

**Peer-Reviewed Journal Papers (dagger † denotes Zhao's research group member)**

1. H. Xia<sup>†</sup>, Irfan Asif, X. **Zhao**, A Cloud-based Software for Improving the Quality of ECGs, *Computer Methods and Programs in Biomedicine*, to appear
2. J.A. Freedman, C.E. Milner, D. Thompson, S. Zhang, and X. **Zhao**, The Influence of Body Mass Index and Velocity on Knee Biomechanics during Walking, *Gait and Posture*, to appear
3. J. McBride<sup>†</sup>, X. **Zhao**, T. Nichols, V. Vagnini, N. Munro, D. Berry, and Y. Jiang, Scalp EEG-Based Discrimination of Cognitive Deficits after Traumatic Brain Injury Using Event-Related Tsallis Entropy Analysis, *IEEE Transaction on Biomedical Engineering*, 60(1), 90-96, 2013
4. A. Petrie and X. **Zhao**, "Estimating Eigenvalues of Dynamical Systems from Time Series with Applications to Predicting Cardiac Alternans," *Proceedings of Royal Society A*, 468(2147): 3649-3666, 2012
5. H. Xia<sup>†</sup>, K. Wong and X. **Zhao**, "A Fully Coupled Model for Electromechanics of the Heart", Special Issue on Cardiovascular System Modeling, *Computational and Mathematical Methods in Medicine*, 2012, Article ID 927279, 10 pages
6. Y. Wu<sup>†</sup>, X. **Zhao**, and M. Zhang, "Dynamics of Stochastic Mutation to Immunodominance," *Mathematical Biosciences and Engineering*, 9(4): 937-952, 2012
7. H. Xia<sup>†</sup>, G. Garcia<sup>†</sup>, J. Bains, D. Wortham, and X. **Zhao**, Matrix of Regularity for Improving the Quality of ECG, in *Focus issues: Signal quality in cardiorespiratory monitoring*, *Physiological Measurement*, 33:1535-1548, 2012
8. H. Xia<sup>†</sup>, G. Garcia<sup>†</sup>, and X. **Zhao**, Automatic Detection of Electrode Misplacement in ECG: A Tale of Two Algorithms, in *Focus issues: Signal quality in cardiorespiratory monitoring*, *Physiological Measurement*, 33:1549-1561, 2012
9. A. Sullivan<sup>†</sup>, F. Agosto, S. Bewick, C. Su, S. Lenhart, and X. **Zhao**, A Mathematical Model for Within-host *Toxoplasma gondii* Invasion Dynamics, *Mathematical Biosciences and Engineering*, 9:647-662, 2012
10. Y. Wu<sup>†</sup>, M. Zhang, J. Wu, X. **Zhao**, L. Xia, Evolutionary Game Theoretic Strategy for Optimal Drug Delivery to Influence Selection Pressure in Treatment of HIV-1, *Journal of Mathematical Biology*, 64: 495-512, 2012
11. W. Jiang<sup>†</sup>, A. Sullivan<sup>†</sup>, C. Su, and X. **Zhao**, An Agent-based Model for the Transmission Dynamics of *Toxoplasma Gondii*, *Journal of Theoretical Biology*, 293, 15–26, 2012.
12. E.G. Tolkacheva and X. **Zhao**, "Nonlinear dynamics of periodically paced cardiac tissue", *Nonlinear Dynamics*, 68:347-376, 2012.
13. W. Jiang<sup>†</sup> and X. **Zhao**, "Dynamics and Control of the Two-pulse Protocol in Electroporation: Numerical Exploration," *Mathematical Biosciences*, 232: 24-30, 2011.
14. J. McBride<sup>†</sup>, A. Sullivan<sup>†</sup>, H. Xia<sup>†</sup>, A. Petrie, and X. **Zhao**, "Reconstruction of physiological signals using iterative retraining and accumulated averaging of neural network models," *Physiological Measurement*, 32: 661-675, 2011.
15. L. Xia, S.C. Lenaghan, M. Zhang, Y. Wu<sup>†</sup>, X. **Zhao**, J.N. Burris and C.N. Stewart Jr., "Characterization of English ivy (*Hedera helix*) adhesion force and imaging using atomic force microscopy," *Journal of Nanoparticle Research*, 13:1029–1037, 2011.
16. Y. Wu<sup>†</sup>, L. Xia, M. Zhang, and X. **Zhao**, "Immunodominance analysis through interactions of CD8+ T cells and DCs in lymph nodes," *Mathematical Biosciences*, 225, 53-58, 2010.
17. Y. Wu<sup>†</sup>, X. **Zhao**, and M. Zhang, "Adhesion Mechanics of Ivy Nanoparticles," *Journal of Colloid and Interface Science*, 344:533-540, 2010.
18. X. **Zhao**, R. Yang, M. Zhang, and H. Xia<sup>†</sup>, "A Computational Approach for Understanding Immunodominance Based on Optimal Control Formulation," *Communications in Nonlinear Science and Numerical Simulations*, 15, 4209–4218, 2010.
19. X. **Zhao**, M. Zhang, and R. Yang "Control of Pore Radius Regulation for Electroporation-based Drug Delivery," *Communications in Nonlinear Science and Numerical Simulations*, 15:1400-1407, 2010.
20. X. **Zhao**, "Indeterminacy of Spatiotemporal Cardiac Alternans," *Physical Review E*, 78, 011902, 2008.

