Joseph Peter Zbilut

Education

1987: D.N.Sc., Rush University, Chicago, Illinois

1984: M.S., Rush University, Chicago, Illinois

1973: Ph.D., Northwestern University, Evanston, Illinois, 1971: M.A., Northwestern University, Evanston, Illinois

1970: B.A., Honors, Summa Cum Laude, Loyola University, Chicago, Illinois

Positions

- 2001: Visiting Professor, Department of Biophysics, University of Rome "La Sapienza"
- 2000: Professor, Department of Molecular Biophysics and Physiology, Rush Medical College, Chicago, IL
- 2000: Visiting Professor, Department of Chemistry, University of Rome "La Sapienza"
- 1999: Visiting Professor, Istituto di Fisiologia Clinica, Consiglio Nazionale della Ricerche, (Institute of Clinical Physiology, National Research Council of Italy), Pisa, Italy
- 1998: Consultant, Co-evolution of planets and biospheres: lessons from earth and mars project, Dr. Michail Zak, NASA, Jet Propulsion Laboratory, Pasadena, CA
- 1997-98: Visiting Professor, Department of Biochemistry, Faculty of Medicine, University of Rome "La Sapienza"
- 1992-: Associate Professor, Dept. of Molecular Biophysics and Physiology, Rush Medical College, Rush University, Chicago, IL.
- 1989-: Research Associate (Cardiology), Research Service, VA Edward Hines, Jr. Hospital, Hines, IL.
- 1988-89: Visitor, The Santa Fe Institute, Santa Fe, New Mexico
- 1987-90: Visitor, Center for Nonlinear Studies, Los Alamos National Laboratories, Los Alamos, NM.
- 1988-92: Assistant Professor, Dept. of Physiology, Rush Medical College, Rush University, Chicago, IL.
- 1984-87: Adjunct Assistant Professor, St. Francis College, Fort Wayne, Indiana

Professional Service

- Invited Plenary Speaker, The First Maga Circe Conference on Metabolic Systems Analysis, Monte Circeo, Italy, March, 2006.
- Grants Reviewer, Italian Cancer Society, 2005-.
- Scientific Organizing Committee, Workshop on Recurrence Analysis, University of Potsdam, Sept., 2005
- Scientific Committee, New Economic Windows, University of Salerno, Salerno, Italy, 2003-2004
- Scientific Committee, Mind and Complexity, Dept. of Psychiatry, Catholic University of the Sacred Heart, Rome, 2003-2004
- Scientific Committee, Complexity in the Living II, CISB (Interdepartmental Research Centre for Models and Information Analysis in Biomedical Systems), University of Rome, 2003-2004
- Scientific Committee, Third International Symposium on Medical Data Analysis, Rome, 2002
- Referree, Agenzia Spaziale Italiana [Italian Space Agency], 2001-
- Proposal Reviewer: NIH Special Study Sections (Multidisciplinary--Computational Biology, Nonlinear Dynamics), 1993-
- NIH/ADAMHA Peer Review Consultant, 1993-

Editorial Boards

- International Journal of Computers and Their Applications (Biomedical Applications), 1995-2001
- Chaos and Complexity Letters, 2000-
- Economics & Complexity, 2002 (Special Issue, Co-Editor)

Journal Review

Circulation Research, American Journal of Physiology, Journal of the American College of Cardiology, Journal of Applied Physiology, Annals of Biomedical Engineering, International Journal for Computers and Their Applications (Biomedical Applications), Cardiovascular Research, Heart & Lung, The Journal of Nursing Research, Research in Nursing and Health, European Heart Journal, American Heart Journal, Biological Cybernetics, Physics Letters A, IEEE Trans. BME, IEEE Trans. Rehabilitation, Progress in Physiology Teaching, Critical Care Medicine, Journal of Geophysical Research: Climate and Physics of the Atmosphere, Information Sciences, Medical and Biological Engineering and Computing, Diabetes Research and Clinical Practice, Economics & Complexity, Physica A, Physica D, Proteins: Structure Function and Bioinformatics, Biochemistry, Journal of Biochemical and Biophysical Methods, Journal of Theoretical

