Donald C. Wunsch II

Missouri University of Science & Technology
Dept. of Electrical and Computer Engineering
131 Emerson Electric Co. Hall
301 W. 16th St.
Rolla, Missouri 65409
Work: (573) 341-4521
dwunsch@mst.edu http://ece.mst.edu/facultystaffandfacilities/facultydirectory/donwunsch/

Education

Kellogg Executive Scholar in Nonprofit Management, Northwestern University 2007
Washington University in St. Louis, Olin School of Business. Executive MBA, 2006
University of Washington. Ph.D. Electrical Engineering. 1991
University of Washington. M.S. Applied mathematics. 1987
University of New Mexico. B.S. Applied mathematics, Philosophy Minor. 1984
Seattle University. Jesuit Core Humanities Honors Program. 1981

Experience

Missouri University of Science & Technology
Mary K. Finley Missouri Distinguished Professor.
Department of Electrical and Computer Engineering. Courtesy appointments in Systems Engineering, Computer Science and Business Administration.

1999 - present. **Director, Applied Computational Intelligence Laboratory**. Graduate, undergraduate teaching, international service, and faculty mentoring.
Faculty governance and various board-level services (see pp. 3-6)

Texas Tech University, Associate Professor.
Department of Electrical and Computer Engineering. Joint appointment in Computer Science.

1998 - 1999. Previously (1993-1998), Assistant Professor.
Director, Applied Computational Intelligence Laboratory.

The Boeing Company, Senior Principal Scientist. 1984 - 1993.

Hardware task leader, Boeing Computer Services neural network IR&D. MX missile launch control system EMP. Also: AI Specialist, Research Engineer, and Engineer. Work prominently featured in Boeing 75th Anniversary Poster and 1992 Annual Report.

University of Washington, Electrical Engineering Department. Teaching Assistant.

Fall 1988-Spring 1989. Taught Linear Systems Analysis.

Rockwell International, Kirtland Air Force Base, Technician. 1982-1983.

Optical Component Evaluation Lab, Air Force Weapons Lab (AFWL), Airborne Laser Laboratory project. Optical Testing, holographic interferometry.

International Laser Systems, Kirtland Air Force Base, Coating Technician. 1981-1982.

Developmental Optics Facility, AFWL, Airborne Laser Lab project. Thin film coating.

Publications, Presentations, Products (Over 500 with over 15,000 citations):

Books

1. Lei Meng, Ah-Hwee Tan, and Donald C. Wunsch II, *Adaptive Resonance Theory in Social Media Data Clustering*, under contract with Springer-Verlag, 2019.

2. Khalid Al-Jabery, Gayla Olbricht, Tayo Obafemi-Ajayi and Donald C. Wunsch II, *Computational Intelligence Approaches to Data Analytics in Biomedical Applications*, under contract with Elsevier, 2019.

3. Tetyana Baydyk, Ernst Kussul, and Donald C. Wunsch II, *Intelligent Automation in Renewable Energy*, Springer-Verlag, 2019.

4. J. Sieffertt and D.C. Wunsch, *Unified Computational Intelligence for Complex Systems: Studies in Neural, Economic and Social Dynamics.* Springer-Verlag, 2010.

5. E. Kussul, T. Baidyk, and D.C. Wunsch II, *Neural Networks in Micromechanics*, Springer-Verlag, 2010.

6. R. Xu and D.C. Wunsch II, *Clustering*. IEEE Press / Wiley, 2009.

7. D.-S. Huang, D.C. Wunsch, D.S. Levine, and K.-H. Jo, Eds., "Advanced intelligent computing theories and applications: With aspects of contemporary intelligent computing techniques," in *Communications in Computer and Information Science*, vol. 15. Springer, 2008.

8. D.-S. Huang, D.C. Wunsch, D.S. Levine, and K.-H. Jo, Eds., "Advanced intelligent computing theories and applications: With aspects of artificial intelligence". in *Lecture Notes in Artificial Intelligence*, vol. 5227, Springer, 2008.

9. D.-S. Huang, D.C. Wunsch, D.S. Levine, and K.-H. Jo, Eds., "Advanced intelligent computing theories and applications: With aspects of theoretical and methodological issues," in *Lecture Notes in Computer Science*, vol. 5226, Springer, 2008.

10. A. Gorban, B. Kégl, D.C. Wunsch, and A. Zinovyev, Eds., *Principal Manifolds for Data Visualization and Dimension Reduction*. Springer, 2007.

11. J. Si, A.G. Barto, W.B. Powell, and D.C. Wunsch II, Eds., *Handbook of Learning and Approximate Dynamic Programming*. IEEE Press, 2004.

12. D.C. Wunsch II, M. Hasselmo, K. Venayagamoorthy, and D. Wang, Eds., *Advances in Neural Network Research: IJCNN 2003*. Elsevier, 2003.

Book Chapters

1. James Foster and Donald C. Wunsch II, "The Ethical Status of an AI," in *No-Boundary Thinking in Bioinformatics*, Jason Moore, Xiuzhen Huang and Yu Zhang, Eds., Cambridge University Press, to appear.

2. Joan Peckham, Bryan Dewsbury, Bindu Nanduri, Andy Perkins, Dun Wunsch, and Yu Zhang, "No-Boundary Education Across the Disciplines Results from the First Trial NBT Classes," in *No-Boundary Thinking in Bioinformatics*, Jason Moore, Xiuzhen Huang and Yu Zhang, Eds., Cambridge University Press, to appear.

3. Donald C. Wunsch II, "How Can a Machine Promote Peace?" in *Rauhankone (The Peace Machine: Artificial Intelligence Testament)*, Timo Honkela, Ed., Gaudeamus Press, 2017.

4. Ashraf M. Abdelbar, Islam El-Nabarawy, Donald C. Wunsch, and Khalid M. Salama, "Ant Colony Optimization Applied to the Training of a High Order Neural Networks with Adaptable Exponential Weights, in *Applied Artificial Higher Order Neural Networks for Control and Recognition*, IGI Global, May 2016.

5. Dao Lam and Donald C. Wunsch, "Clustering", in Academic Press Library in Signal Processing, Signal Processing Theory and Machine Learning, Vol. 1, 2014.

6. J. Seiffertt and D.C. Wunsch II, "Approximate Dynamic Programming and Backpropagation on Timescales", in *Reinforcement Learning and Approximate Dynamic Programming for Feedback Control*, F.L. Lewis and D. Liu (eds.), IEEE Press / Wiley, 2012, pp. 474-493.

7. M. Versace, R.T. Kozma, and D.C. Wunsch, "Adaptive Resonance Theory design in mixed memristive-fuzzy hardware," in *Advances in Neuromorphic Memristor Science and Applications*, R. Kozma, R. Pino, and G. Pazienza (eds.), Springer, 2012.

8. R. Xu and D.C. Wunsch, "Exploring the nature of unknown data: Cluster analysis and application," in *Handbook of Research on Machine Learning Applications and Trends: Algorithms, Methods and Techniques*, E. Soria et. al., Eds. IGI Global, 2009, pp. 1-27.

9. J. Seiffertt and D.C. Wunsch II, "Higher order neural network architectures for agent – based computational economics and finance," in *Artificial Higher Order Neural Networks for Economics and Business*, M. Zhang, Ed.. New York: Information Science Reference, 2008, pp. 79–93.

10. R. Xu, G.C. Anagnostopoulos, and D.C. Wunsch II, "A hybrid of neural classifier and swarm intelligence in multi-class cancer diagnosis with gene expression signatures," in *Computational Intelligence in Bioinformatics*, G. Fogel, D. Corne, and Y. Pan, Eds. IEEE Press / Wiley, 2008, pp. 3–20.

11. X. Cai and D.C. Wunsch II, “Computer Go: A grand challenge to AI,” in *Challenges for Computational Intelligence* (Studies in Computational Intelligence, vol. 63), W. Duch and J. Mandziuk, Eds. Springer-Verlag, 2007.

12. X. Cai, G.K. Venayagamoorthy, and D. C. Wunsch II, “Hybrid PSO-EA algorithm for training feedforward and recurrent neural networks for challenging problems,” in *Advances in Computational Intelligence: Theory and Applications* (Series in Intelligent Control and Intelligent Automation, vol. 5), World Scientific, 2006, , pp. 171-214.

13. E. Kussul, T. Baidyk, F. Lara-Rosano, O. Makeyev, A. Martin, and D.C. Wunsch, “Micromechanics as a testbed for artificial intelligence methods evaluation,” in *IFIP International Federation for Information Processing*, (Professional Practice in Artificial Intelligence, vol. 218), J. Debenham, Ed. Boston: Springer, 2006, pp. 275-284.

14. G.K. Venayagamoorthy, R.G. Harley, and D.C. Wunsch II, “Applications of approximate dynamic programming in power systems control,” in *Handbook of Learning and Approximate Dynamic Programming*, J. Si, A. Barto, W. Powell, and D.C. Wunsch Eds. Wiley, July 2004, pp. 479-515.

15. D.C. Wunsch II, D.V. Prokhorov, "Adaptive critic designs," in *Computational Intelligence: A Dynamic Systems Approach*, R.J. Marks, Ed. New Jersey: IEEE Press, 1995.

16. K. Bergerson and D.C. Wunsch II, "A commodity trading model based on a neural network-expert system hybrid," in *Neural Networks in Finance and Investing*, R.R. Trippi and E. Turban, Eds. Chicago: Probus, 1993.

Archival Journal Papers

1. Lee Emerson Voth-Gaeddert, Khalid Al-Jabery, Gayla Olbricht, Donald Wunsch II, Daniel Barton Oerther, “Complex Associations Between Environmental Factors and Child Growth: A Novel Mixed Methods Approach,” *ASCE Journal of Environmental Engineering*, to appear.

2. Yongliang Yang, Shusen Cheng, Yixin Yin and Donald C. Wunsch II, “Containment Control of Heterogeneous Systems With Non-Autonomous Leaders: A Distributed Optimal Model Reference Approach,” *IEEE Access*, to appear.

3. Seaar Al-Dabooni and Donald C. Wunsch II, "The Boundedness Conditions for Model-Free HDP(λ)," *IEEE Transactions on Neural Networks and Learning Systems*, to appear.

4. Leonardo Enzo Brito da Silva, Islam Elnabarawy, and Donald C. Wunsch II, “Dual Vigilance Fuzzy Adaptive Resonance Theory,” *Neural Networks*, to appear.

5. Yongliang Yang, Zhishan Guo, Haoyi Xiong, Yixin Yin, and Donald C. Wunsch, Data-driven Robust Control of Discrete-Time Uncertain Linear Systems via Off-policy Reinforcement Learning, *IEEE Transactions on Neural Networks and Learning Systems*, to appear.

6. Majid Bagheri, Khalid Al-Jabery, Donald C. Wunsch II, and Joel Burken, "A deeper look at plant uptake of environmental contaminants using intelligent approaches," *Science of the Total Environment*, to appear.

7. Jacob Mueller, Jonathan Kimball and Donald C. Wunsch II, "Forecast-Informed Energy Storage Utilization in Local Area Power Systems," *IEEE Trans. on Sustainable Energy*, to appear.

8. John Matta, Tayo Obafemi-Ajayi, Jeffrey Borwey, Koushik Sinha, Donald Wunsch, Gunes Ercal, "Node-Based Resilience Measure Clustering with Applications to Noisy and Overlapping Communities in Complex Networks," *Applied Sciences*, to appear.

9. Seaar Al-Dabooni and Donald C. Wunsch II, "An Improved N-Step Value Gradient Learning Adaptive Dynamic Programming Algorithm for Online Learning, with Convergence Proof and Case Studies," *IEEE Trans. on Neural Networks and Learning Systems*, to appear.

10. Dustin Tanksley and Donald C. Wunsch II, "Outsmart Moore's Law With Machine Learning," *IEEE Eta Kappa Nu The Bridge Magazine*, Vol. 115, No. 2, pp. 6-9, 2018.

11. S. Sadati, L. E. B. Da Silva, D.C. Wunsch, K. H. Khayat, "Artificial Intelligence to Investigate Modulus of Elasticity of Recycled Aggregate Concrete", *American Concrete Institute Materials Journal*, to appear.

12. Yongliang Yang, Hamidreza Modares, Donald C. Wunsch and Yixin Yin, " Leader-Follower Output Synchronization of Linear Heterogeneous Systems with Active Leader Using Reinforcement Learning," *IEEE Trans. on Neural Networks and Learning Systems*, Vol. 29, No. 6, pp. 2139-2153, 2018.

13. Yongliang Yang, Hamidreza Modares, Yixin Yin and Donald C. Wunsch, "Optimal Containment Control of Unknown Heterogeneous Systems with Active Leaders," *IEEE Trans. on Control Systems Technology*, to appear.

14. Pavlo Tymoshchuk and Donald C. Wunsch II, "Design of a K-Winners-Take-All Model with a Binary Spike Train," *IEEE Trans. on Cybernetics*, to appear.

15. Hüseyin Göksu, Donald C. Wunsch, II, Xiaopeng Dong, Ali Kökçe, and Daryl G. Beetner, "Detection and Identification of Vehicles Based on Their Spark-Free Unintended Electromagnetic Emissions," *IEEE Trans. On Electromagnetic Compatibility*, Vol. 60, No. 5, pp. 1594-1597, 2018.

16. Guang-Bin Huang, Jonathan Wu, and Donald C. Wunsch II, "Hierarchical Extreme Learning Machines," *Neurocomputing*, Vol. 277, pp. 1-3, February 2018.

17. Emily G. Hernandez and Donald C. Wunsch II, “Graphical Trust Models for Agent-Based Systems,” *IEEE Potentials*, Vol. 37, No. 5, pp. 25-33, September/October 2018.

18. S. Al-Dabooni, and D. Wunsch, “Model Order Reduction Based on Agglomerative Hierarchical Clustering,” *IEEE Trans. on Neural Networks and Learning Systems*, to appear.

19. L. Xue, C. Sun, D. Wunsch, “An Adaptive Strategy via Reinforcement Learning in the Prisoner’s Dilemma Game,” *IEEE/CAA Journal of Automatica Sinica*, Vol. 5, No. 1, pp. 301-310, 2018.

20. Leonardo Enzo Brito da Silva; and Donald C. Wunsch, "An Information-Theoretic-Cluster Visualization for Self-Organizing Maps," *IEEE Transactions on Neural Networks and Learning Systems*, Vol. 29, No. 6, pp. 2595 – 2613, 2018.

21. Fuchun Sun, Guang-Bin Huang, Q.M. Jonathan Wu, Shiji Song, and Donald C. Wunsch II, “Efficient and Rapid Machine Learning Algorithms for Big Data and Dynamic Varying Systems,“ *IEEE Trans. on Systems, Man and Cybernetics: Systems*, Vol. 47, No. 10, pp. 2625- 2626, October 2017.

22. Yongliang Yang, Yixin Yin, Donald Wunsch, Sen Zhang, Xianzhong Chen, Xiaoli Li, Shusen Cheng, Min Wu, and Kang-Zhi Liu, “Development of Blast Furnace Burden Distribution Process Modeling and Control,” *Iron and Steel Institute of Japan International*, Vol 57, No. 8, pp. 1350 - 1363, 2017.

23. Yongliang Yang, Donald C. Wunsch, Yixin Ying, “Hamiltonian-Driven Adaptive Dynamic Programming for Continuous Nonlinear Dynamical Systems,” *IEEE Trans. Neural Networks and Learning Systems*, Vol. 28, No. 8, pp. 1929 – 1940, 2017.

24. D. Lam; D. Wunsch, "Unsupervised Feature Learning Classification With Radial Basis Function Extreme Learning Machine Using Graphic Processors," in *IEEE Transactions on Cybernetics*, vol. 47, no. 1, pp. 224 - 231, 2017.

25. K. Al-Jabery; Z. Xu; W. Yu; D. Wunsch; J. Xiong; Y. Shi, "Demand-Side Management of Domestic Electric Water Heaters Using Approximate Dynamic Programming," *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems* , vol.36, no.5, pp.775-788, 2017.

26. D. Wunsch, "How to Revise and Resubmit a Journal Paper," *IEEE Potentials*, vol. 35, no. 3, pp. 12-14, May-June 2016.

27. W. Kayani, S.P. Acharya, I.G. Guardiola, D.C. Wunsch, B. Schumacher, Isaac Wagner-Muns, Shape Analysis of Traffic Flow Curves Using a Hybrid Computational Analysis, *Procedia Computer Science*, Volume 95, Pages 457-466, ISSN 1877-0509, 2016.

28. Lei Meng, Ah-Hwee Tan, and Donald Wunsch, "Adaptive Scaling of Cluster Boundaries for Large-scale Social Media Data Clustering," *IEEE Trans. on Neural Networks and Learning Systems*, Vol. 27, No. 12, pp. 2656-2669, 2016.

29. Dao Lam, Mingzhen Wei, Donald Wunsch, "Clustering Data of Mixed Categorical and Numerical Type with Unsupervised Feature Learning," *IEEE Access*, Vol. 3, pp. 1605-1613, Sept. 2015.

30. Xiuzhen Huang, Steven F. Jennings, Barry Bruce, Alison Buchan, Liming Cai, Pengyin Chen, Carole Cramer, Weihua Guan, Uwe KK Hilgert, Hongmei Jiang, Zenglu Li, Gail McClure, Donald F. McMullen, Bindu Nanduri, Andy Perkins, Bhanu Rekepalli, Saeed Salem, Jennifer Specker, Karl Walker, Donald Wunsch, Donghai Xiong, Shuzhong Zhang, Yu Zhang, Zhongming Zhao and Jason H Moore, "Big data – a 21st century science Maginot Line? No-boundary thinking: shifting from the big data paradigm," *Journal of BMC BioData Mining*, Vol. 8, No. 7, February 2015.

31. Steven Damelin, Y. Gu, Donald Wunsch, and Rui Xu, "Fuzzy Adaptive Resonance Theory, Diffusion Maps, and their applications to Clustering and Biclustering," *Mathematical Modelling of Natural Phenomena: Special Issue on Model Reduction Across Disciplines in Honor of Alexander N. Gorban*, Vol. 10, No. 3, 2015, pp. 206-211.

32. Gennady Fridman, Jeremy Levesley, Ivan Tyukin, and Donald Wunsch (Eds.), "Preface," *Mathematical Modelling of Natural Phenomena: Special Issue on Model Reduction Across Disciplines in Honor of Alexander N. Gorban*, Vol. 10, No. 3, 2015, pp. 1-5.

33. Xingang Fu, Shuhui Li, Michael Fairbank, Donald Wunsch, and Eduardo Alonso, "Training Recurrent Neural Networks with the Levenberg-Marquardt Algorithm for Optimal Control of a Grid-Connected Converter," IEEE Transactions on Neural Networks and Learning Systems, Vol 26, No. 9, September 2015.

34. Dao Lam, Shuhui Li, and Donald Wunsch, "Hidden Markov Model with Information Criteria Clustering and Extreme Learning Machine Regression for Wind Forecasting," *J. Computer Science and Cybernetics: Special Issue 30th Anniversary*, Vol. 30, No. 4, 2014, pp. 361-376.

35. Ahmed Ezzat, Ashraf Abdelbar and Donald Wunsch, "A Bare-Bones Ant Colony Optimization Algorithm That Performs Competitively on the Sequential Ordering Problem", *Memetic Computing*, Vol. 6, No. 1, pp. 19-29, 2014.

36. Michael Fairbank, Shuhui Li, Xingang Fu, Eduardo Alonso and Donald Wunsch, "An adaptive recurrent neural network controller using a stabilization matrix and predictive inputs to solve a tracking problem under disturbances," *Neural Networks* 49, pp. 74-86, 2014.

37. Shuhui Li, Michael Fairbank, Cameron Johnson, Donald C. Wunsch, Eduardo Alonso, and Julio Proano, Artificial Neural Networks for Control of a Grid-Connected Rectifier/Inverter under Disturbance, Dynamic and Power Converter Switching

Conditions. *IEEE Transactions on Neural Networks and Learning Systems*, Vol. 25, No. 4, April 2014, pp. 738-750.

38. Xiuzhen Huang, Barry Bruce, Alison Buchan, Clare Bates Congdon, Carole Cramer, Steven F. Jennings, Hongmei Jiang, Guojun Li, Zenglu Li, David Liberles, Gail McClure, Rick McMullen, Jason Moore, Bindu Nanduri, Joan Peckham, Andy Perkins, Shawn W. Polson, Bhanu Rekepalli, Saeed Salem, Jennifer Specker, Donald Wunsch, Donghai Xiong, Shuzhong Zhang, and Zhongming Zhao, "No-Boundary Thinking in Bioinformatics Research," Journal of BMC BioData Mining, Vol. 6, No. 19, November 2013.

