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C U R R I C U L U M V I T A E

Tomáš Gedeon

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Education

1989 B.S. Mathematics Comenius University, Bratislava, Slovakia
1994 Ph.D. Mathematics Georgia Institute of Technology

Theses and Dissertations

Master's thesis: *Stability and chaos in 1-dimensional dynamical systems*, 1989.
Advisor: Jaroslav Smital
Ph.D. thesis: *Cyclic feedback systems*, 1994.
Advisor: Konstantin Mischaikow

Professional Experience

1989–1990	Teaching Assistant,	Comenius University, Bratislava
1990–1993	Assistant Professor	Technical University, Bratislava, (on leave)
1990–1991	Teaching Assistant	Georgia Institute of Technology
1991–1991	Research Assistant	Georgia Institute of Technology
1991–1994	Teaching Assistant	Georgia Institute of Technology
1994–1995	Visiting Assistant Professor	Northwestern University
1994–2000	Assistant Professor	Montana State University
2000–2005	Associate Professor	Montana State University
2006–	Professor	Montana State University

Honors and Awards

1989 Ministry of Education Outstanding Undergraduate Prize
2010 Cox Family Award for Creative Scholarship and Teaching
2010 Dean's Award for Meritorious Research and Creativity
2012 Kopriva Lecture
Each year one Montana State faculty member is selected to give a public lecture in biological sciences.
2012-2015 College of Letters and Sciences Distinguished Professor

Research Interests

Applied Dynamical Systems
Topological Data Analysis
Mathematical Neuroscience
Systems Biology
Microbiology and Molecular Biology

Refereed Publications

Appeared:

1. T. Gedeon, "There are no chaotic mappings with residual scrambled sets", *Bull. Austral. Math. Soc.* **36** (1987), 411-416.
2. T. Gedeon, "Generic chaos can be large", *Acta Math. Univ. Comenianae* **LIV-LV** (1988), 237-241.
3. T. Gedeon, "A counterexample to a Fedorenko statement", *Acta Math. Univ. Comenianae* **LX** (1) (1991), 15-18.
4. T. Gedeon, "Stable and non-stable non-chaotic maps of the interval", *Math. Slovaca* **41** (4) (1991), 379-391.
5. T. Gedeon and M. Kuchta, "Shadowing property of continuous maps", *Proceedings of the AMS* **115** (1) (1992), 271-281.
6. T. Gedeon and K. Mischaikow, "Structure of the global attractor of cyclic feedback systems", *J. Dynamics Diff. Eq.* **7** (1995), 141-190.
7. T. Gedeon and K. Mischaikow, "Dynamics of cyclic feedback systems", *Resenhas IME-USP* **1** (4) (1994), 495-515.
8. T. Gedeon and B. Fiedler, "A class of convergent neural network dynamics", *Physica D* **111** (1998), 288-294.
9. T. Gedeon, "*Cyclic feedback systems*", *Memoirs of AMS* **134** (637) (1998).
10. T. Gedeon and G. Hines, "Upper-semicontinuity of Morse sets of a discretization of a delay-differential equation", *J. Diff. Eq.* **151** (1999), 36-78.
11. T. Gedeon and L. Glass, "Continuity of resetting curves for FitzHugh-Nagumo equations on the circle", *Fields Institute Comm.* **21** (1999), 225-236.
12. T. Gedeon, "Structure and dynamics of artificial neural networks", *Fields Institute Comm.* **21** (1999), 217-224.
13. T. Gedeon, "Additive neural networks and periodic patterns", *Neural Networks* **12** (1999), 617-626.
14. T. Gedeon, H. Kokubu, H. Oka, K. Mischaikow and J. Reineck, "The Conley index for fast-slow systems I: One dimensional slow variable" *J. Dynamics Diff. Eq.* **11** (1999), 427-470.
15. B. Fiedler and T. Gedeon, "A Lyapunov function for tridiagonal competitive-cooperative systems", *SIAM J. Math. Anal.* **30** (3) (1999), 469-478.
16. T. Gedeon, "The global dynamics of neural networks with infinite gain", *Physica D* **146** (2000), 200-212.
17. A. Dimitrov, J. Miller, Z. Aldworth and T. Gedeon, "Non-uniform quantization of neural spike sequences through an information distortion measure", *Neurocomputing* **38-40** (2001), 175-181.
18. T. Gedeon, H. Kokubu, H. Oka and K. Mischaikow, "Chaotic solutions in slowly varying perturbations of Hamiltonian systems with applications to shallow water sloshing", *J. Dynamics Diff. Eq.* **14** (1) (2002), 63-84.
19. T. Gedeon and G. Hines, "Upper-semicontinuity properties of the discretization of scalar differential delay equation: A complete solution", *J. Diff. Eq.* **179** (2002), 369-383.
20. A. Dimitrov, J. Miller, T. Gedeon, Z. Aldworth and A. Parker, "Analysis of neural coding using quantization with an information-based distortion measure", *Network* **14** (2002), 151-176.

