

PHILIP JOHN HOLMES: Short Curriculum Vitae and Recent Publications (updated Sept 2009)

Born - Lincolnshire, United Kingdom, May 24, 1945. British and naturalized U.S. citizen. Married with four children.

Education

Oxford University; B.A. (Hons). Engineering Science: 1967.
Southampton University; Ph.D. Engineering: 1974.

Recent Positions

Professor of Theoretical and Applied Mechanics and Mathematics, Cornell University: 1984-1994.
Sherman Fairchild Distinguished Scholar, California Institute of Technology: 1988-1989.
Professeur Associé, Université de Nice: July 1989.
Charles N. Mellowes Professor of Engineering and Professor of Mathematics, Cornell University: 1992-94
Professeur Associé, Université de Paris-Sud: June-July 1993.
Professor of Mechanics and Applied Mathematics, Princeton University: 1994-; Associate Faculty in Department of Mathematics, 2002-.
Director, Program in Applied and Computational Mathematics, Princeton University: 1994-97.
Visiting Member, Institute for Advanced Study, Princeton: Spring 2003.
Interim Chair, Department of Mechanical and Aerospace Engineering, Princeton University, 2006-07.
Eugene Higgins Professor of Mechanical and Aerospace Engineering, Princeton University: 2008-.

Major Honors and Recent Invited Lectures

John Simon Guggenheim Memorial Fellow, 1993-4.
Elected Fellow of the American Academy of Arts and Sciences, 1994.
Erdős Visiting Professor, Paul Erdős Mathematical Center, Budapest, Hungary, January 2000.
Elected Honorary Member of the Hungarian Academy of Sciences, 2001.
Plenary Speaker, SIAM 50th Anniversary Meeting, Philadelphia PA, July 2002.
Listed among Highly Cited Researchers by the American Society for Information Science & Technology, 2003
ISIHighlyCited.com.
Plenary Speaker, International Symposium on Nonlinear Theory and its Applications (NOLTA2004), Fukuoka, Japan, December 2004.
Opening Plenary Speaker, Fifth EUROMECH Nonlinear Dynamics Conference (ENOC-2005), Eindhoven University of Technology, the Netherlands, August 2005.
Math Matters Public Lecture, Institute for Mathematics and Its Applications, Minneapolis, MN, December 2005.
Appointed to SIAM Visiting Lecturer Program, 2006.
Rainich Lecturer, Department of Mathematics, University of Michigan, October-November 2006.
Elected Fellow of the American Physical Society, 2006.
Lyapunov Award from American Society of Mechanical Engineers' Technical Committee on Multibody Systems and Nonlinear Dynamics, 2009.
Safra Distinguished Visiting Professor in the Faculty of Mechanical Engineering, Technion, Israel, Feb-March 2009.
Plenary Speaker, 16th International Congress on Mathematical Physics, Prague, Czech Republic, Aug 3-8, 2009.

Theses Directed (Ph.D., unless stated otherwise)

B.D. Greenspan (1981); J. Belair (1983); S.W. Shaw (1983); S.R. Wiggins (1985); N. MacGiolla Mhuiris (1986); K.G. Hockett (1986); J.J.P. Veerman (1986); A. Szeri (1988); E. Stone (1989); T. Kiemel (1990); V. Brunsden (MSc., 1990); O. O'Reilly (1990); C. Moore (1991); S.A. Campbell (1991); G. Berkooz (1991); P.J. Swart (1991); B. Zombro (1993); J. Duan (1993); W. Kalies (1994); H. Dankowicz (1995); B.D. Coller (1995); R.W. Ghrist (1995); D.A. Taylor (MSc., 1996); R.W. Wittenberg (1998); J.J. Jenkins (MSc., 1999); J.M. Schmitt (2001); J. Cisternas (2003); T.R. Smith (2003); E.T. Brown (2004); R.M. Ghigliazza (2004); J. Seipel (2006); J. Gao (2007); Y. Liu (2007); P. Eckhoff (2009).