39. A.M. Abdelbar and D.C. Wunsch, "Search Context Awareness in Several Ant Colony Optimization Models," *International Journal of Computers and Their Applications*, Vol. 20, No. 2, 2013.

40. F.H. Montgomery, S. Chellappan, R. Katikalapudi, D.C. Wunsch and K.F. Lutzen, "Monitoring student internet patterns: Big brother or promoting mental health?," *Journal of Technology in Human Services*, V. 31, No. 1, 2013, pp. 61-70.

41. R. Katikalapudi, S. Chellappan, F. Montgomery, D. Wunsch and K. Lutzen, "Associating internet usage with depressive behavior among college students," IEEE Technology and Society Magazine, vol. 31, no. 4, pp. 73-80, 2012.

42. R. Xu, J. Xu, and D.C. Wunsch, "A Comparison Study of Validity Indices on Swarm Intelligence-Based Clustering," *IEEE Trans. on Systems, Man and Cybernetics, part B*, Vol. 42, No. 4, pp. 1243 – 1256, 2012.

43. R. Xu and D.C. Wunsch, "BARTMAP: A viable structure for biclustering," *Neural Networks*, vol. 24, no. 7, pp. 709-716, 2011.

44. S.E. Watkins, B.A. Konz, R. Dua, A. Belarbi, and D.C. Wunsch, "Smart truss for education," *Journal of Intelligent Material Systems and Structures*, vol. 22, pp. 317–326, Mar. 2011.

45. L. du Plessis, R. Xu, S. Damelin, M. Sears, and D.C. Wunsch II, "Reducing dimensionality of hyperspectral data with diffusion maps and clustering with K-means and fuzzy ART," *International Journal of Systems, Control and Communications*, Vol. 3, No. 3, pp. 232-251, 2011.

46. R. Xu and D.C. Wunsch, "Clustering algorithms in biomedical research: A review," *IEEE Reviews in Biomedical Engineering*, vol. 3, pp. 120–154, 2010.

47. J. Seiffertt and D.C. Wunsch, “Backpropagation and ordered derivatives in the time scales calculus,” *IEEE Transactions on Neural Networks*, vol. 21, no. 8, pp. 1262-1269, 2010.

48. R. Xu, S. Damelin, B. Nadler, and D.C. Wunsch II, “Clustering of high-dimensional gene expression data with feature filtering methods and diffusion maps,” *Artificial Intelligence in Medicine*, vol. 48, no. 2-3, pp. 91-98, 2010.

49. R. Meuth, E. Saad, D.C. Wunsch, and J. Vian, “Memetic mission management,” *IEEE Computational Intelligence Magazine*, vol. 5, no. 2, pp. 32–40, May 2010.

50. R. Meuth, Y.-S. Ong, and D.C. Wunsch II, “A proposition on memes and meta-memes in computing for higher-order learning,” *Memetic Computing*, vol. 1, no. 2, pp. 85-100, 2009.

51. N. Brannon, J. Seiffertt, T. Draelos, and D.C. Wunsch, “Coordinated machine learning for situation awareness,” *Neural Networks*, vol. 22, no. 3, pp. 316–325, Apr. 2009.

52. R. Xu, J. Xu, and D.C. Wunsch II, “MicroRNA expression profile-based cancer classification using default ARTMAP,” *Neural Networks*, vol. 22, pp. 774-780, 2009.

53. X. Cai, G.K. Venayagamoorthy, and D.C. Wunsch, “Evolutionary swarm neural network game engine for Capture Go,” *Neural Networks*, vol. 23, pp. 295-305, 2010.

54. R. Xu and D.C. Wunsch II, “Recent advances in cluster analysis,” *International Journal of Intelligent Computing and Cybernetics*, vol. 1, no. 4, pp. 484-508, 2008.

55. J. Seiffertt and D.C. Wunsch, “Intelligence in markets: Asset pricing, mechanism design, and natural computation,” *IEEE Computational Intelligence Magazine*, vol. 3, No. 4, pp. 27–30, Nov. 2008.

56. J. Seiffertt, S. Sanyal, and D.C. Wunsch, “Hamilton-Jacobi-Bellman equations and approximate dynamic programming on time scales,” *IEEE Trans. on SMC Part B, Special Issue on Adaptive Dynamic Programming and Reinforcement Learning in Feedback Control*, vol. 38, no. 4, pp. 918-923, Aug. 2008.

57. F. Lewis, J. Huang, T. Parsini, D.V. Prokhorov, and D.C. Wunsch, “Special issue on neural networks for feedback control systems,” *IEEE Trans. on Neural Networks*, (Guest Editorial), vol. 18, no. 4, pp. 969–972, July 2007.

58. X. Hu, D.V. Prokhorov, and D.C. Wunsch II, “Time series prediction with a weighted bidirectional multi-stream extended Kalman filter,” *Neurocomputing,* vol. 70, pp. 2392-2399, 2007.

59. R. Xu, G.K. Venayagamoorthy, and D.C. Wunsch II, “Modeling of gene regulatory networks with hybrid differential evolution and particle swarm optimization,” *Neural Networks*, vol. 20, pp. 917-927, 2007.

60. R. Xu, L.R. Frank, and D.C. Wunsch, “Inference of genetic regulatory networks with recurrent neural network models using particle swarm optimization,” *IEEE / ACM Transactions on Computational Biology and Bioinformatics*, vol. 4, no. 4, pp. 674-684, Oct.-Dec. 2007.

61. S.E. Watkins, F. Akhavan, R. Dua, K. Chandrashekhara, and D.C. Wunsch, “Impact induced damage characterization of composite plates using neural networks, *Smart Mater. Struct.*, vol. 16, no. 2, pp. 515-524, 2007.

62. W. Liu, J. Sarangapani, G. Venayagamoorthy, D.C. Wunsch II, and D. Cartes, “Decentralized neural network-based excitation control of large-scale power systems,” *International Journal of Control, Automation and Systems*, vol. 5, no. 5, pp. 526-528, 2007.

63. W. Liu, J. Sarangapani, G.K. Venayagamoorthy, D.C. Wunsch II, M.L. Crow, and D.A. Cartes, "Two neural network based decentralized controller designs for large scale power systems," *Dynamics of Continuous, Discrete and Impulse Systems - an International Journal, Series B: Application and Algorithm, Supplement, Advances in Neural Networks*, vol. 14, no. S1, pp. 486-493, 2007.

64. W. Liu, J. Sarangapani, G.K. Venayagamoorthy, D.C. Wunsch II, M.L. Crow, and D.A. Cartes, "Comparisons of an adaptive neural network based controller and an optimized conventional power system stabilizer," *Dynamics of Continuous, Discrete and Impulse Systems - an International Journal, Series B: Application and Algorithm, Supplement, Advances in Neural Networks*, vol. 14, no. S1, pp. 494-502, 2007.

65. X. Cai, D.V. Prokhorov, and D.C. Wunsch II, “Training winner-take-all simultaneous recurrent neural networks,” *IEEE Transactions on Neural Networks,* vol. 18, no. 3, pp. 674-684, May 2007.

66. X. Dong, H. Weng, D.G. Beetner, T.H. Hubing, D.C. Wunsch II, M. Noll, H. Goksu, and B. Moss, “Detection and identification of vehicles based on their unintended

electromagnetic emissions," *IEEE Transactions on Electromagnetic Compatibility*, vol. 48, no. 4, pp. 752–759, Nov. 2006.

67. N. Zhang and D.C. Wunsch II, "Speeding up VLSI layout verification using fuzzy attributed graphs approach," *IEEE Transactions on Fuzzy Systems*, vol. 14, no. 6, pp. 728-737, Dec. 2006.

68. E. Saad and D.C. Wunsch II, "Neural network explanation using inversion," *Neural Networks*, vol. 21, pp. 78-93, Jan. 2007.

69. X. Cai, N. Zhang, G.K. Venayagamoorthy, and D.C. Wunsch II, "Time series prediction with recurrent neural networks trained by a hybrid PSO-EA algorithm," *Neurocomputing*, vol. 70, pp. 2342-2353, 2007.

70. R. Xu, G.C. Anagnostopoulos, and D.C. Wunsch, "Multiclass cancer classification using semi-supervised ellipsoid ARTMAP and particle swarm optimization with gene expression data," *IEEE Transactions on Computational Biology and Bioinformatics*, vol. 4, no. 1, pp. 65-77, Jan.-Mar. 2007.

71. E. Kussul, T. Baidyk, D.C. Wunsch, O. Makeyev, and A. Martin, "Permutation coding technique for image recognition systems," *IEEE Transactions on Neural Networks*, vol. 17, no. 6, pp. 1566-1579, Nov. 2006.

72. W. Liu, G.K. Venayagamoorthy, and D.C. Wunsch, "A heuristic dynamic programming based power system stabilizer for a turbogenerator in a single machine power system," *IEEE Transactions on Industry Applications*, vol. 41, issue 5, Sept. 2005.

73. A.M. Abdelbar, M.A. El-Hemaly, E.A.M. Andrews, and D.C. Wunsch, "Recurrent neural networks with backtrack-points and negative reinforcement applied to cost-based abduction," *Neural Networks*, vol. 18, pp. 755–764, Aug. 2005.

74. A.M. Abdelbar, E.A.M. Andrews, and D.C. Wunsch II, "A connectionist approach to cost-based abduction," *International Journal of Computational Cognition*, vol. 3, no. 2, pp. 46-51, June 2005.

75. R. Xu and D.C. Wunsch II, "Survey of clustering algorithms," *IEEE Trans. on Neural Networks*, vol. 16, no. 3, pp. 645-678, May 2005.

76. F. Haray, M.-H. Lim, and D.C. Wunsch, "Algorithms for derivation of structurally stable Hamiltonian signed graphs," *International Journal of Computer Mathematics*, vol. 81, no. 11, pp. 1349-1356, Nov. 2004.

77. R. Dua, S.E. Watkins, S. Mulder, and D.C. Wunsch, "Matlab-based neural network introduction for sensors curriculum," *International Journal of Engineering Education: Special Edition on Matlab and Simulink in Engineering Education*, vol. 21, no. 4, pp. 636-648, 2005.

78. G.K. Venayagamoorthy, R. Harley, and D.C. Wunsch, “Real-time dual heuristic programming-based neurocontroller for a turbogenerator in a multimachine power system,” *Engineering Intelligent Systems Journal*, vol. 2, pp. 105-111, June 2005.

79. R. Dua, S.E. Watkins, and D.C. Wunsch, “Demodulation of extrinsic Fabry-Perot interferometric sensors for vibration testing using neural networks,” *Optical Engineering*, vol. 43, no. 12, Dec. 2004.

80. A. Goltsev and D.C. Wunsch II, "Generalization of features in the assembly neural networks," *International Journal of Neural Systems*, vol. 14, no. 1, pp. 39-56.

81. R. Dua, D. Beetner, W.V. Stoecker and D.C. Wunsch, "Detection of basal cell carcinoma using electrical impedance and neural networks,” *IEEE Transactions on Biomedical Engineering*, vol. 51, no. 1, pp. 66-71, Jan. 2004.

82. E.W. Saad, J.J. Choi, J.L. Vian, and D.C. Wunsch, “Query-based learning for aerospace applications,” *IEEE Trans. on Neural Networks*, vol. 14, no. 6, pp. 1437-1448, Nov. 2003.

83. H. Goksu and D.C. Wunsch, “Neural networks applied to electromagnetic compatibility (EMC) simulations,” *Lecture Notes in Computer Science*, vol. 2714, pp. 1057-1063, 2003.

84. M.H. Lim, F. Harary, and D.C. Wunsch, “Signed graphs for portfolio analysis in risk management,” *IMA Journal of Management Mathematics*, vol. 13, pp. 201-210, 2002.

85. N. Zhang, D.C. Wunsch, and F. Harary, “The subcircuit extraction problem,” *IEEE Potentials*, vol. 22, no. 3, pp. 22-25, Aug./Sept. 2003.

86. W. Liu, G.K. Venayagamoorthy, and D.C. Wunsch II, “Design of an adaptive neural network based power system stabilizer,” *Neural Networks*, July 2003.

87. A.M. Abdelbar, E.A.M. Andrews, and D.C. Wunsch, “Abductive reasoning with recurrent neural networks,” *Neural Networks*, July 2003.

88. S. Mulder and D.C. Wunsch II, “Million city traveling salesman problem solution by divide and conquer clustering with adaptive resonance neural networks,” *Neural Networks*, July 2003.

89. G.K. Venayagamoorthy, R.G. Harley, and D.C. Wunsch, “Implementation of adaptive critic based neurocontrollers for turbogenerators in a multimachine power system,” *IEEE Trans. On Neural Networks -- Special Issue on Hardware Implementations*, vol. 14, no. 5, Sept. 2003.

90. G.K. Venayagamoorthy, R.G. Harley, D.C. Wunsch II, “Dual heuristic programming excitation neurocontrol for generators in a multimachine power system,” *IEEE Transactions on Industry Applications*, vol. 39, no. 2, pp. 382-394, Mar./Apr. 2003.

91. G.K. Venayagamoorthy, R.G. Harley, and D.C. Wunsch, “Comparison of heuristic dynamic programming and dual heuristic programming adaptive critics for neurocontrol of a turbogenerator,” *IEEE Trans. On Neural Networks*, vol. 13, no. 3, pp. 764-773, May 2002.

92. S. Li, D.C. Wunsch, E. O’Hair, and M.G. Giesselmann, “Extended Kalman filter training of neural networks on a SIMD parallel machine,” *Journal of Parallel and Distributed Computing*, vol. 62, no. 4, April 2002.

93. A.G. Ivakhnenko, G.A. Ivakhnenko, E.A. Savchenko, and D.C. Wunsch, “Problems of further development of GMDH algorithms: Part 2,” *Pattern Recognition and Image Analysis*, vol. 12, no. 1, pp. 6-18, 2002.

94. M.S. Iyer and D.C. Wunsch II, "Dynamic reoptimization of a fed-batch fermentor using adaptive critic designs," *IEEE Trans. on Neural Networks*, vol. 12, no. 6, pp. 1433–1444, Nov. 2001.

95. S. Li, D.C. Wunsch, E. O’Hair, and M.G. Giesselmann, “Comparative analysis of regression and artificial neural network models for wind turbine power curve estimation,” *ASME Journal of Solar Energy Engineering*, vol. 123, issue 4, pp. 327-332, Nov. 2001.

96. S. Li, D.C. Wunsch II, E. O’Hair, and M.G. Giesselmann, “Using neural networks to estimate wind turbine power generation,” *IEEE Trans. On Energy Conversion*, vol 16, issue 3, pp. 276-282, Sept. 2001.

97. A.N. Gorban, K.O. Gorbunova, and D.C. Wunsch, "Liquid brain: The proof of algorithmic universality of quasichemical model of fine-grained parallelism," *Neural Network World*, pp. 391-412, Apr. 2001.

98. P.H. Eaton, D.V. Prokhorov, and D.C. Wunsch, “Neurocontroller alternatives for "fuzzy" ball-and-beam systems with nonuniform, nonlinear friction,” *IEEE Trans. on Neural Networks*, vol. 11, no. 2, pp. 423-435, Mar. 2000.

99. W. Dunin-Barkowski and D.C. Wunsch, “Phase-based cerebellar learning of dynamic signals,” *Neurocomputing*, vols. 32-33, pp. 709-725, 2000.

100. A. Petrosian, D. Prokhorov, R. Homan, R. Dasheiff, and D.C. Wunsch, "Recurrent neural network based prediction of epileptic seizures in intra- and extracranial EEG," *Neurocomputing*, vol. 30, pp. 201-208, 2000.

101. A.G. Ivakhnenko, G.A. Ivakhnenko, E.A. Savchenko, and D.C. Wunsch, “Algebraic approach and optimal physical clusterization in interpolation problems of artificial intelligence,” *Pattern Recognition and Image Analysis*, vol. 10, no. 3, pp. 404-409, 2000.

102. S.L. Shishkin and D.C. Wunsch, "Discrete-time method for robust global stabilization of induction motors," *Int. J. Adaptive Control and Signal Processing*, vol. 14, issue 2-3, pp. 141-156, 2000.

103. J. Dunyak and D.C. Wunsch II, “Fuzzy number neural networks,” *Fuzzy Sets and Systems*, vol. 112, no. 3, pp. 371-380, 2000.

104. A.N. Gorban, A.A. Rossiev, and D.C. Wunsch, “Neural network modeling of data with gaps,” *Radioelectronica, Informatika, Upravlenie*, vol. 1, pp. 47-55, 2000.

105. J. Dunyak, D.C. Wunsch, and I.W. Saad, "A theory of independent fuzzy probabilities for system reliability," *IEEE Trans. On Fuzzy Systems*, vol. 7, no. 3, pp. 286-294, June 1999.

106. W.L. Dunin-Barkowski and D.C. Wunsch, "Phase-based storage of information in the cerebellum," *Neurocomputing*, vols. 26-27, No. 1-3, pp. 677-685, 1999.

107. W.L. Dunin-Barkowski, S.N. Markin, L.N. Podladchikova, and D.C. Wunsch, “Activity properties of branches of a climbing fiber which controls different Purkinje cells,” *Biofizika*, vol. 44, no. 6, pp. 1094-1100, 1999.

108. J. Dunyak and D.C. Wunsch II, “Fuzzy regression by fuzzy number neural networks,” *Fuzzy Sets and Systems*, vol. 108, no. 1, pp. 49-58, 1999.

109. W.L. Dunin-Barkowski, S. Shishkin, and D.C. Wunsch, "Stability properties of cerebellar neural networks: The Purkinje cell - climbing fiber dynamic module," *Neural Processing Letters* vol. 9, no. 2, pp. 97-106, 1999.

110. E. Saad, D.V. Prokhorov, and D.C. Wunsch II, "Comparative study of stock trend prediction using time-delay, recurrent and probabilistic neural networks," *IEEE Trans. on Neural Networks*, vol. 9, issue 6, pp. 1456-1470, Nov. 1998.

111. A. Goltsev and D.C. Wunsch, "Inhibitory connections in the assembly neural network for texture segmentation," *Neural Networks*, vol. 11, no. 5, pp. 951-962, July 1998.

112. D.V. Prokhorov and D.C. Wunsch, "Adaptive critic designs," *IEEE Trans. on Neural Networks*, vol. 8, no. 5, pp. 997-1007, Sept. 1997.

113. D. Prokhorov, R. Santiago, and D.C. Wunsch, "Adaptive critic designs: A case study for neurocontrol," *Neural Networks*, vol. 8, no. 9, pp. 1367-1372, Dec. 1995.

114. D.C. Wunsch II, T.P. Caudell, D. Capps, R.J. Marks II, and R.A. Falk, "Optoelectronic implementation of the adaptive resonance neural network," *IEEE Transactions on Neural Networks*, vol. 4, issue 4, pp. 673-684, July 1993.

115. D.C. Wunsch II, D.J. Morris, R.K. McGann, and T.P. Caudell, "Photorefractive Adaptive Resonance Neural Network," *Applied Optics*, vol. 32, Special Issue on Neural Networks, March 1993.

116. D.C. Wunsch II, R.J. Marks II, T.P. Caudell, and C.D. Capps, "Limitations of a class of binary phase-only filters," *Applied Optics*, vol. 31, Special Issue on Optical Computing, Sept.10, 1992.

Tutorials

1. Lei Meng, Ah-Hwee Tan, Donald C. Wunsch, and Leonardo Enzo Brito da Silva, "Adaptive Resonance Theory in Social Media Clustering with Applications," *IEEE / INNS International Joint Conference on Neural Networks*, Rio de Janeiro, Brazil, July 2018.

2. Donald C. Wunsch, Tayo Obafemi-Ajayi, Gayla Olbricht, and Khalid Al-Jabery, "Computational Learning Approaches to Data Analytics in Biomedical Applications," IEEE Engineering in Medicine and Biology Conference, August 16, 2016.

3. R. Xu and D.C. Wunsch, "Clustering: Basics, algorithms, applications, and trends," presented at the IEEE/INNS International Joint Conference on Neural Networks, part of the World Congress on Computational Intelligence '10, Barcelona, Spain, July 18, 2010.

4. R. Xu and D.C. Wunsch, "Cluster analysis and swarm intelligence in clustering," presented at the IEEE Swarm Intelligence Symposium, Sept. 21, 2008.

