

PUBLICATIONS and CREATIVE ACTIVITY

Scholarly Book:

1. Poulton, M., (Ed.), 2001, Computational Neural Networks for Geophysical Data Processing: Pergamon, Amsterdam, 335p.

Invited Papers:

2. Poulton, M., 2002, Neural networks as an intelligence amplification tool: A review of applications: *Geophysics*, vol. 67, no. 3, pp. 979-993.

Refereed Journals:

3. Coppola, E. A. Rana, M. Poulton, F. Szidarovszky, and V. Uhl, 2004, A Neural Network Model for Predicting Aquifer Water Level Elevations: *Journal of Ground Water*, *in press*.
4. Coppola, E., F. Szidarovszky, M. Poulton, and E. Charles, 2003, Artificial Neural Network Approach for Predicting Transient Water Levels in a Multilayered Groundwater System under Variable State, Pumping, and Climate Conditions. *Journal of Hydrologic Engineering*, vol 8, no 6, pp. 348-360.
5. Coppola, E., Poulton, M., Dustman, J., Szidarovszky, F., and Charles, E., 2003, Application of neural networks to complex groundwater problems: *Journal of Natural Resources*, vol 12, no. 4, pp. 303-320.
6. Zhang, L., Poulton, M., and Wang, T., 2002, Borehole electrical resistivity modeling using neural networks: *Geophysics*, vol. 67, no. 6, pp. 1779-1789.
7. Buffenmyer, V., Poulton, M., and Johnson, R., 2000, Identification of seismic crew noise in marine surveys by neural networks: *The Leading Edge*, vol. 19, no. 4, pp. 370-377.
8. Birken, R., M. Poulton, and K. Lee, 1999, Neural network interpretation of high-frequency electromagnetic ellipticity data part I: Understanding the half-space and layered-earth response: *Jour. Of Environmental and Engineering Geophysics*, vol. 4, no. 2, pp. 93-104.
9. Birken, R., and M. Poulton, 1999, Neural network interpretation of high-frequency electromagnetic ellipticity data part II: Analyzing 3D responses: in *Jour. Of Environmental and Engineering Geophysics*, vol. 4, no. 3, pp. 149-165.
10. Poulton, M., and R. Birken, 1997, Estimating one-dimensional models from frequency-domain electromagnetic data using modular neural

- networks: IEEE Geoscience and Remote Sensing Journal, vol. 36, no. 2, pp. 547-555.
11. Brown, M., and M. Poulton, 1996, Locating buried objects for environmental site investigations using neural networks: Jour. Of Environmental and Engineering Geophysics, vol. 1, no. 3, pp. 179-188.
 12. Poulton, M., B. Sternberg, and C. Glass, 1992, Location of subsurface targets in geophysical data using neural networks: Geophysics, vol. 57, no. 12, pp. 1534-1544.
 13. Poulton, M., B. Sternberg, and C. Glass, 1992, Neural network pattern recognition of subsurface EM images: Journal of Applied Geophysics, vol. 29, pp. 21-36.
 14. Poulton, M., B. Sternberg, and I. Farmer, 1991, In situ strength measurements of weak rocks: ASCE Journal of Geotechnical Engineering, vol. 117, no. 9, pp. 1424-1429.
 15. Kulatilake, P., D. Wathugala, M. Poulton, and O. Stephanson, 1990, Analysis of structural homogeneity around the ventilation drift at the Stripa Mine: International Journal of Engineering Geology, vol. 29, pp. 195-211.

Refereed Book Chapters:

16. Poulton, M., 2002, Mineral Uses and Consumption *in* EarthInquiry: W.H. Freeman and Company (www.whfreeman.com/earthinquiry) (hard copy and electronic versions)
17. Zhang, L., and Poulton, M., 2001, Neural network inversion of EM39 induction log data: accepted *in* B. Sandham and M. Leggett (Eds), Geophysical Applications of Artificial Neural Networks and Fuzzy Logic: Kluwer Academic Publishing, Netherlands.
18. Poulton, M., and J. Kemeny, 2000, A Model For Integrating Technology Preceptors In The Classroom: *in* J. Miller (Ed) Student Assisted Teaching And Learning: Anker Publishing.
19. Poulton, M., M. Brown, T. Larson, and R. Callow, 1995, Hazardous waste site characterization using virtual environments and neural networks, accepted *in* Wang, F., and Lever, P. (Eds) Advances in Robotics and Automates Systems for Hazardous Environments: World Scientific Publishers.
20. Williamson, R., and M. Poulton, 1994, The geology of the Mineral Hill area, Mission Mine, Pima County, Arizona, *in* Pierce, F., Bohm, J. (Eds)

Porphyry Copper Deposits of the American Cordillera: Arizona Geological Survey Digest 20, pp. 442-454.