Current Graduate Students (Ph.D., unless stated otherwise)

R. Kukillaya; J. Proctor; A. Nedic; S. Goldfarb; S. Feng.

Postdoctoral Scholars

D.C. Whitley (1982-83); I.M. Moroz (1983-84); D. Armbruster (1986-88); A. Mielke (1986-87); J. Elezgaray (1989-91); G. Domokos (1991-92); A. Doelman (1992-93); D. Begie (1993-95); J.N. Kutz (1995-97); R. Goodman (1999-2001); H. Hanßmann (2000-01); J. Moehlis (2000-03); R. Bogacz (2001-04); T. McMillen (2003-06); P. Simen (2004-06); A.J. Yu (2005-08); M. Srinivasan (2006-09); P. Varkonyi (2006-07); KF. Wong-Lin (2006-); E. Fuchs (2008-).

Editorial Board Memberships

Addison-Wesley, monographs on Global Analysis and Its Applications: 1981-1985. SIAM Journal on Applied Mathematics: 1984-1990. Archive for Rational Mechanics and Analysis: 1986-2003. Complex Systems: 1986-1988. Journal of Nonlinear Science: 1990-; Managing Editor 2001-2005. Nonlinear Science Today: 1990-96. Proceedings of the Edinburgh Mathematical Society: 1991-96. Regular & Chaotic Dynamics: 1996-. Springer Verlag, Applied Mathematics Series and Texts in Applied Mathematics, 1997-. Annual Reviews of Fluid Mechanics, guest editor, 1998. SIAM Journal on Applied Dynamical Systems, 2001-. Applied Mathematics Research eXpress, 2001-.

Advisory Board Memberships

Centre de Recherches Mathématiques, Université de Montréal: 1986-1991. S.E.R.C. Nonlinear Systems Panel (U.K.): 1986-1990. Theory Center, Cornell University: 1987-1989. L'Institut des Sciences Mathématiques, Montréal: 1991-96. US National Committee on Theoretical and Applied Mechanics: 1996-2000. AMS NSF Postdoctoral Fellowship Selection Committee: 1998-2000 (Chair, 1999). AMS/SIAM Wiener Prize Committee: 2003. SIAM Jürgen Moser Prize Selection Committee: 2006. Membership Panel, American Academy of Arts and Sciences: 1997-98 and 2004-7 (Chair, 2005-7). SIAM Major Awards Committee, 2008-2010. Centrum voor Wiskunde en Informatica, Amsterdam (CWI) Advisory Council, 2008-.

Professional Society Memberships

American Mathematical Society (AMS representative to US National Committee on Theoretical and Applied Mechanics, 1996-2000); American Physical Society; International Society for the Interaction of Mechanics and Mathematics; Society for Industrial and Applied Mathematics (Council member, 1987-89); Society for Natural Philosophy; Society for Neuroscience.