21. **X. Zhao**, D.G. Schaeffer, C.M. Berger, D.J. Gauthier, and W. Krassowska, "Cardiac Alternans Arising from an Unfolded Border-collision bifurcation", *Journal of Computational and Nonlinear Dynamics*, 4, 041004, 2008.
22. D.G. Schaeffer, W. Ying, and **X. Zhao**, "Asymptotic Approximation of an Ionic Model for Cardiac Restitution", *Nonlinear Dynamics*, Vol. 51, pp. 189-198, 2008
23. **X. Zhao**, D.G. Schaeffer, "Alternate Pacing of Border-collision Period-doubling Bifurcations", *Nonlinear Dynamics*, Vol. 50, pp. 733-742, 2007.
24. C.M. Berger, **X. Zhao**, D.G. Schaeffer, W. Krassowska, H.M. Dobrovolny, and D.J. Gauthier, "Period-doubling bifurcation to alternans in paced cardiac tissue: Crossover from smooth to border-collision characteristics", *Physical Review Letters*, Vol. 99, 058101, 2007.
25. H. Dankowicz, **X. Zhao**, S. Misra, "Near-Grazing Dynamics in Tapping-Mode Atomic Force Microscopy", *International Journal of Non-linear Mechanics*, Vol. 42, pp. 697-709, 2007.
26. **X. Zhao**, D.G. Schaeffer, C.M. Berger, and D.J. Gauthier, "Small Signal Amplification of Period-doubling Bifurcations in Smooth Iterated Maps", *Nonlinear Dynamics*, Vol. 48, pp. 381-389, 2007.
27. **X. Zhao** and H. Dankowicz, "Unfolding Degenerate Grazing Dynamics in Impact Actuators", *Nonlinearity*, Vol. 19, pp. 399-418, 2006.
28. **X. Zhao** and H. Dankowicz, "Characterization of Intermittent Contacts in Tapping Mode Atomic Force Microscopy", *ASME Journal of Computational and Nonlinear Dynamics*, Vol. 2, 2006.
29. P. Thota, **X. Zhao**, and H. Dankowicz, "Co-dimension-two grazing bifurcations in single-degree-of-freedom impact oscillators", *ASME Journal of Computational and Nonlinear Dynamics*, Vol. 1, pp. 328-335, 2006.
30. **X. Zhao** and H. Dankowicz, "Control of Impact Microactuators for Precise Positioning", *ASME Journal of Computational and Nonlinear Dynamics*, Vol. 1, pp. 65-70, 2006.
31. H. Dankowicz and **X. Zhao**, "Local Analysis of Co-dimension-one and Co-dimension-two grazing bifurcations in Impact Microactuators", *Physica D*, Vol. 202, pp. 238-257, 2005.
32. **X. Zhao**, C.K. Reddy, and A.H. Nayfeh, "Nonlinear Dynamics of an Electrically Driven Impact Microactuator", *Nonlinear Dynamics*, Vol. 40, pp. 227-239, 2005.
33. **X. Zhao**, H. Dankowicz, C.K. Reddy, and A.H. Nayfeh, "Modeling and Simulation Methodology for Impact Microactuators", *Journal of Micromechanics and Microengineering*, Vol. 14, pp. 775-784, 2004.
34. **X. Zhao**, E.M. Abdel-Rahman, and A.H. Nayfeh, "A Reduced-Order Model for Electrically Actuated Microplates", *Journal of Micromechanics and Microengineering*, Vol. 14, pp. 900-906, 2004.

**Journal Manuscripts in Submission (dagger † denotes Zhao's research group member)**

1. J. McBride<sup>†</sup>, **X. Zhao**, N. Munro, C. Smith, G. Jicha, L. Hively, D. Wekstein, and Y. Jiang, Quantitative EEG Diagnostics for Mild Cognitive Impairment and Early Alzheimer's Disease, *IEEE Transaction on Biomedical Engineering*, submitted
2. J. McBride<sup>†</sup>, **X. Zhao**, N. Munro, C. Smith, G. Jicha, and Y. Jiang, Resting EEG discrimination of early stage Alzheimer's disease from normal aging using connectivity network of coherence measures, *ABME*, submitted
3. H Xia<sup>†</sup>, **X Zhao**, D Wortham, Multi-level Simulation and Analysis of the Influence of Ion Blockers on Heart Rhythm Dynamics, *Computers in Biology and Medicine*, submitted
4. H Xia<sup>†</sup>, I Asif, D Wortham, A Talkachova, **X Zhao**, Resampling for reliable evaluation and improved performance in automatic detection of electrode misplacements in ECG, *Physiological Measurement*, submitted
5. H. Xia<sup>†</sup>, N. Keeney<sup>†</sup>, B.J. Daley, A. Petrie, **X. Zhao**, Patient Specific ICU Mortality Prediction, Submitted
6. M. Turner<sup>†</sup>, S. Lenhart, B. Rosenthal, A. Sullivan, and **X. Zhao**, Modeling Effective Transmission Mechanisms and Control of the World's Most Successful Parasite, *Journal of Mathematical Biology*, submitted