5. D.C. Wunsch, "Why neural nets are still our best hope for computational intelligence," presented at the Fourth International Symposium on Neural Networks (ISNN), Nanjing, China, June 2, 2007.

6. D.C. Wunsch, "Reinforcement learning neural architectures with adaptive critics – Where do we go from here?" presented at the Seventh International Conference on Cognitive and Neural Systems, Boston University, Boston, MA, May 28-31, 2003.

7. D.C. Wunsch, "Intelligent agents, knowledge discovery and the Internet: Opportunities for a confluence of computational intelligence technologies," presented at the World Congress on Computational Intelligence, May 1998.

8. D.C. Wunsch, "Adaptive critic designs in neurocontrol and intelligent agents," presented at Artificial Neural Networks in Engineering (ANNIE '97), Oct. 1997.

Conference Papers, Presentations, Seminars, Reports, Other Papers

1. Donald C. Wunsch II, "Clustering Contributions to Lifelong Learning Machines," *Gulf Coast Deep Learning Workshop*, Lafayette, Louisiana, October 26, 2018.

2. Donald C. Wunsch II, "Clustering, Validation, Visualization, and Reinforcement Learning: Tying the Knot," Keynote Presentation, *World Intelligent Manufacturing Summit*, Nanjing, China, October 13, 2018.

3. Donald C. Wunsch II, "The Iterated Prisoner's Dilemma and Why Games Matter So Much," Research Seminar, Southeast University, Nanjing, China, October 12, 2018.

4. Ethar H.K. Alkamil, Ralph Flori, Leonardo Enzo Brito da Silva and Donald C. Wunsch II, "Extended Learning from Experience: Stuck Pipe Prediction System Using Unsupervised Learning," *11th International Petroleum Technology Conference*, Beijing, 2019.

5. Ethar H.K. Alkamil, Seaar Al-Dabooni, Ahmed K. Abbas, Ralph Flori, and Donald C. Wunsch II, "Learning from Experience: An Automatic pH Neutralization System Using Hybrid Fuzzy System and Neural Network," *Complex Adaptive Systems Conference*, Chicago, Illinois, November 2018.

6. Ethar H.K. Alkamil, Ralph Flori, Leonardo Enzo Brito da Silva and Donald C. Wunsch II, "Learning from Experience: Stuck Pipe Prediction System Using an Unsupervised Learning and Fuzzy System," *Society of Petroleum Engineers International Heavy Oil Conference and Exhibition*, Kuwait City, October 2018.

7. Ethar H.K. Alkamil, Ahmed K. Abbas, Ralph Flori, Leonardo Enzo Brito da Silva, Donald C. Wunsch, and Chatetha Chumkratoke, "Learning from Experience: Real-Time H2S Monitoring System Using Fuzzy ART Unsupervised Learning," *IADC / SPE Asia Pacific Drilling Technology Conference*, Bangkok, Thailand, 27-29 August, 2018.

8. Donald C. Wunsch II, "Computational Intelligence in Biomedical Research," Poster Presentation, Ozark Biomedical Initiative, Rolla, MO, August 2018.

9. Donald C. Wunsch II, "Automated Negotiations, Games, and Tools," Keynote, *International Conference on Intelligent Computing*, Wuhan, China, August 16, 2018.

10. Donald C. Wunsch II, "Mixed Modality Learning," Research Seminar, Huazhong University of Science and Technology, Wuhan, China, August 15, 2018.

11. Donald Wunsch, "Clustering Contributions to Lifelong Learning Machines," Seminar, presented to the Measurement and Modeling Services Branch Modeling and Simulation Division Night Vision and Electronic Sensors Directorate, Ft. Belvoir, VA, July 2018.

12. Donald Wunsch, "Current Progress and Advances Needed in Unsupervised Learning," Seminar, presented at the *Symposium on Computational Intelligence and Data Mining Applications: State of the Art and Trends*, University Rio Grande do Norte, Natal, Brazil, July 2018.

13. Ethar H.K. Alkamil, Ahmed K. Abbas, Ralph E. Flori, Leonardo Enzo Brito da Silva, and Donald C. Wunsch II, "Learning from Experience: Using an Unsupervised Learning Real-Time Mud Contamination Monitoring Simulator in Umm Er Radhuma and Tayarat Hydrogen Sulfide Formations," AADE Fluids Technical Conference and Exhibition, Houston, TX, 2018.

14. Yongliang Yang, Kyriakos G. Vamvoudakis, Hamidreza Modares, Dawei Ding, Yixin Yin, Donald C. Wunsch, "Dynamic Intermittent Suboptimal Control: Performance Quantification and Comparisons," *37th Chinese Control Conference*, Wuhan, China, July 2018.

15. Leonardo Enzo Brito da Silva and Donald C. Wunsch II, "A study on exploiting VAT to mitigate ordering effects in Fuzzy ART," *Proc. IEEE / INNS International Joint Conference on Neural Networks*, Rio de Janeiro, Brazil, July 2018.

16. Ashraf Abdelbar, Islam Elnabarawy, Khalid Salama and Donald Wunsch, "Matrix Factorization Based Collaborative Filtering with Resilient Stochastic Gradient Descent," *Proc. IEEE / INNS International Joint Conference on Neural Networks*, Rio de Janeiro, Brazil, July 2018.

17. Yongliang Yang, Xianzhong Chen, Yixin Yin and Donald Wunsch, "Off-Policy Integral Reinforcement Learning for Semi-Global Constrained Output Regulation of Continuous-Time Linear Systems," *Proc. IEEE / INNS International Joint Conference on Neural Networks*, Rio de Janeiro, Brazil, July 2018.

18. Yongliang Yang, Hamidreza Modares, Kyriakos G. Vamvoudakis, Yi-Xin Yin, Donald C. Wunsch, "Model-Free Event-Triggered Containment Control of Multi-Agent Systems," *American Control Conference*, Milwaukee, pp. 877-884, June 2018.

19. James A. Foster and Donald C. Wunsch, "The Ethical Status of an AI," *IEEE Computational Intelligence in Bioinformatics and Computational Biology conference*, St. Louis, June 2, 2018.

20. Niklas Melton and Donald C. Wunsch, "Gene Expression Analysis using Adaptive Resonance Theory," *IEEE Computational Intelligence in Bioinformatics and Computational Biology conference*, St. Louis, June 2, 2018.

21. Yongliang Yang, Dawei Ding, Yixin Yin, Donald C. Wunsch, "Model-Free Semi-Global Output Regulation for Discrete-Time Linear Systems Subject To Input Amplitude Saturation," *Youth Academic Annual Conference of Chinese Association of Automation*, Nanjing, China, May 2018, pp. 150-155.

22. Donald C. Wunsch II, "Computational Intelligence in Multi-Agent Systems," Keynote, *Forum on the Frontier of the Discipline of Computational Intelligence in Intelligent Control*, Huazhong University of Science and Technology, Wuhan, China, May 8, 2018.

23. Donald C. Wunsch II, "Challenges and Opportunities in Neural Networks," Seminar Presentation, Huazhong University of Science and Technology, Wuhan, China, May 3, 2018.

24. Donald C. Wunsch II, "On- and Off-Line Mixed-Modality Learning," *NSF Workshop on Real-Time Learning and Decision Making in Dynamical Systems*, February 12-13, 2018.

25. Tayo Obafemi-Ajayi, Luke Settles, Yuqing Su, Gayla Olbricht, Cynthia Germeroth, T. Nicole Takahashi, Judith Miles, and Donald Wunsch, "Genetic Variant Analysis of Boys with Autism: a Pilot Study on Linking Facial Phenotype to Genotype," *BIBM 2017: IEEE International Conference on Bioinformatics and Biomedicine*, November 2017.

26. Ayah Helal, Enas Jawdat, Islam Elnabarawy, Ashraf Abdelbar and Donald Wunsch, "Integrated Particle Swarm and Evolutionary Algorithm Approaches to the Quadratic Assignment Problem," *IEEE Symposium Series on Computational Intelligence*, Honolulu, November 2017.

27. Tayo Obafemi-Ajayi, Khalid Al-Jabery, Lauren Salminen, David Laidlaw, Ryan Cabeen, Donald Wunsch and Robert Paul, "Neuroimaging Biomarkers of Cognitive Decline in Healthy Older Adults via Unified Learning," *IEEE Symposium Series on Computational Intelligence*, Honolulu, November 2017.

28. Leonardo Enzo Brito da Silva and Donald C. Wunsch, "Validity Index-based Vigilance Test in Adaptive Resonance Theory Neural Networks," *IEEE Symposium Series on Computational Intelligence*, Honolulu, November 2017.

29. Yongliang Yang, Yixin Yin, Donald C. Wunsch II and Hamidreza Modares, "Containment Control of Heterogeneous Systems with Active Leaders of Bounded Unknown Control using Reinforcement Learning," *IEEE Symposium Series on Computational Intelligence*, Honolulu, November 2017.

30. George Shannon, James Levett, Steve Corns and Donald C. Wunsch II, "Cognitive Relevance," *IEEE Symposium Series on Computational Intelligence*, Honolulu, November 2017.

31. Islam Elnabarawy, Dustin Tanksley, Kristjana Arroyo and Donald C. Wunsch II, "Tools, Libraries and Algorithms for PYSC2," *DeepMind / Blizzard StarCraft II AI Workshop*, invited presentation, Anaheim, CA, November 4, 2017.

32. Jacob A. Mueller, Donald C. Wunsch, Jonathan W. Kimball, "Active Stabilization of line-regulating converters with constant power loads," *North American Power Symposium (NAPS)*, 2017, pp. 1-6.

33. Yongliang Yang, Zhishan Guo, Donald Wunsch, and Yixin Yin, "Off-policy Reinforcement Learning for Robust Control of Discrete-time Uncertain Linear Systems," *36th Chinese Control Conference*, Dalian, China, pp. 2507-2512, July 26-28, 2017.

34. Islam Elnabarawy, Daniel R. Tauritz, and Donald C. Wunsch, "Evolutionary Computation for the Automated Design of Category Functions for Fuzzy ART: An Initial Exploration," *Proc. Workshop on Evolutionary Computation for the Automated Design of Algorithms (ECADA) at GECCO, The Genetic and Evolutionary Computation Conference*, Berlin, July 15-19, 2017.

35. Yongliang Yang, Donald Wunsch, Zhishan Guo and Yixin Yin, "Hamiltonian-driven adaptive dynamic programming based on extreme learning machine," *International Symposium on Neural Networks*, Sapporo, Japan, pp. 197 – 205, 2017.

36. Seaar Al-Dabooni and Donald Wunsch, "Mobile Robot Control Based on Hybrid Neuro-Fuzzy Value Gradient Reinforcement Learning," *Proc. IEEE / INNS International Joint Conference on Neural Networks*, Anchorage, Alaska, pp. 2820 – 2827, 2017.

37. Yongliang Yang, Donald Wunsch and Yixin Yin, "Hamiltonian-driven Adaptive Dynamic Programming for Nonlinear Discrete-Time Dynamic Systems," *Proc. IEEE / INNS International Joint Conference on Neural Networks*, Anchorage, Alaska, pp. 1339 – 1346, 2017.

38. Jason H. Moore, Steven F. Jennings, Casey S. Greene, Lawrence E. Hunter, Andy D. Perkins, Clarlynda Williams-Devane, Donald C. Wunsch, Zhongming Zhao, and Xiuzhen Huang, "No-Boundary Thinking in Bioinformatics," Pacific Symposium on Biocomputing, Hawaii, Vol. 22, pp. 646 - 648, 2017.

39. J. Matta, T. Obafemi-Ajayi, J. Borwey, D. Wunsch, G. Ercal, "Robust Graph-Theoretic Clustering Approaches Using Node-Based Resilience Measures", *IEEE International Conference on Data Mining*, pp. 320-329, Dec 2016.

40. N. Melton and D. C. Wunsch, "Enhancing Supervisory Training Signals with Environmental Reinforcement Learning Using Adaptive Dynamic Programming and Artificial Neural Networks," *Proceedings of the 15th IEEE International Conference on Cognitive Informative and Cognitive Computing*, pp 331-335, 2016.

41. Khalid Al-Jabery, Tayo Obafemi-Ajayi, Gayla Olbricht, T. Nicole Takahashi, Stephen Kanne, Donald Wunsch, "Ensemble Statistical and Subspace Clustering Model for Analysis of Autism Spectrum Disorder Phenotypes," *IEEE Engineering in Medicine and Biology Conference*, Orlando, FL, pp. 3329-3333, 2016.

42. Seaar Al-Dabooni and Donald Wunsch, "Heuristic Dynamic Programming for Mobile Robot Path Planning Based on Dyna Approach," *IEEE International Joint Conference on Neural Networks*, Vancouver, Canada, pp. 3723 – 3730, July 2016.

43. Leonardo Enzo Brito da Silva and Donald C. Wunsch, "An Information Theoretic ART for Robust Unsupervised Learning," *IEEE International Joint Conference on Neural Networks*, Vancouver, Canada, pp. 3023-3029, July 2016.

44. Islam Elnabarawy, Donald Wunsch and Ashraf Abdelbar, "Biclustering ARTMAP Collaborative Filtering Recommender System," *IEEE International Joint Conference on Neural Networks*, Vancouver, Canada, pp. 2986 – 2991, July 2016.

45. Donald Wunsch, "Data analytics challenges in biomedical engineering," Plenary Presentation, *IEEE World Congress on Intelligent Control and Automation*, Guilin, China, June 14, 2016.

46. Donald Wunsch, "Data analytics challenges in biomedical engineering," Invited Seminar, South China University of Technology, Guangzhou, June 10, 2016.

47. Donald Wunsch, "Fundamentals and Future Possibilities in Hybrid Learning," Keynote Presentation, IEEE Computational Intelligence Society – University of District of Columbia Winter School, Washington DC, February 20, 2016.

48. W Kayani, SP Acharya, IG Guardiola, DC Wunsch, B Schumacher, “A Hybrid of Computational Intelligence Techniques for Shape Analysis of Traffic Flow Curves,” *Transportation Research Board 94th Annual Meeting*, 2015.

49. S. Li, X. Fu, I. Jaithwa, E. Alonso, M. Fairbank and D. C. Wunsch, "Control of three-phase grid-connected microgrids using artificial neural networks," *7th International Joint Conference on Computational Intelligence* (IJCCI), Lisbon, Portugal, 2015, pp. 58-69.

50. S. Li, E. Alonso, M. Fairbank, I. Jaithwa, D.C. Wunsch, “Hardware Validation for Control of Three-Phase Grid-Connected Microgrids Using Artificial Neural Networks,” *12th International Conference on Applied Computing*, 2015.

51. Donald Wunsch, “Complications of Realistic Data-Intensive Applications,” Seminar, Beijing University of Science & Technology, September 14, 2015.

52. Donald Wunsch, “Validation measures in clustering,” *International Conference on Intelligent Computing*, Opening Keynote Presentation, Fuzhou, China, August 21, 2015.

53. Tayo Obafemi-Ajayi, Dao Lam, T. Nicole Takahashi, Stephen Kanne, Donald Wunsch, “Sorting the Phenotypic Heterogeneity of Autism Spectrum Disorders: a Hierarchical Clustering Model,” *IEEE Conference on Computational Intelligence in Bioinformatics and Computational Biology*, August 12-15, 2015, Niagara Falls, Canada.

54. Clayton Smith and Donald Wunsch, “Time series prediction via two-step clustering,” *Proc. IEEE / INNS International Joint Conference on Neural Networks*, July 12-16, 2015.

55. Clayton Smith and Donald Wunsch, “Particle swarm optimization in an adaptive resonance framework,” Proc. IEEE / INNS International Joint Conference on Neural Networks, July 12-16, 2015.

56. Leonardo Enzo Brito da Silva and Donald Wunsch, “Multi-Prototype Local Density-based Hierarchical Clustering,” *Proc. IEEE / INNS International Joint Conference on Neural Networks*, July 12-16, 2015.

57. Shuhui Li, Xingang Fu, Michael Fairbank, Eduardo Alonso, and Donald C. Wunsch, “Neural network-based vector control of VSCHVDC transmission systems,” *IEEE International Conference on Renewable Energy Research and Applications*, pp. 173-180, 2015.

58. Donald Wunsch, “Results We’ve Seen and Results I Wish We’ve Seen in Reinforcement Learning,” seminar at Chinese University of Hong Kong, December 19, 2014.

59. Donald Wunsch, “Performance Issues for Extreme Learning Machines,” Keynote Presentation, The International Conference on Extreme Learning Machines, Singapore, December 9, 2014.

60. Donald Wunsch, “Agents, Hybrids, Signals, Object Nets: Directions in Adaptive Dynamic Programming,” Lecture Series in Complex Systems and Intelligence Science, Lecture No. 06-20141125-082, State Key Laboratory of Management and Control for Complex Systems, Chinese Academy of Sciences, Beijing, November 25, 2014.

61. Donald Wunsch, “Computational Intelligence Collaboration,” *DeTao Knowledge Capital Seminar*, Shanghai, November 11, 2014.

62. Khalid Al-Jabery, Donald C. Wunsch, Jinjun Xiong and Yiyu Shi," A Novel Grid Load Management Technique Using Electric Water Heaters and Q-Learning," in *Proc. of IEEE Smart Grid Comm.*, Venice, Italy, 2014.

63. Ahmed Ezzat, Ashraf M. Abdelbar, and Donald C. Wunsch, “An extended EigenAnt colony system applied to the sequential ordering problem,” *IEEE Symposium on Swarm Intelligence (SIS)*, pp. 1-7, 2014.

64. Donald Wunsch, Stephen Damelin, and Rui Xu, “Adaptive Resonance Theory and Diffusion Maps for Clustering Applications in Pattern Analysis,” Invited Opening Keynote, *Model Reduction Across Disciplines*, Leicester, U.K., August 19-22, 2014.

65. Donald Wunsch, “Innovations and Open Problems in Supervised, Unsupervised and Reinforcement Learning,” Invited Lecture, *IEEE / INNS World Congress on Computational Intelligence*, Beijing, July 7, 2014.

66. Donald Wunsch, “Innovations in Supervised, Unsupervised and Reinforcement Learning,” Intel New Business Initiatives Technical Seminar, Hillsboro, Oregon, June 2014.

67. George Shannon, Steven Corns and Donald Wunsch, “Discovering Objective Functions for Tagging Medical Text Concepts,” *IEEE Conference on Computational Intelligence in Bioinformatics and Computational Biology*, May 2014, pp. 1-7.

68. Shuhui Li, Michael Fairbank, Xingang Fu, Donald C. Wunsch, and Eduardo Alonso, “Nested-Loop neural network vector control of permanent magnet synchronous motors” *IEEE/INNS International Joint Conference on Neural Network*s, Dallas, USA, August 4-8, 2013, pp. 1-8.

69. Islam El-Nabarawy, Ashraf Abdelbar and Donald Wunsch, “Levenberg-Marquardt and Conjugate Gradient Methods Applied to a High Order Neural Network” *IEEE/INNS International Joint Conference on Neural Network*s, Dallas, USA, August 4-8, 2013.

70. Lei Meng, Ah-Hwee Tan and Donald C. Wunsch, “Vigilance Adaptation in Adaptive Resonance Theory,” *IEEE/INNS International Joint Conference on Neural Network*s, Dallas, USA, August 4-8, 2013.

71. Dao Lam and Donald Wunsch, “Unsupervised feature learning classification using an Extreme Learning Machine,” *IEEE/INNS International Joint Conference on Neural Network*s, Dallas, USA, August 4-8, 2013.

72. D. C. Wunsch, “Validation, Similarity and Hierarchy: Opportunities for Relating Reinforcement and Unsupervised Learning,” 16th Yale Workshop on Adaptive and Learning Systems, June 4-8, 2013.

73. Ravi Santosh Arvpally, Xiaoqing (Frank) Liu, Donald C. Wunsch, "Fuzzy c-means clustering based polarization assessment in intelligent argumentation system for collaborative decision support", *IEEE Computer Software and Applications Conference* (COMPSAC 2013).

74. D.C. Wunsch, “Blurring the Distinctions Between Supervised and Unsupervised Learning,” *Extreme Learning Machines 2012*, Keynote Presentation, Singapore, December 12, 2012.

75. Ashraf M. Abdelbar, and Donald C. Wunsch, “A Modified Ant Colony Optimization Algorithm,” *Proceedings International Conference on Information Science and Computing Applications*, Bali, Indonesia, November 2012, pp. 150-154.

76. Ashraf M. Abdelbar, and Donald C. Wunsch, “Promoting Search Diversity in Ant Colony Optimization with Stubborn Ants,” *Proceedings Complex Adaptive Systems Conference*, Vol. 12 of *Procedia Computer Science*, Washington, DC, November 2012, pp. 456-462.