SELECTED PUBLICATIONS

(1) Recent archival articles

- [1.151] P. Holmes, R.J. Full, D. Koditschek and J. Guckenheimer (2006) *SIAM Review* 48 (2), 207-304. The dynamics of legged locomotion: Models, analyses, and challenges.
- [1.152] R. Altendorfer, D. Koditschek and P. Holmes (2004) *Int. J. Robotics Research* 23 (10-11), 979-999. Stability analysis of legged locomotion models by symmetry-factored return maps.
- [1.153] R. Altendorfer, D. Koditschek and P. Holmes (2004) *Int. J. Robotics Research* 23 (10-11), 1001-1012. Stability analysis of a clock-driven rigid-body SLIP model of RHex.
- [1.154] R.M. Ghigliazza and P. Holmes (2004) *SIAM J. on Applied Dynamical Systems* 3 (4), 636-670. Minimal models of bursting neurons: How multiple currents, conductances and timescales affect bifurcation diagrams.
- [1.155] R.M. Ghigliazza and P. Holmes (2004) *SIAM J. on Applied Dynamical Systems* 3 (4), 671-700. A minimal model of a central pattern generator and motoneurons for insect locomotion.
- [1.156] T.R. Smith, J. Moehlis and P. Holmes (2005) *J. Fluid Mech.* 538, 71-110. Low-dimensional models for turbulent plane Couette flow in a minimal flow unit.
- [1.157] T.R. Smith, J. Moehlis and P. Holmes (2005) *Nonlinear Dynamics* 41 (1-3), 275-307. Low-dimensional modelling of turbulence using the proper orthogonal decomposition: A tutorial.
- [1.158] T.R. Smith, J. Moehlis and P. Holmes (2005) *Physica D* 211, 347-376. Dynamics of an 0:1:2 O(2)-equivariant system: Heteroclinic cycles and periodic orbits.
- [1.159] E. Brown, J. Gao, P. Holmes, R. Bogacz, M. Gilzenrat and J.D. Cohen (2005) *Int. J. Bifurcation and Chaos* 15 (3), 803-826. Simple neural networks that optimize decisions.
- [1.160] R. Bogacz, E. Shea-Brown, J. Moehlis, P. Holmes and J.D. Cohen (2006) *Psych. Rev.* 113 (4), 700-765. The physics of optimal decision making: A formal analysis of models of performance in two-alternative forced choice tasks.
- [1.161] J.E. Seipel and P. Holmes (2005) *Int. J. Robotics Research* 24 (8), 657-674. Running in three dimensions: Analysis of a point-mass sprung-leg model.
- [1.162] T. McMillen and P. Holmes (2006) *J. Math. Psych.* 50 (1), 30-57. The dynamics of choice among multiple alternatives.
- [1.163] R.M. Ghigliazza and P. Holmes (2005) *Regular & Chaotic Dynamics* 10 (2), 193-225. Towards a neuromechanical model for insect locomotion: Hybrid dynamical systems.
- [1.164] R.M. Ghigliazza, R. Altendorfer, P. Holmes and D. Koditschek (2005) *SIAM Review* 47 (3) 519-549. A simply stabilized running model. (Updated version of [1.145] invited for republication in SIGEST.)
- [1.165] P. Holmes, E. Shea-Brown, J. Moehlis, R. Bogacz, J. Gao, G. Aston-Jones, E. Clayton, J. Rajkowski and J.D. Cohen (2005) *IEICE Transactions on Fundamentals on Electronics, Communications and Computer Science E88A* (10), 2496-2503. Optimal decisions: From neural spikes, through stochastic differential equations, to behavior.
- [1.166] J.E. Seipel and P. Holmes (2006) *Int. J. Robotics Research* 25 (9), 889-902. Three-dimensional translational dynamics and stability of multi-legged runners.
- [1.167] T. McMillen and P. Holmes (2006) *J. Math. Biol.* 53, 843-866. An elastic rod model for anguilliform swimming.
- [1.168] P.A. Simen, J.D. Cohen and P. Holmes (2006) *Neural Networks* 19, 1013-1026. Rapid decision threshold modulation by reward rate in a neural network.
- [1.169] J. Gao and P. Holmes (2007) *J. Comp. Neurosci.* 22, 39-61. On the dynamics of electrically-coupled neurons with inhibitory synapses.
- [1.170] Y. Liu, P. Holmes and J.D. Cohen (2008) *Neural Computation* 20 (2), 345-373. A neural network model of the Eriksen task: Reduction, analysis, and data fitting.
- [1.171] Y. Liu, A.J. Yu and P. Holmes (2009) *Neural Computation* 21 (6), 1520-1553. Dynamical analysis of Bayesian inference models for the Eriksen task.

