Dankowicz, H. (2006) "Nonlinear Dynamics as an Essential Tool for Nondestructive Characterization of Soft Nanostructures using Tapping Mode Atomic Force Microscopy," *Philosophical Transactions of the Royal Society A* **364**, pp. 3505-3520.
32. Thota, P., Dankowicz, H. (2006) "Analysis of Grazing Bifurcations of Quasiperiodic System Attractors," *Physica D* **220**, pp. 163-174.
33. Thota, P., Zhao, X., and Dankowicz, H. (2006) "Co-dimension-two Grazing Bifurcations in Single-degree-of-freedom Impact Oscillators" *ASME Journal of Computational and Nonlinear Dynamics* **1(4)**, pp. 328-335.
34. Dankowicz, H. (2007) "On the Purposeful Coarsening of Smooth Vector Fields," *Nonlinear Dynamics* **50(3)**, pp. 511-522.

35. Dankowicz, H., Zhao, X., and Misra, S. (2007) "Near-Grazing Dynamics in Tapping-Mode Atomic Force Microscopy," *International Journal of Non-Linear Mechanics* **42**, pp. 697-709.
36. Thota, P., MacLaren, S., and Dankowicz, H. (2007) "Controlling Bistability in Tapping-Mode AFM using Dual Frequency Excitation," *Applied Physics Letters* **91**, pp. 0931081-3.
37. Dankowicz, H., Svahn, F. (2007) "On the Stabilizability of Near-grazing Dynamics in Impact Oscillators," *International Journal of Robust and Nonlinear Control* **17**, pp. 1405-1429.
38. Svahn, F., Dankowicz, H. (2008) "Energy Transfer in Vibratory Systems with Friction due to Low-velocity Collisions," *Journal of Vibration and Control* **14(1-2)**, pp. 255-284.
39. Misra, S., Dankowicz, H., Paul, M. (2008) "Event-driven Feedback Tracking and Control of Tapping-Mode Atomic Force Microscopy," *Proceedings of the Royal Society of London, series A* **464**, pp. 2113-2133.
40. Hashemi, N., Dankowicz, H., and Paul, M.R. (2008) "The Nonlinear Dynamics of Tapping Mode Atomic Force Microscopy with Capillary Force Interaction," *Journal of Applied Physics* **103**, pp. 093512 1-6.
41. Thota, P. and Dankowicz, H. (2008) "TC-HAT: A Novel Toolbox for the Continuation of Periodic Trajectories in Hybrid Dynamical Systems," *SIAM Journal of Applied Dynamical Systems* **7(4)**, pp. 1283-1322.
42. Hashemi, N., Paul, M.R., Dankowicz, H., Lee, M., and Jhe, W. (2008) "The Dissipated Power in Atomic Force Microscopy due to Interactions with a Capillary Fluid Layer," *Journal of Applied Physics* **104**, pp. 063518 1--5.
43. Kang, W., Wilcox, B., Dankowicz, H., and Thota, P. (2009) "Bifurcation Analysis of a Microactuator Using a New Toolbox for Continuation of Hybrid System Trajectories," *ASME Journal of Computational and Nonlinear Dynamics* **4(1)**, pp. 011009 1-8. Paper presented at the ASME 2007 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (DETC2007-34441).
44. Eriten, M. and Dankowicz, H. (2009) "A Rigorous Dynamical-Systems-Based Analysis of the Self-Stabilizing Influence of Muscles," *ASME Journal of Biomechanical Engineering* **131**, pp. 011011 1-8. Paper presented at the ASME 2007 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (DETC2007-34469).
45. Nordmark, A., Dankowicz, H., and Champneys, A. (2009) "Discontinuity-Induced Bifurcations in Systems with Impact and Friction; Discontinuities in the Impact Law," *International Journal of Non-Linear Mechanics* **44**, pp. 1011-1023.
46. Dankowicz, H. and Paul, M.R. (2009) "Discontinuity-induced Bifurcations in Systems with Hysteretic Force Interactions," *ASME Journal of Computational and Nonlinear Dynamics* **4**, pp. 041009 1-6. Paper presented at the ASME 2008 Eight Biennial Conference on Engineering Systems Design and Analysis (ESDA2008-59293).
47. Wilcox, B., Svahn, F., Dankowicz, H., and Jerrelind, J. (2009) "Transient Growth Rates of Near-grazing Impact Velocities: Theory and Experiments," *Journal of Sound and Vibration* **325**, pp. 950-958.

48. Svahn, F. and Dankowicz, H. (2009) "Controlled onset of low-velocity collisions in a vibro-impacting system with friction," *Proceedings of the Royal Society of London, series A* **465**, pp. 3647-3665.
49. Misra, S., Dankowicz, H., and Paul, M.R. (2010) "Degenerate Discontinuity-Induced Bifurcations in Tapping-Mode Atomic-Force Microscopy," *Physica D* **239**, pp. 33-43.
50. Misra, S. and Dankowicz, H. (2010) "Control of Near-grazing Dynamics and Discontinuity-induced Bifurcations in Piecewise-smooth Dynamical Systems," *International Journal of Robust and Nonlinear Control* **20(16)**, pp. 1836-1851.
51. Dankowicz, H. and Schilder, F. (2011) "An Extended Continuation Problem for Bifurcation Analysis in the Presence of Constraints," *ASME Journal of Computational and Nonlinear Dynamics*, **6(3)**, art. no. 031003. Paper presented at the ASME 2009 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (DETC2009-86343).
52. Nordmark, A., Dankowicz, H., and Champneys, A. (2011) "Friction-induced Reverse Chatter in Rigid-body Mechanisms with Impacts," *IMA Journal of Applied Mathematics*, **76(1)**, pp. 85-119.
53. Wilcox, B, and Dankowicz, H. (2011) "Limit-switch Sensor Functionality Based on Discontinuity-Induced Nonlinearities," *ASME Journal of Computational and Nonlinear Dynamics*, **6(3)**, art. no. 031004. Paper presented at the ASME 2009 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (DETC2009-86560).
54. Reinke, R., Dankowicz, H., Phelan, J., and Kang, W. (2011) "A Dynamic Grain Flow Model for a Mass Flow Yield Sensor on a Combine," *Precision Agriculture*, **12(5)**, pp. 732-749.
55. Dankowicz, H. and Lacarbonara, W. (2011) "On Various Representations of Higher-order Approximations of the Free Oscillatory Response of Nonlinear Dynamical Systems," *Journal of Sound and Vibration*, **330(14)**, pp. 3410-3423.
56. Wilcox, B. and Dankowicz, H. (2012) "An Experimental Testbed for Investigating Nonsmooth Bifurcations in an Electromechanical System," *Journal of Vibration and Control*, **18(4)**, pp. 521-535.
57. Dankowicz, H. and Katzenbach, M. (2012) "Discontinuity-induced Bifurcations in Models of Mechanical Contact, Capillary Adhesion, and Cell Division: A Common Framework," *Physica D*, **241(22)**, pp. 1869-1881.
58. Park, K., Dankowicz, H., and Hsiao-Wecksler, E. (2012) "Characterization of Spatiotemporally Complex Gait Patterns Using Cross-Correlation Signatures," *Gait and Posture*, **36(1)**, pp. 120-126.
59. Kijowski, D., Dankowicz, H., and Loui, M. (2013) "Observations on the Responsible Development and Use of Computational Models and Simulations," *Science and Engineering Ethics*, **19(1)**, pp. 63-81.
60. Formica, G., Arena, A, Lacarbonara, W., and Dankowicz, H. (2013), "Coupling FEM with Parameter Continuation for Analysis of Bifurcations of Periodic Responses in Nonlinear Structures, *ASME Journal of Computational and Nonlinear Dynamics*, **8(2)**, art no. 021013.
61. Tabor, W, Cho, P.-W., and Dankowicz, H. (2013) "Birth of an Abstraction: A Dynamical Systems Account of the Discovery of an Elsewhere Principle in a Category Learning Task," *Cognitive Science*, **37(7)**, pp. 1193-1227.