Biology, Journal of Economic Behavior and Organization, Decision Support Systems, Biological Research in Nursing, Chaos

Publications

Books

1. **Zbilut JP,** Scheibel T (Eds). To fold or not to fold: some current concepts of protein chemistry. (in press). Nova Publishers.
2. Benigni R, Colosimo A, Giuliani A, Sirabella P, **Zbilut** J (Eds)(2005). International Meeting, Complexity in the Living: A Problem-Oriented Approach. Rome September 28-30, 2004. (Rapporti ISTISAN 05/20). Istituto Sueriore di Sanita, Rome.
3. **Zbilut JP** (2004). Unstable Singularities and Randomness: Their Importance in the Complexity of the Physical, Biological and Social Sciences. Elsever, Boston, Amsterdam.
4. **Zbilut JP** (2004). Singolarità Instabili e Casualità. La loro Importanza nella Complessità delle Scienze Fisiche e Psico-sociali. FrancoAngeli, Milan.
5. Zak M, **Zbilut JP**, Meyers RE (1997). From instability to intelligence: complexity and predictability in nonlinear dynamics. (Lecture Notes in Physics: New Series m 49). Springer Verlag, Berlin Heidelberg New York.

Book Chapters, Proceedings, Contributions

1. Darovic G, **Zbilut JP** (in prep). Chapters on Pulmonary Physiology, Cardiac Physiology and Hemodynamic Monitoring. Hemodynamic Monitoring: Invasive and Noninvasive Clinical Applications, 4th Edition .Philadelphia, Saunders,
2. Webber CL, **Zbilut JP** (2005). Recurrence quantification analysis of nonlinear dynamical systems. In: MA Riley & GC Van Orden (Eds.). Tutorials in Contemporary Nonlinear Methods for the Behavioral Sciences . http://www.nsf.gov/sbe/bcs/pac/nmbs/nmbs.jsp
3. **Zbilut JP**, Mitchell JC, Giuliani A, Colosimo A, Marwan N, Colafranceschi M, Webber Jr CL (2005). Aggregation propensity of proteins quantified by hydrophobicity patterns and net charge. In: Benigni R, Colosimo A, Giuliani A, Sirabella P, **Zbilut J** (2005). International Meeting, Complexity in the Living: A Problem-Oriented Approach. Rome September 28-30, 2004. (Rapporti ISTISAN 05/20). Istituto Sueriore di Sanita, Rome, pp 136-151.
4. Bianciardi M, Sirabella P, Hagberg GE, Giuliani A, **Zbilut JP**, Colosimo A (2005). Analyzing spatial distributions of fMRI "bold" signals by RQA variables. In: Benigni R, Colosimo A, Giuliani A, Sirabella P, **Zbilut J** (2005). International Meeting, Complexity in the Living: A Problem-Oriented Approach. Rome September 28-30, 2004. (Rapporti ISTISAN 05/20). Istituto Sueriore di Sanita, Rome, pp 238-243.

5. **Zbilut JP** (2005). Use of recurrence quantification analysis in economic time series. In: Economics: Complex Windows (Salzzano M and Kirman A, Eds.). Springer, Milan, Berlin, Heidelberg, New York, pp 91-104.

6. Orsucci F, Giuliani A, **Zbilut JP** (2004). Structure & coupling of semiotic sets. AIP Conference Proceedings. 742: 83-93.

7. Darovic G, **Zbilut JP** (2004). Chapters on Pulmonary Physiology and Hemodynamic Monitoring. Handbook of Hemodynamic Monitoring, 2nd Edition. Philadelphia, Saunders.