77. D.C. Wunsch, “Hierarchical Clustering for Biological Data,” Biological Sciences Department Seminar Series, Missouri University of Science and Technology, December 3, 2012.

78. T. Kim and D.C. Wunsch, “Modified Cellular Simultaneous Recurrent Networks with Cellular Particle Swarm Optimization,” *Proc. IEEE / INNS International Joint Conference on Neural Networks*, part of *World Congress on Computational Intelligence 2012*, Brisbane, Australia, paper #N-0683, June 10-15, 2012.

79. S. Li, M. Fairbank, D.C. Wunsch, and E. Alonso, “Vector Control of a Grid-Connected Rectifier / Inverter Using an Artificial Neural Network,” *Proc. IEEE / INNS International Joint Conference on Neural Networks*, part of *World Congress on Computational Intelligence 2012*, Brisbane, Australia, paper #133, June 10-15, 2012.

80. D.C. Wunsch, “Hierarchical Clustering,” *NCEI ’12*, Auckland, New Zealand, June 8, 2012.

81. D.C. Wunsch, “Adaptive Resonance Theory Advantages in Clustering and Hierarchical Clustering,” Invited Presentation, *C2I Workshop on Computational Intelligence*, Nanyang Technological University, Singapore, June 4, 2012.

82. A. M. Abdelbar and D.C. Wunsch, “Improving the performance of MAX-MIN ant system on the TSP using stubborn ants,” *GECCO-12 – Proceedings of the 14th International Conference on Genetic and Evolutionary Computation*, pp. 1395-1396, 2012.

83. D.C. Wunsch, “Clustering Design Issues in Biomedical Research,” Biomedical Computing Interest Group, National Institutes of Health, May 10, 2012.

84. D.C. Wunsch, “BARTMAP vs. Iterative Two-Way Clustering, and Other Innovations,” Graduate Research Seminar, University of Missouri – Columbia, May 8, 2012.

85. Sriram Chellappan, Raghavendra Kotikalapudi, Donald Wunsch and Jacqueline Bichsel, "A Cluster Analytic Investigation on Math Anxiety," Technical Report, Missouri S&T, 2012.

86. D.C. Wunsch, "Unsupervised Hierarchical Biclustering," presented at the Electrical & Computer Engineering Dept. Graduate Seminar, Baylor University, Waco, TX, March 2012.

87. D.C. Wunsch, "Hierarchical Biclustering," presented at the Computer Science Dept. Graduate Seminar, American University Cairo, Egypt, November 2011.

88. D.C. Wunsch, "Hierarchical clustering," presented at the International Conference on Intelligent Computing, Zhengzhou, China, Aug. 12, 2011.

89. R.T. Kozma and D.C. Wunsch, "Learning in the memristor domain: Massively parallel fuzzy adaptive neural algorithms for efficient implementation on memristive hardware," presented at the World Conference on Computational Intelligence Memristor Workshop, Aug. 4, 2011.

90. S. Kim and D.C. Wunsch, "A GPU-based parallel hierarchical fuzzy ART clustering," in *Proc. International Joint Conference on Neural Networks*, San Jose, CA, July 2011, pp. 2778–2782.

91. D.C. Wunsch, "Context: Clustering, approximate dynamic programming, and soft computing consolidation for improved classification measures," presented at the Berkeley Initiative on Soft Computing (BISC) Roundtable Discussion, University of California at Berkeley, July 22, 2011.

92. D.C. Wunsch, "Hierarchical clustering on specialized hardware, and Biclustering: Two recent advances," presented at the Charles Hedlund Distinguished Visiting Professor Research Seminar, American University Cairo, Egypt, May 2011.

93. D.C. Wunsch, "Clustering algorithms," presented at the Charles Hedlund Distinguished Visiting Professor Public Seminar, American University Cairo, Egypt, May 2011.

94. D.C. Wunsch, "Monkism has its rewards, dissatisfaction is your friend, you've got plenty of time to sleep when you're dead, and work-life balance assumes you have a life outside of work: The joys of being a grad student," presented at the Dissertation Boot Camp, Rensselaer Polytechnic Institute, Troy, NY, Jan. 20, 2011.

95. D.C. Wunsch, "Clustering fundamentals and new contributions," presented at the Artificial Neural Networks in Engineering Conference, St. Louis, MO, Nov. 1, 2010.

96. T.-H. Kim, G.K. Venayagamoorthy, D.C. Wunsch, "Recursive and non-recursive algorithms for the group size counting problem in computer Go," in *Proc. Artificial Neural Networks in Engineering 2010*, ASME Press.

97. R. Xu, J. Xu, and D.C. Wunsch II, "Clustering with differential evolution particle swarm optimization," in *Proc. World Congress on Computational Intelligence (WCCI) 2010*, Barcelona, Spain, 2010.

98. R. Woodley, W. Noll, J. Barker, and D.C. Wunsch, "Automatic building identification using GPS and machine learning," in *Proc. International Geoscience and Remote Sensing Symposium IGARSS-2010*, Honolulu, HI, July 25-30, 2010, pp. 2739-2742.

99. D.C. Wunsch, "Design issues and applications in clustering," presented at the IEEE Electron Devices Society Distinguished Lecturer Presentation, Fudan University, Shanghai, China, June 10, 2010.

100. D.C. Wunsch, "ART advantages in engineering applications," presented at the International Conference on Cognitive and Neural Systems, Boston, MA, 2010.

101. T.-H. Kim, G.K. Venayagamoorthy, and D.C. Wunsch, "Group size counting problem in computer Go has a way to autonomously count the size of an undirected graph in a grid world," presented at the 2nd Annual NSF-EFRI Missouri S&T-GATech Workshop, Rolla, MO, May 16-19, 2010, Paper #06.

102. R. Woodley, B. Walenz, J. Seiffertt, P. Robinette, and D.C. Wunsch, "Data fusion and classification using a hybrid intrinsic cellular inference network," in *Proc. SPIE*, Vol. 7710, 2010.

103. D.C. Wunsch, "Design issues and applications in clustering," presented at the 2nd International Conference on Computer Engineering and Applications, Bali, Indonesia, 2010.

104. D.C. Wunsch, "Design issues and applications in clustering," presented at the International Conference on Knowledge Discovery in Databases, Phuket, Thailand, Jan. 9, 2010.

105. Tae-hyung Kim, J. Adam Nisbett, and Donald C. Wunsch, "Robotic Go: Exploring a different perspective on human-computer interaction with the game of go," IEEE International Conference on Systems, Man and Cybernetics, San Antonio, 2009, pp 2439-2444.

106. P. Robinette, R.J. Meuth, R. Dolan, and D.C. Wunsch, "LabRat™: Miniature robot for students, researchers and hobbyists," presented at the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2009), St. Louis, MO, Oct. 2009.

107. D.C. Wunsch, "ART properties of interest in engineering applications," in *Proc. IEEE / INNS International Joint Conference on Neural Networks*, Atlanta, GA, 2009.

108. J. Seiffertt, S. Mulder, R. Dua, and D.C. Wunsch, "Neural networks and Markov models for the iterated prisoner's dilemma," in *Proc. IEEE / INNS International Joint Conference on Neural Networks*, Atlanta, GA, 2009.

109. P. Robinette, J. Seiffertt, R. Meuth, R. Dolan, and D.C. Wunsch, "An agent-based computational model of a self-organizing project management paradigm for research teams," in *Proc. IEEE / INNS International Joint Conference on Neural Networks*, Atlanta, GA, 2009.

110. R. Xu, J. Xu, and D.C. Wunsch, "Using default ARTMAP for cancer classification with microRNA expression signatures," in *Proc. IEEE / INNS International Joint Conference on Neural Networks*, Atlanta, GA, 2009.

111. R. Xu, L. du Plessis, S. Damelin, M. Sears, and D.C. Wunsch, "Analysis of hyperspectral data with diffusion maps and fuzzy ART," in *Proc. IEEE / INNS International Joint Conference on Neural Networks*, Atlanta, GA, 2009.

112. T.-H. Kim, L.D. Pyeatt, and D. C. Wunsch II, "Reconfigurable disruption tolerant routing via reinforcement learning," in *Proc. IEEE / INNS International Joint Conference on Neural Networks*, Atlanta, GA, 2009.

113. R.J. Meuth, E.W. Saad, D.C. Wunsch, and J. Vian, "Adaptive task allocation for search area coverage," in *Proc. IEEE Conf. on Technologies for Practical Robot Applications, (TePRA 09)*, 2009, pp. 67-74.

114. T.-H. Kim, X. Sun, and D.C. Wunsch, "Investigating the properties of cellular simultaneous recurrent networks," in *Proc. First Annual NSF EFRI Workshop*, Rolla, MO, June 2009.

115. D.C. Wunsch, "Clustering algorithms and applications," presented at the IEEE EDS Distinguished Lecture Series and IEEE CIS Local Chapter Combined Forum, Nanyang Technological University, Singapore, May 22, 2009.

116. T.-H. Kim and D.C. Wunsch II, "Estimation of string safety in the game of Go with neural networks in cellular structure," presented at the Thirteenth International Conference on Cognitive and Neural Systems, Boston University, Boston, MA, May 2009.

117. R. Xu, R. Woodley, and D.C. Wunsch, "A comparison of major machine learning methods in classification of anthrax time series from inhalation anthrax models," presented at the 14th U.S. Army Conference on Applied Statistics, Oct. 22-24, 2008.

118. D.C. Wunsch, "Clustering," presented at the Computer Science Seminar Series, National University of Singapore, Oct. 2008.

119. J. Seiffertt and D.C. Wunsch, "Decision theory on dynamic domains: Nabla derivatives and the Hamilton-Jacobi-Bellman equation," presented at the SMC 2008: IEEE International Conference on Systems, Man and Cybernetics, Singapore, Oct. 2008.

120. D.C. Wunsch, "Clustering," presented at the Computer Science Seminar Series, Tsinghua University, Beijing, Sept. 2008.

121. J. Seiffertt, A. Vanbrunt, and D.C. Wunsch, "Maximum likelihood methods in biology revisited with tools of computational intelligence," in *Proc. EMBS 2008: The 30th Annual Conference of the IEEE Engineering in Medicine and Biology Society,* Aug. 2008, pp. 2401 – 2404.

122. R. Xu, R. Woodley, and D.C. Wunsch, "Default ARTMAP neural networks for classification of anthrax time series from inhalation anthrax models," in *Proc.2008 International Conference on Data Mining*, vol. 1. Las Vegas, July, 2008, pp. 211-216.

123. D.C. Wunsch, "Clustering," presented at the Electrical & Computer Engineering Seminar Series, Nanyang Technological University, Singapore, Sept. 2008.

124. R.J. Meuth, P. Robinette, and D.C. Wunsch, "Modeling environmental uncertainty in ground robot navigation," presented at the AUVSI Unmanned Systems North America Conference, St. Louis, 2008.

125. D.C. Wunsch, “Clustering,” presented at the International Workshop on Advanced Computational Intelligence, Macau, China, June 2008.

126. J. Seiffertt and D.C. Wunsch II, “A quantum calculus formulation of dynamic programming and ordered derivatives,” in *Proc. IEEE / INNS International Joint Conference on Neural Networks*, Hong Kong, China, June 2008, pp. 3689–3694.

127. R. Xu, S. Damelin, and D.C. Wunsch II, “Clustering of cancer tissues using diffusion maps and fuzzy ART with gene expression data,” in *Proc. IEEE / INNS International Joint Conference on Neural Networks*, Hong Kong, China, June 2008, pp. 183-188.

128. R.J. Meuth, P. Robinette, and D.C. Wunsch II, “Computational intelligence meets the NetFlix prize,” in *Proc. IEEE / INNS International Joint Conference on Neural Networks*, Hong Kong, China, June 2008, pp. 687-692.

129. R.J. Meuth and D.C. Wunsch II, “Divide and conquer evolutionary TSP solution for vehicle path planning,” in *Proc. IEEE Congress on Evolutionary Computation*, Hong Kong, China, June 2008, pp. 676-681.

130. R. Xu, S. Damelin, B. Nadler, and D.C. Wunsch II, “Clustering of high-dimensional gene expression data with feature filtering methods and diffusion maps,” in *Proc. of the IEEE International Conference on Biomedical Engineering and Informatics*, Sanya, China, May 2008.

131. D.C. Wunsch, “Clustering,” presented at the *IEEE Region 5 Conference Luncheon*, Kansas City, MO, Apr. 19, 2008.

132. D.C. Wunsch, “Clustering,” presented at the Memphis University Dept. of Computer Science Colloquium Series, Memphis, TN, Apr., 2008.

133. R. Xu, R. Woodley, and D.C. Wunsch, “Identification of anthrax time series from inhalation anthrax models using default ARTMAP,” presented at the 12th International Conference on Cognitive & Neural Systems, Boston, MA, May 14-17, 2008.

134. J. Seiffertt and D.C. Wunsch, “An ART-based reinforcement learning architecture and the iterated prisoner’s dilemma,” presented at the 12th International Conference on Cognitive & Neural Systems, Boston, MA, May 14-17, 2008.

135. D.C. Wunsch, “Clustering,” presented at the Science of Learning Seminar Series, Boston University, Center for Adaptive Systems & Dept. of Cognitive & Neural Systems, Boston, MA, Mar. 21, 2008.

136. W. Liu, G.K. Venayagamoorthy, J. Sarangapani, D.C. Wunsch, M.L. Crow, L. Liu, and D.A. Cartes, “Comparisons of an adaptive neural network based controller and an optimized conventional power system stabilizer,” in *Proc. Intelligent Control, 2007. ISIC 2007. IEEE 22nd International Symposium on Intelligent Control*, Oct. 1-3, 2007, pp. 922 – 927.

137. W. Liu, J. Sarangapani, G.K. Venayagamoorthy, D. Wunsch, M.L. Crow, and D.A. Cartes, "Neural network based decentralized controller designs for large scale power systems," presented at the 22nd IEEE International Symposium on Intelligent Control, Singapore, Oct. 1-3, 2007.

138. Tae-hyung Kim and D.C. Wunsch, “Prediction of the critical point in the life-death problem in Go with BP-trained MLP,” presented at the Intelligent Systems Center Research Symposium, University of Missouri-Rolla, Rolla, MO, 2007.

139. R.J. Meuth and D.C. Wunsch, "Neural computation on game hardware," in *Proc. International Symposium on Intelligent Control*, Singapore, Oct. 1-3, 2007.

140. X.S. Chen, M.H. Lim, and D.C. Wunsch II, “A memetic algorithm configured via a problem solving environment for the Hamiltonian cycle problems,” presented at the IEEE Congress on Evolutionary Computation, Singapore, Sept. 25-28, 2007, Paper #2097.

141. N. Brannon, G. Conrad, T. Draelos, J. Seiffertt, D.C. Wunsch, and P. Zhang, “Coordinated machine learning and decision support for situation awareness,” Sandia National Laboratories, Albuquerque, NM, SAND2007-6058, Sept. 2007.

142. R. Xu, S. Damelin, and D.C. Wunsch, “Applications of diffusion maps in gene expression data-based cancer diagnosis analysis,” in *Proc. Engineering in Medicine and Biology Society, 2007. EMBS 2007. 29th Annual International Conference of the IEEE*, Aug. 22-26, 2007, pp. 4613–4616.

143. T.-H. Kim, R.J. Meuth, P. Robinette, and D.C. Wunsch, “GPU Go: Accelerating Monte-Carlo UCT,” presented at the UMR Intelligent Systems Center Poster Conference, Rolla, MO, Fall 2007.

144. A.M. Abdelbar, S. Abdelshahid, and D.C. Wunsch, “Gaussian versus Cauchy membership functions in PSO,” in *Proc. International Joint Conference on Neural Networks*, Orlando, FL, Aug. 2007, pp. 2902-2907.

145. R. Meuth and D.C. Wunsch II, “Approximate dynamic programming and neural networks on game hardware,” in *Proc. International Joint Conference on Neural Networks*, Orlando, FL, Aug. 2007, pp. 852-856.

146. D.C. Wunsch, “Why neural nets are still our best hope for computational intelligence,” presented at the Tsinguha University Research Seminar, Beijing, China, May 29, 2007.

147. J. Seiffertt and D.C. Wunsch, “A single-ART architecture for seamlessly switching among unsupervised, supervised, and reinforcement learning,” presented at the Eleventh International Conference on Cognitive and Neural Systems, Boston, MA, May 2007.

148. T.-H. Kim, L.D. Pyeatt, and D.C. Wunsch II, “Performance comparison of Z-learning to Q-learning for reconfigurable disruption tolerant routing,” presented at the *Eleventh International Conference on Cognitive and Neural Systems*, Boston University, Boston, MA, May 2007.

149. D.C. Wunsch, “Making hard problems easier,” presented at the European Symposium on Time Series Prediction (ESTSP 2007), Espoo, Finland, Feb. 7-9, 2007.

150. D.C. Wunsch II, “Neuroengineering für schwere probleme: Modularität, skalierung, komplexität und robustheit,” presented at an invited research seminar at the Technical University of Munich, Germany, Oct. 4, 2006.

151. D.C. Wunsch, “Neuroengineering hard problems: Modularity, scale, complexity and robustness,” presented at an invited research seminar at the Technical University of Dresden, Germany, Department of Informatics, Oct. 2, 2006.

152. D.C. Wunsch, “Neuroengineering hard problems: Modularity, scale, complexity and robustness,” presented at an invited research seminar at the Research Center Julich, Germany, Sept. 29, 2006.

153. D.C. Wunsch, “Neuroengineering hard problems: Modularity, scale, complexity and robustness,” presented at an invited research seminar at the Technical University of Berlin, Germany, Sept. 28, 2006.

154. D.C. Wunsch, “Neuroengineering hard problems: Modularity, scale, complexity and robustness,” presented at an invited research seminar at Shanghai Jiao Tong University, Shanghai, China, Mar. 12, 2006.

155. D.C. Wunsch, “Neuroengineering hard problems: Modularity, scale, complexity and robustness,” presented at the International Conference on Intelligent Computing (ICIC), Kunming, China, Aug. 16-19, 2006.

156. D.C. Wunsch, “Neuroengineering hard problems: Modularity, scale, complexity and robustness,” presented at the Third International Symposium on Neural Networks (ISNN), Chengdu, China, May 28–31, 2006.

157. R. Xu, G.K. Venayagamoorthy, and D.C. Wunsch, “A study of particle swarm optimization in gene regulatory networks inference,” in *Advances in Neural Networks – ISNN 2006: Third International Symposium on Neural Networks (ISNN)*, Chengdu, China: Springer, May 28–31, 2006, pp. 648 - 653.

158. N. Zhang and D.C. Wunsch II, “Application of collective robotic search using neural network based dual heuristic programming (DHP),” presented at the Third International Symposium on Neural Networks (ISNN), Chengdu, China, May 28–31, 2006.

159. E. Kussul, T. Baidyk, F. Lara-Rosano, O. Makeyev, A. Martin, D.C. Wunsch, “Micromechanics as a testbed for artificial intelligence methods evaluation,” in *Proc. IFIP WCC Symposium on Professional Practice in AI2006, IFIP WCC AI2006*, Santiago de Chile, Chile, Aug. 21-24, 2006, pp. 10.

160. W. Liu, J. Sarangapani, G. Venayagamoorthy, D. Wunsch, and D. Cartes, “Neural network based decentralized excitation control of large scale power systems,” presented at the *IEEE / INNS International Joint Conference on Neural Networks (IJCNN 2006)*, Vancouver, Canada, July 16-21 2006.

161. T. Draelos, N. Brannon, J. Seiffertt, D.C. Wunsch, and G. Conrad, “Information fusion and situation awareness using ARTMAP and partially observable Markov decision processes,” presented at the IEEE / INNS International Joint Conference on Neural Networks (IJCNN 2006) Vancouver, Canada, July 16-21 2006.

162. E. Kussul, T. Baidyk, D. Wunsch II, O. Makeyev, and A. Martin, “Image recognition systems based on random local descriptors,” presented at the *IEEE / INNS International*

Joint Conference on Neural Networks (IJCNN 2006) Vancouver, Canada, July 16-21, 2006.

163. R. Xu and D.C. Wunsch II, "Computational intelligence in clustering algorithms, with applications," in *Proc. 5th International Conference on Algorithms for Approximation (A4A5)*, A. Iske and J. Levesley, Eds. Chester, England, UK: Springer, Heidelberg, 2006, pp. 31-50.