62. Keefer, M.W., Wilson, S.E., Dankowicz, H., and Loui, M.C. (2014) "The Importance of Formative Assessment in Science and Engineering Ethics Education: Some Evidence and Practical Advice," *Science and Engineering Ethics*, **20(1)**, pp. 249-260.
63. DiBerardino, L.A. III and Dankowicz, H. (2014) "Accounting for Nonlinearities in Protocols for Fault Compensation," *ASME Journal of Computational and Nonlinear Dynamics*, **9(2)**, art. no. 021002. Paper presented at the ASME 2012 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (DETC2012-70387).
64. Jeffrey, M.R. and Dankowicz, H. (2014) "Discontinuity-Induced Bifurcation Cascades in Flows and Maps with Application to Models of the Yeast Cell Cycle," *Physica D*, **271**, pp. 32-47.
65. Saghafi, M. and Dankowicz, H. (2015) "Singularities in Differential-Algebraic Boundary-Value Problems Governing the Excitation Response of Beam Structures," *ASME Journal of Computational and Nonlinear Dynamics*, **10(1)**, art. no. 011017. Paper presented at the ASME 2013 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (DETC2013-13115).
66. Nguyen, K.-D. and Dankowicz, H. (2015) "Adaptive Control of Underactuated Robots with Unmodeled Dynamics," *Robotics and Autonomous Systems*, **64**, pp. 84-99.
67. Sanghvi, P. and Dankowicz, H. (2015) "A Consistent, Hybrid-Dynamical-System, Lumped-Parameter Model of Tire-Terrain Interactions," *ASME Journal of Computational and Nonlinear Dynamics,* **10(3)**, art. no. 031002.
68. Saghafi, M., Dankowicz, H., and West, M. (2015) "On the Use of Nonlinear Boundary-Value Problems to Estimate the Cloud-Formation Potential of Aerosol Particles," *SIAM Journal on Applied Dynamical Systems*, **14(2)**, pp. 822-859.
69. Saghafi, M., Dankowicz, H., and Lacarbonara, W. (2015) "Nonlinear tuning of microresonators for dynamic range enhancement," *Proceedings of the Royal Society A*, **471**, art. 20140969.
70. Nguyen, K.-D. and Dankowicz, H. (2016) "Cooperative Control of Networked Robots on a Dynamic Platform in the presence of Communication Delays," *International Journal of Robust and Nonlinear Control*, doi: 10.1002/rnc.3624.
71. Nguyen, K.-D., Li, Y., and Dankowicz, H. (2015) "Delay Robustness of an Adaptive Controller for a Class of Systems with Unknown Nonlinearities," in review.
72. Nguyen, K.-D., Rodriguez Reina, A., and Dankowicz, H. (2016) "End-Effector Control For Manipulators Operating on Dynamic Platforms," in review.
73. Saghafi, M., Dankowicz, H., and Tabor, W. (2016) "Emergent Task-Differentiation in Network Filters," in review.
74. Gernat, T., Rao, V.D., Middendorf, M., Dankowicz, H., Goldenfeld, N., and Robinson, G.E. (2016) "Rapid Spreading Dynamics Despite Bursty Interaction Patterns in Honeybee Social Networks," in review.

Books

1. Dankowicz, H. (1997), *Chaotic Dynamics in Hamiltonian Systems; with applications to celestial mechanics*, World Scientific Publishing Co.

2. Dankowicz, H. (1998), *Mechanics Problems, and Their Solutions*, Royal Institute of Technology, Stockholm, Sweden.
3. Dankowicz, H. (2004), *Multibody Mechanics and Visualization*, Springer Verlag.
4. Dankowicz, H. and Schilder, F. (2013), *Recipes for Continuation*, SIAM.

Other Refereed Book and Conference Publications

Book chapters

1. Elezgaray, J., Berkooz, G., Dankowicz, H., Holmes, P., Myers, M. (1997), "Local Models and Large Scale Statistics of the Kuramoto-Sivashinsky Equation," in *Multiscale Wavelet Methods for Partial Differential Equations*, ed. W. Dahmen, A. Kurdila & P. Oswald, Academic Press, pp. 441-471.
2. Dankowicz, H. (1997), "Dynamical Friction Modeling," in *Computational Methods in Contact Mechanics III*, ed. M.H. Aliabadi, A. Samartin, Computational Mechanics Publications, pp. 227-236.
3. Dankowicz, H., (2000), "Robotics – New Approaches to the Mobility of Mechanisms," in *Swedish Mechanics in the 21th century*, ed. H. Alfredsson, G. Amberg, the Swedish National Committee for Mechanics, in Swedish, pp. 67-85.
4. Svahn, F., Jerrelind, J., and Dankowicz, H. (2008), "Suppression of Bumpstop Instabilities in a Quarter-Car Model," in *Non-smooth Problems in Vehicle Systems Dynamics* (eds: P.G. Thomsen, H. True), Springer-Verlag, Berlin Heidelberg, pp. 137-147.
5. Dankowicz, H. and Svahn, F. (2009), "Control of Instabilities Induced by Low-Velocity Collisions in a Vibro-Impacting System with Friction," in *Vibro-Impact Dynamics of Ocean Systems* (eds: R.A. Ibrahim *et al.*), Springer-Verlag, Berlin Heidelberg, pp. 41-52.
6. Dankowicz, H. and Fotsch, E. (2016) "On the Analysis of Chatter in Mechanical Systems with Impacts," to appear, *Procedia IUTAM, Proceedings of 24th International Congress on Theoretical and Applied Mechanics*.
7. Nguyen, K. and Dankowicz, H. (2016) "On the Time-Delay Margin of Nonlinear Control Systems," to appear, *Procedia IUTAM, Proceedings of IUTAM Symposium on Nonlinear and Delayed Dynamics of Mechatronic Systems*.

Conference papers

8. Dankowicz, H., Nordmark, A.B. (2000), "Stick-slip oscillations – Quo Vadis," in *Proceedings of the 1st International Symposium on Impact and Friction of Solids, Structures and Intelligent Machines*, Ottawa, Canada, 1998, World Scientific Publishing Co. Pte. Ltd., pp. 95-98.
9. Dankowicz, H., Piiroinen, P., and Nordmark, A.B. (2001), "Grazing Bifurcations of Initially Quasi-Periodic System Attractors," *Proceedings of 18th Biennial Conference on Mechanical Vibration and Noise*, Pittsburgh, Pennsylvania, USA.
10. Jerrelind, J., Dankowicz, H. (2003), "Low-Cost Control of Impact Hammer Performance," *Proceedings of 19th Biennial Conference on Mechanical Vibration and Noise*, Chicago, Illinois, USA.