8. Webber CL, **Zbilut JP**, (April 14, 2006). Ventilatory pattern variability. In: Metin Akay, Ed., Wiley Encyclopedia of Biomedical Engineering. Hoboken. John Wiley & Sons. DOI: 10.1002/9780471740360.ebs1355

9. **Zbilut JP**, Webber, CL, (April 14, 2006). Recurrence quantification analysis. In: Metin Akay, Ed., Wiley Encyclopedia of Biomedical Engineering. Hoboken. John Wiley & Sons. DOI: 10.1002/9780471740360.ebs1355

10. **Zbilut JP**, Giuliani A. Algorithmic complexity (2004). In: Encyclopedia of Nonlinear Science (Scott, A, Ed). Routledge, New York and London.

11. Conte E, Federici A, Khrennikov A, **Zbilut JP**, (2004). Is determinism the basic tenet in dynamics of biological matter? Procedings of the International Conference on QuantumTheory, University of Vaxjo,Sweden,June 1-6,2003

12. **Zbilut JP**, Santucci PA, Yang S-Y, Podolski, JL (2002). Linear and Nonlinear Evaluation of Ventriuclar Arrhythmias. In: Medical Data Analysis: Proceedings of the Third International Symposium. A. Colosimo, A. Giuliani and P. Sirabella (eds.). (Lecture Notes in Computer Science 2526). Springer, Berlin.

13. Darovic GO, **Zbilut JP** (2002). Pulmonary anatomy and physiology (Chap. 2). In: Darovic GO (ed), Hemodynamic Monitoring: Invasive and Noninvasive Clinical Applications (3rd ed). Philadelphia, W.B. Saunders, pp 9-41.

14. Darovic GO, **Zbilut JP** (2002). Fluid-filled monitoring systems (Chap. 6). In: Darovic GO (ed), Hemodynamic Monitoring: Invasive and Noninvasive Clinical Applications (3rd ed). Philadelphia, W.B. Saunders, pp 113-131.

15. Webber Jr Cl , **Zbilut JP** (2001). Recurrence Quantification Analysis. In: Proceedings of 4th International IEEE EMBS Summer School on Biocomplexity, Bioscaling and Biosignal Interpretation (ed. M. Akay). Dartmouth College, Dartmouth, Vermont.

16. **Zbilut JP**, Zhihong H, Giuliani A, Webber Jr C (2000). Singularities of the Heart Beat as Demonstrated by Recurrence Quantification Analysis. Proceedings (CD) World Congress of Biomedical Engineering, IEEE-EMBS.

17. Balocchi R, Di Garbo A, Michelassi C, Chillemi S, Varanini M, Barbi M, Legramante JM, Raimondi G, **Zbilut JP** (1999). Heart rate and blood pressure response to short-term head-down bed rest: a nonlinear approach. In: Proceedings

of the 3rd International Workshop on Biosignal Interpretation. B. He, K. Yana, M. Akay, and S. Cerutti (eds.). Chicago, pp 25-27.

18. Santucci P, **Zbilut JP**, Mitra R (1998). Detecting undersensing in implantable defibrillators using recurrence analysis. Computers in Cardiology 98, pp 261-264.

19. Webber, Jr. CL and **Zbilut JP** (1998). Recurrent structuring of dynamical and spatial systems. In: Complexity in the Living: A Modelistic Approach. A. Colosimo (ed.), Universita di Roma "La Sapienza", Rome, pp 101-133.

20. **Zbilut JP**, Webber Jr., CL, Zak M (1998). Quantification of heart rate variability using methods derived from nonlinear dynamics. In: Drzewiecki G, and Li J K-J, (eds.) Assessment and Analysis of Cardiovascular Function. Springer Verlag, NY, Chapter 19, pp 324-334.

21. Webber CL, Jr, **Zbilut JP** (1996). Assessing deterministic structures in physiological systems using recurrence plot strategies. In: Bioengineering Approaches to Pulmonary Physiology and Medicine. M.C.K. Khoo (ed.) Plenum Press, N Y, Chapter 8, pp 137-148, 1996.