7. J.A. Freedman, C.E. Milner, D. Thompson, and **X. Zhao**, Performance Effects of Gait Instruction on Stiff-knee Gait, *Clinical Biomechanics*, submitted
8. R. Visweswaran, S.D. McIntyre, Y. Mori, E.G. Tolkacheva, **X. Zhao**, Spatio-temporal evolution and prediction of electromechanical alternans in isolated rabbit hearts

#### **Journal Manuscripts in Preparation (dagger † denotes Zhao's research group member)**

9. A.M. Sullivan<sup>†</sup>, **X. Zhao**, Y. Suzuki, M.A. Gilchrist, A Model-Selection Approach Based on Experimental Data to Understand Cyst Growth and Removal Properties of *Toxoplasma gondii*
10. A.M. Sullivan<sup>†</sup>, **X. Zhao**, D. Mordue, M. Gilchrist, Acute Infection Modeling of *Toxoplasma gondii*

#### **Edited Special Issues**

1. **X. Zhao**, A. Talkachova, and W. Ying, Nonlinear Dynamics in Biology and Medicine, a special issue in *Nonlinear Dynamics*, Vol. 68, No. 3, 2012.
2. A. Shukla and **X. Zhao**, Discontinuous Dynamical Systems: Modeling, Analysis, and Control, a special issue in *Nonlinear Dynamics*, Vol. 50, No. 3, pp. 373-742, 2007.

#### **Book Chapters**

1. **X. Zhao**, "Discontinuity Mapping for Near-grazing Dynamics in Vibro-impact Oscillators," in *Vibro-Impact Dynamics of Ocean Systems and Related Problems*, edited by Raouf A. Ibrahim, Vladimir I. Babitsky, and Masaaki Okuma, Springer-Verlag, Berlin, 2009.

#### **Patents**

1. **X. Zhao** and J. McBride, Scalp EEG Features Based on Multiscale Sample Entropy for Cognitive Disease Detection, US Provisional Patent, 2012 (Licensed to Ascendant Global Technology LLC).
2. **X. Zhao** and J. McBride, Network based on Coherence Analysis of Scalp EEG for Cognitive Disease Detection, US Provisional Patent, 2012 (Licensed to Ascendant Global Technology LLC).

#### **Peer-Reviewed Conference Proceedings**

1. A. Sullivan, M. Gilchrist, D. Mordue, and **X. Zhao**, Modeling and Control of Acute Infection *Toxoplasma gondii*, 5th Annual Dynamic Systems and Control Conference, Ft. Lauderdale, FL, USA in October 17-19, 2012; invited contribution.
2. H. Xia, H. Qi, and **X. Zhao**, ECG Quality Assessment Based on Image Processing Techniques, 5th Annual Dynamic Systems and Control Conference, Ft. Lauderdale, FL, USA in October 17-19, 2012; invited contribution.
3. A. Sullivan, C. Su, and **X. Zhao**, Mathematical Modeling of Within-host Dynamics of *Toxoplasma gondii*, 4th Annual Dynamic Systems and Control Conference, Arlington, VA, Oct 31 – Nov, 2, 2011; invited contribution.
4. H. Xia, K. Wong, and **X. Zhao**, Numerical Simulation of Dynamics in Paced Cardiac Tissue, 4th Annual Dynamic Systems and Control Conference, Arlington, VA, Oct 31 – Nov, 2, 2011; invited contribution.
5. H. Xia, K. Wong, and **X. Zhao**, Parallel FEM Simulation of Electromechanics of the Heart, the International Conference on Applied Mathematics, Modeling and Computational Science, Waterloo, Ontario, Canada from July 25 - 29, 2011.
6. J. McBride, S. Zhang, M. Wortley, M. Paquette, G. Klipple, E. Byrd, L. Baumgartner, and **X. Zhao**, "Neural Network Analysis of Gait Biomechanical Data for Classification of Knee Osteoarthritis," BSEC 2011: 3rd Annual ORNL Biomedical Science and Engineering Conference, Knoxville, Tennessee, March 15-17, 2011
7. J. McBride, **X. Zhao**, T. Nichols, T. Abdul-Ahad, M. Wilson, V. Vagnini, N. Munro, D. Berry, and Y. Jiang, "Classification of Traumatic Brain Injury Using Support Vector Machine Analysis of Event-Related Tsallis Entropy," BSEC 2011: 3rd Annual ORNL Biomedical Science and Engineering Conference, Knoxville, Tennessee, March 15-17, 2011