21. T. Gedeon, "Attractors in continuous-time switching networks", *Communications on Pure and Applied Analysis (CPAA)* **2** (2) (2003), 187-209.
22. T. Gedeon, M. Holzer and M. Pernarowski, "Attractor reconstruction through spike filters and phase locking", *Physica D* **178** (3-4) (2003), 149-172.
23. A. Parker, T. Gedeon and A. Dimitrov, "Annealing and the rate distortion problem", In S. Thrun, S. Becker and K. Obermayer, editors, *Advances in Neural Information Processing Systems* **15**, MIT Press (2003), 969-976.
24. A. Dimitrov, T. Gedeon, B. Mumey, R. Snider, Z. Aldworth, A. Parker and J. Miller, "Derivation of natural stimulus feature set using a data-driven model", *ICCS P.M.A.*, Sloot et. al Eds., Springer-Verlag, Berlin (2003), 337-345.
25. T. Gedeon, A. Parker and A. Dimitrov, "Information distortion and neural coding", *Canadian Applied Math. Q.* **10** (1) (2003), 33-70.
26. B. Mumey, A. Sarkar, T. Gedeon, A. Dimitrov and J. Miller, "Finding neural codes using random projections", *Neurocomputing* **58-60** (2004), 19-25.
27. A. Parker and T. Gedeon, "Bifurcation structure of a class of S_N -invariant constrained optimization problems", *J. Dynamics Diff. Eq.* **16** (3) (2004), 629-678.
28. T. Gedeon and M. Holzer, "Phase locking in integrate-and-fire models with refractory periods and modulation", *J. Math. Biology* **49** (6) (2004), 577-603.
29. E. Boczko, T. Cooper, T. Gedeon, K. Mischaikow, S. Pratap and S. Wells, "Structure theorems and the dynamics of nitrogen catabolite repression in yeast", *Proceedings of National Academy of Science* **102** (2005), 5647-5652.
30. Z. Aldworth, J. Miller, T. Gedeon, G. Cummins and A. Dimitrov, "De-jittered spike-conditioned stimulus waveforms yield improved estimates of neuronal feature sensitivity and spike-timing precision of sensory interneurons", *The Journal of Neuroscience*, **25** (22) (2005), 5323-5332.
31. A. Dimitrov and T. Gedeon, "Effects of stimulus transformations on estimates of sensory neuron functions", *Journal of Computat. Neurosci.* (2006) 20:265-283.
32. T. Gedeon, H. Kokubu, H. Oka and K. Mischaikow, "The Conley index for fast-slow systems II: Multi dimensional slow variable", *J. Differential Equations* **225** (2006) 242-307.
33. T. Gedeon and K. Mischaikow, "Singular boundary value problems via the Conley index", *Topological Methods in Nonlinear Analysis*. vol. 28., No.2 (2006) 263-284.
34. M. Gameiro, T. Gedeon, W. Kallies, H. Kokubu, K. Mischaikow and H. Oka, "Topological horseshoes of travelling waves for fast-slow predator-prey system", *J. Dynamics and Diff. Eq.*, online first 10.1007/s10884-006-9013-6.
35. B. Cummins, T. Gedeon, I. Klapper and R. Cortez, "Interaction between the arthropodfiliform hairs in a fluid environment" *Journal of Theoretical Biology*, Volume 247, Issue 2, 21 July 2007, 266-280.
36. T. Gedeon, Ch. Hayes and R. Swanson, "Genericity of the fixed point set for the infinite population genetic algorithm" in *Foundations of genetic algorithms*, LCNS No. 4436, Springer-Verlag 2007.
37. T. Gedeon, C. Champion, A. Parker and Z. Aldworth, "Annealing an information type cost function computes the normalized cut", *Pattern Recognition* **41** (2):592-606, February 2008.
38. T. Gedeon, E. Boczko and K. Mischaikow, "Dynamics of a simple regulatory switch" *Journal of Mathematical Biology* **55**: No. 5-6 (2007).
39. T. Gedeon and E. Sontag, "Oscillation in multi-stable monotone system with slowly varying positive feedback", *J. of Diff. Eq.* Vol. 239 (2), 273-295, (2007).