22. **Zbilut JP,** Hubler A, Webber Jr CL (1996). Physiological singularities modeled by nondeterministic equations of motion and the effect of noise. In M Millonas (ed), Fluctuations and Order: The New Synthesis, Springer Verlag, NY, pp 397-417

23. Sabelli HC, Carlson-Sabelli L, Patel M, **Zbilut J**, Messer J and Walthall K (1995). Psychological portraits and psycho-cardiological patterns in phase space. In F Abraham and A Gilgen (eds), Chaos Theory in Psychology (Praeger, Westport, CT). Chapter 7.

24. **Zbilut JP**, Zak M, Webber, Jr CL (1994). Nondeterministic chaos approach to neural intelligence. Intelligent Engineering Systems Through Artificial Neural Networks, Vol. 4. ASME Press, NY, pp 819-824.

25. Webber Jr CL, **Zbilut JP** (1994). Neural net estimation of cardiac nondeterminisim. Intelligent Engineering Systems Through Artificial Neural Networks, Vol. 4. ASME Press, NY, pp 695-700.

26. Sabelli HC, Carlson-Sabelli L, **Zbilut J**, Patel M, Messer J, Walthall K and Tom C, Fink P, Sugerman A, Zdanovics O (1994). How the heart informs about the brain. A process analysis of the electrocardiogram. In R Trappl (ed), Cybernetics and Systems '94. Proc. European Meeting on Cybernetics and Systems Research 2 (Vienna), pp 1031-1038.

27. Carlson-Sabelli L, Sabelli HC, **Zbilut J**, Messer J, Diez-Martin J, Walthall K, Tom C, Patel M, Zdanovics O, Fink P, Sugerman A (1994). Cardiac patterns of emotions demonstrated by the process method: psychotic patterns. In B. Brady and L Peeno (eds), New Systems Thinking and Action for a New Century: Proc. International Systems Society 38th Annual Mtg. (Pacific Grove, CA). pp 419-430.

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Proc. European Meeting on Cybernetics and Systems Research 2 (Vienna), pp 967-974.

29. Keegan AP, **Zbilut JP,** Merritt SL, Mercer PJ (1993). Use of recurrence plots in the analysis of pupil diameter dynamics in narcoleptics. SPIE Proceedings: Chaos in Biology and Medicine, Vol 2036, pp 206-213.

30. **Zbilut JP**, Webber CL (1992). Quantification of recurrence plots for analysis of physiologic systems. In: Proceedings of the Second SIAM conference on applications of dynamical systems held at Snowbird, Utah. Philadelphia: SIAM, pp A55.

31. Buckingham TA, **Zbilut JP** (1993). Signal averaged ECG's in patients with bundle branch block. In JA Gomes (Ed), Signal Averaged Electrocardiography: Concepts, Methods, & Applications. Dordrecht, Netherlands: Kluwer Academic., pp 381-388 (Chapter 21).

32. **Zbilut JP**, Eldridge F, Webber Jr CL (1991). Noise-induced metastability in a model of respiratory oscillations. Proceedings IEEE-EMBS, 13: 1863-1864.

33. Webber CL, **Zbilut JP** (1991). Applicability of chaos theory to rhythmic breathing patterns. In H-P. Koepchen and T. Huopaniemi (Eds), Cardiorespiratory and Motor Coordination. Springer, Berlin, pp 239-247.

34. **Zbilut JP**, Briller J, Weinstein N, Wiesner W (1991). Use of a power law scaling relationship for analysis of signal-averaged ECG's. In: Proceedings IEEE Computers in Cardiology (1990), pp 339-341.

35. **Zbilut JP** (1991). Power laws, transients, attractors and entropy: possible implications for cardiovascular dynamics. In H. Haken and H-P Koepchen (Eds), Rhythms in Physiological Systems. Springer: Berlin, pp 139-152.