- [1.172] R. Kukillaya and P. Holmes (2007) *Biological Cybernetics* 97 (5-6), 379-395. A hexapedal jointed-leg model for insect locomotion in the horizontal plane.
- [1.173] J. Seipel and P. Holmes (2007) *Regular & Chaotic Dynamics* 12 (5), 502-520. A simple model for clock-actuated legged locomotion.
- [1.174] J. Zhang, R. Bogacz and P. Holmes (2009) *J. Math. Psych.* 53 (4), 231-241. A comparison of bounded diffusion models for choice in time controlled tasks.
- [1.175] P. Eckhoff, P. Holmes, C. Law, P.M. Connolly and J.I. Gold (2008) *New J. of Physics* 10, doi: 1367-2630/10/1/015006. On diffusion processes with variable drift rates as models for decision making during learning.
- [1.176] P. Simen, D. Contreras, C. Buck, P. Hu, P. Holmes and J.D. Cohen (2009) *J. Exp. Psych. Human Perception and Performance* (in press). Reward rate optimization in two-alternative decision making: Empirical tests of theoretical predictions.
- [1.177] M. Zacksenhouse, P. Holmes and R. Bogacz (2008) (in review). Robust versus optimal strategies for two-alternative forced choice tasks.
- [1.178] M. Srinivasan and P. Holmes (2008) *J. Theoretical Biology* 255, 1-7. How well can spring-mass-like telescoping leg models fit multi-pedal locomotion data?
- [1.179] R. Bogacz, P. Hu, P. Holmes and J.D. Cohen (2009) *Quart. J. Exp. Psych.* (in press). Do humans produce the speed-accuracy tradeoff that maximizes reward rate?
- [1.180] P. Varkonyi, P. Holmes, T. Keimel, K. Hoffman and A.H. Cohen (2008) *J. Comp. Neurosci.* 25 (2), 245-261. On the derivation and tuning of phase oscillator models for lamprey central pattern generators.
- [1.181] J. Gao, G. Schwartz, P. Holmes and M. Berry II (2009) *Network: Computation in Neural Systems* 20 (2), 106-135. An oscillatory circuit underlying the detection of disruptions in temporally-periodic patterns.
- [1.182] P. Varkonyi and P. Holmes (2008) *SIAM J. on Applied Dynamical Systems* 7 (3), 766-794. On synchronization and traveling waves in chains of relaxation oscillators with an application to lamprey CPG.
- [1.183] T. McMillen, T.L. Williams and P. Holmes (2008) *PLoS Computational Biology* 4 (8), e1000157. Nonlinear muscles, passive viscoelasticity and body taper conspire to create neuro-mechanical phase lags in anguilliform swimmers.
- [1.184] Y. Liu, P. Holmes and J.D. Cohen (2008) (in review). A Bayesian inference model for sequential effects in the Eriksen task.
- [1.185] J.Gao, K.F. Wong-Lin, P. Holmes, P. Simen and J.D. Cohen (2009) *Neural Computation* 21 (9), 2407-2436. Sequential effects in two-choice reaction time tasks: Decomposition and synthesis of mechanisms.
- [1.186] P. Eckhoff, K.F. Wong-Lin and P. Holmes (2009) *J. Neurosci.* 29 (13), 4301-4311. Optimality and robustness of a biophysical decision-making model under norepinephrine modulation.
- [1.187] J. Proctor and P. Holmes (2008) *Regular & Chaotic Dynamics* 13 (4), 267-282. Steering by transient destabilization in piecewise-holonomic models of legged locomotion.
- [1.188] R. Kukillaya and P. Holmes (2009) *J. Theoretical Biology* (in press). A model for insect locomotion in the horizontal plane: Feedforward activation of fast muscles, stability, and robustness. Posted on line 29 Aug 2009, doi: 10.1016/j.jtbi.2009.07.036
- [1.189] S. Feng, P. Holmes, A. Rorie and W.T. Newsome (2009) *PLoS Computational Biology* 5 (2), e1000284. Can monkeys choose optimally when faced with noisy stimuli and unequal rewards?
- [1.190] X. Zhou, K.F. Wong-Lin and P. Holmes (2009) *Neural Computation* 21 (8), 2336-2362. Time-varying perturbations can distinguish among integrate-to-threshold models for perceptual decision making in reaction time tasks.
- [1.191] R. Kukillaya, J. Proctor and P. Holmes (2009) *CHAOS: An Interdisciplinary Journal of Nonlinear Science* 19 (2), 026107, DOI:10.1063/1.3141306. Neuro-mechanical models for insect locomotion: Stability, maneuverability, and proprioceptive feedback.
- [1.192] P. Eckhoff, K.F. Wong-Lin and P. Holmes (2009) In review. Dimension reduction and dynamics of a spiking neuron model for decision making under neuromodulation.
- [1.193] J. Proctor and P. Holmes (2009) In prep. Reflexes and preflexes: On the role of sensory feedback on rhythmic patterns in legged locomotion.

[1.194] T. Broderick, K.F. Wong-Lin and P. Holmes (2009) *In review*. Closed-form approximations of first-passage distributions for a stochastic decision-making model.

[1.195] K.F. Wong-Lin, P. Eckhoff, P. Holmes and J.D. Cohen (2009) *In review*. Optimal control of counter-manding saccades.

(2) Recent conference proceedings, abstracts, book chapters and invited papers (* indicates full refereed paper).