40. S. Harker, T. Gedeon and C. Vogel, “A multilinear optimization problem associated with correspondence maximization”, *Journal of Mathematical Imaging and Vision* 29:49-62 (2007).
41. T. Gedeon and D. Arathorn, “Convergence in map finding circuits” *J. of Mathematical Imaging and Vision* 29, p. 235-248, (2007).
42. K. Patterson, T. Gedeon, K. Mischaikow and Traldi, E., “Why does the positive regulation in bacteriophage affect isomerization of the RNAP-DNA complex?”, *Proc. Appl. Math. Mech.* 2007 7(1):1120101-1120102.
43. T. Gedeon, E. Boczko and K. Mischaikow, “Dynamics of transport mediated switch”, *Proc. Appl. Math. Mech.* 2007 7(1):1120103-1120104.
44. B. Cummins and T. Gedeon, “A refined model of viscous coupling between filiform hairs in the cricket cercal system”, *Proceedings of IMECE2007*, # 41075, (2007).
45. T. Gedeon, J.J. Heys, B.C. Knott and J. Mulder-Rosi, “Modeling insect hair motion using the penalty immersed boundary method”, *Proceedings of IMECE2007*, #41076, (2007).
46. T. Gedeon, K. Mischaikow, K. Patterson and E. Traldi, “When activators repress and repressors activate: a qualitative analysis of the Shea-Ackers model”, The Eighth International Conference on Systems Biology (ICSB-2007) Proceedings 2007.
47. T. Gedeon, K. Mischaikow, K. Patterson and E. Traldi, “When activators repress and repressors activate: a qualitative analysis of Shea-Ackers model”, *Bulletin of Mathematical Biology*, 70:6 (2008), p. 1660-1683.
48. T. Gedeon, K. Mischaikow, K. Patterson and E. Traldi, “Binding cooperativity in phage lambda is not sufficient to produce an effective switch”, *Biophysical J.* 94(9) (2008).
49. J.J. Heys, T. Gedeon, B.C. Knott and Y. Kim, “Modeling arthropod hair motion using the penalty immersed boundary method”, *Journal of Biomechanics*, Vol. 41, Issue 5, Pages 977-984 (2008).
50. T. Gedeon and G. Hines, “Multi-valued characteristics and Morse decompositions”, *J. Diff. Eq.*, vol. 247, 4, pp. 1013-1042 (2009).
51. T. Gedeon, C. Bodelon and A. Kuenzi, “Hantavirus transmission in sylvan and peridomestic environment”, *Bull. Math. Biol.*, 72:3, pp. 541 (2010).
52. T. Gedeon, “Oscillations in monotone systems with negative feedback”, *SIAM Applied Dyn. Sys.* 9(1) (2010).
53. A. Dimitrov, A. Parker and T. Gedeon, “Symmetry breaking in soft clustering decoding of neural codes”, *IEEE Trans. Inf. Theory*, (2010).
54. Ch. Hayes and T. Gedeon, “Hyperbolicity of the fixed point set for the simple genetic algorithm”, *Theor. Comp. Science* 411 (2010), pp. 2368-2383.
55. E. Boczko, T. Gedeon, C. Stowers and T. Young, “ODE, RDE and SDE models of cell cycle dynamics and clustering in yeast”, *J. Biol. Dynamics*, 4(4), pp. 328-345, (2010).
56. P. De Leenheer, J. Dockery, T. Gedeon and S. Pilyugin, “The chemostat with lateral gene transfer”, *J. Biol. Dynamics*, 4(6), p.607-620 (2010).
57. M. Campanelli and T. Gedeon, “Somitogenesis clock-wave initiation requires differential decay and multiple binding sites for clock protein”, *PLoS Comp. Biol.* 6(4), e1000728, (2010).
58. P. De Leenheer, J. Dockery, T. Gedeon and S. Pilyugin, “Senescence and antibiotic resistance in an age-structured population model”, *J. Math. Biol.*, 61(4), pp. 475-499, (2010).