21. Sternberg, B., M. Poulton, and S. Thomas, 1990, Geophysical investigations in support of the Arizona SSC project: in S. Ward (Ed) Environmental and Engineering Geophysics: SEG, Tulsa, OK.

Papers in Preparation:

1. Coppola, E. F. Szidarovszky, M. Poulton, D. Davis, S. Spayd, and E. Roman. Balancing Risk with Water Supply for a Public Well Field. Submitted to Journal of Water Resources Planning and Management. Being revised in accordance with editor's suggestions.
2. Coppola, E. C. Mclane, M. Poulton, R. Magelky, and F. Szidarovszky. An Artificial Neural Network Approach for Predicting Conductance Levels in a Coastal Aquifer under Variable Pumping and Climate Conditions. Being prepared for submission as two papers, Journal of Ground Water.
3. Mullen, S., Poulton, M., Brooks, H., and Hamill, T., Calibration of short-range, ensemble precipitation forecasts by an artificial neural network: submitted to Weather and Forecasting.

Invited Presentations with conference papers:

1. Poulton, M., R. Birken, and L. Zhang, 1997, Integrating neural networks in field interpretations for environmental geophysics surveys: Proceedings, Workshop on Geophysical Applications of Artificial Neural Networks and Fuzzy Logic, 59th EAGE Conference, May 26, Geneva, Switzerland.
2. Sternberg, B., and M. Poulton, 1996, The LASI High-frequency Electromagnetic Subsurface Imaging System: System description and demonstration site characterization survey at the Idaho National Engineering Laboratory: Proceedings from the Industry Partnerships to Deploy Environmental Technology Meeting: DOE Morgantown Energy Technology Center, Morgantown, WVA, Oct. 22-24.
3. Poulton, M., 1994, Neural networks applied to problems in the geosciences: UA Neural Network Workshop, April 23, Tucson, AZ.
4. Poulton, M., 1993, Toward real-time interpretation with neural networks: Range Cleanup Workshop, Naval Post Graduate School, March 23-25, Monterey, CA.

Conference Proceedings (with some level of peer review):

5. Coppola, E., McClane, C., Poulton, M., Szidarovszky, F., Magelky, R., 2004, Artificial Neural Network Modeling of Saltwater Upconing, American Water Resources Association 2004 Annual Conference.
6. Coppola, E., Poulton, M., Szidarovszky, F., Charles, E., McClane, C., Magelky, R., and Woods, H., 2004, Artificial Neural Network Applications to Water Resources Management Problems, Arizona Hydrologic Society Meeting, Tucson, AZ.
7. Coppola, E., Woods, H., Poulton, M., Szidarovszky, F., 2004, Forecasting Water Consumption for a Large Water Utility using Artificial Neural Networks, American Water Resources Association 2004 Annual Conference.
8. Hunter, R., Wilson, Scott, Casavant, R., Johnson, R., Poulton, M., Glass, C., Mallon, K., Patil, S., Dadekar, A., Collett, T., 2004, Reservoir-Fluid Characterization and Reservoir Modeling of Potential Gas Hydrate Resources, Alaska North Slope: AAPG Annual Meeting, Dallas, TX, April 18-23.
9. Salazar, R., Coppola, E., Rojano, A., Poulton, M., Szidarovszky, F., 2004, Forecasting Solar Radiation with Artificial Neural Networks, American Water Resources Association 2004 Annual Conference.
10. Snyder, D., MacInnes, S., Hare, J., Grimm, R., Poulton, M., Szidarovszky, A., 2004, The value of multi-component TEM data for the estimation of UXO target parameters: SAGEEP04, Colorado Springs, CO, Feb. 22-25.
11. Moreno, R., Coppola, E., Poulton, M., Szidarovszky, F., and Jacinto, A., 2003, An artificial neural network approach for forecasting available reservoir water storage for irrigation in a semi-arid region: AWRA 2003 Annual Water Resources Conference, Nov 3, San Diego, CA.
12. Coppola, E. Rana, A., Poulton, M., Szidarovszky, F., and Uhl, V., 2003, Artificial Neural Network Approach for Accurately Predicting Groundwater Levels: American Water Resources Association 2003 International Congress, Watershed Management for Water Supply Systems, New York City, NY. June 29-July 2, 2003.
13. Coppola, E., Dustman, J., Poulton, M., and Szidarovszky, F., 2003, Optimizing Wellfield Energy Efficiency using an Automatic Data Collection System and Artificial Neural Network Technology: Frontiers in Assessment Methods for the Environment, Minneapolis, Minnesota. August 10-13, 2003.