8. R.M. Wham and **X. Zhao**, "Multiparameter physiological signal reconstruction using NARX neural networks," BSEC 2011: 3rd Annual ORNL Biomedical Science and Engineering Conference, March 15-17, 2011, Knoxville, Tennessee
9. Petrie, A. and **X. Zhao**, 2010, Detection of Cardiac Alternans via Statistical Analysis of Eigenvalues of a Dynamical System. In JSM Proceedings, Statistical Computing Section. Alexandria, VA: American Statistical Association. 1121-1131.
10. H. Xia and **X. Zhao**, "Bifurcation and Control of Cardiac Alternans," Dynamic Systems and Control Conference (DSCC), Cambridge, MA, September 13-15, 2010.
11. H. Xia, K. Wong, W. Ying, and **X. Zhao**, "Numerical Simulations of Coupled Electro-Mechanical Dynamics in a Dog Ventricle," the 5th annual TeraGrid Conference, TG'10, Pittsburgh, PA, August 2-5, 2010.
12. W. Jiang, A.M. Sullivan, C. Su, and **X. Zhao**, "A Mathematical Model for Describing Stage Conversion of *Toxoplasma Gondii*," 16th US National Congress of Theoretical and Applied Mechanics, State College, Pennsylvania, June 27 - July 2, 2010.
13. H. Xia, K.L. Wong, and **X. Zhao**, "Numerical Investigation on the Interaction between Mechanical Contraction and Electrical Propagation in Cardiac Dynamics," 16th US National Congress of Theoretical and Applied Mechanics, State College, Pennsylvania, June 27 - July 2, 2010; invited contribution.
14. **X. Zhao**, R. Yang, and M. Zhang, "A Shooting Algorithm for Complex Immunodominance Control Problems," 31st Annual International IEEE EMBS Conference of the IEEE Engineering in Medicine and Biology Society, Minneapolis, Minnesota, September, 2-6, 2009.
15. H. Xia, **X. Zhao**, J. Bains, and D. Wortham, "Influence of Channel Blockers on Cardiac Alternans," 31st Annual International IEEE EMBS Conference of the IEEE Engineering in Medicine and Biology Society, Minneapolis, Minnesota, September, 2-6, 2009.
16. H. Xia, **X. Zhao**, J. Bains, and D. Wortham, "A Review of Diagnosis Methods for Heart Rhythm Disorders," Biomedical Science and Engineering Conference, Oak Ridge, Oak Ridge, TN, March 18-19, 2009.
17. S. Basile and **X. Zhao**, "Modeling and Analysis of Proximal Tibial Growth Plate Fractures in Adolescents," Biomedical Science and Engineering Conference, Oak Ridge, Oak Ridge, TN, March 18-19, 2009.
18. S. Basile, **X. Zhao**, and M. Zhang, "Dynamics and Control of Electroporation," ASME International Mechanical Engineering Congress and Exhibition, Boston, MA, October 31-November 5, 2008.
19. **X. Zhao**, "Bifurcation of Spatiotemporal Cardiac Alternans," ASME International Mechanical Engineering Congress and Exhibition, Boston, MA, October 31-November 5, 2008.
20. **X. Zhao**, D.G. Schaeffer, C.M. Berger, D.J. Gauthier, and W. Krassowska, "Cardiac Alternans Arising from an Unfolded Border-collision bifurcation", ASME International Design Engineering Technical Conferences & Computers Information in Engineering Conference, Las Vegas, Nevada, September 4-7, 2007.
21. J.P. Cranford, **X. Zhao**, and W. Krassowska, "Guidelines for Controlling Pore Radii from Nonlinear Analysis of a Two Dimensional Model of Electroporation", ASME International Mechanical Engineering Congress and Exhibition, Seattle, Washington, November 10-16, 2007.
22. **X. Zhao**, D.G. Schaeffer, W. Krassowska, and D.J. Gauthier, "A Model-Independent Technique for Eigenvalue Identification and Its Application in Predicting Cardiac Alternans", ASME International Mechanical Engineering Congress and Exhibition, Seattle, Washington, November 10-16, 2007.
23. **X. Zhao** and H. Dankowicz, "Characterization of Intermittent Contacts in Tapping Mode Atomic Force Microscopy", ASME 2005 Design Engineering Technical Conferences, Long Beach, CA, September 24-28, 2005.
24. **X. Zhao** and H. Dankowicz, "Near-Grazing Dynamics in Tapping Mode Atomic Force Microscopy", Fifth EUROMECH Nonlinear Dynamics Conference, Eindhoven, Netherlands, August 7-12, 2005.

25. P. Thota, **X. Zhao**, and H. Dankowicz, "Continuous and Discontinuous Grazing Bifurcations in Impact Oscillators", Fifth EUROMECH Nonlinear Dynamics Conference, Eindhoven, Netherlands, August 7-12, 2005.
26. **X. Zhao**, H. Dankowicz, and A.H. Nayfeh, "Modeling the Nonlinear Dynamics of Electrically Driven Impact Microactuators", 2004 International Conference on MEMS, NANO and Smart Systems, Banff, Alberta, Canada, August 25-27, 2004.
27. **X. Zhao** and A.H. Nayfeh, "A Reduced-Order Model for Electrically Actuated Microplates," in Proceedings of the 45th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Palm Springs, CA, April 19-22, 2004.
28. **X. Zhao**, H. Dankowicz, C.K. Reddy and A.H. Nayfeh, "Dynamic Simulation of an Electrostatically Actuated Impact Microactuator," in Proceedings of NanoTech2004, Boston, MA, March 7-11, 2004.
29. **X. Zhao**, E.M. Abdel-Rahman, and A.H. Nayfeh, "Mechanical Behavior of Electrically Actuated Microplates," ASME 2003 Design Engineering Technical Conferences - 19th Biennial Conference on Mechanical Vibration and Noise, Chicago, IL, September 2-6, 2003.
30. **X. Zhao**, C.K. Reddy, and A.H. Nayfeh, "Bifurcations and Chaotic Dynamics in an Electrostatically Actuated Microactuator: A Numerical Exploration," ASME 2003 Design Engineering Technical Conferences - 19th Biennial Conference on Mechanical Vibration and Noise, Chicago, IL, September 2-6, 2003.