36. **Zbilut JP**, Koebbe M, Loeb H, Mayer-Kress G (1990). Use of recurrence plots for the analysis of heart beat intervals. Proceedings IEEE Computers in Cardiology (1990), pp. 263-266.

37. Webber Jr CL, **Zbilut JP** (1990). The applicability of methods from nonlinear dynamics in assessing physiological states of the respiratory system. Proceedings of the IEEE-EMBS, 12, pp 1863-1864.

38. **Zbilut JP**, Mayer-Kress G, Sobotka P, O'Toole M, Thomas JX (1989). Chaotic heart rate dynamics in isolated perfused rat hearts. In V. Marmarelis (ed), Advanced Methods of Physiological System Modeling, Vol. 2. Plenum: N.Y., pp 215-224.

Journals (Refereed)

1. **Zbilut JP**, Krishnan A, Huey G, Bossa C, Colafranceschi M, Webber CL, Giuliani A (in press). A topological singularity suggests a maximum preferred size in protein domains. Proteins Structure Function & Bioinformatics.

2. Mastrolonardo M, Conte E, **Zbilut JP** (2006). A fractal analysis of skin pigmented lesions using the novel tool of the variogram technique. Chaos Solitons and Fractals 28: 1119-1135.

3. Conte E, Pierri GP, Federici A, Mendulicchio L, **Zbilut J**P (2006). On a model of biological neuron with terminal chaos and quantum like features. Chaos Solitons and Fractals 30: 774-780.

4. Orsucci F, Giuliani A, Webber, Jr C, **Zbilut J,** Fonagy P, Mazza M (2006). Combinatorics and synchronization in natural semiotics. Physica A 361:665-676

5. Schumacher AM, **Zbilut JP**, Webber Jr CL, Schwertz, DW, Piano MR (2006). Detection of cardiac variability in the isolated rat heart. Biological Research for Nursing. 8: 55-66.

6. **Zbilut JP**, Chua GH, Krishnan A, Bossa C, Colafranceschi M, Giuliani A (2006). Entropic criteria for protein folding derived from recurrences: Six residues patch as the basic protein word. FEBS Lett 580: 4861-4864.

7. Benigni R, Giuliani A, **Zbilut JP**, Ellis SW, Allorge D (2005). A signal analysis approach applied to the study of sequence, structure and function of the proteins. Current Computer-Aided Drug Design 2: 1-19.

8. Trulla SLL, Giuliani A, Zimatore G, Colosimo A **Zbilut** JP (2005). Non linear assessment of musical consonance. Electronic Journal of Theoretical Physics 2(8), No. 3 (open access).

9. **Zbilut JP**, Webber Jr CL (in press). Recurrence quantification analysis; introduction and historical context. Int J of Chaos Bifurc.

10. Webber Jr CL, **Zbilut JP** (in press). Recurrence quantifications: feature extractions from recurrence plots. Int J of Bifurc Chaos.

11. **Zbilut JP**, Scheibel T, Huemmerich D, Webber Jr CL, Colafranceschi M, Giuliani A (2005). Statistical approaches for investigating silk properties. Applied Physics A 82: 243-251.

12. **Zbilut JP**, Scheibel T, Huemmerich D, Colafranceschi M, Giuliani A (2005). Spatial stochastic resonance in proteins. Physics Letters A 346: 33-41.

13. Colafranceschi M, Colosimo A, **Zbilut JP**, Uversky VN, Giuliani A (2005). Structure-related statistical singularities along protein sequences: A correlation study. J Chem Inf Model, 45: 183 -189**.**

14. Valerio M, Colosimo A, Conti F, Giuliani A, Grottesi A, Manetti C, **Zbilut JP** (2005). Early events in protein aggregation: molecular flexibility and hydrophobicity/charge interaction in amyloid peptides as studied by molecular dynamics simulations. Proteins Structure Function & Bioinformatics 58:110-118.