59. Z. Aldworth, A. Dimitrov, G. Cummins, T. Gedeon and J.P. Miller, “Temporal coding in a nervous system”, *PLoS Comp. Biol.* 7(5): e1002041, (2011).
60. A. Wright, T. Gedeon and N. Richter, “On the movement of vertex points in the simple GA”, *Proceedings of FOGA (Foundations of Genetic Algorithms)* p.193-208 (2011).
61. B. Cummins and T. Gedeon, “Assessing the mechanical response of groups of arthropod filiform flow sensors”, in *Frontiers in Sensing: From Biology to Engineering*, Barth, F. G.; Humphrey, J. A. C.; Srinivasan, M.V. (Eds.), Springer-Verlag 2012.
62. Z. Arai, M. Gameiro, T. Gedeon, H. Kokubu, K. Mischaikow and H. Oka, “Graph-based topological approximation of saddle-node bifurcation in maps”, *RIMS Kokyuroku Bessatsu*, B 31 (2012), pp.225-241.
63. J. P. Miller, S. Krueger, J. Heys and T. Gedeon, “Quantitative characterization of the filiform mechanosensory hair array on the cricket cercus”, *PLoS ONE* 6(11) e27873, (2011).
64. T. Gedeon, A. Parker and A. Dimitrov, “The mathematical structure of Information Bottleneck methods”, *Entropy* 14(3), pp. 456-479, (2012).
65. J. Brown and T. Gedeon, “Structure of the afferent terminals in terminal ganglion of a cricket and persistent homology”, *PLoS ONE* 7(5): e37278, (2012).
66. J. Berwald, T. Gedeon and J. Sheppard, “Using machine learning to predict catastrophes in dynamical systems”, *J. Comp. and Applied Math.*, 236(9), (2012), pp. 2235-2245.
67. P. Bokes and T. Gedeon, “Delayed protein synthesis reduces the correlation between mRNA and protein fluctuations”, *Biophysical J.* 103(3) (2012), pp 377-385.
68. T. Gedeon, G. Cummins and J. Heys, “Effect of model selection on prediction of periodic behavior in gene regulatory networks”, *Bull. Math. Biology* 74(8), (2012)
69. J. Heys, P.K. Rajaraman, T. Gedeon and J.P. Miller, “A model of filiform hair distribution on the cricket cercus”, *PLoS ONE* 7(10): e46588, doi:10.1371/journal.pone.0046588, (2012)
70. K. Spendlove, J. Berwald and T. Gedeon, “Predicting critical transitions in dynamical systems using active learning”, *Mathematical and Computer Modelling of Dynamical Systems*, DOI:10.1080/13873954.2013.801866, 19(6), 557-574, (2013).
71. D. P. Patterson, B. Schwarz, R. Waters, T. Gedeon and T. Douglas, *Developing Advanced Biomimetic Nanocatalysts: Encapsulation of Synthetic Metabolons Within the Bacteriophage P22 VLP*, *ACS Chemical Biology*, volume 9, issue 2, year 2014, pp. 359 - 365.
72. L. Davis, J. Gedeon, T. Gedeon and J. Thorenson, “Traffic flow model for bio-polymerization processes”, *Journal of Mathematical Biology*, doi:0.1007/s00285-013-0651-0, 68(3), 667-700 (2014)
73. T. Gedeon, E. Harvey and J. Heys, “Quantifying the effects of the division of labour in metabolic pathways”, *J. Theor. Biol.* 360 (2014), 222-242.
74. L. Davis, T. Gedeon and J. Thorenson, Discontinuous Galerkin calculations for a nonlinear PDE model of DNA transcription with short, transient and frequent pausing, *J. Comput. Math.* vol.32 (6), 2014, 601-629.
75. L. Davis, T. Gedeon and J. Thorenson, Parameter Studies for a Nonlinear Continuum Model of Transcription, 21st International Symposium on Mathematical Theory of Networks and Systems July 7-11, 2014. Groningen, The Netherlands. p. 68-75, (2014).
76. B. Cummins, T. Gedeon and K. Spendlove, On the efficacy of state space reconstruction methods in determining causality, *SIAM J. Appl. Dyn. Syst.*, 14(1), 335-381, (2015).