#### **Conference Presentations and Posters**

1. J. McBride, EEG Diagnostics for Mild Cognitive Impairment and Early Alzheimer's Disease, the Knoxville-Oak Ridge Section Meeting of American Institute of Chemical Engineers, Nov. 15, 2019
2. Xiaopeng Zhao, Dynamic signal analysis for intelligent patient monitoring, The East Tennessee chapter of the Engineering in Medicine and Biology Society, October 25, 2012, Knoxville, TN; invited contribution
3. N.B. Munro, L.M. Hively, Y. Jiang, C.D. Smith, G.A. Jicha, and **X. Zhao**, Early Alzheimer's Detection via Advanced EEG Analysis, Oak Ridge Forum on Religion and Science, September 19, 2012, Oak Ridge, TN
4. N. Munro, J. McBride, **X. Zhao**, L. Hively, C. Smith, G. Jicha, J. Li, L. Broster, Y. Jiang, Early Alzheimer's Detection Via Advanced EEG Analysis, BSEC Advisory Council, September 17, 2012, Oak Ridge, TN
5. G.A. Garcia, R.J. Smith, H. Xia, E. Tolkacheva, and **X. Zhao**, Robust Heart Rate Extraction Using Fingertip Video from a Smartphone, Computing in Cardiology, September 9-12, 2012, Krakow, Poland.
6. H. Xia, B.J. Daley, A. Petrie, and **X. Zhao**, A Neural Network Model for Mortality Prediction in ICU, Computing in Cardiology, September 9-12, 2012, Krakow, Poland.
7. A. Sullivan, M. Gilchrist, Y. Suzuki, **X. Zhao**, Size Structured Model for Tissue Cyst Growth of *Toxoplasma gondii*, 2012 Annual Meeting of The Society of Mathematical Biology, July 25-28, 2012 Knoxville TN
8. **X. Zhao**, M. Turner, S. Lenhart, C. Su, Agent-based Modeling and Approximation for *Toxoplasma gondii* Transmission Dynamics in a Virtual Farm, 2012 Annual Meeting of The Society of Mathematical Biology, July 25-28, 2012 Knoxville TN; invited contribution.
9. **X. Zhao**, A Mathematical Model for Within-host *Toxoplasma gondii* Invasion Dynamics, 2012 Annual Meeting of The Society of Mathematical Biology, July 25-28, 2012 Knoxville TN
10. J. McBride, **X. Zhao**, N. Munro, C. Smith, G. Jicha, L. Hively, L. Broster, and Y. Jiang, EEG-based, Diagnostics for Mild Cognitive Impairment and Early Alzheimer's Disease, 26th Annual Alzheimer's Disease Symposium, June 15, 2012, Maryville College, TN
11. J. McBride, **X. Zhao**, N. Munro, C. Smith, G. Jicha, L. Hively, L. Broster, and Yang Jiang, EEG-based, Diagnostics for Mild Cognitive Impairment and Early Alzheimer's Disease, 1st Annual Neurosciences/Neurodegenerative Diseases Symposium, May 29, 2012, UT Medical Center, Knoxville TN