[2.157] P. Holmes and R. Ghigliazza (2005). A central pattern generator for insect locomotion. Invited lecture at Coupled 60: A Focussed Research Group Workshop on the Dynamics, Classification and Applications of Coupled Systems, University of Houston, TX, Feb 3-6, 2005.

[2.158] P. Holmes (2005). Poincaré’s mistake and the origins of ‘Chaos Theory.’ Invited talk at the Third Annual Workshop on Applied Mathematics and Computational Physics, Budapest University of Technology and Economics, March 18th, 2005.

[2.159] P. Holmes (2005). Piecewise-holonomic mechanics, hybrid dynamical systems, and escaping cockroaches. Invited lecture at Mathematical Association of America New Jersey Section Meeting, Middlesex Community College, Edison, NJ, April 2, 2005.

[2.160] P. Holmes (2005). A central pattern generator for insect locomotion. Minisymposium presentation at the Conference on Frontiers in Applied and Computational Mathematics, New Jersey Institute of Technology, May 13-15, 2005.

[2.161] P. Simen, P. Holmes and J.D. Cohen (2005). Performance adaptation by a drift-diffusion-based decision making circuit. Lecture at the 9th International Conference on Cognitive and Neural Systems, Center for Adaptive Systems and Department of Cognitive and Neural Systems, Boston University, May 18-21, 2005.

[2.162] P. Holmes and T. McMillen (2005). What’s optimal about decision-making for two and more choices? Invited presentation at Neurobiology of Decision-Making, Banbury Center, Cold Spring Harbor Laboratory, Long Island, NY, May 22-25, 2005.

[2.163]* R. Bogacz, E. Brown, J. Moehlis, P. Holmes and J.D. Cohen (2005) How a biological decision network can implement a statistical test. Presentation at the workshop on Modelling Natural Action Selection, Edinburgh University, UK, July 30-31, 2005.

[2.164]* P. Holmes (2005). Ninety plus thirty years of nonlinear dynamics: More is different and less is more. Opening plenary lecture at the Fifth EUROMECH Nonlinear Dynamics Conference (ENOC-05), Eindhoven University of Technology, The Netherlands, Aug 7-12, 2005. Invited paper for special ENOC issue of *Int. J. Bifurcation and Chaos* 15(9), 2703-2716.

[2.165] P. Holmes (2005). A swimming rod with a mind of its own (or at least a muscle). Plenary lecture at IMA Conference on Recent Advances in Nonlinear Mechanics (RANM-05), University of Aberdeen, Scotland, Aug 29-Sept 1, 2005.

[2.166] P. Holmes (2006). Dynamics and control in insect running. Invited lecture at Design Principles in Biological Systems, Banbury conference center, Cold Spring Harbor Laoratory, May 7-10, 2006.

[2.167]* P. Holmes, M. Srinivasan, K. Rogale and R. Kukillaya (2006). On spring-mass models for running animals: Approximate solutions, natural frequencies, stability, and double stance phases. Keynote lecture at the James H. Belfer Memorial Symposium on Nonlinear Mechanics, Technion - Israel Institute of Technology, Department of Mechanical Engineering, June 12th, 2006.

[2.168] T. McMillen and P. Holmes (2006). On the neuromechanics of swimming in lampreys. Invited talk at “From Dust to Planets,” a symposium to honor Joe Burns on his 65th birthday. Cornell University, July 28-29th, 2006.

[2.169] P. Holmes (2006) On modeling legged locomotion. Invited lecture at Engineering Principles in Biological Systems, Cold Spring Harbor Laoratory, Dec 3-6, 2006.

[2.170]* R. Ball and P. Holmes (2007) Dynamical systems, stability and chaos. Expository chapter based on lectures given at COSNet/CSIRO Workshop on Turbulence and Coherent Structures in Fluids, Plasmas and Nonlinear Media, Australian National University, Canberra, Australia Jan 10-13, 2006. In “Frontiers in

Turbulence and Coherent Structures,” ed. J.P. Denier and J.S. Frederiksen, pp 1-27, World Scientific Press, Singapore, 2007.

[2.171] R. Kukillaya and P. Holmes (2007) Realistic hexapedal models of insect locomotion: Jointed legs and Hill-type muscles. Society for Integrative and Comparative Biology Annual Meeting, Phoenix, AZ, Jan 3-7, 2007.