15. Zaldívar J M, Bosch J, Strozzi F, **Zbilut JP** (2005) Early warning detection of runaway initiation using chaos-like features Communications in Nonlinear Science and Numerical Simulation 10:299-311

16. **Zbilut JP**, Giuliani A, Colosimo A, Mitchell JC, Colafranceschi M, Marwan N, Uversky,VN, Webber CL Jr (2004). Charge and hydrophobicity patterning along the sequence predicts the folding mechanism and aggregation of proteins: A computational approach. J Proteome Res 3:1243-1253.

17. Conte E , Vena A , Federici A , Giuliani R, **Zbilut JP** (2004). A brief note on possible detection of physiological singularities in respiratory dynamics by recurrence quantification analysis of lung sounds, Chaos, Solitons & Fractals 21:869-877.

18. **Zbilut JP,** Mitchell JC, Giuliani A, Marwan N, Webber Jr. CL (2004). Singular hydrophobicity patterns and net charge: A mesoscopic principle for protein aggregation/folding. Physica A 343: 348–358.

19. Conte E, Federici A, **Zbilut JP** (2004). On a simple case of possible non-deterministic chaotic behavior in compartment theory of biological observables, Chaos, Solitons & Fractals 22:277-284.

20. Vena A, Conte E, Perchiazzi G, Federici A, Giuliani R, **Zbilut JP** (2004). Detection of physiological singularities in respiratory dynamics analyzed by recurrence quantification analysis of tracheal sounds, Chaos, Solitons & Fractals 22:869-881.

21. Manetti C, Castro C, **Zbilut JP** (2004). Application of trilinear SLICING to analyse a single relaxation curve. Journal of Magnetic Resonance. 168:273-7.

22. Porrello A, Soddu S, **Zbilut JP**, Crescenzi M, Giuliani A, (2004). Discrimination of single amino acid mutations of the p53 protein by means of deterministic singularities of recurrence quantification analysis. Proteins Structure Function & Genetics. 55: 743-755

23. Giuliani A, **Zbilut JP**, Conti F, Manetti C, Miccheli A (2004). Invariant features of metabolic networks: a data analysis application on scaling properties of biochemical pathways. Physica A: Statistical and Theoretical Physics, 337: 157-170.

24. Bosch J, Strozzi F, **Zbilut JP**, Zaldívar JM (2004). On-line runaway detection in isoperibolic batch and semibatch reactors using the divergence criterion, Computers & Chemical Engineering, 28:527-544.

25. **Zbilut J.P**., A. Colosimo, F. Conti, M. Colafranceschi, C. Manetti, M. C. Valerio, C. L. Webber, Jr., and A. Giuliani. (2003). Protein aggregation/folding: the role of deterministic singularities of sequence hydrophobicity as determined by nonlinear signal analysis of acylphosphatase and Aβ(1-40). Biophys. J. 85:3544-3557.

26. Trulla LL, Joseph P. **Zbilut JP,** Giuliani A (2003). Putting relative complexity estimates to work: a simple and general statistical methodology, Physica A: Statistical Mechanics and its Applications 319: 591-600.

27. Trulla LL, Joseph P. **Zbilut JP,** Giuliani A (2003). Putting relative complexity estimates to work: a simple and general statistical methodology, Physica A: Statistical Mechanics and its Applications 319: 591-600.

28. **Zbilut JP**, Dixon DD, Zak M (2002). Detecting singularities of piecewise deterministic (terminal) dynamics in experimental data. Physics Letters A 304: 95-101.

29. Shockley K, Butwill M, **Zbilut JP**, Webber Jr CL (2002). Cross recurrence quantification of coupled oscillators. Physics Letters A 305: 59-69.

30. Dippner JW, Heerkloss R, **Zbilut JP** (2002). Recurrence quantification analysis as a tool for characterization of non-linear mesocosm dynamics. Marine Ecology Progress 242:29-37.