14. Hunter, R., Digert, S., Casavant, R., Johnson, R., Poulton, M., Glass, C., Mallon, K., Patil, S., Dandekar, A., and Collett, T., 2003, Resource characterization and quantification of natural gas-hydrate and associated free-gas accumulations in the Prudhoe Bay – Kuparak River area on the north slope of Alaska: AAPG Annual Meeting, Salt Lake City, UT, May 11-14, 2003. *Received 2nd Place for President's Award for Outstanding Poster Presentation.*
15. Poulton, M., 2003, Searching for the next generation of mineral resources professionals: A resistive target: Prospectors and Developers Association of Canada International Convention, Trade Show, and Investors Exchange, Toronto, Canada, March 9-12, 2003.
16. Salazar, R., Poulton, M., Coppola, E., Szidarovszky, F., and Jacinto, A., 2003, An Artificial Neural Network Approach for Forecasting Available Reservoir Water Storage for Irrigation in a Semi-Arid Region: American Water Resources Association Annual Conference, San Diego, California. November 3-6, 2003.
17. Coppola, E., Poulton, M., Szidarovszky, F., Charles, E., 2002, Development of a CNN for better understanding the seasonal responses of a glacial-filled aquifer to variable climate and pumping conditions: Symposium on the Application of Neural Networks to the Earth Sciences, Seventh International Symposium on Mineral Exploration, August 20-21, San Jose, CA.
18. Hunter, R., Pelka, G., Digert, S., Casavant, R., Johnson, R., Poulton, M., Glass, C., Mallon, K., Patil, S., Chukwu, G., Dandekar, A., Khataniar, S., Ogbe, D., and Collett, T., 2002, Resource characterization and quantification of natural gas-hydrate and associated free-gas accumulations in the Prudhoe Bay – Kuparak River area on the north slope of Alaska: Joint Conference of AAPG Pacific Section and SPE Western Region, May 18-23, 2002, Anchorage, AK.
19. Rucker, D., Poulton, M., and Ferre, P., 2002, A Back Propagation Neural Network for Processing First-Break Picks in Cross Borehole Ground Penetrating Radar: GPR2002 Symposium, Santa Barbara, CA, April 29-May 2.
20. El-Kaliouby, H., Hussain, S., El-Diwany, E., Hashish, E., Bayoumi, A., and Poulton, M., 2001, Forward modeling and inversion of IP effects in TEM response using measured rock samples data: SEG Expanded Abstracts, 71st International Society of Exploration Geophysicists meeting, Houston, TX.

21. Potts, K., and Poulton, M., 2001, Neural network classification of water content for agglomeration processes: Mine Planning and Equipment Selection conference, New Delhi, India, Nov 19-22, p. 495-504.
22. Buffenmyer, V., Poulton, M., Johnson, R., and Spitz, S., 1999, Neural network approach to seismic crew noise identification in marine surveys: SEG Expanded Abstracts, 69th International Society of Exploration Geophysicists meeting, Houston, TX.
23. El-Kaliouby, H., and Poulton, M., 1999, Inversion of coincident loop TEM data for layered polarizable ground using neural networks: SEG Expanded Abstracts, 69th International Society of Exploration Geophysicists meeting, Houston, TX.
24. El-Kaliouby, H., and M. Poulton, 1999, Computational intelligence techniques for TEM inversion: SEG 1999 Summer Research Workshop on Geoinversion: Model-based Inversion Challenges the Technology Transfer, August 1-6, Taos, NM.
25. Zhang, L., Poulton, M., Mezzatesta, A., 1999, Neural network based layer picking for unfocused resistivity log parameterization: SEG Expanded Abstracts, 69th International Society of Exploration Geophysicists meeting, Houston, TX.
26. Zhang, L., Poulton, M., Zhang, Z., Mezzatesta, A., and Chakravarthy, S., 1999, Fast forward modeling simulation of resistivity well logs using neural networks: SEG Expanded Abstracts, 69th International Society of Exploration Geophysicists meeting, Houston, TX.
27. Mullen, S., M. Poulton, H. Brooks, and T. Hamill, 1998, Post-processing of the ETA/RSM ensemble forecasts by a neural network: 78th Annual American Meteorological Society, First Conference on Artificial Intelligence, Phoenix, pp. J31-J40.
28. Birken, R., and M. Poulton, 1997, Estimating resistivity and dielectric constant from high-frequency electromagnetic ellipticity data using neural networks: Proceedings, High-Resolution Geophysics Workshop, Jan6-8, Tucson.
29. Birken, R., and M. Poulton, 1997, Neural network interpretation of high-frequency electromagnetic ellipticity data: Symposium on the Applications of Geophysics to Engineering and Environmental Problems, March 23-26, Reno.