11. Zhao, X., Dankowicz, H, Reddy, C.K., and Nayfeh, A.H., (2004) "Dynamic Simulation of an Electrostatically Actuated Impact Microactuator," in *Proceedings of 2004 Nanotechnology Conference and Trade Show*, Boston, Massachusetts, March 7-11, pp. 247-250.
12. Zhao, X., Dankowicz, H., Nayfeh, A., (2004) "Modeling of the Nonlinear Dynamics of Electrically Driven Impact Microactuators," *Proceedings of the 2004 International Conference on MEMS, NANO and Smart Systems*, Banff, Canada, August 25-27, pp. 700-705.
13. Thota, P., Zhao, X., and Dankowicz, H., (2005) "Continuous and Discontinuous Grazing Bifurcations in Impact Oscillators," *Proceedings of ENOC 2005, EUROMECH Nonlinear Dynamics Conference*, Eindhoven, The Netherlands, Aug 7-12, pp. 213-222.
14. Dankowicz, H. and Zhao, X., (2005) "Near-Grazing Dynamics in Tapping-Mode Atomic Force Microscopy," *Proceedings of ENOC 2005, EUROMECH Nonlinear Dynamics Conference*, Eindhoven, The Netherlands, Aug 7-12, pp. 2121-2130.
15. Zhao, X. and Dankowicz, H., (2005) "Characterization of Intermittent Contact in Tapping-Mode Atomic Force Microscopy," *Proceedings of 5th ASME International Conference on Multibody Systems, Nonlinear Dynamics and Control*, Long Beach, California, USA, #84741.
16. Chan, B.J., Thompson, N., Sandu, C., and Dankowicz, H., (2005) "A Novel Tire-soil Interaction Model for Simulation of Off-road Vehicles," *Proceedings of the 15th International Conference of the International Society for Terrain-Vehicle Systems*, Hayama, Japan, September 25-29, #3A03.
17. Dankowicz, H., (2006) "Teaching Advanced Modeling of Multibody Mechanisms to Non-Traditional Engineering Students," *Proceedings of ASEE, 2006 Illinois-Indiana and North Central Joint Section Conference*, Fort Wayne, Indiana, March 31-April 1.
18. Kang, W., Wilcox, B., Dankowicz, H., and Thota, P. (2007) "Bifurcation Analysis of a Microactuator Using a New Toolbox for Continuation of Hybrid System Trajectories," *Proceedings of 6th ASME International Conference on Multibody Systems, Nonlinear Dynamics and Control*, Las Vegas, Nevada, USA.
19. Eriten, M. and Dankowicz, H., (2007) "A Rigorous Dynamical-Systems-Based Analysis of the Self-Stabilizing Influence of Muscles," *Proceedings of 6th ASME International Conference on Multibody Systems, Nonlinear Dynamics and Control*, Las Vegas, Nevada, USA.
20. Hashemi, N., Paul, M., and Dankowicz, H., (2007) "Exploring the Basins of Attraction of Tapping Mode Atomic Force Microscopy with Capillary Force Interactions," *Proceedings of the 2007 ASME International Mechanical Engineering Congress and Exposition*, Seattle, Washington, USA.
21. Dankowicz, H. and Paul, M.R. (2008), "Discontinuity-induced Bifurcations in Systems with Hysteretic Force Interactions," *Proceedings of the 9th Biennial ASME Conference on Engineering Systems Design and Analysis*, Haifa, Israel.
22. Wilcox, B. and Dankowicz, H. (2009) "Design of Limit-switch sensors Based on Discontinuity-Induced Nonlinearities," *Proceedings of 22nd ASME Biennial Conference on Mechanical Vibration and Noise*, San Diego, California, USA.
23. Wilcox, B., Lacarbonara, W., and Dankowicz, H. (2009), "Geometrically Nonlinear Continuum Models for Simulation of Impacting Dynamics in Electrostatically Actuated Microbeams," *Proceedings of 7th ASME International Conference on Multibody Systems, Nonlinear Dynamics, and Control*, San Diego, California, USA.

24. Dankowicz, H. and Schilder, F. (2009), "A Fundamental Formulation of an Extended Continuation Problem for Bifurcation Analysis in the Presence of Constraints," *Proceedings of 7th ASME International Conference on Multibody Systems, Nonlinear Dynamics, and Control*, San Diego, California, USA.
25. Katzenbach, M. and Dankowicz, H. (2010) "Discontinuity-Induced Bifurcations due to Hysteretic Capillary Interactions in Tapping-Mode Atomic-Force Microscopy," *Proceedings of the 4th International Conference on Micro- and Nanosystems*, Montreal, Canada.
26. Dankowicz, H. and Lacarbonara, W. (2010) "Geometrically Nonlinear Corrections to the Euler-Bernoulli Beam Model," *Proceedings of the Special Conference on Mechanical Vibration and Noise*, Montreal, Canada.
27. Sanghvi, P., Dankowicz, H., and Romig, B.E. (2010) "A Steady-State Model for Interaction Between a Deformable Tire and a Deformable Terrain," *Proceedings of the 12th International Conference on Advanced Vehicle and Tire Technologies*, Montreal, Canada.
28. Reinke, R., Dankowicz, H., and Phelan, J. (2010) "Modeling and calibration of combine, impact plate, yield sensors," Society of Automotive Engineers 2010 Commercial Vehicle Engineering Congress and Exhibition, Rosemont, Illinois, October 5-6, 2010. Reprinted in *SAE International Journal of Commercial Vehicles*, **3(1)**, pp. 241-249, 2010. Erratum printed in *SAE International Journal of Commercial Vehicles*, **5(1)**, p. 420, 2012.
29. Arena, A., Lacarbonara, W., Formica, G., and Dankowicz, H. (2011) "Nonlinear Finite Element-Based Path Following of Periodic Solutions," *Proceedings of the 8th ASME International Conference on Multibody Systems, Nonlinear Dynamics, and Control*, Washington, DC, USA.
30. Formica, G., Arena, A., Lacarbonara, W., and Dankowicz, H. (2011) "General-purpose Finite Element-based Path Following of Nonlinear Dynamical Systems," *Proceedings of the XX Congresso Associazione Italiana Di Meccanica Teorica E Applicata, AIMETA 2011*, Bologna, Italy.
31. DiBerardino, L. and Dankowicz, H. (2012) "Accounting for Nonlinearities in Protocols for Open-Loop Fault Compensation," *Proceedings of the 1st ASME Biennial International Conference on Dynamics for Design*, Chicago, IL, 2012.
32. Reinke, R.E., and Dankowicz, H. (2012) "Self-Calibrating Mass Flow Sensor," *Proceedings of the 1st ASME Biennial International Conference on Dynamics for Design*, Chicago, IL, 2012.
33. Sanders, J.W., Dankowicz, H., and Lacarbonara, W. (2012) "Design and Analysis of a Microelectromechanical Device Capable of Testing Theoretical Models of Impact at the Microscale," *Proceedings of the 1st ASME Biennial International Conference on Dynamics for Design*, Chicago, IL, 2012.
34. Nguyen, K.-D., Dankowicz, H., and Hovakimyan, N. (2013) "Marginal Stability in L1-adaptive Control of Manipulators," *Proceedings of the 9th ASME International Conference on Multibody Systems, Nonlinear Dynamics, and Control*, Portland, OR, 2013.
35. Saghafi, M. and Dankowicz, H. (2013) "Nondegenerate Continuation Problems for the Excitation Response of Nonlinear Beam Structures," *Proceedings of the 9th ASME International Conference on Multibody Systems, Nonlinear Dynamics, and Control*, Portland, OR, 2013.

36. Nguyen, K.-D. and Dankowicz, H. (2014) "Principles of Dynamics for Design Applied to a Brush-Belt Material-Transfer System," *Proceedings of the 2nd ASME International Biennial Conference on Dynamics for Design*, Buffalo, NY, 2014.
37. Nguyen, K.-D. and Dankowicz, H. (2014) "Synchronization and Consensus of a Robot Network on an Underactuated Dynamic Platform," *Proceedings of 2014 IEEE/RSJ International Conference on Intelligent Robots and Systems*, Chicago, IL, 2014.
38. Tabor, W., Ritchie, R., and Dankowicz, H. (2014) "Language Emergence in the Laboratory: A Method Suitable to Dynamical Systems Analysis," *Proceedings of 10th Biennial Evolution of Language Conference*, Vienna, Austria, 2014.
39. Li, Y., Nguyen, K.-D. and Dankowicz, H. (2016) "A Robust Adaptive Controller for a Seed Refilling System on a Moving Platform," *Proceedings of Agricontrol 2016*, Seattle, Washington, 2016.