164. D.C. Wunsch II, "Supervised, unsupervised and reinforcement learning: Where we've come and where we're going," presented at the 20th Congreso de Instrumentacion of the Sociedad Mexicana de Instrumentacion (SOMI XX), Leon, Mexico, Oct. 24-28, 2005.

165. X. Hu, A. Maglia, and D.C. Wunsch II, "A general recurrent neural network approach to model genetic regulatory networks," presented at the IEEE EMBC 05, the Engineering in Medicine and Biology Society Annual Meeting, Shanghai, China, Sept. 1-5, 2005.

166. R. Xu, X. Cai, and D.C. Wunsch II, "Gene expression data for DLBCL cancer survival prediction with a combination of machine learning technologies," in *Proc. 27th Annual International Conference of IEEE Engineering in Medicine and Biology Society*, Shanghai, China, Sept., 2005, pp. 894-897.

167. D.C. Wunsch II, "The view from a great mountain: A tribute," presented at SG@65 and CNS@15, Boston, MA, Sept. 2005.

168. H. Weng, X. Dong, X. Hu, D. Beetner, T. Hubing, and D.C. Wunsch, "Neural network detection and identification of electronic devices based on their unintentional emissions," in *Proc. 2005 IEEE International Symposium on Electromagnetic Compatibility*, Chicago, IL, Aug., 2005.

169. A.M. Abdelbar, M.A. El-Hemaly, E.A.M. Andrews, and D.C. Wunsch II, "Negative reinforcement and backtrack-points for recurrent neural networks for cost-based abduction," in *Proc. IEEE / INNS International Joint Conference on Neural Networks*, July 31–Aug. 4, 2005, Paper #1220.

170. E. Kussul, T. Baidyk, D.C. Wunsch II, "Image recognition systems with permutative coding," in *Proc. IEEE / INNS International Joint Conference on Neural Networks*, July 31–Aug. 4, 2005, Paper #1274.

171. A.M. Abdelbar, S. Abdelshahid, and D.C. Wunsch II, "Fuzzy PSO: A generalization of particle swarm optimization," in *Proc. IEEE / INNS International Joint Conference on Neural Networks*, July 31–Aug. 4, 2005, Paper #1517.

172. X. Hu, G. Clark, M. Travis, J. Vian, and D.C. Wunsch II, "Aircraft cabin noise minimization via neural network inverse model," in *Proc. IEEE / INNS International Joint Conference on Neural Networks*, July 31–Aug. 4, 2005, Paper #1714.

173. R. Xu and D.C. Wunsch II, “Gene regulatory networks inference with recurrent neural network models,” in *Proc. IEEE / INNS International Joint Conference on Neural Networks*, July 31–Aug. 4, 2005, pp. 286-291.

174. X. Cai and D.C. Wunsch II, “Engine data classification with simultaneous recurrent network using a hybrid PSO-EA algorithm,” in *Proc. IEEE / INNS International Joint Conference on Neural Networks*, July 31–Aug. 4, 2005, pp. 2319-2323.

175. R. Dua, J. Seiffertt, B.J. Blaha, K. Gupta, V. Satagopan, D. Beetner, R.J. Stanley, and D.C. Wunsch, "Hands-on projects and exercises to strengthen understanding of basic computer engineering concepts," presented at the ASEE Annual Conference and Exposition, Portland, OR, June 12-15, 2005.

176. N. Zhang, D. Beetner, D.C. Wunsch, B. Hemmelman, A. Hasan, “An embedded real-time neuro-fuzzy controller for mobile robot navigation,” in *Proc. Fuzzy Systems, 2005. FUZZ '05. The 14th IEEE International Conference on Fuzzy Systems*, May 22-25, 2005, pp. 319–324.

177. N. Zhang and D.C. Wunsch II, “A switched-resistor approach to hardware implementation of neural networks,” in *Proc. Fuzzy Systems, 2005. FUZZ '05. The 14th IEEE International Conference on Fuzzy Systems*, May 22-25, 2005, pp. 336-340.

178. D.C. Wunsch, “Attacking the traveling salesman problem using neural networks,” *INNS Newsletter*, vol. 2, no. 2-3, Sept.–Dec. 2004, pp. 7-9.

179. R. Xu, X. Hu, and D.C. Wunsch II, “Inference of genetic regulatory networks with recurrent neural network models,” in *Proc. 26th Annual International Conference of IEEE Engineering in Medicine and Biology Society*, vol. 2, Sept. 2004, pp. 2905-2908.

180. R. Xu, G.C. Anagnostopoulos, and D.C. Wunsch II, “Multi-class cancer classification by semi-supervised ellipsoid ARTMAP with gene expression data,” in *Proc. 26th Annual International Conference of IEEE Engineering in Medicine and Biology Society*, vol. 1, Sept. 2004, pp. 188-191.

181. R. Xu, X. Hu, and D.C. Wunsch, “Inference of genetic regulatory networks from time series gene expression data,” in *IJCNN ’04: IEEE / INNS International Joint Conference on Neural Networks*, Budapest, Hungary, 2004, pp. 1215-1220.

182. X. Hu and D.C. Wunsch, “IJCNN 04 challenge problem: Time series prediction with a weighted bidirectional multi-stream extended Kalman filter,” presented at the IJCNN ’04: IEEE / INNS International Joint Conference on Neural Networks, Budapest, Hungary, 2004.

183. X. Cai, N. Zhang, G.K. Venayagamoorthy, and D.C. Wunsch, “Time series prediction with recurrent neural networks using a hybrid PSO-EA algorithm,” in *Proc. IJCNN ’04: IEEE / INNS International Joint Conference on Neural Networks*, Budapest, Hungary, 2004, pp. 1647-1652.

184. W. Liu, J. Sarangapani, G.K. Venayagamoorthy, D. Wunsch, and M. Crow, “Neural network stabilizing control of single machine power system with control limits,” presented at the IJCNN ’04: IEEE / INNS International Joint Conference on Neural Networks, Budapest, Hungary, 2004.

185. W. Liu, J. Sarangapani, D.C. Wunsch II, and M.L. Crow, “Decentralized neural network control of a class of large-scale systems with unknown interconnections," presented at the 43rd IEEE Conference on Decision and Control, Atlantis, the Bahamas, Dec. 14-17, 2004.

186. W. Liu, J. Sarangapani, G.K. Venayagamoorthy, and D.C. Wunsch II, “Feedback linearization based power system stabilizer design with control limits," presented at the 36th North American Power Symposium, Moscow, ID, Aug. 9-10, 2004.

187. H. Goksu, T. Hubing, D. Beetner, and D.C. Wunsch II, “Electromagnetic detection and identification of automobiles,” presented at EUROEM ’04, Germany, 2004.

188. R. Xu and D.C. Wunsch II, “Application of ellipsoid ART/ARTMAP in analyzing gene expression data,” presented at the 8th International Conference on Cognitive and Neural Systems, Boston, MA, 2004.

189. A.N. Rapaka, W. Elmenreich, and D.C. Wunsch II, “TTP/A protocol and design on ATMEL 8-bit microprocessor,” in *Circuit Cellar*, Jan. 2004.

190. D.C. Wunsch II and S. Mulder, “Evolutionary algorithms, Markov decision processes, adaptive critic designs, and clustering: Commonalities, hybridization, and performance,” in *Proc. IEEE International Conference on Intelligent Sensing and Information Processing*, Chennai, India, Jan. 4-7, 2004.

191. D.C. Wunsch II and A. Miller, “Systems of systems: Cybersecurity vulnerabilities and opportunities affecting the power grid,” presented at the NSF Workshop on Applied Mathematics for Deregulated Electric Power Systems: Optimization, Control, and Computational Intelligence, Crystal City, VA, Nov. 3-4, 2003.

192. H. Goksu, D. Pommerenke, and D.C. Wunsch II, “FDTD data extrapolation using multilayer perceptron,” presented at the IEEE Symposium on Electromagnetic Compatibility, Boston, MA, 2003.

193. B. Blaha and D.C. Wunsch II, "Database-driven neural networks and evolutionary computation," in *Proc. Artificial Neural Networks in Engineering*, St. Louis, MO, Nov. 2-5, 2003. New York: ASME Press, 2003, pp. 279-285.

194. J. Dalton, M. Insall, and D.C. Wunsch II, “A Max-plus, dioid based neural network for discrete event system modeling,” in *Proc. Artificial Neural Networks In Engineering*, St. Louis, MO, Nov. 2-5, 2003. New York: ASME Press, 2003, pp. 915-920.

195. N. Zhang and D.C. Wunsch II, "A decision tree approach for the subcircuit extraction problem,"in *Proc. Artificial Neural Networks in Engineering*, St. Louis, MO, Nov. 2-5, 2003. New York: ASME Press, 2003, pp. 921-926.

196. W. Liu, G.K. Venayagamoorthy, and D.C. Wunsch II, "A heuristic dynamic programming – based power system stabilizer for a turbogenerator in a single machine power system," in *Proc. IEEE Industrial Applications Society, 38th Annual Meeting*, Salt Lake City, Utah, Oct. 12-16, 2003, pp. 270-276.

197. N. Zhang and D.C. Wunsch II, "Practical motivational strategies and new thoughts in a computer engineering laboratory," presented at the 38th ASEE Midwest Section Conference, University of Missouri-Rolla, Rolla, MO, Sept. 10-12, 2003.

198. R.J. Bieniek, D.R. Carrol, C. Mendoza, O.A. Pringle, K.T. Wan, and D.C. Wunsch, "How to establish successful cooperative student learning centers for STEM courses," presented at the *38th ASEE Midwest Section Conference*, University of Missouri-Rolla, Rolla, MO, Sept. 10-12, 2003. *Available online:* http://lead.mst.edu/media/studentsupport/lead/documents/ASEEpaper.pdf

199. D.C. Wunsch II, "Fuzzy logic in ethics analysis," presented at the 38th ASEE Midwest Section Conference, University of Missouri-Rolla, Rolla, MO, Sept. 10-12, 2003.

200. W. Liu, G.K. Venayagamoorthy, and D.C. Wunsch II, "Online identification of turbogenerator's dynamics using a neuro-identifier," presented at Intelligent Systems Applications to Power Systems (ISAP), Lemnos, Greece, Aug. 31-Sept. 3, 2003.

201. W. Liu, G.K. Venayagamoorthy, and D.C. Wunsch II, "Real-time dual heuristic programming–based neurocontroller for a turbogenerator in a multimachine power system," presented at Intelligent Systems Applications to Power Systems (ISAP), Lemnos, Greece, Aug. 31-Sept. 3, 2003.

202. A.N. Rapaka, S. Bogollu, and D.C. Wunsch II, "Locating moving objects over sensor networks," presented at *WISES '03*, Vienna, Austria, Aug. 2003.

203. H. Goksu and D.C. Wunsch II, "Information theoretical sliding window optimization applied to discretization of continuous signals," in *Proc. Continuum Models and Discrete Systems, vol.* Shoresh, Israel, 2003, p. 83.

204. N. Zhang and D.C. Wunsch II, "A comparison of dual heuristic programming (DHP) and neural network based stochastic optimization approach on collective robotic search problem," in *Proc. International Joint Conference on Neural Networks (IJCNN)*, Portland, OR, July 20-24, 2003.

205. S. Mulder and D.C. Wunsch II, "Using adaptive resonance theory and local optimization to divide and conquer large scale traveling salesman problems," in *Proc. International Joint Conference on Neural Networks (IJCNN)*, Portland, OR, July 20-24, 2003.

206. A.N. Rapaka, A. Novokhodko, and D.C. Wunsch II, “Intrusion detection using radial basis function network on sequences of system calls,” in *Proc. International Joint Conference on Neural Networks (IJCNN)*, Portland, OR, July 20-24, 2003.

207. R. Dua, V. Eller, K.M. Isaac, S.E. Watkins, and D.C. Wunsch II, “Intelligent strain sensing on a smart composite wing using extrinsic Fabry-Perot interferometric sensors and neural networks,” in *Proc. International Joint Conference on Neural Networks (IJCNN)*, Portland, OR, July 20-24, 2003.

208. W. Liu, G.K. Venayagamoorthy, and D.C. Wunsch II, “Adaptive neural network based power system stabilizer design,” in *Proc. International Joint Conference on Neural Networks (IJCNN)*, Portland, OR, July 20-24, 2003.

209. X. Hu, J. Vian, J.R. Slepski, and D.C. Wunsch II, “Vibration analysis via neural network inverse models to determine aircraft engine unbalance condition,” in *Proc. International Joint Conference on Neural Networks (IJCNN)*, Portland, OR, July 20-24, 2003.

210. R. Xu and D.C. Wunsch II, "Probabilistic neural networks for multi-class tissue discrimination with gene expression data," in *Proc. International Joint Conference on Neural Networks (IJCNN)*, Portland, OR, July 20-24, 2003, pp. 1696-1701.

211. Q. Yao, D. Beetner, D.C. Wunsch II, and B. Osterloh, “A RAM-based neural network for collision avoidance in a mobile robot,” in *Proc. International Joint Conference on Neural Networks (IJCNN)*, Portland, OR, July 20-24, 2003.

212. A.N. Gorban, A.Y. Zinovyev, and D.C. Wunsch II, “Application of the method of elastic maps in analysis of genetic texts,” in *Proc. International Joint Conference on Neural Networks (IJCNN)*, Portland, OR, July 20-24, 2003.

213. N. Zhang and D.C. Wunsch II, “A fuzzy attributed graph approach to subcircuit extraction problem,” in *Proc. IEEE International Conference on Fuzzy Systems (FUZZ-IEEE)*, St. Louis, MO, May 25-28, 2003.

214. N. Zhang and D.C. Wunsch II, “An extended Kalman filter (EKF) approach on fuzzy system optimization problem,” in *Proc. IEEE International Conference on Fuzzy Systems (FUZZ-IEEE)*, St. Louis, MO, May 25-28, 2003.

215. N. Zhang and D.C. Wunsch II, “Fuzzy logic in collective robotic search,” in *Proc. IEEE International Conference on Fuzzy Systems (FUZZ-IEEE)*, St. Louis, MO, May 25-28, 2003.

216. N. Zhang and D.C. Wunsch II, “A comparison of decision tree approach and neural networks based heuristic dynamic programming approach for subcircuit extraction problem,” in *Proc. SPIE Intelligent Computing: Theory and Applications Symposium: OR03 AeroSense 2003*, Orlando, FL, Apr. 2003.

217. G.K. Venayagamoorthy, R.G. Harley, and D.C. Wunsch II, "Intelligent control of turbogenerator exciter/turbine on the electric power grid to improve power generation and stability," in *Proc. Fifth International Conference on Power System Operation and Planning*, Abuja, Nigeria, Dec. 16 - 18, 2002.

218. S. Mulder and D.C. Wunsch II, "Large scale traveling salesman problem via neural network divide and conquer," in *Proc. ICONIP '02*, Singapore, Nov. 2002.

219. R. Dua, S. Watkins, and D.C. Wunsch, "Vibration analysis using extrinsic Fabry-Perot interferometric sensors and neural networks," in *Proc. Artificial Neural Networks in Engineering (ANNIE)*, St. Louis, MO, Nov. 2002.

220. N. Zhang, F. Harary, and D.C. Wunsch "CMOS IC topology design verification by heuristic dynamic programming (HDP)," in *Proc. Artificial Neural Networks in Engineering (ANNIE)*, St. Louis, MO, Nov. 2002.

221. N. Zhang and D.C. Wunsch, "A Novel subcircuit extraction algorithm using heuristic dynamic programming (HDP)," in *Proc. International Conference on VLSI*, Las Vegas, NV, June 24-27, 2002.

222. G.K. Venayagamoorthy, R.G. Harley, and D.C. Wunsch, "Experimental verification of derivative adaptive critic based neurocontroller performance on single turbogenerators on the electric power grid," in *Proc. International Joint Conference on Neural Networks 02, World Congress on Computational Intelligence*, May 12-17, 2002, Paper #1064.

223. T. Draelos, D.C. Wunsch, D. Duggan, M. Collins, "Adaptive critic designs for host-based intrusion detection," in *Proc. International Joint Conference on Neural Networks 02, World Congress on Computational Intelligence*, May 12-17, 2002, Paper #1332.

224. X. Cai and D.C. Wunsch, "Counterexample of a claim pertaining to the synthesis of a recurrent neural network," in *Proc. International Joint Conference on Neural Networks 02, World Congress on Computational Intelligence*, May 12-17, 2002, pp. 2029-2032.

225. R. Xu, G.C. Anagnostopoulos, and D.C. Wunsch, "Tissue classification through analysis of gene expression data using a new family of ART architectures," in *Proc. International Joint Conference on Neural Networks 02, World Congress on Computational Intelligence*, May 12-17, 2002, pp. 300-304.

226. X. Hu, J. Vian, J. Choi, D. Carlson, and D.C. Wunsch, "Propulsion vibration analysis using neural network inverse modeling," in *Proc. International Joint Conference on Neural Networks 02, World Congress on Computational Intelligence*, May 12-17, 2002, paper #2351.

227. B. Blaha and D.C. Wunsch, "Evolutionary programming to optimize an assembly program," in *Proc. Congress on Evolutionary Computation 02, World Congress on Computational Intelligence*, May 12-17, 2002, Paper #7324.

228. A. Agarwahl, M. Insall, and D.C. Wunsch, “Representations of uncertainty in a lattice theoretic framework,” in *Abstracts of Papers Presented to the American Mathematical Society*, AMS Annual Meeting, vol. 23, no. 1, issue 127, Jan. 2002, p. 49.

229. A. Gorban, A. Pitenko, A. Zinovyev, and D.C. Wunsch, “Visualization of any data with elastic map method,” in *Proc. Artificial Neural Networks in Engineering*, St. Louis, MO, Nov. 2001.

230. A. Gorban, T. Popova, M. Sadovsky, and D.C. Wunsch, “Information content of the frequency dictionaries, reconstruction, transformation and classification of dictionaries and genetic texts,” in *Proc. Artificial Neural Networks in Engineering*, St. Louis, MO, Nov. 2001.

231. R. Xu and D.C. Wunsch, “Analysis of gene expression data by ellipsoid ART and ARTMAP,” presented at the *3rd Georgia Tech - Emory Intl. Conf. On Bioinformatics*, Atlanta, GA, Nov. 2001.

232. R. Dua, S.E. Watkins, D.C. Wunsch, F. Akhavan, and K. Chandrashekhara, "Detection and classification of impact-induced damage in composite plates using neural networks," presented at NIMIA2001, Crema, Italy, Oct. 2001

233. T. Draelos, M. Collins, D. Duggan, E. Thomas, and D.C. Wunsch, “Experiments on adaptive techniques for host-based intrusion detection,” Sandia National Laboratories, Albuquerque, NM, SAND2001-3065, Sept. 2001.

234. G.K. Venayagamoorthy, R. Harley, and D.C. Wunsch, “Experimental studies with continually online trained artificial neural network identifiers for multiple turbogenerators on the electric power grid,” in *Proc. IEEE International Joint Conference on Neural Networks*, vol. 2. Washington, DC, July 2001, pp. 1267-1272.

235. G.K. Venayagamoorthy, R. Harley, and D.C. Wunsch, “Excitation and turbine neurocontrol with derivative adaptive critics of multiple generators on the power grid,” in *Proc. IEEE International Joint Conference on Neural Networks*, vol. 2. Washington, DC, July 2001, pp. 984-989.

236. N. Vishwanathan and D.C. Wunsch, “ART / SOFM: A hybrid approach to the TSP,” in *Proc. IEEE International Joint Conference on Neural Networks*, vol. 4. Washington, DC, July 2001, pp. 2554-2557.

237. X. Cai and D.C. Wunsch, “A parallel computer Go player, using HDP method,” in *Proc. IEEE International Joint Conference on Neural Networks*, vol. 4. Washington, DC, July 2001, pp. 2373-2375.

238. X. Cai, R. Xu, V.A. Samaranayake, D.C. Wunsch, “A statistical solution to a text decoding challenge problem,” in *Proc. IEEE International Joint Conference on Neural Networks*, vol. 2. Washington, DC, July 2001, pp. 1043-1046.

239. R. Dua, S.E. Watkins, D.C. Wunsch, K. Chandrashekhara, F. Akhavan, “Detection and classification of impact-induced damage in composite plates using neural networks,” in *Proc. IEEE International Joint Conference on Neural Networks*, vol. 1. Washington, DC, July 2001, pp. 681-686.