[2.172] D.M. Dudek, P. Holmes, M. Srinivasan, K. Rogale, R. Kukillaya and R.J. Full (2007) The relevance of resonant frequency in running cockroaches modeled by a spring-loaded, inverted pendulum. Society for Integrative and Comparative Biology Annual Meeting, Phoenix, AZ, Jan 3-7, 2007.

[2.173] P. Holmes (2007) A central pattern generator for insect locomotion: Phase response curves, averaging and reduction of ionic current models of bursting neurons. Invited lecture at MSRI Introductory Workshop on Dynamical Systems with Emphasis on Extended Systems, Berkeley, CA, Jan 21-26, 2007.

[2.174] P. Holmes (2007) Do deciders drift and diffuse? On models of decision making. Invited lecture at AFOSR workshop on Robust Decision Making, Alexandria, VA, Feb 27-28, 2007.

[2.175] P. Holmes (2007) Piecewise-holonomic mechanics, hybrid dynamical systems, and escaping cockroaches. Invited plenary lecture at British Applied Mathematics Colloquium, Bristol University, Bristol, UK, April 16-20, 2007.

[2.177]* P. Holmes and E.T. Shea-Brown (2007) Stability. Scholarpedia, p.4208.
<http://www.scholarpedia.org/article/Stability>

[2.178]* P. Holmes (2007) History of Dynamical Systems. Scholarpedia, p.13425.
http://www.scholarpedia.org/article/History_of_Dynamical_Systems

[2.179] P. Holmes (2007) Drift-diffusion models for the dynamics of decision making. Contributed presentation at the SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, May 28-June 1, 2007.

[2.180] P. Holmes (2007) Models of legged locomotion, or How cockroaches run stably without thinking about it. Invited presentation at the Danish Symposium on Applied Analysis, University of Copenhagen, Copenhagen, Denmark, Aug 16-18, 2007.

[2.181] P. Holmes (2007) Oscillatory circuits underlying the retinal detection of temporal patterns. Invited presentation at the Workshop in Mathematical Neuroscience, Centre de Recherches Mathématiques, Université de Montréal, Canada, Sept 16-19, 2007.

[2.182] P. Holmes (2007) What do poems and differential equations share? Some thoughts on metaphors and models. Mathematical Association of America Eastern Pennsylvania and Delaware Section Meeting, Drexel University, Philadelphia PA, Nov 10th, 2007.

[2.183] P. Holmes (2007) Anguilliform swimming by muscle activation of an elastic rod. Invited presentation at Fluids Days, Jawaharlal Nehru Center for Advanced Scientific Research, Bangalore, India, Dec 31, 2007-Jan 1, 2008.

[2.184] P. Holmes (2008) Towards an integrated model for insect locomotion. Presentation at the Workshop on Neuromechanics of Locomotion, Mathematical Biosciences Institute, Ohio State University, Mar 31-Apr 4, 2008.

[2.185] P. Holmes (2008) An oscillatory circuit underlying the retinal detection of disruptions in temporally-periodic patterns. Invited presentation at the Workshop on Dynamical Systems in Biology, New York University NYC, Apr 12-13, 2008.

[2.186] P. Holmes (2008) Stochastic models for individual decisions and social influence in groups. Presentation at the Workshop on Systems Biology of Decision Making, Mathematical Biosciences Institute, Ohio State University, June 16-20, 2008.

[2.187]* P. Simen, J.D. Cohen and P. Holmes (2009) On the neural implementation of optimal decisions. In “The Oxford Handbook of Human Action,” ed. E. Morsella, J.A. Bargh, and P.M. Gollwitzer, pp 533-548, Oxford University Press, Oxford, UK.

[2.188]* P. Holmes (2008) A Short History of Dynamical Systems Theory: 1885-2007. In the “Encyclopedia of Life Support Systems (EOLSS): Mathematical Sciences,” UNESCO-EOLSS Publishers, Oxford, UK. Accessible online at www.eolss.net.