Manuscripts in preparation:

1. Nguyen, K.-D. and Dankowicz, H. "Input-Delay Compensation in the L1 Adaptive Control Framework."
2. Nguyen, K.-D. and Dankowicz, H. "Analysis of Time-Delay Margin of a Class of Adaptive Controllers for Underactuated Lagrangian Systems."

Software

- MAMBO – public-domain software for modeling and analysis of multi-body systems, 1999-2003. Jointly with Arne Nordmark, Royal Institute of Technology, Stockholm, Sweden, see http://danko.mechanical.illinois.edu/Mambo.
- MAMBO TOOLBOX – public-domain plug-in for Maple/Matlab/Mathematica for modeling and analysis of multi-body systems, 1998-2003, see http://danko.mechanical.illinois.edu/Mambo.
- TC-HAT – public-domain AUTO-compatible FORTRAN software package for continuation of periodic trajectories of hybrid dynamical systems, 2006-present. Jointly with Phanikrishna Thota, University of Bristol, Bristol, United Kingdom, see http://seis.bris.ac.uk/~enzpt/.
- COCO – public-domain Matlab software for general-purpose parameter continuation of sets of constrained orbit segments, 2007-present. Jointly with Frank Schilder, Technical University of Denmark, Kgs. Lyngby, Denmark, see http://sourceforge.net/projects/cocotools.

Intellectual property

Invention Disclosures:

- Dankowicz, H. and A. Dutta, "Active Ankle Foot Orthosis/Prosthesis to Enhance Gait Stability," see http://www.vtip.org, invention disclosure 03-080, 2003.
- Dankowicz, H. et al., "Systems and Methods for Multi-Dimensional Characterization and Classification of Spinal Shape," US Patent Application 20090226055. Abandoned.

- Dankowicz, H. et al., "Computer-aided three-dimensional bending of spinal rod implants, other surgical implants and other articles, systems for three-dimensional shaping, and apparatuses therefor." US Patent Application 20050262911. Abandoned.
- Dankowicz, H. and K. Nguyen, "Brush Design for Seed-Delivery Systems," invention disclosure filed on July 27, 2012 to UIUC OTM, file number TF12156.

Patents:

- Dankowicz, H. and R. Reinke, "Self-Calibrating Mass Flow Sensor System," US Patent 9,127,972, issued on September 8, 2015.

Contributed Papers at Conferences (not listed elsewhere)

- *Chaos, Degeneracy, and the Three-Body Problem,*
  Swedish Mechanics Days 1993, Boras, Sweden
- *Some Special Orbits in the Two-Body Problem,*
  Swedish Mechanics Days 1993, Boras, Sweden
- *Looking for Chaos. An Extension and Alternative to Melnikov's Method,*
  US Dynamics Days 1994, Durham, North Carolina, USA
- *Local Models of Spatio-Temporally Complex Fields,*
  The Northeast Dynamics Meeting 1995, Hartford, Connecticut, USA
  The NATO/ASI workshop on From Finite to Infinite Dimensional Systems, 1995, Cambridge, England
- *Escape of Particles Orbiting Asteroids through Arnol'd Diffusion*
  Conference on Ordinary and Partial Differential Equations 1996, Dundee, Scotland
- *Dynamical Friction Modeling,*
  Swedish Mechanics Days 1997, Luleå, Sweden
  SIAM Conference on Applications of Dynamical Systems 1997, Snowbird, Utah, USA
  Contact Mechanics 1997, Madrid, Spain
  3rd EUROMECH Solid Mechanics Conference 1997, Stockholm, Sweden
- *3D Stable Gait in Passive Bipedal Mechanisms,*
  Euromech 357, Biology and Technology of Walking, 1998, Munich, Germany
- *Stick-Slip Oscillations -- Quo Vadis,*
  International Symposium on Impact and Friction in Structures and Mechanisms, 1998, Ottawa, Canada
  European Nonlinear Oscillations Conference 1999, Copenhagen, Denmark
- *Slow Diffusion and Effective Stability of Dust Particles Orbiting Asteroids,*
  SIAM Conference on Applications of Dynamical Systems 1999, Snowbird, Utah, USA
  European Nonlinear Oscillations Conference 1999, Copenhagen, Denmark
- *Stability analysis of passive, bipedal gait in a three-dimensional environment,*

International Workshop on Symmetry and Stability in Nonlinear Mechanics, 2000, Budapest, Hungary,
ICTAM 2000, Chicago, Illinois, USA

- *A Successive Constraint Imposition Approach to Multibody Mechanics,*
  1st SIAM Conference on Computational Science and Engineering, 2000, Washington, D.C., USA
- *Grazing Bifurcations of Initially Quasi-Periodic System Attractors,*
  18th Biennial Conference on Mechanical Vibration and Noise, 2001, Pittsburgh, Pennsylvania, USA.
- *Exploiting Discontinuities for Stabilization of Recurrent Motion,*
  Dynamics Days, 2002, Baltimore, Maryland, USA.
  14th US National Congress of Theoretical and Applied Mechanics, 2002, Blacksburg, Virginia, USA
- *Stabilizing Control of 2D and 3D Passive Walkers*
  Ninth Conference on Nonlinear Vibrations, Stability, and Dynamics of Structures, 2002, Blacksburg, Virginia, USA
- *Low-Cost Control of Repetitive Gait in Passive Bipedal Walkers*
  Twenty-first Southern Biomedical Engineering Conference, 2002, Bethesda, Maryland, USA
- *Low-Cost Control of Impact Hammer Performance*
  19th Biennial Conference on Mechanical Vibration and Noise, 2003, Chicago, Illinois, USA
- *Design of an actuated ankle-foot orthosis for improved gait stability*
  2003 Biomedical Engineering Society Annual Fall Meeting, Nashville, Tennessee, USA
- *Characterizing Grazing Contact Between Quasiperiodic Attractors and State-space Discontinuities*
  Dynamics Days 2004, Chapel Hill, North Carolina
- *Grazing Bifurcations of Quasiperiodic System Attractors*
  Dynamics Days 2004, Chapel Hill, North Carolina
- *A Normal-form Analysis of Co-dimension-two Grazing Bifurcations in Impact Oscillators*
  Dynamics Days 2004, Chapel Hill, North Carolina
- *Grazing Bifurcation of Quasiperiodic System Attractors*
  Tenth Conference on Nonlinear Vibrations, Stability, and Dynamics of Structures, 2004, Blacksburg, Virginia, USA
- *Modeling and Simulation of Impact Microactuators*
  Tenth Conference on Nonlinear Vibrations, Stability, and Dynamics of Structures, 2004, Blacksburg, Virginia, USA
- *Analysis of Grazing Bifurcations in Impact Microactuators*
  ICTAM 2004, Warsaw, Poland
- *Discontinuity-driven Design and Control of an Impact Microactuator*
  International workshop on Piecewise Smooth Dynamical Systems: Analysis, Numerics, and Applications, Bristol University, 2004, Bristol, United Kingdom
  SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, 2005
- *Control of Near-Grazing Dynamics in Impact Oscillators*
  SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, 2005