Under Review:

1. P. Kosa, M. Komori, R Waters, T. Wu, I. Cortese, J. Ohayon, K. Fenton, J. Cherup, T. Gedeon and B. Bielekova, Novel semi-quantitative age-adjusted MRI scale correlates highly with clinical disability in multiple sclerosis patients
2. L. Davis, T. Gedeon, J. Thorenson and K. Weber, Tradeoffs between transcription elongation rate, number, and duration of ubiquitous pauses on rrn operon
3. T. Gedeon and P. Murphy, Dynamics of simple food webs.
4. T. Gedeon, M. Pernarowski and A. Wilander, Autoinducer feedback in synthetic quorum sensing models.
5. L. Davis, T. Gedeon and T. Heberling, A transport problem in one-dimensional random media

Refereed Conference Proceedings Publications

1. B. Mumey, A. Sarkar, T. Gedeon, A. Dimitrov, and J. Miller, “Finding neural codes using random projections”, Computational Neuroscience Meeting (CNS 2003), Alicante, Spain.
2. A. Dimitrov, T. Gedeon, B. Mumey, R. Snider, Z. Aldworth, A. Parker, and J. Miller, “Derivation of natural stimulus features set using a data-driven model”, 5th IFAC Symposium on Modelling and Control in Biomedical Systems (2003), Melbourne.
3. C. Hayes and T. Gedeon, “Hyperbolic fixed points are typical in the space of mixing operators for the infinite population genetic algorithm”, Proceedings of Genetic and Evolutionary Computation Conference, (GECCO 2005), ACM 1-59593-097-3/5/0006.
4. J. Berwald, T. Gedeon and K. Mischaikow, “Modeling complexity of physiological time series in-silico”, Biosignals 2010.

Refereed Conference Posters

1. B. Mumey, T. Gedeon, J. Taubman and K. Hall, “Studying network dynamics in genetic and neural Systems”, Poster at ISMB 2000 (Intelligent Systems for Molecular Biology), La Jolla 2000.
2. B. Mumey and T. Gedeon, “Optimal mutual information quantization is NP-complete”, Poster at Neural Information and Coding Workshop (NICW 2003), Snowbird, Utah.
3. J. Miller, Z. Aldworth, A. Dimitrov, T. Gedeon and M. Sheiko, “De-jittered stimulus reconstruction kernels yield substantially different estimates of feature sensitivity and higher estimates of information encoding rates”, Society for Neuroscience (2004), San Diego.
4. Z. Aldworth, A. Dimitrov, T. Gedeon and J. Miller, “Analysis of feature sensitivity through iterative stimulus refinement”, Society for Neuroscience (2004), San Diego.
5. A. Dimitrov and T. Gedeon, “De-jittering of the stimulus”, Society for Neuroscience (2004), San Diego.
6. K. Patterson, T. Gedeon, K. Mischaikow and E. Traldi, “When activators repress and repressors activate”, Systems Biology conference 2007, Long Beach.
7. T. Gedeon, K. Patterson, “Quorum sensing by phage lambda: what counts as a concurrent infection”?, Stochastic Physics in Biology, Gordon research conference, Ventura CA, Jan 23-28 2011
8. T. Gedeon, J. Brown, “Structure of the afferent terminals in terminal ganglion of a cricket and persistent homology”, Computational Neuroscience annual meeting, Atlanta, GA, July 2012.