31. Strozzi F, Zaldivr-Comenges J-M, **Zbilut JP** (2002). Application of nonlinear time series analysis techniques to high frequency currency exchange data. Physica A 312/3-4 : 520-538.

32. **Zbilut JP,** Zaldivar-Comenges J-M, Strozzi F (2002). Recurrence quantification based-Liapunov exponents for monitoring divergence in experimental data. Physics Letters A 297: 173-181.

33. Giuliani A, Benigni B, **Zbilut J**, Webber CL, Sirabella P, Colosimo P (2002). Nonlinear signal analysis methods in the elucidation of protein sequence/structure relationships. Chemical Reviews 102(5): 1471-1492.

34. **Zbilut JP**, Thomasson N, Webber Jr CL (2002). Recurrence quantification analysis as a tool for nonlinear exploration of nonstationary cardiac signals. Medical Engineering and Physics 24: 53-60.

35. Thomasson N, Webber, CL Jr, **Zbilut JP** (2002). Application of recurrence quantification analysis to EEG signals. International Journal for Computers and their Applications 9: 1-6.

36. **Zbilut JP,** Sirabella P, Giuliani A, Manetti C, Colosimo A, Webber, Jr CL (2002). Review of nonlinear analysis of proteins through recurrence quantification. Cell Biochemistry and Biophysics 36: 67-87.

37. Sirabella P, Giuliani A, **Zbilut J**, Colosimo A (2001). Recurrence quantification analysis and multivariate statistical methods in the study of protein sequences. Recent Res Devel Protein Eng 1:261-275.

38. Giuliani A, Colafranceschi M, Webber Jr CL, **Zbilut JP** (2001). A complexity score derived from principal components analysis of nonlinear order measures. Physica A 301:567-588.

39. Webber Jr CL, Giuliani A, **Zbilut JP**, Colosimo A (2001). Elucidating protein secondary structures using alpha-carbon recurrence quantifications. Proteins Structure, Function, and Genetics 44: 292-303.

40. Manetti C, Giuliani A, Ceruso M-A, Webber, Jr CL, **Zbilut JP** (2001). Recurrence analysis of hydration effects on nonlinear protein dynamics: multiplicative scaling and additive processes. Physics Letters A 281:317-323

41. Thomasson N, Hoeppner TJ, Webber, Jr CL, **Zbilut JP** (2001). Recurrence quantification in epileptic EEGs. Physics Letters A 279: 94-101

42. Ikagawa S, Shinohara M, Fukunaga T, **Zbilut JP**, Webber, Jr CL (2000). Nonlinear time-course of lumbar muscle fatigue using recurrence quantifications. Biological Cybernetics 82: 373-382.

43. Balocchi R, DiGarbo A, Michelassi C, Chillemi S, Varanini M, Barbi M, Legramante JM, Raimondi G, **Zbilut JP** (2000). Heart rate and blood pressure response to short-term head-down bed rest: a nonlinear approach. Method Inform Med 39: 157-159.

44. **Zbilut JP**, Giuliani A, Webber Jr CL (2000). Recurrence quantification analysis as an empirical test to distinguish relatively short deterministic versus random number series. Physics Letters A 267: 174-178.

45. **Zbilut JP**, Webber Jr CL, Colosimo A (2000). The role of hydrophobicity patterns in prion folding as revealed by recurrence quantification analysis of primary structure. Protein Engineering 13: 99-104

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47. Manetti C, Ceruso M-A, Giuliani A, Webber CL, **Zbilut JP** (1999). Recurrence quantification analysis in molecular dynamics. Annals of the New York Academy of Sciences 879: 258-266.

48. Orsucci F, Walter K, Giuliani A, Webber Jr CL, **Zbilut JP** (1999). Orthographic structuring of human speech and texts: linguistic application of recurrence quantification analysis. Int J Chaos Theory Applicantions, 4:29-38.