- *Continuous and Discontinuous Grazing Bifurcations in Impact Oscillators*
  EUROMECH Nonlinear Dynamics Conference, Eindhoven, The Netherlands, 2005
- *Near-Grazing Dynamics in Tapping-Mode Atomic Force Microscopy*
  EUROMECH Nonlinear Dynamics Conference, Eindhoven, The Netherlands, 2005
- *Characterization of Intermittent Contact in Tapping Mode Atomic Force Microscopy*
  5th ASME International Conference on Multibody Systems, Nonlinear Dynamics and Control, Long Beach, California, 2005
- *Teaching Advanced Modeling of Multibody Mechanisms to Non-Traditional Engineering Students*
  ASEE, 2006 Illinois-Indiana and North Central Joint Section Conference, Fort Wayne, Indiana, 2006
  Conference on Rethinking the Mathematics Curriculum for Engineering and Science Students, Atlanta, Georgia, 2006
- *Energy Transfer in Vibratory Systems with Friction Due to Low-Velocity Collisions*
  Second International Conference on Nonlinear Normal Modes and Localization in Vibrating Systems, Samos, Greece, 2006
  Eleventh Conference on Nonlinear Vibrations, Stability, and Dynamics of Structures, Blacksburg, Virginia, 2006
- *Quantifying the Dynamics of Tapping Mode Atomic Force Microscopy*
  SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, 2007
- *A New Development Platform for Computational Bifurcation Analysis*
  Workshop on Bifurcations in Dynamical Systems with Applications, Bielefeld, Germany, 2008
- *Controlled Onset of Low Velocity Collisions in Vibro-Impacting Systems with Friction*
  ICTAM 2008, Adelaide, Australia
- *Reduced-Order Models of Electrostatically Actuated Flexible MEMS Structures Suffering Impacts*
  EUROMECH Colloquium 503, Rome, Italy, 2009
- *On the Effects of Higher-Order Nonlinearities on the Frequency Characteristics of Vibration Microbeams*
  Thirteenth Conference on Nonlinear Vibrations, Dynamics, and Multibody Systems Blacksburg, Virginia 2010
- *A Lumped-Parameter Model of Tire-Terrain Interactions for Off-Road Vehicles*
  Duke Vibrations Workshop, Durham, NC, 2010
- *A Matlab Continuation Toolbox for Response Tracking in Experiments*
  EUROMECH Nonlinear Dynamics Conference, Rome, Italy, 2011
- *Continuation of Connecting Orbits with Lin's Method using COCO*
  EUROMECH Nonlinear Dynamics Conference, Rome, Italy, 2011
- *A Micro-Electro-Mechanical Realization of a Tunable Crowbar Device*
  EUROMECH Nonlinear Dynamics Conference, Rome, Italy, 2011
- *Period-Adding Cascades in Models of the Eukaryotic Cell Cycle*
  SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, 2013
- *Singular Boundary-Value Formulations for Nonlinear Beams*
  EUROMECH Nonlinear Dynamics Conference, Vienna, Austria, 2014

- *Atlas Merging Algorithms and Parallelization*
  EUROMECH Nonlinear Dynamics Conference, Vienna, Austria, 2014
- *Analysis of Cloud Particle Activation using Numerical Continuation*
  EUROMECH Nonlinear Dynamics Conference, Vienna, Austria, 2014
- *Mechanisms of Recruitment and Inhibition on a Time-Dependent Interaction Network*
  Keck Futures Initiative. Collective Behavior: From Cells to Societies, Irvine, CA, 2014
- *Continuation of Chatter in a Mechanical Valve*
  SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, 2015
- *Analysis of Periodic Chatter in a Mechanical Pressure Relief Valve*
  ASME 11th International Conference on Multibody Systems, Nonlinear Dynamics, and Control, Boston, MA, 2015
- *Nonlinear Tuning of Microresonators for Dynamic Range Enhancement*
  EquaDiff 2015, Lyon, France, 2015
- *Automated Tracking of Individuals Reveals Temporal Structure and Resiliency of Honey Bee Social Networks*
  Conference on Complex Systems 2015, Tempe, Arizona, 2015

Academic Seminars (not listed elsewhere)

- *Some Special Orbits in the Two-Body Problem with Radiation Pressure,*
  Cornell Univ., Dept. of Space Sciences, USA, 1992
  Cornell Univ., Dept. of Theoretical and Applied Mechanics, USA, 1993
- *Chaos, Degeneracy, and the Three-Body Problem,*
  Cornell Univ., Program of Applied Mathematics, USA, 1993
- *Local Models of Spatio-Temporally Complex Fields,*
  Princeton Univ., Program for Applied and Computational Mathematics, USA, 1995
  KTH, Dept. of Mechanics, Sweden, 1996
- *Regular Celestial Mechanics and Radiation Pressure,*
  KTH, Dept. of Mechanics, Sweden, 1995
- *Evolving Control Strategies for Suppressing Heteroclinic Bursting in the Turbulent Boundary Layer,*
  KTH, Dept. of Mechanics, Sweden, 1996
  Cornell Univ., Dept. of Theoretical and Applied Mechanics, USA, 1996
  Univ. of Maryland at College Park, Inst. for Physical Science and Technology, USA, 1996
  Univ. of Maryland at College Park, Dept. of Mechanical Engineering, USA, 1997
- *Escape of Particles Orbiting Asteroids through Arnol'd Diffusion*
  Brown Univ., Division of Applied Mathematics, USA, 1996
- *Dynamic Friction Modeling,*
  Univ. of Pennsylvania, Dept. of Mechanical Engineering and Applied Mechanics, USA, 1997
  Univ. of Colorado at Boulder, Dept. of Mechanical Engineering, USA, 1997
  Linköping's Technical Institute, Dept. of Mechanics, Sweden, 1997
  Technical Univ. of Denmark, Dept. of Mathematical Modelling, Denmark, 1997

- *On the Origin and Bifurcations of Stick-Slip Oscillations*
  Univ. of Maryland at College Park, Inst. for Physical Science and Technology, USA, 1998
  Princeton Univ., Program for Applied and Computational Mathematics, USA, 1998
  Brown Univ., Division of Applied Mathematics, USA, 1998
  KTH, Dept. of Mathematics, Sweden, 1999
  MIT, Dept. of Mechanical Engineering, USA, 2000
- *Stable* 3D *Gait in Two-Legged Mechanisms*
  MIT, Leg Laboratory, USA, 1998
  Boston Univ., Dept. of Mechanical Engineering, USA, 1998
  Brown Univ., Dept. of Computer Science, USA, 1998
  Yale Univ., Dept. of Mechanical Engineering, USA, 1998
  Chalmers Univ. of Technology, Dept. of Mechanics, Sweden, 1999
  KTH, Dept. of Mechanics, Sweden, 1999
  KTH, Center for Autonomous Systems, Sweden, 1999
  Virginia Tech, Dept. of Engineering Science and Mechanics, USA, 1999
  Univ. of Minnesota, Dept. of Aerospace Engineering and Mechanics, USA, 1999
- *Slow Diffusion and Effective Stability of Dust Particles Orbiting Asteroids,*
  Virginia Tech, Dept. of Mathematics, USA, 1999
  Virginia Tech, Dept. of Engineering Science and Mechanics, USA, 1999
- *A Successive Constraint Imposition Approach to Multibody Mechanics,*
  Cornell Univ., Dept. of Theoretical and Applied Mechanics, USA, 2001
- *Teaching Advanced Modeling of Multi-Body Mechanisms to Non-Traditional Engineering Students,*
  Univ. of Pennsylvania, Dept. of Mechanical Engineering and Applied Mechanics, USA, 2001
  Royal Institute of Technology, Dept. of Machine Design, Sweden, 2006
  Michigan State University, Dept. of Mechanical Engineering, USA, 2006
- *Exploiting Discontinuities for the Control of Recurrent Motion in Non-smooth Dynamical Systems,*
  Virginia Tech, Dept. of Engineering Science and Mechanics, USA, 2002
  Virginia Tech, Dept. of Electrical and Computer Engineering, USA, 2002
  Virginia Tech, Dept. of Physics, USA, 2002
- *Discontinuity-Driven Design and Control of Impact Microactuators*
  University of Maryland, Dept. of Mechanical Engineering, USA, 2005
  University of Delaware, Dept. of Mathematical Sciences, USA, 2005
  University of Illinois at Urbana-Champaign, Dept. of Mechanical & Industrial Engineering, USA, 2005
  Cornell University, Dept. of Theoretical and Applied Mechanics, USA, 2005
- *Near-Grazing Dynamics in Tapping-Mode Atomic Force Microscopy*
  University of Illinois at Urbana-Champaign, Dept. of Mechanical & Industrial Engineering/Dept. of Mathematics, USA, 2005
- *On the purposeful coarsening of smooth vector fields*
  Michigan State University, Dept. of Mechanical Engineering, USA, 2006