[2.189]* A. Nedic, D. Tomlin, P. Holmes, D.A. Prentice and J.D. Cohen (2008) A simple decision task in a social context: preliminary experiments and a model. Presentation invited for the special session Mixed

Robot/Human Team Decision Dynamics, IEEE CDC, Cancun, Mexico, Dec 9-11th, 2008. *Proc. 47th IEEE Conference on Decision and Control*.

[2.190] P. Holmes (2008) From spike rates to simple decisions: Stochastic ODEs as models for evidence accumulation in cortical circuits. Invited presentation at “From Nonlinear Dynamics to Systems Biology: a conference in honor of David Rand on his 60th birthday,” Mathematics Institute, University of Warwick, Coventry, U.K., Dec 1-2, 2008.

[2.191] P. Holmes (2008) Neuromechanical models of animal locomotion. Invited presentation at “Stability and Instability in Dynamical Systems: Applications and Numerical Tools,” University of Barcelona and Centre de Recerca Matemàtica, Bellaterra, Barcelona, Spain, Dec 1-5, 2008.

[2.192]* P. Holmes (2009) Neuromechanical models of legged locomotion: How cockroaches run fast and stably without thinking about it. Keynote lecture at the James H. Belfer Memorial Symposium on Neuro-Mechanics, Dynamics and Decision-making, Technion - Israel Institute of Technology, Department of Mechanical Engineering, Feb 15-16th, 2009.

[2.193] P. Holmes, A. Nedic, D. Tomlin, D. Prentice and J.D. Cohen (2009) A decision task in a social context: Experiments, modeling, and preliminary analyses of behavioral and brain imaging data. SIAM Conference on Control and its Applications, Denver, CO, July 6-8, 2009.

[2.194] P. Holmes, M. Zacksenhouse and R. Bogacz (2009) Robust versus optimal strategies for two-alternative forced-choice tasks. MathPsych 2009, University of Amsterdam, Aug 1-4, 2009.

[2.195] P. Simen, D. Contreras, P. Holmes and J.D. Cohen (2009) Adaptive performance in two-alternative decision making. MathPsych 2009, University of Amsterdam, Aug 1-4, 2009.

[2.196]* P. Holmes (2009) The physics of decision making: Stochastic differential equations as models for neural dynamics and evidence accumulation in cortical circuits. Invited plenary lecture at the 16th International Congress on Mathematical Physics, Prague, Czech Republic, Aug 3-8, 2009.

[2.197] P. Holmes (2009) The dynamical legacy of Lyapunov and Poincaré: Reflections on stability, chaos and randomness. Lyapunov Award Lecture for the Technical Committee on Multibody Systems and Nonlinear Dynamics, ASME Design Engineering Technical Conferences and Computers and Information in Engineering Conference, San Diego, CA, Aug 31-Sept 2, 2009.

(3) Books

[3.3] J. Guckenheimer and P. Holmes (1983) “Nonlinear Oscillations, Dynamical Systems and Bifurcations of Vector Fields.” Applied Mathematical Science No. 42, Springer Verlag, New York, Heidelberg, Berlin. Sixth printing 2002, Chinese paperbound reprint, 1999; Russian translation, R&C Dynamics, Moscow, 2003.

[3.4] P. Holmes, J. L. Lumley and G. Berkooz (1996) “Turbulence, Coherent Structures, Dynamical Systems and Symmetry.” Cambridge University Press, Cambridge Monographs on Mechanics. Korean translation, 1999.

[3.5] F. Diacu and P. Holmes (1996) “Celestial Encounters: The Origins of Chaos and Stability.” Princeton University Press, Princeton, NJ. Also in Chinese, Greek, Hungarian, Japanese, Roumanian and Russian translations.

[3.6] R.W. Ghrist, P. Holmes and M. Sullivan (1997) “Knots and Links in Three-Dimensional Flows.” Springer Lecture Notes in Mathematics Volume 1654, Springer Verlag, Heidelberg, 1997.

(4) Poetry

[4.1] P. Holmes (1971) “3 Sections of Poems”, Anvil Press, London.

[4.2] P. Holmes (1977) “A Place to Stand”, Anvil Press, London.

[4.3] P. Holmes (1986) “The Green Road”, Anvil Press, London (Poetry Book Society Recommendation).

[4.4] P. Holmes (2002) “Lighting the Steps”, Anvil Press, London (shortlisted for Ernest Sandeen Award, Notre Dame University, 1995).