240. G.K. Venayagamoorthy, R.G. Harley, and D.C. Wunsch, “Dual heuristic programming excitation neurocontrol for generators in a multimachine power system,” in *Proc. Industry Applications Conference, 2001. Thirty-Sixth IAS Annual Meeting, vol. 2*, 2001, pp. 926 –931.

241. A. Novokhodko and D.C. Wunsch, “Using an adaptive critic design for intrusion detection,” in *Proc. Application and Science of Computational Intelligence: SPIE Aerosense Conference*, vol. 4390. Orlando, FL, Apr. 2001.

242. N. Zhang and D.C. Wunsch, “A comparative study of neural networks based algorithms on robotic search problems,” in *Proc. Application and Science of Computational Intelligence: SPIE Aerosense Conference*, vol. 4390. Orlando, FL, Apr. 2001.

243. G.K. Venayagamoorthy, R.G. Harley, and D.C. Wunsch, "Artificial neural networks for identifying turbogenerators in a multimachine power system,"in *Proc. Tenth South African Universities Power Engineering Conference*, Cape Town, South Africa, Jan. 24-25, 2001, pp. 258-261.

244. S. Li, D.C. Wunsch, E. O’Hair, M. Giesselmann“Using neural networks to estimate wind turbine power generation,” in *Proc. IEEE Power Engineering Society Winter Meeting 2001*, vol. 3. Columbus, OH, Jan. 28–Feb. 1, 2001, pp. 1294-1299.

245. G.K. Venayagamoorthy, R.G. Harley, and D.C. Wunsch, "Adaptive neural network identifiers for effective control of turbogenerators in a multimachine power system," in *Proc. IEEE Power Engineering Society Winter Meeting 2001*, vol. 3. Columbus, OH, Jan. 28-Feb. 1, 2001, p. 977.

246. G.K. Venayagamoorthy, R.G. Harley, D.C. Wunsch, “A nonlinear voltage controller with derivative adaptive critics for multi-machine power systems,” in *Power Industry Computer Applications, 2001. PICA 2001. Innovative Computing for Power - Electric Energy Meets the Market. 22nd IEEE Power Engineering Society International Conference*, Sydney, Australia, May 20-24, 2001, pp. 324–329.

247. A.N. Gorban, A.A. Rossiev, and D.C. Wunsch II, “Neural network modeling of data with gaps: Method of principal curves, Carleman’s formula, and other,” presented at the Krasnoyarsk State Technical University Seminar Series, Siberia, Russia, 2000.

248. A. Goltsev and D.C. Wunsch, “A neural network for segmentation of line drawings into lines of different orientations,” *Proc. Artificial Neural Networks in Engineering*, St. Louis, MO, Nov. 5-8, 2000.

249. D.C. Wunsch, “The cellular simultaneous recurrent network adaptive critic design for the generalized maze problem has a simple closed-form solution,” in *Proc. IEEE/INNS International Joint Conference on Neural Networks,* Vol. 3. Como, Italy, July 24-27, 2000, pp. 79-82.

250. G.K. Venayagamoorthy, R.G. Harley, and D.C. Wunsch, “Comparison of a heuristic dynamic programming and a dual heuristic programming based adaptive critics neurocontroller for a turbogenerator,” in *Proc. IEEE/INNS International Joint Conference on Neural Networks*, vol. 3. Como, Italy, July 24-27, 2000, pp. 233 - 238.

251. G.K. Venayagamoorthy, D.C. Wunsch, and R.G. Harley, "Neurocontrol of turbogenerators with derivatives adaptive critics,” presented at the IFAC Conference on Technology Transfer in Developing Countries – Automation in Infrastructure Creation, Pretoria, South Africa, July 5-7, 2000.

252. G.K. Venayagamoorthy, R.G. Harley, and D.C. Wunsch, “Adaptive critic based neurocontroller for turbogenerators with global dual heuristic programming,” in *Proc. IEEE Power Engineering Society Winter Meeting 2000*, vol. 1. Singapore, Jan. 23-27, 2000, pp. 291-294.

253. G.K. Venayagamoorthy, D.C. Wunsch, and R.G. Harley, "Neurocontrol of turbogenerators with adaptive critic designs," in *Proc. IEEE Africon 99 Conference*, vol. 1. Cape Town, South Africa, Sept. 28-Oct. 2, 1999, pp. 489-494.

254. M. Iyer, T. Wiesner, and D.C. Wunsch, “Dynamic re-optimization and control of a fed-batch fermentor using adaptive critic designs,” presented at the American Society of Chemical Engineers Winter Annual Meeting, Dallas, TX, Oct. 31-Nov. 5, 1999.

255. S.L. Shishkin and D.C. Wunsch, "Harmonic control for robust global stabilization of induction motors," in *Proc. American Control Conference '99*, vol. 3. San Diego, CA, June 2-4, 1999, pp. 2163-2167.

256. M. Iyer and D.C. Wunsch, "Dynamic re-optimization of a fed-batch fermentor using heuristic dynamic programming," in *Proc. American Control Conference '99*, vol. 5. San Diego, CA, June 2-4, 1999, pp. 2980-2985.

257. M. Iyer and D.C. Wunsch, "Fed-batch dynamic optimization using generalized dual heuristic programming," in *Proc. IEEE / INNS International Joint Conference on Neural Networks '99*, vol. 5. Washington, DC, pp. 3305-3310.

258. M.R. Us-Zaman and D.C. Wunsch, "TD methods applied to mixture of experts for learning 9x9 Go evaluation function," in *Proc. IEEE / INNS International Joint Conference on Neural Networks '99*, vol. 6. Washington, DC, pp. 3734-3739.

259. A.G. Ivakhnenko, D.C. Wunsch, and G.A. Ivakhnenko, "Inductive sorting-out GMDH algorithms with polynomial complexity for active neurons of neural network," in *Proc.*

IEEE / INNS International Joint Conference on Neural Networks '99, vol. 2. Washington, DC, pp. 1169-1173.

260. E. Saad, J. Vian, J. Choi, and D.C. Wunsch, "Efficient training techniques for classification with vast input space," in *Proc. IEEE / INNS International Joint Conference on Neural Networks '99*, vol. 2. Washington, DC, pp. 1333-1338.

261. E. Saad, T. Caudell, and D.C. Wunsch, "Predictive head tracking for virtual reality," in *Proc. IEEE / INNS International Joint Conference on Neural Networks '99*, vol. 6. Washington, DC, pp. 3933-3936.

262. S. Li, D.C. Wunsch, E. O'Hair, and M. Giesselmann, "Wind turbine power estimation by neural networks with Kalman filter training on a SIMD parallel machine," in *Proc. IEEE / INNS International Joint Conference on Neural Networks '99*, vol. 5. Washington, DC, pp. 3430-3434.

263. E. Kussul, D. Rachkovskij, and D.C. Wunsch, "The random subspace coarse coding scheme for real-valued vectors," in *Proc. IEEE / INNS International Joint Conference on Neural Networks '99*, vol. 1. Washington, DC, pp. 450-455.

264. W.L. Dunin-Barkowski, S. Markin, L. Podladchikova, and D.C. Wunsch, "Cerebellar learning: A possible phase switch in evolution," in *Proc. IEEE / INNS International Joint Conference on Neural Networks '99*, vol. 1. Washington, DC, pp. 21-26.

265. L. Witali, S.M. Dunin-Barkowski, L. Podladchikova, and D.C. Wunsch, "Climbing fiber Purkinje cell twins are found," in *Proc. IEEE / INNS International Joint Conference on Neural Networks '99*, vol. 1. Washington, DC, 219-222.

266. W.L. Dunin-Barkowski, S.N. Markin, L.N. Podladchikova, and D.C. Wunsch, "On a role of a climbing fiber in granule cells – Purkinje cell connections tuning," in *Proc. Society for Neuroscience Annual Meeting*, 1999, p. 1561.

267. S. Li, D.C. Wunsch, E. O'Hair, and M. Giesselmann, "Extended Kalman filter training of neural networks on a SIMD parallel machine," in *Proc. Artificial Neural Networks in Engineering '99*, ASME Press.

268. Z. Ge, D.C. Wunsch, and L. Philips, "Tornado prediction: A Markov decision process," presented at the Conference on Severe Weather, Lubbock, TX, Feb. 9-11, 1999.

269. M. Iyer and D.C. Wunsch, "Dynamic re-optimization of a fed-batch fermentor using dual heuristic programming," presented at the International Conference on Computational Intelligence for Modelling, Control and Automation, CIMCA '99, Vienna, Austria.

270. J. Dunyak and D.C. Wunsch, "Fuzzy probability for system reliability," in *Proc. 37th IEEE Conference on Decision and Control*, vol. 3, 1998, pp. 2934-2935.

271. W.L. Dunin-Barkowsky, S.N. Martin, L.N. Podladchikova, and D.C. Wunsch, "Super-synchrony: Climbing fiber Purkinje cells twins, in search of events and a case study," in *Proc. Beyond Neurons and Synchrony, The 6th Annual Dynamical Neuroscience Satellite Symposium, in Conjunction with the 28th Annual Meeting for the Society for Neuroscience*, Los Angeles, CA, Nov. 6-7, 1998.

272. S. Li, E. O'Hair, M.G. Giesselmann, and D.C. Wunsch, "Comparative analysis of regression and neural network models for wind power," in *Proc. Artificial Neural Networks in Engineering '98*, ASME Press.

273. W.L. Dunin-Barkowski, S.L. Shishkin, and D.C. Wunsch, "Phase-based storage of information in cerebellum: A case of stationary random inputs," in *Proc. CNS*98: The Annual Computational Neuroscience Meeting*, Santa Barbara, CA, July 25-30, 1998.

274. W.L. Dunin-Barkowski, J.M. Orem, and D.C. Wunsch, "Detection of influence of brain-stem neurons and intra-cranial field potentials on the diaphragm activity," in *Proc. CBMS'98: The 11th IEEE Symposium on Computer-Based Medical Systems*, Lubbock, TX, June 12-14, 1998, pp. 264-269.

275. W.L. Dunin-Barkowski, J.M. Orem, and D.C. Wunsch, "Cerebellar pathologies and Ondine's curse," in *Proc. International Workshop on Neural Modeling of Brain and Cognitive Disorders*, College Park, MD, June 4-6, 1998.

276. J. Dunyak and D.C. Wunsch, "Training fuzzy number neural networks using constrained backpropagation," in *Proc. FUZZ-IEEE '98, IEEE World Congress on Computational Intelligence*, vol. 2. Anchorage, AK, May 1998, pp. 1142-1146.

277. A.N. Gorban and D.C. Wunsch, "The general approximation theorem," in *Proc. IEEE / INNS International Joint Conference on Neural Networks '98, IEEE World Congress on Computational Intelligence*, vol. 1. Anchorage, AK, May 1998, pp. 1271-1274.

278. W. Dunin-Barkowski, S.L. Shishkin, and D.C. Wunsch, "Computational intelligence and cerebellar enigmas," in *Proc. IEEE / INNS International Joint Conference on Neural Networks '98, IEEE World Congress on Computational Intelligence*, vol. 1. Anchorage, AK, May 1998, pp. 640-645.

279. E.M. Kussul, D.A. Rachkovskij, L.M. Kasatkina, N.N. Kussul, and D.C. Wunsch, "On possible ACD application for optimization of cutting and assembly in mechanical engineering," in *Proc. IEEE / INNS International Joint Conference on Neural Networks '98, IEEE World Congress on Computational Intelligence*, vol. 2. Anchorage, AK, May 1998, pp. 1685-1687.

280. E.M. Kussul, L.M. Kasatkina, D.A. Rachkovskij, and D.C. Wunsch, "Application of random threshold neural networks for diagnostics of micro machine tool condition," in *Proc. IEEE / INNS International Joint Conference on Neural Networks '98, IEEE World Congress on Computational Intelligence*, vol. 1. Anchorage, AK, May 1998, pp. 241-244.

281. D.C. Wunsch, "Adaptive critics for machine learning," presented at Texas Systems Day, Lubbock, Nov. 1998.

282. R. Uz-Zaman and D.C. Wunsch, "A hybrid learning architecture for computer Go," presented at Texas Systems Day, Lubbock, Nov. 1998.

283. J. Dunyak and D.C. Wunsch, "Safety analysis of redundant systems using fuzzy probability theory," in *Proc. High Consequences Operations Safety Symposium II*, Albuquerque, NM: Sandia National Laboratories, July 1997.

284. D.C. Wunsch, "The need for improved reinforcement learning techniques in intelligent agents," in *Proc. IEEE International Conference on Neural Networks*, Houston, TX: IEEE, 1997, pp. 2279-2282.

285. R. Zaman, D. Prokhorov, and D.C. Wunsch, "Adaptive critic design in learning to play game of Go," in *Proc. IEEE International Conference on Neural Networks*, Houston, TX: IEEE, 1997, pp. 1-4.

286. S. Li, D.C. Wunsch, E. O'Hair, and M.G. Giesselmann, "Neural network for wind power generation with compressing function," in *Proc. IEEE International Conference on Neural Networks*, Houston, TX: IEEE, 1997, pp. 115-120.

287. A.N. Gorban, Y.M. Mirkes, and D.C. Wunsch, "High order orthogonal tensor networks: Information capacity and reliability," in *Proc. IEEE International Conference on Neural Networks*, Houston, TX: IEEE, 1997, pp. 1311-1314.

288. M.Y. Senashova, A.N. Gorban, and D.C. Wunsch, "Back-propagation of accuracy," in *Proc. IEEE International Conference on Neural Networks*, Houston, TX: IEEE, 1997, pp. 1998-2001.

289. J. Dunyak and D.C. Wunsch, "A training technique for fuzzy number neural networks," in *Proc. IEEE International Conference on Neural Networks*, Houston, TX: IEEE, 1997, pp. 533-536.

290. R. Zaman and D.C. Wunsch, "Prediction of yarn strength from fiber properties using fuzzy ARTMAP," in *Proc. Vision, Recognition, Action: Neural Models of Mind and Machine*, Boston, MA, May 1997.

291. D.V. Prokhorov and D.C. Wunsch, "A general training procedure for stable control with adaptive critic designs," in *Proc. Vision, Recognition, Action: Neural Models of Mind and Machine*, Boston, MA, May 1997.

292. S. Li, D.C. Wunsch II, E. O'Hair, and M.G. Giesselmann, "Using a neural network to predict wind power generation," presented at the ASME International Solar Energy Conference, Washington, DC, Apr. 27-30, 1997.

293. D.C. Wunsch and D.V. Prokhorov, “The need for adaptive critic designs in intelligent agents,” in *Proc. IEEE International Conference on Systems, Man and Cybernetics*, Orlando, FL: IEEE, Oct. 12-15, 1997, pp. 3073-3077.

294. J. Dunyak and D.C. Wunsch, “Training fuzzy number neural networks with alpha-cut refinements,” in *Proc. IEEE International Conference on Systems, Man and Cybernetics*, Orlando, FL: IEEE, Oct. 12-15, 1997, pp. 189-194.

295. D. Prokhorov and D.C. Wunsch, “Convergence of critic-based training,” in *Proc. IEEE International Conference on Systems, Man and Cybernetics*, Orlando, FL: IEEE, 1997, pp. 3057-3060.

296. E.M. Kussul, N.N. Kussul, and D.C. Wunsch, “Adaptive critic design for optimization of micromechanical factory neural control systems,” in *Proc. 5th European Congress on Intelligent Techniques and Soft Computing*, Aachen, Germany, vol. 1, Sept. 1997, pp. 528-534.

297. W. Dunin-Barkowski and D.C. Wunsch II, “Cerebellar learning after 35 years: Hypotheses, facts and applications,” presented at Machines That Think, Snowbird, UT, 1997.

298. A. Petrosian, R. Homan, D. Prokhorov, and D.C. Wunsch II, "Classification of epileptic EEG using neural network and wavelet transform," in *Proc. SPIE,* vol. 2825, Aug. 1996, pp. 834-843.

299. J.C. Haggard, N.A. Visnevski, and D.C. Wunsch, "Object-oriented approach for neural network implementation," Research report for the White Sands Missile Range (WSMR), NM, May 1996.

300. P. Eaton, D. Prokhorov, and D.C. Wunsch II, "Neurocontrollers for ball-and-beam systems,” in *Proc. Artificial Neural Networks in Engineering*, Nov. 1996.

301. D. Prokhorov and D.C. Wunsch II, “Advanced adaptive critic designs,” in *Proc. World Congress on Neural Networks*, International Neural Networks Society Annual Meeting, Sept. 1996.

302. D.C. Wunsch II, “Applied Computational Intelligence Laboratory at Texas Tech University,” presented at the *IEEE International Conference on Neural Networks*, Washington, DC, June 1996.

303. E. Saad, D. Prokhorov, and D.C. Wunsch II, “Advanced neural network training methods for low false alarm stock trend prediction,” in *Proc. International Conference on Neural Networks*, vol. 4, June 1996, pp. 2021-2026.

304. I. Saad, J. Dunyak, and D.C. Wunsch II, “Fuzzy Markov processes for nuclear transportation surety analysis,” presented at the Third Annual Student Research Conference of the Texas Engineering Experimental Station, Nov. 1996.

305. D.C. Wunsch II, “Introduction to adaptive critic designs for neurocontrol,” presented at the V.M. Glushov Institute for Cybernetics Two Day Short Course, Kiev, Ukraine, June 1996.

306. D.C. Wunsch II, “Neurocontrol for the aerospace industry,” presented at *WESTCON ’95*, San Francisco, CA, Oct. 1995.

307. B. Turner and D.C. Wunsch II, “Identification of choke points in a complex logistics optimization system,” presented at the *World Congress on Neural Networks*, International Neural Networks Society, Washington, DC, July 1995.

308. H. Tan, D.V. Prokhorov, and D.C. Wunsch II, "Probabilistic and time-delay techniques for conservative short-term stock trend prediction," in *Proc. World Congress on Neural Networks*, Washington, DC: International Neural Networks Society, July 1995.

309. H. Tan, D.V. Prokhorov, and D.C. Wunsch II, "Conservative thirty calendar day stock prediction using a probabilistic neural network," in *Proc. IEEE / International Association for Financial Engineers Conference on Computational Intelligence for Financial Engineering*, IEEE Press, Apr. 1995, pp. 113-117.

310. D.C. Wunsch II and D.V. Prokhorov, "Adaptive critic designs," presented at the *IEEE International Conference on Neural Networks*, Perth, Australia, Nov. 1995.

311. D.C. Wunsch II, "Adaptive critic designs," presented at the *1st NSF US--Mexico Workshop on Neural Networks*, Playa Del Carmen, Mexico, Sept. 1995.

312. D.C. Wunsch II, "A hierarchy of control problems and implementation of adaptive critic solutions," in *Proc. World Congress on Neural Networks*, Washington, DC: International Neural Networks Society, July 1995.

313. D. Prokhorov and D.C. Wunsch II, "Adaptive critic control of Autolander," presented at the *NASA Ames Workshop on Neural Networks in Aerospace*, Aug. 1994.

314. R. Uz-Zaman and D.C. Wunsch, “An adaptive VLSI neural network chip,” in *Proc. IEEE International Conference on Neural Networks, 1994. IEEE World Congress on Computational Intelligence*, vol. 4, 1994, pp. 2018 –2021.

315. D.C. Wunsch II, "Philosophical and societal implications of computational intelligence," presented at the *Proc. IEEE International Conference on Neural Networks, IEEE World Congress on Computational Intelligence*, Orlando, FL, July 1994.

316. W. Kreesuradei, D.C. Wunsch II, and M. Lane, "Time delay neural network for small time series data sets," in *Proc. World Congress on Neural Networks*, vol. II. International Neural Networks Society, June 1994, pp. 248-253.

317. D.V. Prokhorov and D.C. Wunsch II, "A threshold polynomial neural network," in *Proc. World Congress on Neural Networks,* vol. II. INNS, June 1994, pp. 334-337.

318. D.C. Wunsch II, “Neural networks in the former Soviet Union,” in *Proc. World Congress on Neural Networks,* vol. IV. INNS, June 94, pp. 260-268.

319. D.C. Wunsch II, “Fuzzy logic and neural network techniques in surety assessment,” presented at the *Sandia National Laboratories Surety Seminar Series,* Oct. 1994.

320. B. Turner and D.C. Wunsch II, “Neural network enhancement of the Los Alamos force deployment estimator,” in *Proc. High Consequence Surety Symposium*, Sandia National Laboratory, July 1994.

321. D.C. Wunsch II, "Aerospace applications of neural networks: A Russian perspective," in *Proc. AIAA Symposium on Aerospace Applications*, AIAA, Oct. 1993.