12. H. Xia, **X. Zhao**, A Neural Network Model for Mortality Prediction in ICU, Comparative & Experimental Medicine and Public Health Research Symposium, May 21-22, 2012, Knoxville, TN
13. H. Xia, **X. Zhao**, Automatic Detection of ECG Electrode Misplacement: A Tale of Two Algorithms, Comparative & Experimental Medicine and Public Health Research Symposium, May 21-22, 2012, Knoxville, TN
14. A. Sullivan, M. Gilchrist, Y. Suzuki, **X. Zhao**, Size Structured Model for Tissue Cyst Growth of *Toxoplasma gondii*, Comparative & Experimental Medicine and Public Health Research Symposium, May 21-22, 2012, Knoxville, TN
15. J. McBride, **X. Zhao**, N. Munro, C. Smith, G. Jicha, L. Hively, L. Broster, and Yang Jiang, EEG-based, Diagnostics for Mild Cognitive Impairment and Early Alzheimer's Disease, Comparative & Experimental Medicine and Public Health Research Symposium, May 21-22, 2012, Knoxville TN
16. M. Gilchrist, A. Sullivan, Y. Suzuki, **X. Zhao**, Incorporating size structured models of intra-cellular growth into a model of within-host dynamics, Working Group on Integrated Modeling and Analysis of within-host Infection and between-host Transmission for *Toxoplasma gondii*, Knoxville, TN, March 12-14, 2012; invited contribution.
17. A. Sullivan, M. Gilchrist, Y. Suzuki, **X. Zhao**, Inferring growth and death functions from cyst size distribution, Working Group on Integrated Modeling and Analysis of within-host Infection and between-host Transmission for *Toxoplasma gondii*, Knoxville, TN, March 12-14, 2012; invited contribution.
18. **X. Zhao**, Modeling Stage Conversion and Reactivation of *Toxoplasma gondii*, Working Group on Integrated Modeling and Analysis of within-host Infection and between-host Transmission for *Toxoplasma gondii*, Knoxville, TN, March 12-14, 2012; invited contribution.
19. **X. Zhao**, Agent-based Modeling and Approximation for *Toxoplasma gondii* Transmission Dynamics, Working Group on Integrated Modeling and Analysis of within-host Infection and between-host Transmission for *Toxoplasma gondii*, Knoxville, TN, March 12-14, 2012; invited contribution.
20. K.L. Wong, **X. Zhao** and H. Xia, Simulation of Electromechanics in the Heart abstract, 15th SIAM Conference on Parallel Processing for Scientific Computing, Savannah, GA, Feb. 15-17, 2012
21. **X. Zhao**, Nonlinear Cardiac Dynamics, in Frontier Session: Dynamic System and Control Issues in Bio-Systems and Health Care, 4th Annual Dynamic Systems and Control Conference, Arlington, VA, Oct 31 – Nov, 2, 2011; invited contribution.
22. A. Sullivan, M. Gilchrist, and **X. Zhao**, Mathematical Modeling of *Toxoplasma* Infection, Third International Conference on Mathematical Modeling and Analysis of Population in Biological Systems, San Antonio, TX, Oct. 7-9, 2011
23. H. Xia, G. Garcia, J. McBride, A. Sullivan, T. De Bock, J. Bains, D. Wortham, and **X. Zhao**, Computer Algorithms for Evaluating the Quality of ECGs in Real Time, Computing in Cardiology, September 19-21, Hangzhou, China, 2011
24. C.E. Milner, J. McBride, J.A. Freedman and **X. Zhao**, Investigating the Influence of Obesity on Gait Using Support Vector Machine Analysis, The Annual Meeting of American Society of Biomechanics, Long Beach, CA on August 10-13, 2011.
25. A. Sullivan, C. Su, and **X. Zhao**, Mathematical Modeling of Withinhost Transmission Dynamics of *Toxoplasma gondii*, Comparative & Experimental Medicine and Public Health Research Symposium 2011, Knoxville, TN, June 20-21, 2011.
26. J. McBride, **X. Zhao**, T. Nichols, T. Abdul-Ahad, M. Wilson, V. Vagnini, N. Munro, D. Berry, and Y. Jiang, Detection of Traumatic Brain Injury from Scalp EEG Using Event-related Tsallis Entropy Functionals, Comparative & Experimental Medicine and Public Health Research Symposium 2011, Knoxville, TN, June 20-21, 2011.
27. H. Xia, K. Wong, and **X. Zhao**, Parallel FEM Simulation of Electromechanics of the Heart, Comparative & Experimental Medicine and Public Health Research Symposium 2011, Knoxville, TN, June 20-21, 2011.