Grants

1. “Dynamics of large systems of ODE’s.” MONTS-EPSCOR, \$ **12,000**, 09/01/1994 - 08/31/1995, PI.
2. “Ring neural networks and delay equations.” MONTS-EPSCOR, \$ **13,000**, 09/01/1995 - 08/31/1996, PI.
3. “Analog neural networks and delay equations.” NSF-DMS, \$ **61,771**, 06/01/1996 - 05/30/1999, PI.
4. “BITS: Algorithms for decoding and modulations of neural spike trains.” NSF, \$ **1,400,000**, 04/01/02 - 03/31/06, Co-PI.
5. “Topological methods in nonlinear dynamics.” NSF, \$ **38,700**, 04/01/01 - 03/31/04, Co-PI.
6. “Complex Biological Systems.” NSF-IGERT, \$ **2,700,000**, 01/01/00 - 12/31/04, Co-PI.
7. “Montana Network of Biological Research Excellence.” NIH-NCRR, \$ **16,600,000**, 07/01/2004 - 06/30/09, mentor.
8. “Collaborative proposal: NCR-circuit dynamics.” DMS/NIH, \$**153,345**, 05/15/2005 - 05/14/08, Co-PI.
9. “Optimality of a sensory receptor array.” NSF-CRCNS, \$**599,642**, 09/01/05 - 8/31/08, PI.
10. “International conference: Mathematical tools for multi-scale biological processes” NSF-DMS, \$ **16,000**, 01/01/08 - 12/31/08, PI.
11. “Fluid-structure interaction in arthropod mechanoreceptors” NSF ENG/CMMI/DS \$**399,943**, 10/01/08-09/30/11, PI.
12. “Designing networks with physiological complexity” DARPA subcontract \$**13,310** 04/01/08-03/31/09, MSU PI.
13. “Dynamics and synchronization of biochemical oscillators”, NSF-DMS \$**156,770** 08/15/08-07/31/11, PI.
14. “Predictive Biology: Adaptability, Robustness and the Fundamental Laws of Biology” DARPA subcontract \$**213,992** 08/01/09 - 07/31/10, MSU PI.
15. “Impact of hepatocyte lineage life history dynamics on homeostasis in liver” NIH R01AG040020 \$**1.5 mil** 08/15/2011-7/31/2016 co-PI (PI: Ed Schmidt, MSU).
16. “Biochronicity: Time, Networks, Evolution and Function”, DARPA subcontract \$**295,357** 01/01/2012 - 12/31/2015, MSU PI (PI: J. Harer, Duke University).
17. “Mathematical Models for pause-induced delays in bioprocesses”, NSF DMS \$**269,648** 09/01/12-08/31/15, co-PI (PI: Lisa Davis, MSU).
18. “Emergent properties of synthetic microbial consortia”, NSF/NIH joint program in Mathematical Biology \$**745,616** 08/01/2014-07/31/2018, PI.

Conference Organizer

- 2003 December NIPS 2003 Workshop co-organizer and talk.
- 2004 December Quantitative Mathematical Modelling of Gene Regulatory Networks in Mathematical Biosciences Institute at Ohio State.
- 2007 July ICIAM’07 Workshop Dynamics of gene regulation.’
- 2008, June Mathematical tools for multi-scale biological processes in Bozeman, Montana.
- 2008, August Computational Topology and Dynamics Workshop in Bozeman, Montana.
- 2011, June/July Mathematical models of gene regulation workshop at ECMTB 08, Krakow, Poland.

Invited Presentations:

1. 2001 June Canadian Applied and Industrial Math meeting, Victoria BC.
2. 2001 August Colloquium at McGill University, Montreal.
3. 2002 July 5th International conference of Differential Equations, Edmonton, CA, (plenary talk).
4. 2002 November Georgia Tech, Dynamical systems seminar.
5. 2003 February Neural Coding workshop, MBI, Ohio State.
6. 2003 May SIAM Dynamical systems conference, Snowbird (workshop).
7. 2003 June Workshop on symmetry breaking bifurcations in biological sciences, Banff.
8. 2003 October Workshop on Nonlinear Dynamics and Life Sciences, University of Southampton (UK).
9. 2003 October seminar in Applied Analysis, Oxford University (UK).
10. 2003 December NIPS 2003 Workshop.
11. 2004 March Workshop on Dynamics and Computation, Shonan Village Center, Japan.
12. 2004 August Dynamics, control and computation in biochemical networks, Banff, Canada.
13. 2004 November Functional differential equations, Banff, Canada.
14. 2004 December Quantitative Mathematical Modelling of Gene Regulatory Networks in Mathematical Biosciences Institute at Ohio State, December 2-4.
15. 2004 December Applied Math seminar, Arizona State University, Tempe AZ.
16. 2005 July SIAM meeting on Control Theory, Workshop.
17. 2006 March DARPA workshop on state dependent delays, Rutgers University.
18. 2006 April Dynamical Systems seminar, University of Minnesota.
19. 2006 April Applied Math seminar, University of Montana.
20. 2006 June AIMS Applied Mathematics conference, Poitier, France.
21. 2006 October Applied Dynamics seminar, Rutgers University.
22. 2007 April Mathematical Biology conference, Tuscon Arizona.
23. 2007 May Colloquium, University of Nebraska.
24. 2007 May Mathematical Biology Seminar, Mathematical Biosciences Institute at Ohio State.
25. 2007 July Symposium talk at ICIAM'07, Zurich, Switzerland.
26. 2007 October Mathematical Biology seminar, BioMaps program, Rutgers University.
27. 2008 June Mathematical epidemiology and population dynamics, Marseille, France.
28. 2008 June Gordon conference on Theoretical Biology, Italy.
29. 2008 October Sensors and sensing in biology and engineering, Cetraro, Calabria.
30. 2008 November BioMaps colloquium, Rutgers University.
31. 2009 February Mathematical Biology workshop, Kyoto, Japan.