322. DC.. Wunsch, “Open challenges in the field of neural networks,” presented at the *Russian Neural Network Society Quarterly Meeting*, Moscow, Russia, June 1993.

323. M. Fritz, D.C. Wunsch, and S. Mitra, "Adaptive control of an active automobile suspension system," presented at the *SPIE Conf. on Image Processing & AI*, Boston, MA, Sept. 1993.

324. D.C. Wunsch, "Weapons systems security assessment with intelligent computing," presented at the *Conference on High-Consequence Surety*, Albuquerque, NM, Oct. 1993.

325. D.C. Wunsch II, D.J. Morris, T.P. Caudell, and R.A. Falk, “An optical adaptive resonance neural network utilizing phase conjugation,” in *Proc. First Russian Neural Network Society / IEEE Symposium on Neuroinformatics and Neurocomputers*, Rostov-on-Don, Russia, vol. 1, IEEE Press, Oct. 1992, pp. 615-622.

326. D.C. Wunsch II, “A comparison of adaptive resonance hardware options,” in *Proc. Second International Conference on Neural Networks for Learning, Recognition and Control*, May 14-16, 1992.

327. D.C. Wunsch II, D.J. Morris, T.P. Caudell, and R.A. Falk, “An optical implementation of adaptive resonance utilizing phase conjugation,” in *Proc. International Joint Conference on Neural Networks*, vol. 1, Baltimore, MD, June 7-11, 1992, pp. 59-63.

328. D.C. Wunsch II, T.P. Caudell, and K. Zikan, “Optical and optoelectronic neural network implementations at the Boeing Company,” presented at the *Government Microcircuit Applications Conference*, Las Vegas, NV, Oct. 1992.

329. D.C. Wunsch II, T.P. Caudell, D.J. Morris, and R.A. Falk, "An optical implementation of adaptive resonance utilizing phase conjugation," in *Proc. Second International Conference on Neural Networks for Learning, Recognition and Control*, May 14-16, 1992.

330. T.P. Caudell, S.D.G. Smith, G.C. Johnson, and D.C. Wunsch II, “An application of neural networks to group technology,” in *Proc. SPIE,* vol. 1469, *Applications of Neural Networks II*, Apr. 1991.

331. D.C. Wunsch II, “Performance assessment of a parallel optoelectronic neural network,” presented at *Supercomputing 91*, Albuquerque, NM, Nov. 1991.

332. D.C. Wunsch II, T.P. Caudell, D. Capps, and R.A. Falk, “An optoelectronic adaptive resonance unit,” in *Proc. International Joint Conference on Neural Networks*, vol. 2. Seattle, WA, July 1991, pp. 541-549.

333. K. Bergerson and D.C. Wunsch II, “A commodity trading model based on a neural network - expert system hybrid,” in *Proc. International Joint Conference on Neural Networks*, vol. 1. Seattle, WA, July 1991, pp. 289-293.

334. T.P. Caudell, S. Smith, C. Johnson, D.C. Wunsch II, and R. Escobedo, “An industrial application of neural networks to reusable design,” in *Proc. International Joint Conference on Neural Networks*, vol. 2. Seattle, WA, July 1991, p. 919.

335. T.P. Caudell and D.C. Wunsch II, “A hybrid optoelectronic ART-1 neural processor,” in *Proc. International Joint Conference on Neural Networks*, vol. 2. Seattle, WA, July 1991, p. 926.

336. D.C. Wunsch II, T.P. Caudell, D. Capps, and R.A. Falk, “A neural architecture for unsupervised learning with shift, scale and rotation invariance, efficient software simulation heuristics, and optoelectronic implementation,” in *Proc. Hawaii International Conference on System Sciences*, vol. 1, Jan. 1991, pp. 298-304.

337. D.C. Wunsch II, A. Gaillard, and R. Escobedo, “Hypercolumn architectures for preprocessing of weld image data,” presented at the *International Conference on Neural Sensory Motor Systems*, Dusseldorf, Germany, 1990.

338. D.C. Wunsch II, T.P. Caudell, D. Capps, and R.A. Falk, “An optoelectronic learning machine,” presented at the *Optical Society of America Annual Meeting*, Boston, MA, Nov. 1990.

339. D.C. Wunsch II, A. Gaillard, and R. Escobedo, “An introduction to neural hypercolumn architectures,” presented at the *International Conference on Neural Computing*, Dusseldorf, Germany, 1990.

340. D.C. Wunsch II, A. Gaillard, and M. Singer, "Neural network architectures for machine vision," *Boeing Advanced Technology Center Report*, Seattle, WA, 1990.

341. D.C. Wunsch II, T.P. Caudell, D. Capps, and R.A. Falk, “An optoelectronic learning machine,” in *Northcon Proceedings*, Seattle, WA, Oct. 1990.

342. A. Gaillard, D.C. Wunsch II, and R. Escobedo, “Neural hypercolumn architectures for the preprocessing of radiographic weld images,” in *Proc. SPIE*, vol. 1294, *Applications of Neural Networks*, Apr. 1990.

343. T. Caudell, S. Smith, C. Johnson, D.C. Wunsch and R. Escobedo, “A data compressed ART1 neural network algorithm,” in *Proc. SPIE Conference on Aerospace Sensing*, Apr. 1990.

344. D. Wunsch, “Optical neural networks,” presented at the Puget Sound Section of the Optical Society of America, Aug. 1989.

345. R. Escobedo, A. Gaillard, M. Singer, and D.C. Wunsch II, "A neural network investigation of radiographic weld images," *Boeing Advanced Technology Center Report*, Seattle, WA, 1989.

346. D.C. Wunsch II, “Adaptive resonance theory, masking fields, and other advanced neural network architectures,” presented at the Boeing Neural Networks Interest Group Seminar, Seattle, WA, Sept. 1987.

347. D.C. Wunsch II, “Introduction to neural networks,” presented to the Seattle Section of American Association of Artificial Intelligence, Seattle, WA, March 1987.

348. D.C. Wunsch II, “Optical artificial neural systems: Technical overview and recommendations,” Boeing High Technology Center Photonics Laboratory Report, Seattle, WA, 1987.

349. D.D. Nguyen, D.C. Wunsch II, and E.C. Goldstick, “An optical computer design for stochastic processing with applications to neural networks,” *Boeing High Technology Center Report*, Seattle, WA, 1986.

Videoconferences

1. D.C. Wunsch II, Neural Network Interest Group, May 1991.

2. D.C. Wunsch II, A. Gaillard, and R. Escobedo, Neural Network Interest Group, 1989.

3. D.C. Wunsch II, Boeing Neural Network Videoconference 5-Part Series, Summer 1988.

Patents

1. R. Dua, S.E. Watkins, D.C. Wunsch, "Neural network demodulator for optical sensor," U.S. Patent 7,603,004, Filed June 12, 2007, Issued October 13, 2009.

2. R. Meuth, J.L. Vian, E.W. Saad, D.C. Wunsch, "Adaptive multi-vehicle coverage optimization system and method, U.S. Patent 8,260,510, Filed July 12, 2012, Issued December 31, 2013.

3. R. Meuth, J.L. Vian, E.W. Saad, D.C. Wunsch, "Adaptive multi-vehicle coverage optimization system and method, U.S. Patent 8,260,485, Filed September 18, 2007, Issued September 4, 2012.

4. E.W. Saad, J.L. Vian, R.J. Meuth, and D.C. Wunsch, "Hierarchical mission management," U.S. Patent Application 20110082717, October 5, 2009.

5. E.W. Saad, J.L. Vian, M.A. Vavrina, J.A. Nisbett, D.C. Wunsch, "Vehicle base station," US Patent 8,899,903, Application November 6, 2014, Issued 2017.

6. E.W. Saad, J.L. Vian, M.A. Vavrina, J.A. Nisbett, D.C. Wunsch, "Vehicle base station," US Patent 9,840,380, Application November 6, 2014, Issued 2017.

7. S Li, M Fairbank, X Fu, D Wunsch, E Alonso, "Systems, methods and devices for vector control of permanent magnet synchronous machines using artificial neural networks," Applied for June 9, 2014, US Patent No. 9,379,546, issued June 28, 2016.

8. E.W. Saad, S.R. Bieniawski, P.E.R. Pigg, J.L. Vian, P.M. Robinette, D.C. Wunsch, "Real time mission planning," U.S. Patent 9,064,222, Applied for May 14, 2010, issued June 23, 2015.

9. R. Xu, D.C. Wunsch, S. Kim, "Methods and systems for biclustering algorithm," U.S. Patent 9,043,326 Filed January 28, 2012, claiming priority to Provisional U.S. Patent Application, January 28, 2011, issued May 26, 2015.

National / International Service Activities and Memberships

Special Issue Guest Editor, *Neural Networks*, Elsevier, 2019.
IEEE Systems, Man and Cybernetics (SMC) Fellow Nominee Evaluation Committee 2018
IEEE Computational Intelligence Society (CIS) Fellow Nominee Evaluation Committee 2011, 2012, 2013, 2015, 2016, 2017
General Chair, IEEE Computational Intelligence in Bioinformatics and Computational Biology conference 2018
International Neural Networks Society Ad Hoc Advisory Committees:
2018 (Foundation formation, journal relations, other matters)
2017 (Management contract evaluation, call for proposals, bid evaluations)

International Neural Networks Society History Committee, 2018-present.
Chair, IEEE CIS History Committee, 2014-2015
Member, IEEE CIS History Committee, 2012 – present.
IEEE CIS Neural Networks Technical Committee, 2007 – present
IEEE CIS Computational Finance and Economics Technical Committee, 2007 – present
IEEE CIS Games Technical Committee, 2007 - present
International Neural Networks Society Senior Fellow 2007-2013
Advisory Committee, International Symposium on Neural Networks, 2010
Federation of International Robosoccer Association Executive Committee 2009- 2011.
Federation of International Robosoccer (FIRA) Congress 09, Steering Committee.
NRC Assessment Rating Survey Invited Reviewer 2007.
International Neural Networks Society Past President, 2006.
International Neural Network Society President, 2005.
International Neural Networks Society President-Elect, 2004.
Elected International Neural Network Society Board of Governors Member 02-03.
General Chair, IEEE / INNS IJCNN 03.
International Conference on Intelligent Computing 08, Shanghai, General Chair.
IEEE Computational Intelligence Society Technical Committee, 2002-2004. (Vice-Chair, 2003).
Technical Co-Chair and Special Sessions Chair, IJCNN 02.
Action Editor, 03- 13, *Neural Networks* (Journal of the International Neural Networks Society)
Editorial Board, *Cybernetics and Computer Engineering*
Editorial Board, *Memetic Computing*
Idaho EPSCOR Project Advisory Board, member 2002 - 2004, Chair, 2003.
General Chair, NSF / ACIL USA NIS Neurocomputing Opportunities Workshop, Washington, D.C., July 1999.
Associate Editor, 1998, *IEEE Transactions on Neural Networks*
Technical Program Committee Member: FEPCON 98, South Africa; Second IEEE / RNNS Symposium on Neuroinformatics and Neurocomputing, Rostov-on-Don, Russia, 1995; IEEE Conference on Computer Based Medical Systems, 1998 and 1995; Artificial Neural Networks in Engineering 98 - present; SPIE Applications and Science of Computational Intelligence 1999, 2000, 2001; IEEE / INNS IJCNN (many times), ISIC 2006, 2008, numerous other meetings.
Special Session Chair and Organizer, IEEE Systems, Man and Cybernetics Society Annual Meeting, 1997.
Program Chair, IEEE Neural Network Council Distinguished Lecturer Series, 1991 - 95.
Session Chair, INNS World Congress on Neural Networks, 1995.
Session Chair, IEEE International Conference on Neural Networks, 1995.
Publications Chair, First IEEE / International Association of Financial Engineers Conference on Computational Intelligence for Financial Engineering, 1995.
Voting member IEEE Neural Network Council 1992 - 1994.
Special Session Chair and Organizer on Philosophical and Societal Implications of Computational Intelligence, IEEE World Congress on Computational Intelligence, 94.
Session Chair, IEEE World Congress on Computational Intelligence, 1994.
Session Chair, IEEE/INNS International Joint Conference on Neural Networks, 1992.
Session Chair, IEEE/INNS International Joint Conference on Neural Networks, 1991.
Local Arrangements Chair, IEEE/INNS International Joint Conference on Neural Networks, 1991.
Book reviewer for *Neural Networks*.

Member: Eta Kappa Nu, SPIE, Mathematical Association of America, Phi Kappa Phi, Sigma Xi, Association for Computing Machinery, American Association for Artificial Intelligence (Member for Life), International Neural Network Society, IEEE with several society memberships.

Reviewer for:

Proceedings of the IEEE, IEEE Press, Prentice-Hall, McGraw-Hill, *IEEE Transactions on Neural Networks, Neurocomputing, Neural Networks, AIAA Journal, Journal of Intelligent Control, Neurocomputing and Fuzzy Logic, Applied Optics, Optical Engineering, JOSA A, IEEE Circuits andDevices, IEEE Transactions on Systems, Man and Cybernetics, International Journal of Approximate Reasoning, Journal of Risk Analysis, Optics Letters*, IEEE Engineering Research Initiation Grant, Three Diplom (M.S. equivalent) projects at Krasnoyarsk State Technical University, Russia, numerous conferences, various international funding agency reviews, NASA contracts, and NSF proposals and panels (regular programs, Phase I & II SBIR's, Center grants, site visits, special programs, and CAREER Awards).

Local Service Activities

While At UMR / Missouri S&T:

University of Missouri (Statewide) System Level
UM Bioinformatics Consortium Executive Committee (representing UMR) 00-06
President's Award for Research & Creativity Selection Committee 99-02
University of Missouri Research Board Proposal Reviewer, 02, 06, 07

UMR / Missouri S&T and Outside of School of Engineering Level
Chair, Information Technology and Computing Committee, 06-13
Chair, CIO Search Committee, 07, 12 - 13
Vice-Chair, Student Design and Experiential Learning Center (SDELC) Director Search, 12-13
Vice-Chair, SDELC Board, 12-13
Chair, SDELC Board, 13-14
Member, SDELC Board, 07 - present
Curators' Teaching Professor Selection Committee, 13, 15, 16
University Corporate Relations Team, Faculty Senate Rep. 08 - 12
Ad-hoc Faculty Committee for Inquiry of Research Misconduct Allegations 08, 13
Member, Information Technology and Computing Committee, 03-13
Elected member, Faculty Senate, 06 – 10
Chair, ITCC Computer Security Task Force 03- 12
Chair, ITCC Computer Security Subcomittee, 12-16
Faculty Advisor, Robotics Team 07 – 16
Faculty Advisor, Newman Center, 16 - present
Faculty Advisor, Underwater Robotics Team 16 - present
Faculty Advisor, Youn Wha Ryu Club 07 – 16
Faculty Advisor, Tae-Kwon-Do Club 12 – present
Faculty Advisor, Aikido Club 15 - present
Faculty Advisor, Go Miners Club (Go, Baduk, Weichi), 08 - 12

Chair, UMR Computer Security Cluster of Excellence 04-06
Senior Investigator, Intelligent Systems Center 04 - present
UMR Intellectual Property Committee, 07 – 10
School of Materials, Energy & Earth Resources Promotion & Tenure Committee, 05
Provost's Task Force on Conflict of Interests 04
UMR Research Excellence Award Committee 01-02, 04
Co-Chair, Bioinformatics Faculty Search Committee 00-01
Co-Chair, Bioinformatics Faculty Search Committee 01-02
Distinguished Teaching Professor Selection Committee 03-06
Curator's Professor Selection Committee 04-06
Committee on Standards for Distinguished and Named Chairs 03
Campus-wide Promotion and Tenure Committee (alternate) 03-06
Faculty Excellence Awards Selection Committee, 00 , 04 – 08
Member, CIO Search Committee, 2016

School of Engineering & Out of Department Level
Distinguished Teaching Professor Nominating Committee 07
Bernard Sarchet Professor Search Committee, Engineering Management, 05-06
School of Engineering Third-Year Review Committee 02-04
School of Engineering Promotion and Tenure Committee 02-04

ECE Department Level
Chair, Electrical & Computer Engineering Promotion & Tenure Committee, 2017 - present
Electrical & Computer Engineering Promotion and Tenure Committee Member 99 – present
Promotion & Tenure Process Subcommittee 09 – 13
Computer Science & Computer Engineering Working Group 08-09
Chair, Electrical & Computer Engineering Post-Tenure Standards Committee 02
Chair, Computer Engineering Search Committee 04
Chair, Computer Engineering Search Committee 08
Computer Engineering Search Committee (numerous times, every search so far)
ECE Wilkins Chair Search Committee 01-02
ECE Scholarship Committee 00-present
ABET Accreditation Committee, 00-02
Attended ABET EC2000 Open Enrollment Faculty Workshop, Baltimore, April 2000.
ECE Graduate Studies Committee 02-03
Ph.D. Qualifying Examiner 00 – present
Chair, Cynthia Tang Missouri Distinguished Professor of Computer Engineering Search Committee, 2011-2014
ECE Lab Committee 2016 – present

Community Service:
St. Patrick Newman Center Board Member 2015-present
St. Patrick Newman Center Director Search Committee Member 2017-2018
Cub Scout Pack 85 Assistant Cubmaster 07-08
Cub Scout Pack 85 Chair of Pack Committee 08-10
Boy Scout Troop 85 Assistant Scoutmaster 10-16
Boy Scout Troop 85 Committee Member 18 - present

Boy Scout River Trails District Merit Badge Counselor 10-present
St. Patrick School Board 10 – 13
Lector, St. Patrick's Church, 07 – present
Extraordinary Minister, St. Patrick's Church, 16 – present
Jury Foreman 08

Prior to UMR / Missouri S&T:

Occasional volunteer activity at St. John Neumann Church.
Interview committee for Minority Engineering Program Director, 1993.
Collaboration with Minority Engineering Program, including Reese Recruitment Concept, assistance with Grow Your Own proposal, recruitment of a distinguished minority guest speaker, and referrals of students to that program.
Prolific Contributor to COE Strategic Planning Task Force Report, March 1995.
Faculty Forum contributor.
Active participant in Dean's Strategic Planning Retreat, Fall 1995.
Participant in exchange program with Fachoschule Wilmhelmshafen, Germany, 98.
Digital Electronics Curriculum Committee member.
Graduate Curriculum Committee Member.
Ph.D. preliminary examiner in communications.
Departmental representative for numerous thesis examinations.
Member, EE Chair Search Committee 95.
Member, CS Chair Search Committee 98.
Member, EE Faculty Search Committee 98, 99.

Teaching, Advising and Supervision

Advised 21 completed Ph.D.'s

Ph.D.'s

Advisor for completed Ph.D.s of:

From Texas Tech
(all Electrical Engineering):
Danil Prokhorov, Toyota Research USA (1999 INNS Young Investigator Award)
Mohammad Raonak-Uz-Zaman, Integrated Device Technologies
Emad Saad, Boeing
Shuhui Li, University of Alabama – Tuscaloosa, Associate Professor. (Co-advisor, with O'Hair)

From UMR / Missouri S&T:
(Computer Engineering)
Nian Zhang, University of the District of Columbia, Assistant Professor
Alexander Novokhodko, Microsoft
Xiao Hu, GE Global Research, Manager, Data Analytics
Xindi Cai, Schneider Electric, Research Engineer
Brian Blaha (awarded posthumously)
Ryan Meuth, Arizona State University, Lecturer

John Seiffertt, Truman State University, Assistant Professor
Sejun Kim, Intel, Research Scientist
Dao Lam, Washington University in St. Louis
Seaar Al-Dabooni, Basrah Oil Company, (formerly South Oil Company), Iraq
Khalid Al-Jabery, Basrah Oil Company, (formerly South Oil Company), Iraq

(Systems Engineering)
George Shannon, National Library of Medicine (Co-advisor with Corns)

(Computer Science)
Samuel Mulder, Sandia National Laboratories, Member of Technical Staff

(Electrical Engineering)
Wenxin Liu, Lehigh University, Assistant Professor. (Co-advisor, with Venayagamoorthy)
Rui Xu, GE Global Research
Rohit Dua, Missouri S&T, Teaching Assistant Professor (Co-advisor, with Watkins)
Tae-hyung Kim, Korea Telecom, Seoul

Advisor

At UMR/ Missouri S&T:

Serving as Ph.D. advisor for:

Computer Engineering:	Adam Sampson, Leonardo Enzo Brito de la Silva, Dustin Tanksley, Niklas Melton, Raghu Yelugam, Ronit Das
Electrical Engineering:	
Systems Engineering:	
Computer Science:	Islam Elnarawaby, Tao Wu

Serving as M.S. advisor for:

Computer Engineering:	Ben Smith
Electrical Engineering:	
Systems Engineering:	
Computer Science:	

Advisor for Completed MS of:

Electrical Engineering:	Amit Agarwahl, Vishwanathan Narayan, Xiao Hu, Rohit Dua, Qiang Yao, Huseyin Goksu, A.J. Shrestha, J. Adam Nisbett, Matt Strautmann
Computer Engineering:	Haiying Huang (posthumously awarded), Xindi Cai, Brian Blaha, Arvind Rapka Nath, Kevin Bollom, Ryan Meuth, Paul Robinette, Sejun Kim, Clayton Smith
Computer Science	Paul Pigg, Raghavendra Kotikalapudi
Systems Engineering	Sravan Aravpalli

Prior to UMR:

Served on numerous M.S. committees in EE and CS.
Served on Ph.D. committees of: Mike Morelli, Emre Kaymaz, Dogan Timucin, Surya Pemmaraju, Alok Kher, Mahesh Iyer and John Joe Anderson.
Advisor for completed M.S. Theses of: Worapoj Kreesuradej, Raonak Uz-Zaman, Hong Tan, Emad Saad, Paul Eaton, Ihab Saad, Nikita Visnevski, Dmitri Abramov.
Served as advisor or co-advisor, prior to leaving Texas Tech, for:
Dr. Murat Guven, Dr. Zhanyu Ge, Ravi Siringeedi, Madhu Kassymayolua, Ashish Pandaya, Dr. Sergey Maslyakov.