- *Tapping at the Nanoscale: Discontinuity-Induced Degeneracies in Atomic Force Microscopy*
  University of Maryland at College Park, Dept. of Mechanical Engineering, USA, 2009
- *Degenerate Discontinuity-Induced Bifurcations in Tapping-Mode Atomic-Force Microscopy*
  Sapienza University of Rome, Dept. of Structural and Geotechnical Engineering, Italy, 2009
- *A New Development Platform for Parameter Continuation and Bifurcation Analysis in Nonlinear Dynamical Systems*
  University of Bristol, Dept. of Engineering Mathematics, United Kingdom, 2009
- *Control of Discontinuity-Induced Bifurcations in Mechanical Systems with Intermittent Contact*
  University of Wisconsin at Madison, Dept. of Engineering Physics, USA, 2010
- *A Lumped-Parameter Model of Tire-Terrain Interactions for Off-Road Vehicles*
  University of Illinois at Urbana-Champaign, Beckman Institute, USA 2010
- *Friction-induced Reverse Chatter in Rigid-body Mechanisms with Impacts*
  University of South California, Dept. of Aerospace and Mechanical Engineering, October 2010
  University of Michigan, Dept. of Mechanical Engineering, November 2010
  University of Maryland Baltimore County, April 2011
  University of North Carolina Charlotte, April 2011
  University of Connecticut, July 2011
  Polytechnic Institute of New York University, April 2012
- *Period-Adding Cascades in Models of the Eukaryotic Cell Cycle*
  The University of Auckland, Department of Mathematics, New Zealand, February 2014
- *Tools of the Trade – An Inventory of Techniques for Modeling, Analysis and Control of Mechanical Systems with Friction and Impact*
  University of Bristol, Department of Engineering Mathematics, United Kingdom, July 2014
- *Tutorial workshop on the Matlab-based Computational Continuation Core*
  University of Bristol, Department of Engineering Mathematics, United Kingdom, July 2014
- *Discontinuity-induced Bifurcations in Models of Mechanical Contact, Capillary Adhesion, and Cell Division*
  McGill University, Department of Mechanical Engineering, Quebec, Canada, September 2014
- *Emergent Coordination in Leaderless Networks*
  Clarkson University, Department of Mechanical and Aeronautical Engineering, Potsdam, NY, November 2014
- *Adaptive Control of Underactuated Robots with Unmodeled Dynamics*, Jet Propulsion Laboratory, CA, November 2014

Audio Interviews

ASME Applied Mechanics Reviews podcast series. Full-length audio interviews, conducted and edited by Harry Dankowicz.

http://appliedmechanicsreviews.asmedigitalcollection.asme.org/podcasts.aspx

In order of publication:

1. Avram Bar-Cohen, January 2014
2. David Barnett, April 2014
3. Markus Buehler, May 2014
4. Howard Stone, June 2014
5. Joe Goddard, July 2014
6. Anthony Bloch, July 2014
7. Karl Johan Åström, September 2014
8. Irene Beyerlein, October 2014
9. Philip Holmes, November 2014
10. Stuart Antman, December 2014
11. Katia Bertoldi, January 2015
12. Zhigang Suo, February 2015
13. Edwin Kreuzer, March 2015
14. Igor Mezic, April 2015
15. Julie Greer, June 2015
16. Melany Hunt, September 2015
17. Gabor Stepan, October 2015
18. Thomas Hughes, May 2016
19. Rodney Clifton, June 2016

Areas of Research

Dynamical systems, nonlinear dynamics, piecewise smooth dynamics, computational science and engineering, orthopaedic biomechanics, multibody dynamics, robotics, contact and friction modeling, complex systems.

Teaching Experience

- Teaching assistant in the Dept. of Mechanics, KTH, 1990/91. Undergraduate and upper level undergraduate courses in *basic mechanics and analytical mechanics*.
- Teaching assistant in the Dept. of Theoretical and Applied Mechanics, Cornell Univ., 1993/94. Upper level undergraduate course in *differential equations*.
- Graduate-level course on *infinite-dimensional dynamical systems,* Dept. of Mechanics, KTH, 1996/97.
- Upper-level undergraduate and graduate course *on advanced dynamics of complex multibody mechanisms*, Dept. of Mechanics, KTH, 1997.
- Introductory course in *multi-body mechanics and visualization* for computer science undergraduates, Dept. of Mechanics, KTH, 1999.
- Sophomore *statics* in Dept. of Engineering Science and Mechanics, Virginia Tech.

- Graduate level course on *advanced vibrations*, Dept. of Engineering Science and Mechanics, Virginia Tech.
- Upper-level undergraduate engineering science elective for electrical and computer engineers on *multi-body mechanics and visualization*, Dept. of Engineering Science and Mechanics, Virginia Tech.
- Sophomore introduction to *differential equations*, Dept. of Mathematics, Virginia Tech.
- Advised several groups of Engineering-Science-and-Mechanics and Mechanical-Engineering senior students in *biomedical-engineering capstone design projects*, Virginia Tech.
- Senior-level introduction to *nonlinear dynamics and chaos*, Dept. of Engineering Science and Mechanics, Virginia Tech.
- Graduate-level course on *intermediate dynamics*, Dept. of Engineering Science and Mechanics, Virginia Tech.
- Graduate-level course on *energy and variational methods in applied mechanics*, Dept. of Engineering Science and Mechanics, Virginia Tech.
- Graduate-level course on *advanced dynamics*, Dept. of Engineering Science and Mechanics, Virginia Tech.
- Junior-level course on *modeling and analysis of dynamic systems*, Dept. of Mechanical and Industrial Engineering, UIUC.
- Upper-level undergraduate and graduate elective on *multibody mechanics and visualization*, Dept. of Mechanical and Industrial Engineering, UIUC.
- Upper-level undergraduate and graduate elective on *kinematics and dynamics of mechanical systems*, Dept. of Mechanical Science and Engineering, UIUC.
- Upper-level undergraduate required course and graduate elective on *intermediate dynamics*, Dept. of Mechanical Science and Engineering, UIUC.
- Graduate-level course on *mathematical methods of engineering*, Dept. of Mechanical Science and Engineering, UIUC.
- Freshman *calculus*, UIUC.
- Graduate-level course on *computational nonlinear dynamics*, Dept. of Mechanical Science and Engineering, UIUC.

Advisory Activity

M.Sc.