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50. **Zbilut JP**, Giuliani A, Webber, Jr CL (1998). Detecting deterministic signals in exceptionally noisy environments using cross recurrence quantification. Physics Letters A 246:122-128.

51. Manetti C, Ceruso M-A, Giuliani A, Webber, Jr CL, **Zbilut JP** (1999). Recurrence quantification analysis as a tool for the characterization of molecular dynamics simulations. Physical Review E 59: 992-998

52. Giuliani A, **Zbilut JP** (1998). The relevance of physical and mathematical modes of thought on complex systems behavior in biological systems. Complexity 3(5): 23-24.

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54. **Zbilut JP**, Giuliani A, Webber Jr CL (1998). Recurrence quantification analysis and principal components in the detection of short complex signals. Physics Letters A 237: 131-135.

55. Trulla LL, Giuliani A, **Zbilut JP**, Webber Jr CL (1996). Recurrence quantification analysis of the logistic equation with transients. Physics Letters A 223: 225-260.

56. **Zbilut JP,** Zak M, Meyers Ronald E (1996). A terminal dynamics model of the heartbeat. Biological Cybernetics 75:277-280

57. Giuliani A, Lo Giudice P, Mancini AM, Quatrini G, Pacifici L, Webber CL, Jr., Zak M, **Zbilut JP** (1996). A Markovian formalization of heart rate dynamics evinces a quantum-like hypothesis. Biological Cybernetics 74:181-187.

58. Kim SY, Montoya A, **Zbilut JP**, Mawulawde K, Sullivan HJ Lonchyna VA, Terrell M, Pifarre R (1995). The effect of HeartMate left ventricular assist device on cardiac autonomic nervous activity. Annals of Thoracic Surgery 61:591-593.

59. **Zbilut JP,** Webber, Jr, CL, Zak, M, Giuliani A, Lo Giudice P, Mancini AM, Quatrini G, Pacifici L (in press). Nondeterministic physiological singularities: theory and preliminary experimental evidence. Mathematical Modelling and Scientific Computing.

60. **Zbilut JP**, Zak M, Webber Jr CL (1995). Physiological singularities in respiratory and cardiac dynamics. Chaos, Solitons and Fractals 5:1509-1516.

61. Wiessner WH, Casey LC, **Zbilut JP** (1995). Treatment of sepsis and septic shock--a review. Heart & Lung, 24:380-392.

62. Carlson-Sabelli L, Sabelli H, Patel M, Messer J, **Zbilut JP**, Walthall K, Sugarman A, Tom C, Zdanovics O (1995). Electropsychocardiography: illustrating the application of process methods and chaos theory to the comprehensive evaluation of coronary patients. Complexity and Chaos in Nursing 2 (1):16-24.

63. **Zbilut JP**, Webber CL, Jr (1995). Physiological Non-Lipschitz Systems. In Proceedings of the Third SIAM conference on applications of dynamical systems held at Snowbird, Utah. Philadelphia: SIAM, pp A25.

64. Park S, Houck H, Pifarre R, Sullivan H, Garrity E, Kim S, **Zbilut J**, Montoya A (1995). Optimal size match in single lung transplant. Journal of Heart and Lung Transplantation 14:671-675.

65. Buckingham TA, Bhutto ZR, Telfer EA, **Zbilut J** (1994). Differences in corrected QT intervals at minimal and maximal heart rate may identify patients at risk for Torsades de Pointes during treatment with antiarrhythmic drugs. J Cardiovasc Electrophysiol, 5:408-411.

66. Webber Jr CL, **Zbilut JP** (1994). Dynamical assessment of physiological systems and states using recurrence plot strategies. Journal of Applied Physiology. 76:965-973.

67. Buckingham TA, Radin MM, Volgman AS, Jhangiani A, **Zbilut JP** (1993). Does atrial fibrillation cause false positive late potentials? PACE, 16, 2222-2226.

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mechanism contributing to dysrhythmias induced by Ca^{2+} overload. Experimental Physiology, 78:79-93.

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