28. **X. Zhao**, Individual based modeling of *Toxoplasma gondii*, NIMBioS Investigative Workshop on Individual-Based Ecology of Microbes: Observations and Modeling, Knoxville, June 8-10, 2011; invited contribution.
29. J.F. Silvernail, C.E. Milner, S. Zhang, and **X. Zhao**, The Influence of Body Mass Index on Biomechanical Risk Factors for Osteoarthritis during Walking, The 58th Annual Meeting of American College of Sports Medicine, Denver, CO, May 31-June 4, 2011
30. C.E. Milner, J.F. Silvernail, and **X. Zhao**, Gait Instruction Improves Stiff Knee Gait during Walking, The 58th Annual Meeting of American College of Sports Medicine, Denver, CO, May 31-June 4, 2011
31. **X. Zhao**, "A Parallel FEM Platform for Simulation of Electromechanics of the Heart," 2011 NHLBI-VCU International Conference on Mathematical Modeling & Computational Simulation of Cardiovascular & Cardiopulmonary Dynamics, Williamsburg, VA, May 31- June 3, 2011; invited contribution.
32. **X. Zhao**, "Mathematical Modeling of *Toxoplasma Gondii*," Working Group on Integrated Modeling and Analysis of within-host Infection and between-host Transmission for *Toxoplasma gondii*, Knoxville, TN, May 16-18, 2011; invited contribution.
33. H. Xia, K. Wong, and **X. Zhao**, "A Parallel FEM Platform for Simulation of Electromechanics of the Heart," 35th SIAM Southeastern Atlantic Section Conference, Charlotte, NC, March 26-27, 2011
34. Munro, N. B., T. J. De Bock, S. Das, M. Mohsin, J. McBride, **X. Zhao**, L. M. Hively, C. Smith, G. Jicha, L. Broster, and Y. Jiang, "Early Detection of Mild Cognitive Impairment Using Nonlinear Analysis of EEG via Tsallis Entropy and Support Vector Machine Classification," BSEC 2011: 3rd Annual ORNL Biomedical Science and Engineering Conference, Knoxville, TN, March 15-17, 2011
35. **X. Zhao**, "Nonlinear Dynamics of Cardiac Rhythms," NSF CMMI Research and Innovation Conference, Atlanta, GA, Jan. 4-7, 2011
36. H. Xia, K. Wong, and **X. Zhao**, "Finite Element Based Parallel Simulation of Coupled Electro-Mechanical Dynamics in 3d Dog Ventricle," NSF CMMI Research and Innovation Conference, Atlanta, GA, Jan. 4-7, 2011
37. A.M. Sullivan, H. Xia, J. McBride, and **X. Zhao**, "Reconstruction of missing physiological signals using artificial neural networks," the 2010 Computing in Cardiology conference, Belfast, Northern Ireland, United Kingdom, September 26-29, 2010.
38. A.M. Sullivan, K. Wong, C. Su, and **X. Zhao**, "A Parallel Agent Based Model to Describe Host-Pathogen Interaction for *Toxoplasma Gondii*," the 5th annual TeraGrid Conference, TG'10, Pittsburgh, PA, August 2-5, 2010.
39. H. Xia, A.M. Sullivan, **X. Zhao**, "Mind the Gap: Artificial Neural Network Models for Physiological Signal Reconstruction," Summer School in Biophysics at UT/ORNL: Computational and Experimental Challenges, Knoxville, TN, July 7-10, 2010.
40. A.M. Sullivan, W. Jiang, C. Su, and **X. Zhao**, "An Agent Based Model of the Life Cycle of *Toxoplasma Gondii*," Summer School in Biophysics at UT/ORNL: Computational and Experimental Challenges, Knoxville, TN, July 7-10, 2010.
41. H. Xia, S. Lenhart, **X. Zhao**, "Optimal Control of Cardiac Alternans," 34th SIAM Southeastern-Atlantic Section Conference, North Carolina State University, March 20-21, 2010; invited contribution.
42. H. Xia and **X. Zhao**, "Multi-level Simulation and Analysis of the Influence of Ion Blockers on Heart Rhythm Dynamics," 2009 BMES Annual Meeting, Pittsburgh, PA, October 7-10, 2009.
43. A.M. Sullivan and **X. Zhao**, "Bifurcation Analysis on Transmission Dynamics of Infectious Diseases," Summer School in Biophysics at ORNL: Computational and Experimental Challenges, August 3-5, 2009.
44. W. Jiang and **X. Zhao**, "A Novel Control Protocol for Regulating Pore Radius in Electroporation," Summer School in Biophysics at ORNL: Computational and Experimental Challenges, August 3-5, 2009.

45. C.M. Berger, **X. Zhao**, D.G. Schaeffer, W. Neu, and D.J. Gauthier, "Evidence for an Unfolded Border-Collision Bifurcation in Paced Cardiac Tissue," International Workshop on Resonance Oscillations and Stability of Nonsmooth Systems, London, United Kingdom, June 16-25, 2009; invited contribution.
46. **X. Zhao**, "Bifurcation analysis of spatially discordant alternans," SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, May 17-21, 2009; invited contribution.
47. C. Berger, **X. Zhao**, D. G. Schaeffer, W. K. Neu, and D. Gauthier, "Investigating an Unfolded Border-Collision Bifurcation in Paced Cardiac Tissue," SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, May 17-21, 2009; invited contribution.
48. **X. Zhao**, "Discontinuity Mapping and Its Applications," International Symposium on Vibro-Impact Dynamics of Ocean Systems and Related Problems, Troy, MI, October 2008; invited contribution.
49. S. Basile, **X. Zhao**, and M. Zhang, "Control Facilitated Electroporation for Drug Delivery," Comparative Medicine, Comparative and Experimental Medicine Research Symposium, Knoxville, TN, June 17, 2008.
50. **X. Zhao**, "Bifurcation Analysis of a Model of Cardiac Dynamics," The Twelfth Conference on Nonlinear Vibrations, Stability, and Dynamics of Structures, Blacksburg, VA, June, 2008.
51. **X. Zhao**, "Understanding Bifurcation to Cardiac Alternans," ESM Conference, Blacksburg, VA, May, 2008.
52. D.J. Gauthier, C.M. Berger, **X. Zhao**, H. Dobrovolny, D.G. Schaeffer, and W. Krassowska, "Evidence for an unfolded border-collision bifurcation in paced cardiac muscle," Nonlinear Dynamics Seminar, U. Maryland, College Park, MD, Apr. 17, 2008; invited contribution.
53. C.M. Berger, **X. Zhao**, D.G. Schaeffer, S. Idriss, D.J. Gauthier, "Understanding a Period-Doubling Bifurcation in Cardiac Cells," American Physical Society March Meeting, New Orleans, LA, March 6, 2008.
54. **X. Zhao**, "Spatiotemporal Instability in Cardiac Muscle," The Third Center for Advancement of Computational Research Symposium on Dynamical Systems in Science, Oxford, OH, March 6-7, 2008; invited contribution.
55. **X. Zhao**, "Indefinite Patterns of Cardiac Alternans Due to Spatiotemporal Border-collision Bifurcation," Dynamics Days 2008, Knoxville, TN, January 3-6, 2008; invited contribution.
56. **X. Zhao**, A.G. Petrie, D.G. Schaeffer, D.J. Gauthier, and W. Krassowska, "Predicting Cardiac Alternans Based on Empirical Stability Analysis," Dynamics Days, Knoxville, TN, January 3-6, 2008.
57. **X. Zhao**, D.G. Schaeffer, C.M. Berger, D.J. Gauthier and W. Krassowska, "Evidence of an unfolded border-collision bifurcation in paced cardiac tissue", KITP Miniprogram on Cardiac Dynamics, Kavli Institute for Theoretical Physics, Santa Barbara, CA, July 13, 2006; invited contribution.
58. **X. Zhao**, D.G. Schaeffer, C.M. Berger, D.J. Gauthier, W. Krassowska, "Border-Collision Bifurcations in a Model of Cardiac Tissue", the Eleventh Conference on Nonlinear Vibrations, Stability, and Dynamics of Structures, Blacksburg, VA, August 13-18, 2006.
59. **X. Zhao**, D.G. Schaeffer, C.M. Berger, D.J. Gauthier, W. Krassowska, "Differentiation between Smooth and Nonsmooth Period-Doubling Bifurcations in Cardiac Tissue", the 6th Symposium of Understanding Complex Systems, Urbana, Illinois, May 15-18, 2006.
60. **X. Zhao**, D.G. Schaeffer, C.M. Berger, D.J. Gauthier, W. Krassowska, "Theoretical Analysis of Smooth and Nonsmooth Period-Doubling Bifurcations in Cardiac Tissue", Dynamics Days, Bethesda, MD, January 4-7, 2006.
61. C.M. Berger, H. Dobrovolny, **X. Zhao**, D.G. Schaeffer, W. Krassowska, and D.J. Gauthier, "Investigating a Period-Doubling Bifurcation in Cardiac Tissue Using Alternate Pacing", Dynamics Days, Bethesda, MD, January 4-7, 2006.
62. **X. Zhao** and H. Dankowicz, "Characterization of Intermittent Contacts in Tapping Mode Atomic Force Microscopy", Dynamics Days, Bethesda, MD, January 4-7, 2006.