32. 2009 May DIMACS workshop on Control in Systems Biology, Rutgers University.
33. 2009 June Research and education in a flat world, Honolulu, Hawaii.
34. 2009 October MBI institute, Computational challenges for multi-scale modeling of biological systems, Columbus, Ohio.
35. 2010 June AIMS conference on Delay-differential equations, Palo Alto.
36. 2010 June 4th International conference on recent advances in Dynamical Systems, Jinhua, China.
37. 2010 August Conference in Christchurch, New Zealand.
38. 2010 August Applied Mathematics Colloquium, Auckland, NZ.
39. 2010 October McGill University talk, Montreal.
40. 2011 January Gordon conference on Physics of biological systems, Ventura, CA.
41. 2011 May Sontagfest, Rutgers University, Piscataway, NJ.
42. 2011 June Colloquium at Comenius University, Bratislava, Slovak Republic.
43. 2011 July 8Th European Conference on Mathematical and Theoretical Biology, Krakow, Poland.
44. 2012 Feb 2 Kopriva Lecture, Montana State University, Bozeman.
45. 2012 March 29-30 Workshop on cognitive dynamics in neural systems: mathematical and computational methods, Lyon France.
46. 2012 April 3 Rutgers Applied Topology Seminar.
47. 2012 April 4 Joint IAS, Penn and Rutgers seminar in computational topology, University of Pennsylvania.
48. 2012 April 26 Applied mathematics seminar, University of Nebraska.
49. 2012 April 27 Colloquium, University of Nebraska.
50. 2012 May 17 Applied Dynamics talk, INRIA Antipolis, France.
51. 2012 Sept 24 Colloquium at Department of Mathematics, Georgia Tech, Atlanta, GA.
52. 2012 Oct 26 Colloquium at University of Wisconsin, Milwaukee.
53. 2012 Nov 14 Mathematical Biology Seminar, University of Utah, Salt Lake City.
54. 2013 Jan 13-16 Gordon conference "Stochastic physics of biology", Ventura, CA.
55. 2013 Feb 7 Colloquium, University of Alberta, Edmonton
56. 2013 May 20 Snowbird Applied Dynamical Systems conference, Workshop organizer and presenter
57. 2013 March 16-20, International conference on dynamics of differential equations, Georgia Tech, invited speaker
58. 2013 June 16-21 Canadian Applied Mathematics Society annual meeting, invited speaker.
59. 2013 December IMA, Minneapolis: Topological structures in computational biology, "Structure of afferent terminals in terminal ganglion of a cricket and persistent homology,"
60. 2014 January DARPA meeting, San Francisco: Database of dynamics
61. 2014 February IMA Minneapolis: Topological Data Analysis

62. 2014 June Structural Dynamical Systems conference, Monopoli, Italy
63. 2014 July Mathematical Theory of Networks and Systems, Groningen, Netherlands.
64. 2014 August Lorentz Center: Combinatorial/Topological Frameworks for Multiparameter Nonlinear Dynamics
65. 2014 October BEER (Biomathematics and Ecology: Education and Research), Pomona College, CA.
66. 2014 December FOCM 2014 conference Montevideo, Uruguay