- Urban Dahlberg, Engineering Physics, KTH, 1998
- Klas Blomström, Mechanical and Materials Engineering, KTH, 1999
- Anna Glennmar, Vehicle Engineering, KTH, 1999
- David Ruppert, Mechanical Engineering, Virginia Tech, 2003
- Colleen Shannon, Mechanical Engineering, Virginia Tech, 2003
- Dean Entrekin, School of Biomedical Engineering and Sciences, Virginia Tech, 2004
- Gunjan Thakur, Engineering Science and Mechanics, Virginia Tech, 2004

- Ryan Pilson, Mechanical Engineering, Virginia Tech, 2006
- Melih Eriten, Applied Mathematics non-thesis, UIUC, 2008
- Pravesh Sanghvi, Mechanical Science and Engineering, UIUC, 2010
- Ryan Reinke, Mechanical Science and Engineering, UIUC, 2010
- Michael Katzenbach, Mechanical Science and Engineering, UIUC, 2010
- David Kijowski, Mechanical Science and Engineering, UIUC, 2011
- Janglih Lin, Mechanical Science and Engineering, UIUC, 2012
- John Sanders, Mechanical Science and Engineering, UIUC, 2013
- Pratik Mallya, Computer Science, UIUC, 2014
- Erika Fotsch, Mechanical Science and Engineering, UIUC, 2016
- Cole Anderson, Mechanical Science and Engineering, UIUC, present
- Tonghui Cui, Mechanical Science and Engineering, UIUC, present
- Andres Rodriguez Reina, Mechanical Science and Engineering, UIUC, present
- Marie Biscarrat, Mechanical Science and Engineering, UIUC, present
- Yuqing Wang, Mechanical Science and Engineering, UIUC, present

Ph.D.

- Jesper Adolfsson, Mechanics, KTH, 2001 (unofficial, co-advised with Prof. Martin Lesser)
- Petri Piiroinen, Mechanics, KTH, 2002
- Phanikrishna Thota, Engineering Science and Mechanics, Virginia Tech, 2007
- Fredrik Svahn, Aeronautical and Vehicle Engineering, KTH, 2009 (co-advised with Prof. Annika Stensson)
- Sambit Misra, Mechanical Science and Engineering, UIUC, 2009
- Bryan Wilcox, Mechanical Science and Engineering, UIUC, 2010
- Louis DiBerardino, Mechanical Science and Engineering, UIUC, 2014 (co-advised with Prof. Elizabeth Hsiao-Wecksler)
- Mehdi Saghafi, Mechanical Science and Engineering, UIUC, 2014
- Kim Nguyen, Mechanical Science and Engineering, UIUC, 2015
- Yang Li, Mechanical Science and Engineering, UIUC, present
- Mingwu Li, Mechanical Science and Engineering, UIUC, present
- Yu Mao, Mechanical Science and Engineering, UIUC, present
- Zaid Ahsan, Mechanical Science and Engineering, UIUC, present
- Christopher Marry, Mechanical Science and Engineering, UIUC, present

Post-docs

- Xiaopeng Zhao, Engineering Science and Mechanics, Virginia Tech, 2004-2005
- Michael Jeffrey, Mechanical Science and Engineering, UIUC, 2010-2011
- Weibing Deng, Mechanical Science and Engineering, UIUC, 2013-2014

- Mehdi Saghafi, Mechanical Science and Engineering, UIUC, 2014-2015
- Kim Nguyen, Mechanical Science and Engineering, UIUC, 2015-2016

Other graduate student collaborators

- Noelani Thompson, Engineering Science and Mechanics, Virginia Tech
- Brendan Chan, Mechanical Engineering, Virginia Tech
- Nastaran Hashemi, Virginia Tech
- Anirban Dutta, Virginia Tech
- Jenny Jerrelind, Aeronautical and Vehicle Engineering, KTH
- Wonmo Kang, UIUC
- Kiwon Park, UIUC
- Mazharul Islam, UIUC

University Service

- Organizer of Horizon 2020 Grants Information Workshops, March 2014
- Office of Vice Chancellor for Research Faculty Coordinator for Horizon 2020 initiatives, 2014
- Faculty liaison for INSPIRE (The Illinois-Sweden Program for Educational and Research Exchange), 2010-present
- Co-organizer of INSPIRE Stage I and Stage II Research Symposia in Urbana (December 2010) and in Stockholm (May 2011), and the INSPIRE Alliance Summit in Urbana (April 2012)
- Webmaster, http://inspire.illinois.edu, 2011-present
- Faculty Senate, UIUC, 2008-2009, 2010-2012, 2015-2016
- Calculus Project Coordinator, College of Engineering, UIUC, 2009-2011
- Equal Opportunity and Affirmative Action Officer, UIUC, 2011-2012
- Faculty advisor, University of Illinois Rube Goldberg Team, 2008-2013
- Member of department ad-hoc committee on Undergraduate Mentoring, UIUC, 2009
- Member of departmental Advisor Committee, UIUC, 2008-2009
- Member of departmental Faculty Recruiting Committee, UIUC, 2007-2010
- Member of college Engineering-Mathematics Liaison Subcommittee, UIUC, 2006-2011
- Member of departmental Undergraduate Program Committee, UIUC, 2006-2010, 2011-2014
- Member of departmental ad-hoc committee on Future of Mechanics, UIUC, 2006
- Member of departmental Graduate Program Committee, UIUC, 2006-2007
- Member of departmental Graduate Admissions Committee, UIUC, 2006, 2010
- Member of departmental Awards Committee, UIUC, 2006-2007
- Member of Applied Mathematics Steering Committee, UIUC, 2005-2006
- Honors advisor for departmental James Scholars, UIUC, 2005-present
- Member of departmental Executive Committee, Virginia Tech, 2004-2005

- Member of departmental Strategic Thinking Committee, Virginia Tech, 2004
- Member of College of Engineering Dean search committee, Virginia Tech, 2005
- Chair of departmental Computing Resources Committee, Virginia Tech, 2003-2005
- Member of departmental Undergraduate Curriculum Committee, Virginia Tech, 2000-2004
- Member of department Computing Resources Committee, Virginia Tech, 2000-2002
- Webmaster, Center for Biomedical Engineering at Virginia Tech, 1999-2002
- Layout, editing, and production of the Center for Biomedical Engineering at Virginia Tech promotional poster
- Layout, editing and production of the Dept. of Mechanics, KTH, promotional brochure, 1997-1999
- Editing and production of the Dept. of Mechanics, KTH, SAFARI homepages, 1998-1999
- Head of the project Alternative Approaches to the Mobility of Mechanisms, KTH, 1997-2002

Professional Service

Societal duties

- Member, Society for Industrial and Applied Mechanics (SIAM), 1997-present
- Member, EUROMECH, 1998-2001, 2011-2012
- Member, ASEE, 2000-present
- Member, AAM, 2005-2007
- Member, ASME, 2002-present
- Member, ASME Technical Committee on Multibody Systems and Nonlinear Dynamics, 2005-2017
- Recording Secretary, ASME Technical Committee on Multibody Systems and Nonlinear Dynamics, 2009-2011
- Vice-Chair, ASME Technical Committee on Multibody Systems and Nonlinear Dynamics, 2011-2013
- Chair, ASME Technical Committee on Multibody Systems and Nonlinear Dynamics, 2013-2015
- Member, Society of Engineering Science (SES), 2008-2012
- Board of Directors, Society of Engineering Science, 2010-2012
- Recording Secretary, Board of Directors, Society of Engineering Science, 2010-2012

Editorial duties

- Associate Editor, Journal of Computational and Nonlinear Dynamics, 2005-2011.
- Guest Editor, Journal of Computational and Nonlinear Dynamics, special issue for Philip Holmes, 2005-2006.
- Contributing Editor, International Journal of Non-Linear Mechanics, 2005-2011.