Selected as one of the favorite faculty in many graduating Seniors' exit interviews and polls.

Supervision of Visiting Scientists

Prof. Ernst Kussul, Sabbatical, Universidad Autonoma Nacional de Mexico, Fall 2016

Prof. Tetyana Baidyk, Sabbatical, Universidad Autonoma Nacional de Mexico, Fall 2016

Prof. Pavlo Tymoshchuk, Univ. Lyvov, Ukraine, Fulbright Fellow, Fall 2015 – Summer 2016

Yongliang Yang, Univ. Science & Technology Beijing, 1/2015 – 1/2017

Dr. Tayo Obafemi-Ajayi, Postdoctoral Fellow, Spring 2014 - Summer 2016

Lei Xue, Northeastern Univ. Nanjing, 1/2014 – 1/2015

Dr. Cameron Johnson, Postdoctoral Fellow, Fall 2008 – Spring 2009

Prof. Larry Pyeatt, Associate Professor, Texas Tech University, January 05 – August 06.

Prof. Frank Harary, Distinguished Visiting Professor, UMR, Spring 2000.

Prof. Meng Hiot Lim, Associate Professor, Nanyang Technological Institute, Singapore.Sabbatical Visit, UMR, Fall 1999 – Spring 2000.

Dr. Mahesh Iyer, Postdoctoral Fellow, Texas Tech, Spring, Summer 1998.

Dr. Serge Shishkin, Postdoctoral Fellow, Texas Tech, Fall 1996 – Summer 1999.

Prof. Witali Dunin-Barkowski, Research Professor, Texas Tech, Spring 1996 – Summer 1999.

Classes

Fall 1988
EE 235 Linear Systems Analysis
Spring 1989
EE 235 Linear Systems Analysis
Spring 1993
EE 5380 Digital System Theory
2nd Summer 1993
EE 2372 Modern Digital System Design
Fall 1993
EE 2372 Modern Digital System Design
EE 4334 Project Laboratory V
Spring 1994
EE 4333 Project Laboratory IV
EE 5380 Digital Systems Theory
1st Summer 1994
EE 2303 Electrical Systems Analysis
2nd Summer 1994
EE 5335 Special Topic: Synthetic Intelligence (new)
Fall 1994
EE 2372 Modern Digital System Design
EE 3333 Project Laboratory III
Spring 1995
EE 2372 Modern Digital System Design
EE 3333 Project Laboratory III
Fall 1995
EE 2372 Modern Digital System Design
EE 4364 Digital Signal Processing
Spring 1996
EE 2372 Modern Digital System Design
EE 5363 Adaptive Image Processing
Fall 1996
EE 2372 Modern Digital System Design
Spring 1997
EE 2372 Modern Digital System Design
EE 3333 Project Lab III
Fall 1997
IS1100 The Freshman Seminar
EE 5328 Statistical Theory of Communications
Spring 1998
EE 3303 Linear Systems Analysis
Summer 1998
Artificial Intelligence (Advanced Undergraduate class, Fachhochschule Wilhelmshaven, exchange program. Taught in English and German.)
Fall 1998
EE 2372 Modern Digital System Design

IS 1100 The Freshman Seminar
Spring 1999
EE 5331 Adaptive Critic Designs (new)
EE 2333 Project Lab 2
Fall 1999
ECE 243 Communication Systems
Winter 2000
CpE 111 Introduction to Computer Engineering
Fall 2000
CpE 213 Digital System Design (8051 – based)
Winter 2001
CpE 401 Markov Decision Processes (new)
Fall 2001
CpE 401 Adaptive Critic Designs (new)
Winter 2002
Cpe 401 Literature Search Techniques in Computer Engineering (new)
CpE 111 Introduction to Computer Engineering
Fall 2002
Cpe 401 Scientific Method in Computer Engineering (new)
CpE 111 Introduction to Computer Engineering
Winter 2003
CpE 111 Introduction to Computer Engineering (Two sections)
Fall 2003
CpE/EE 392 Senior Project Lab II
Winter 2004
CpE 111 Introduction to Computer Engineering
Fall 2004
CpE 111 Introduction to Computer Engineering
Cpe 401 Literature Search Techniques in Computer Engineering (new)
Winter 2005
CpE 401 Markov Decision Processes (new, team taught with Larry Pyeatt)
Cpe 401 Scientific Method in Computer Engineering (new)
Fall 2005
CpE 111 Introduction to Computer Engineering
CpE 458 Adaptive Critic Designs (team taught with Larry Pyeatt)
Winter 2006
CpE 401 Markov Decision Processes (new, team taught with Larry Pyeatt)
Fall 2006
CpE 111 Introduction to Computer Engineering
Winter 2007
CpE 111 Introduction to Computer Engineering
Cpe 401 Scientific Method in Computer Engineering
Fall 2007
CpE 111 Introduction to Computer Engineering
Cpe 412 Advanced Digital Logic Design
Winter 2008
Cpe 401 Clustering

Fall 2008
- CpE 111 Introduction to Computer Engineering
- CpE 300 Introduction to Robotics (new, with Ryan Meuth)

Winter 2009
- CpE/EE 392 Senior Project Lab II

Fall 2009
- CpE 111 Introduction to Computer Engineering
- CS 345 Robotic Manipulation (with Paul Robinette)

Winter 2010
- CpE 111 Introduction to Computer Engineering
- Cpe 401 Clustering

Fall 2010
- CpE 111 Introduction to Computer Engineering
- CpE/EE 392 Senior Project Lab II

Winter 2011
- CpE 111 Introduction to Computer Engineering
- CS 345 Robotic Manipulation (with Adam Nisbett)

Fall 2011
- CpE 111 Introduction to Computer Engineering
- CpE/EE 391 Senior Project Lab I

Winter 2012
- CpE 457 Clustering
- CpE/EE 392 Senior Project Lab II

Fall 2012
- CpE 111 Introduction to Computer Engineering

Spring 2013
- CpE 458 Adaptive Critic Designs
- CpE/EE 392 Senior Project Lab II

Fall 2013
- CpE/EE 392 Senior Project Lab II
- CpE 358 Computational Intelligence

Spring 2014
- CpE 457 Clustering
- CpE/EE 392 Senior Project Lab II

Fall 2014
- CpE 5310 Computational Intelligence
- CpE/EE 4097 Senior Project Lab II

Spring 2015
- CpE 6320 Adaptive Dynamic Programming
- CpE/EE 4097 Senior Project Lab II

Fall 2015
- CpE 2210 Digital Logic Design
- CpE 5310 Computational Intelligence

Spring 2016
- CpE 2210 Digital Logic Design
- CpE 6330 Clustering

Fall 2016

CpE 2210 Digital Logic Design
CpE 6310 Markov Decision Processes
Spring 2017
CpE 2210 Digital Logic Design
CpE 6320 Adaptive Dynamic Programming
Fall 2017
CpE 6001 Advanced Computational Intelligence
Spring 2018
CpE 6330 Clustering
Summer 2018
CpE 4999 Undergraduate Independent Study / Research
Fall 2018
CpE 6310 Markov Decision Processes

Course Creation

Created the following courses, new at its institution:
Synthetic Intelligence, Artificial Intelligence, Adaptive Image Processing, Adaptive Critic Designs, Markov Decision Processes, Scientific Method in Computer Engineering, Clustering, Introduction to Robotics, Adaptive Dynamic Programming, Advanced Computational Intelligence.

Awards and Recognition

Missouri University of Science & Technology Faculty External Recognition Award, 2016
INNS Gabor Award, 2015
IEEE Fellow
INNS Fellow
INNS Senior Fellow (Leader of INNS Fellows)
IEEE Electron Devices Society Distinguished Lecturer, 2005 - 2014
IEEE Computational Intelligence Society Distinguished Lecturer, 2011-2014
Charles Hedlund Distinguished Visiting Professor – American University in Cairo,
National Science Foundation CAREER Award,
Eta Kappa Nu, Phi Kappa Phi
Academician, International Academy of Technological Cybernetics
Academician, International Informatization Academy
Halliburton Award for Excellence 94-95
Who's Who in Science and Engineering 1999 - present.
Selected to appear in “Four Noted Professors” for RollaMO ’07 (the Yearbook).
Beta Gamma Sigma
Eagle Scout

Consulting

GoGetter, Inc.
Intel, New Business Initiatives
DeTao Group, Shanghai
Chief Executive Officer, ASSET LLC (sold in 2016 to co-Founder Bryce Schumacher)
Sandia National Laboratories
White Sands Missile Range
Accurate Automation Corporation
Rockwell International
Texas Tech University
Boston University
American University in Cairo
Universita Degli Studi di Siena
SAIC
Idaho EPSCOR
Greensfelder, Hemker and Gayle

Languages

English (native)
German (fluent, capable of university-level lectures)
Spanish (functional)
Limited ability (traveler's level) in Russian, Vietnamese, and Mandarin

Clearance

Secret (During Boeing MX Missile Electromagnetic Pulse analysis. Currently inactive.)

Previous and Current Funding

Over $10 million of which my share of credit was over $6 million. Sources included NSF, Boeing, DARPA, Sandia National Laboratories, Army Research Office, Ford Research Labs, and others. I served as sole or lead investigator in most of these contracts, and am highly skilled in both competitive and negotiated fundraising. Several of these contracts involved scouting for funds in non-obvious sources. These skills are transferable; I have learned them from others and passed them along to others. (Full list follows.)

Funding Details

Amount	Wunsch credit	Agency	Dates	Title (Wunsch sole PI except were indicated)
$ 12,500	$ 12,500	CFAR	9/93 - 8/94	Intelligent Computing Project
$ 225,800	$ 225,800	NSF	9/94-8/97	Adaptive Critic Designs and Implementations
$ 22,000	$ 22,000	CFAR	9-94 - 8/95	ACIL
$ 150,000	$ 150,000	Cascade	9/94-8/95	VLSI Design Software Grant
$ 90,000	$ 90,000	ANRCP	6/95 - 1/97	Neural Network Surety Analysis
$ 13,000	$ 13,000	Army AI Ctr	8/95 - 12/96	Neural Network Radar Scheduling
$ 112,000	$ 112,000	ARO	9/95 - 8/98	AASERT (matching grant Army AI Center Project)
$ 320,000	$ 250,000	NSF	9/95 - 8/96	Academic Research Infrastructure
				Wunsch, PI, S. Mitra, Co-PI
$ 14,000	$ 14,000	CFAR	9/95 - 8/96	ACIL
$ 10,500	$ 10,500	NSF	9/95 - 8/96	REU Supplement (for Adaptive Critic Designs)
$ 19,000	$ 19,000	AAC	11/95 - 10/96	SBIR Subcontract: Neurocontrol Models
$ 159,800	$ 79,900	TX ARP	1/96 - 8/97	Neural Network Modeling of Cotton
				Wunsch, PI, D. Ethridge, Co-PI
$ 48,295	$ 48,295	Ford	1/96 - 11/97	Neurocontrol Research Contract
$ 10,317	$ 10,317	Boeing	5/96 - 8/96	Ejection Seat Research Contract
$ 23,000	$ 11,500	CFAR	9/96 - 8/97	Neural Mapping for Wind Energy
				Wunsch, PI, E. O'Hair, Co-PI
$ 17,000	$ 17,000	CFAR	9/96 - 8/97	ACIL
$ 20,000	$ 20,000	Boeing	5/97 - 8/97	Neural Networks Aerospace Control Applications
$ 300,000	$ 300,000	NSF	7/97 - 6/99	CAREER:Adaptive Intelligent Agents for Internet (Later transferred)
$ 84,500	$ 84,500	NSF	7/97 - 6/99	Adaptive Critic Designs (Accomplishment-Based Renewal) (Later transfe
$ 10,000	$ 10,000	CFAR	7/97 - 8/98	ACIL
$ 40,000	$ 40,000	CER	7/97 - 8/00	CAREER: Adaptive Int...(matching grant)
$ 45,000	$ 45,000	CFAR	7/97 - 8/00	Adaptive Critic Designs (matching grant)
$ 141,018	$ 141,018	TX ARP	1/98 - 7/99	Detection of Tornadoes

$ 296,000	$ 148,000	INEEL	1/98 - 12/00	Intelligent Agents Wunsch, PI, J. Dunyak, Co-PI
$ 25,372	$ 25,372	Sandia	9/98 - 2/99	Adaptive Critic Designs in Intelligent Agents
$ 37,118	$ 37,118	Sawtek	11/98 - 5/99	Nonlinear Global Optimization
$ 25,500	$ 25,500	NSF	7/99 - 7/99	NSF/ACIL Neuro...Opportunities Workshop
$ 496,000	$ 248,000	NSF	10/99 - 9/02	CRCD Multidisciplinary Comp Eng (Later transferred) Wunsch, PI, J. Dunyak, Co-PI
$ 241,500	$ 241,500	NSF *	7/99 - 6/01	CAREER: Adaptive Intelligent Agents for the Internet
$ 41,200	$ 41,200	NSF *	7/99 - 6/00	Adaptive Critic Designs (Accomplishment-Based Renewal)
$ 236,831	$ 239,000	TTU *	10/99 - 9/02	Subcontract: NSF CRCD Multidisciplinary … * The above three contracts were transferred from TTU to UMR (now Missouri S&T) and thus are not counted in the total, to avoid double counting.
$ 25,967	$ 25,967	Boeing	5/00 - 8/00	Summer 00 Research Contract 1
$ 25,967	$ 25,967	Boeing	5/00 - 8/00	Summer 00 Research Contract 2
$ 23,536	$ 23,536	Boeing	9/00 - 5/01	Decision Algorithms Integrated Vehicle Health Management
$ 431,401	$ 21,570	NSF	9/00 - 8/01	Development of Virtual … Manufacturing (M. Leu, PI, et. al.)
$ 12,500	$ 625	MO Ent	7/00 - 6/01	Development of Virtual … Manufacturing (M. Leu, PI, et. al.)
$ 429,560	$ 266,724	NSF	10/00 - 9/03	ACD Neurocontrollers for Nonlinear Large Scale … Wunsch, PI, R. Harley, Co-PI
$ 40,001	$ 40,001	Sandia	11/00 - 9/01	Intrusion Detection
$ 20,006	$ 20,006	Boeing	5/01 - 8/01	Diagnostic / Prognostic Algorithms for IVHM
$ 10,000	$ 10,000	MO-RTC	8/01 - 8/01	Match for Diagnostic / Prognostic Algorithms for IVHM
$ 37,449	$ 37,449	Boeing	6/02 - 8/02	Integrated Vehicle Health Management
$ 12,316	$ 12,316	Boeing	6/02 - 8/02	Integrated Vehicle Health Management II
$ 210,000	$ 210,000	NSF	5/03 - 4/06	Scalable, Cellular Architectures, for Improving Solutions with Experienc
$ 103,458	$ 103,458	Boeing	3/03 - 9/04	Technical Support for Vibration Diagnostic Algorithms
$ 25,547	$ 25,547	Boeing	3/03 - 9/03	Technical Support for Discrete Diagnostic Algorithms

$	70,000	$ 17,500	NSF	11/02 - 10/03	SGER: Intelligent Adaptive Control of FACTS Devices in Distributed… (Venayagamoorthy, PI, et. al.)
$	33,500	$ 11,167	NSF	8/03 - 8/05	US- Brazil Collaborative Research: Feasibility Studies to Implement Neu (Venayagamoorthy, PI, et. al.)
$	45,159	$ 45,159	NSF	9/03 - 8/06	Supplement: ACD for control of MEMS
$	230,000	$ 57,500	NSF	6/04 - 5/07	Neural Network Based Wide Area Coordination and Local Control of Ele (Crow, PI, et. al.)
$	230,751	$ 230,751	Sandia	10/04 - 9/07	Knowledge Discovery via Sensor Fusion in Ad-Hoc Networks Project
$	42,112	$ 42,112	Boeing	11/04 -012/05	Engine Unbalance Detection in the Internal Stages
$	185,000	$ 185,000	BBN - DARPA	1/05 - 3/06	Survivable Policy Influenced Networking: Disruption-tolerance through I
$	71,977	$ 71,977	Boeing	11/05 - 8/06	Health Based Adaptive System Algorithms
$	240,000	$ 60,000	NSF	5/06 - 4/09	Impulse Control of Nonlinear Systems with Uncertainties Using Neural N (Balakrishnan, PI, Wunsch, Co-PI)
$	37,075	$ 37,075	Boeing	11/06 - 9/07	Health Based Adaptive System Algorithms
$	37,075	$ 37,075	Boeing	11/06 - 9/07	Health Based Adaptive System Algorithms
$	299,986	$ 239,989	NSF	8/07 - 7/10	Computer Go -- A Proxy for Key Open Challenges and Opportunities in C Wunsch, PI, Venayagamoorthy, Co-PI
$	80,000	$ 80,000	21st Century Systems	9/07 - 3/08	Hybrid Intrinsic Cellular inference Network (STTR Subcontract)
$	32,250	$ 8,063	NSF	8/07 - 4/09	Singapore supplement to Impulse Control of Nonlinear Systems with Unc Balakrishnan, PI, Wunsch , Co-PI
$	89,840	$ 89,840	Boeing	10/07 - 9/08	Health Based Adaptive System Algorithms
$	2,000,183	$ 750,069	NSF	11/08 - 10/12	EFRI-COPN: Neuroscience and Neural Networks for Engineering the Fut Venayagamoorthy, PI, Wunsch, Harley, Potter, Courzine, Co-PI's
$	140,201	$ 140,201	Boeing	10/08 - 9/09	Intelligent Adaptive System Algorithms
$	105,121	$ 105,121	21st Century Systems	10/08 - 9/09	Hybrid Intrinsic Cellular inference Network (STTR Subcontract)
$	82,395	$ 82,395	Boeing	5/09 - 9/09	Self-Aware Autonomous Swarms Testbed Integration
$	150,000	$ 75,000	ONR	4/09 - 3/10	DURIP: A GPU-based High Performance Computing Cluster for Multipl Wunsch, PI; Agarwahl, Tauritz, Venayagamoorthy, Co-PI's

$ 359,964	$ 179,999	NSF	8/11 - 7/15	Collaborative Research: Wind Power - Neural Network Control, Multidis
$ 16,052	$ 16,052	Dept. Transportation		CIES: Adapting Risk Management & Computational Intelligence Networ
$ 217,780	$ 47,836	NSF / UA	9/14 - 8/17	Toward Commercialization: Development of Neural Network Control &
$ 15,000	$ 7,500	MST Innovation Fund	9/15 - 5/16	In-Memory Data Analytics System to Support Visualization in Autism Sp
$ 300,000	$ 10,000	NSF / ASU	9/14 - 8/17	NSF EAGER: Building a Starting Core for No-Boundary Education and I
$ 922,744	$ 138,412	Dept Education	8/15 - 7/19	Interdisciplinary GAANN Program in Electrical Engineering and Enginee Pis
$ 202,000	$ 202,000	DARPA / ARL	10/18 - 9/19	M2L for L2M: Mixed Modality Learning for Lifelong Learning
$ 10,411,593	**$ 6,001,277**			