Postdoctoral Associates Supervised

Emily Harvey 2012-2013
Bree Cummins 2013-

Ph.D. Students Supervised

Al Parker	PhD Mathematics	2003
Christina Hayes	PhD Mathematics	2006
Zane Aldworth	PhD Neuroscience co-advisor	2007
Kate Patterson	PhD Mathematics	2009
Bree Cummins	PhD Mathematics	2009
Shaun Harker	PhD Mathematics	2009
Mark Campanelli	PhD Mathematics	2009
Jesse Berwald	PhD Mathematics	2011
Jacob Brown	PhD Mathematics	in progress
Ryan Waters	PhD Mathematics	in progress
Diana Schepens	PhD Mathematics	in progress]]

Supervised Research of Undergraduate Students

Matt Holzer	2001-2003
Kristina Ferris	2002
Eric Siegfried	2003-2004
Collette Champion	2003-2004
Christopher Mischaikow	2004- 2005
Bovard Tiberi	2005
Matt Welsch	2005-2006
Shuai Zhao	2010
Kelly Spendlove	2011-2013
Bridget Fan	2013 -
Julia Platt	2013 -2014
Patrick Murphy	2013-
Zane Huttinga	2014-

Teaching Experience

I have taught 18 different courses at MSU.

- Math 181 Calculus I Honors section
- Math 182 Calculus II, special section for biology majors
- Stat 216 Introduction to Statistics, special section for biology majors
- Math 221 Linear algebra
- Math 361 Advanced Calculus I
- Math 362 Advanced Calculus II
- Math 416 Introduction to Modern Algebra
- Math 454 Introduction to Dynamics I
- Math 455 Introduction to Dynamics II
- Math 503 Linear Algebra
- Math 504 Algebra
- Math 509 Stochastic Processes
- Math 511 Topology
- Math 512 Algebraic Topology
- Math 597 Mathematical Neuroscience
- Math 591 Special Topics: Mathematical Epidemiology
- Math 591 Special Topics: Computational Homology
- Math 591 Special Topics: Introduction to Systems Biology

Course Development

- Math 182 Calculus II, special section for biology majors
- Stat 216 Introduction to Statistics, special section for biology majors
- Math 597 Mathematical Neuroscience
- Math 591 Special Topics: Mathematical Epidemiology
- Math 591 Special Topics: Computational Homology
- Math 591 Special Topics: Introduction to Systems Biology

Professional Service

- I am an Associated Editor for Discrete and Continuous Dynamical systems series B (DCDS-B) journal.
- NSF/NIH panel on Mathematical Biology in 2005;
- I have served on an NSF Mathematical Biology, Neuroscience, or Engineering panels in 2007, 2008, 2010 and 2011 (two panels);
- CAREER panel 2014.
- external reviewer for NSF 2009;
- external reviewer for Czech national granting agency;
- external reviewer for Slovak national granting agency;
- external reviewer for Canadian national granting agency.
- referee for: *Journal of Differential Equations*
- referee for: *Journal of Dynamics and Differential Equations*
- referee for: *Journal of Discrete and Continuous Dynamical Systems*
- referee for: *Control Letters*
- referee for: *Physica D*

- referee for: *SIAM Journal on Applied Dynamical Systems*
- referee for: *Mathematical Biosciences*
- referee for: *Journal of Mathematical Biology*
- referee for: *The ANZIAM journal*
- referee for: *Neural Networks*
- referee for: *International Journal of Bifurcation and Chaos*
- referee for: *Mathematical Reviews*
- referee for: *Proceedings of Royal Society of London. Series A*
- referee for: *PLoS Computational Biology*
- referee for: *Physical Review E*
- referee for: *Bulletin for Mathematical Biology*
- referee for: *PLoS ONE*
- referee for: *Biophysical Journal*

Service to the University

- CL&S Promotion and Tenure committee. 2001-2005;
- IGERT program Steering Committee 2002-2004;
- Computer Science Department Head Search Committee 2002-2003;
- Bioinformatics Assistant professor Search Committee Department of Microbiology 2002-2003.
- INBRE program mentoring board 2003-2008
- Molecular Biosciences graduate program board 2009-present
- Center for Computational Biology Faculty Leadership Committee 2011-present
- Department Head 2013-present

Service to the Department

- I have organized Applied Mathematics Seminar since 2000
- Executive Committee 1999-2000
- Assistant Professor Search Committee 2004-2005
- Assistant Professor Search Committee 2006-2007, Chair