- Guest Editor, International Journal of Non-Linear Mechanics, special issues on "Micro- and Nanoscale Beam Dynamics," 2006; "Nonlinear Dynamics and Mechanics of Macromolecules," 2008; "Non-Linear Mechanics of Biological Structures," 2010.
- Member of Editorial Board, Journal of Computational Dynamics, 2011-2015.
- Associate Editor, SIAM Journal on Applied Dynamical Systems, 2012-2016.
- Editor, Transactions of the ASME, Applied Mechanics Review, 2012-2017.

Conference organization

- Member, Organizing Team, 19th Southern Biomedical Engineering Conference, Blacksburg, Virginia, April 14-16, 2000
- Co-organizer of symposium on "Non-Smooth Dynamics, Micro-Scale Systems and Nonlinear Resonance," 5th International Conference on Multibody Systems, Nonlinear Dynamics, and Control (MSNDC), Long Beach, California, September 24-28, 2005.
- Co-organizer of symposium on "Musculoskeletal Biomechanics and Bioassistive Devices" and "Analysis and Applications of Discontinuous Dynamical Systems," 6th International Conference on Multibody Systems, Nonlinear Dynamics, and Control (MSNDC), Las Vegas, Nevada, September 4-7, 2007.
- Co-organizer of "Workshop on Behavioral and Cognitive Dynamical Systems," Cornell University, Ithaca, NY, August 2007
- Co-organizer of symposium on "Dynamics of Biomechanical Processes," Society of Engineering Science 2008, Champaign, Illinois, October 12-15, 2008
- Technical Program co-chair, ASME 2009 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference, San Diego, August 30-September 2, 2009.
- Co-organizer of symposium on "Musculoskeletal Biomechanics and Bioassistive Devices" and "Computational Methods for Nonlinear Dynamics Analysis," 7th International Conference on Multibody Systems, Nonlinear Dynamics, and Control (MSNDC), San Diego, California, August 30-September 2, 2009.
- Co-organizer of symposium on "Computational Methods for Dynamical Systems Analysis," 16th US National Congress on Theoretical and Applied Mechanics, University Park, Pennsylvania, June 27-July 2, 2010.
- Member, Organizing Committee, "Special Conference on Mechanical Vibration and Noise," to be held as part of the ASME 2010 International Design and Engineering Technical Conferences & Computers and Information in Engineering Conference, Montreal, Canada, August 15-18, 2010.
- Co-organizer of symposium on "Dynamic Atomic Force Microscopy," 4th International Conference on Micro- and Nanosystems, Montreal, Canada, August 15-18, 2010.
- Co-organizer of symposium on "Computational Methods," 2011 European Nonlinear Oscillations Conference, Rome, Italy, July 24-29, 2011.

- Technical Program co-chair, ASME 2011 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference, Washington D.C., August 28-August 31, 2011.
- Program Chair, 8th International Conference on Multibody Systems, Nonlinear Dynamics, and Control, Washington D.C., August 28-August 31, 2011.
- Conference Co-Chair, 1st Biennial International Conference on Dynamics for Design, Chicago, IL, August 15-18, 2012.
- General Conference Co-chair, ASME 2013 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference, Portland, Oregon, August 4-7, 2013.
- Co-organizer of symposium on "Computational Methods," 2014 European Nonlinear Oscillations Conference, Vienna, Austria, July 2014.
- Co-organizer of symposium on "Dynamics of Non-Smooth Systems, Contact, and Impact," 11th International Conference on Multibody Systems, Nonlinear Dynamics, and Control and 27th Conference on Mechanical Vibration and Noise, August 2-5, 2015.
- Co-organizer of symposium on "Computational Methods," 2017 European Nonlinear Oscillations Conference, Budapest, Hungary, June 2017.

Journal, book, and proposal review

- AIAA Journal
- ASME Journal of Vibration and Acoustics
- ASME Journal of Applied Mechanics
- ASME Journal of Mechanical Design
- Astronomy and Astrophysics
- Chaos
- Dynamics and Stability of Systems
- European Journal of Mechanics/Solids
- IEEE Transactions on Robotics
- Indian Journal of Pure and Applied Mathematics
- International Journal of Bifurcation and Chaos
- International Journal of Non-Linear Mechanics
- International Journal of Robust and Nonlinear Control
- Journal of Applied Mathematics and Computation
- Journal of Astronautical Sciences
- Journal of Tribology
- Journal of Celestial Mechanics and Dynamical Astronomy
- Journal of Nonlinear Science
- Journal of Sound and Vibration

- Journal of Differential Equations
- Journal of Guidance, Control, and Dynamics
- Journal of Vibration and Acoustics
- Journal of Vibration and Control
- Materials Today Magazine
- Nonlinear Dynamics
- Nonlinearity
- Physica D
- SIAM Journal of Applied Dynamical Systems
- Systems & Control
- Princeton Academic Press
- ZAMM
- Birkhauser
- Academic Press
- Elsevier
- Springer Verlag
- Swedish Engineering Research Council
- Swedish Science Council
- National Science Foundation
- US Civilian Research and Development Foundation
- Engineering and Physical Sciences Research Council, United Kingdom
- University of Missouri Research Board
- ASME, Design and Technical Conferences
- European Nonlinear Oscillations Conference
- AIAA Young Professionals Paper Competition

Funding

Around $3.7M (my share: $2.7M) as principal investigator in funded research from US and Swedish federal agencies, private firms, and foundations. Research sponsors include the National Science Foundation, the Swedish Science Council, the Swedish Engineering Research Council, the Swedish Foundation for Strategic Research, Carilion Biomedical Institute, the Commonwealth Health Research Board, the National Aeronautics and Space Administration, The National Institute of Food and Agriculture, and the Jeffress Memorial Trust.

Selected research projects:

- "PECASE: Analysis and Design of Discontinuity-Driven Bifurcations," National Science Foundation, $443,001, 2003-2010, sole investigator

- "Passive Gait in Anthropomorphic, Bipedal Mechanisms including Musculoskeletal Modeling," Jeffress Memorial Trust, $50,582, 2000-2002, sole investigator
- "Integrated Design and Evaluation Expert System for Treatment of Idiopathic Scoliosis," Commonwealth Health Research Board, $89,989, 2003-2004, sole investigator
- "Suppression of Catastrophic Loss of Stability of Low-Velocity Impacting Motions," Swedish Science Council, $400,000, 2004-2008, co-investigator (principal investigator Annika Stensson, Royal Institute of Technology, Sweden)
- "Self-Calibrating Mass-Flow Sensor," John Deere & Company, $192,627, 2008-2010, sole investigator
- "Ultrafast and Robust, Resettable Threshold Sensors Based on Discontinuity-Induced Nonlinearities," National Science Foundation, $302,001, 2009-2012, sole investigator
- "INSPIRE: Asynchronous Communication, Self-Organization, and Differentiation in Human and Insect Networks," National Science Foundation, $999,850, 2012-2015, principal investigator (co-investigators Gene Robinson, UIUC, and Whitney Tabor, University of Connecticut).
- "Cooperative Human-Robot Networks for Agricultural Applications," National Institute of Food and Agriculture, $532,607, 2014-2017, sole investigator.

Public Appearances

- Swedish Public Radio, P1, *Tendens*, April 12, 1996. Program on 'chaos'.
- ASME Engineering News, online podcast, September 2011: "The Future of Machine Invention," http://www.asme.org/kb/news---articles/media/2011/09/future-of-machine-invention
- NSF Science Nation, online video, June 2014: "No leader? Now what?" http://www.nsf.gov/news/special_reports/science_nation/complexsystems.jsp