63. C.M. Berger, H. Dobrowolny, **X. Zhao**, D.G. Schaeffer, W. Krassowska, and D.J. Gauthier, "Evidence for a Border-collision Bifurcation in Paced Cardiac Tissue", Southeastern Section of the APS, Gainesville, FL, November 10-12, 2005.
64. H. Dankowicz and **X. Zhao**, "Discontinuity-driven Design and Control of an Impact Microactuator", Piecewise Smooth Dynamical Systems Workshop: Analysis, Numerics and Applications, University of Bristol, September 13-16, 2004.
65. **X. Zhao** and H. Dankowicz, "Analysis of Grazing Bifurcations in Impact Microactuators", 21st International Congress of Theoretical and Applied Mechanics, Warsaw, Poland, August 15-21, 2004.
66. **X. Zhao**, H. Dankowicz, C.K. Reddy and A.H. Nayfeh, "Modeling and Simulation of Impact Microactuator," 10th Conference on Nonlinear Vibrations, Stability and Dynamics of Structures, Blacksburg, VA, July 25-28, 2004.
67. **X. Zhao** and H. Dankowicz, "A Normal-Form Analysis of Co-dimension Two Grazing Bifurcation in Impact Oscillators," 23rd Annual International Conference on Nonlinear Dynamics and Complex Systems, Chapel Hill, NC, January 2-5, 2004.

### Seminars

- "Patient Specific ICU Mortality Prediction Using Artificial Neural Networks," Department of Surgery, University of Tennessee Graduate School of Medicine, October 2012.
- "Biomedical Signal Processing for Intelligent Patient Monitoring," Department of Surgery, University of Tennessee Graduate School of Medicine, June 2012.
- "Basic Nonlinear Dynamics and its Application to Cardiac Arrhythmia," Physics Department, University of Tennessee, Knoxville, October 2010.
- "Computational Cardiology," Physics Department, University of Tennessee, Knoxville, May 2010.
- "Some Thoughts on NSF CAREER Proposal," Office of Research, University of Tennessee, Knoxville, March 2010.
- "Nonlinear Dynamics of Heart Rhythm," Mechanical and Aerospace Engineering Department, West Virginia University, March, 2010.
- "Indeterminacy of Spatiotemporal Cardiac Alternans," Department of Mathematics, University of Tennessee, March 2008.
- "How Does Normal Heart Rhythm Become Irregular? – Understanding Cardiac Alternans"
  - Department of Mechanical, Aerospace, and Biomedical Engineering, University of Tennessee, Knoxville, August 2007.
  - Oak Ridge National Laboratory, September 2007.
  - National Institute for Occupational Safety and Health, February 2008.
  - Department of Mechanical and Aerospace Engineering, West Virginia University, February 2008.
- "Modeling of Alternans in Paced Cardiac Tissue", Department of Manufacturing and Mechanical Engineering, Miami University, Oxford, OH, April 2006.
- "Bifurcation Analysis of Cardiac Dynamics", Department of Mechanical Engineering, University of Maryland, College Park, MD, January 2006.
- "Analysis and Application of Nonsmooth Dynamical Systems", University of Waterloo, Waterloo, Canada, September, 2005.
- "Nonlinear Dynamics and Control of Micro-Electro-Mechanical Systems", University of Texas, Austin, TX, April, 2005.