30. Zhang, L., and M. Poulton, 1997, Neural network interpretation of EM39 well log data: Symposium on the Applications of Geophysics to Engineering and Environmental Problems, March 23-26, Reno.
31. Birken, R., M. Poulton, and B. Sternberg, 1996, Physical modeling of small shallow conductive 3D targets with high-frequency electromagnetics: Environmental and Engineering Geophysics Society European Section Meeting, Nantes, France, Sep. 2-5.
32. Birken, R., and M. Poulton, 1995, Neural network interpretation scheme for frequency-domain electromagnetic ellipticity surveys: Symposium on the Applications of Geophysics to Engineering and Environmental Problems, April 23-26, Orlando, FL.
33. Brown, M., and M. Poulton, 1995, Neural network interpretation with electromagnetic and magnetic data for environmental site investigations: Symposium on the Applications of Geophysics to Engineering and Environmental Problems, April 23-26, Orlando, FL.
34. Sternberg, B., and M. Poulton, 1994, High-resolution subsurface imaging and neural network recognition: Symposium on the Applications of Geophysics to Engineering and Environmental Problems, March 27-31, Boston, MA.
35. Sternberg, B., and M. Poulton, 1994, High-resolution subsurface imaging and neural network recognition: Unexploded Ordnance Detection And Range Remediation Conference, May 17-19, Golden, CO.
36. Ashley, D., and M. Poulton, 1993, Geophysical target identification in environmental investigations: in Intelligent Engineering Systems Through Artificial Neural Networks, vol. 3, Proceedings of the Artificial Neural Networks in Engineering Conference, pp. 903-908.
37. Kemeny, J., and M. Poulton, 1993, Minerals, Where and Why: A multimedia computer program for minerals education: AGU Fall Meeting, Dec. 6-10, San Francisco, CA.
38. Poulton, M., and D. Labrecque, 1993, Neural network based inversion: Theory and application: International Workshop on Airborne Electromagnetic Methods, Sept. 13-16, Tucson, AZ.
39. Poulton, M., and K. Zaveron, 1992, Comparison of neural network paradigms for classification of TM images: 23rd International Symposium on the Application of Computers and Operations Research in the Minerals Industry, pp. 37-46.

40. Poulton, M., and A. El-Fouly, 1991, Pre-processing GPR signatures for cascading neural network classification: SEG Expanded Abstracts, 61st International Society of Exploration Geophysicists meeting, Houston, TX, pp. 507-509.
41. Poulton, M., 1991, Comparison of accuracy and sensitivity of neural network parameter estimation paradigm for EM subsurface images: SEG Expanded Abstracts, 61st International Society of Exploration Geophysicists meeting, Houston, TX, pp. 299-301.
42. Glass, C., B. Sternberg, and M. Poulton, 1990, Continuous profiling subsurface monitoring using adaptive pattern recognition: Proceedings from the International Symposium on Mine Mechanization and Automation, Vol. II, June 10-13, 1991.
43. McGill, J., B. Sternberg, G. Glass, and M. Poulton, 1990, GPR Research at the University of Arizona: Third International Conference on Ground Penetrating Radar, May 14-18 Lakewood, Co.
44. Poulton, M., B. Sternberg, and C. Glass, 1990, Continuous-output neural networks for EM ellipticity pattern recognition: IEEE 10th Annual International Geoscience and Remote Sensing Symposium, May 20-24, Washington, D.C., pp. 1297-1300.
45. Poulton, M., C. Glass, and B. Sternberg, 1989, Recognizing EM ellipticity patterns with neural networks: SEG Expanded Abstracts, 59th International Society of Exploration Geophysicists meeting, October 30-November 2, Dallas, TX, pp. 208-211.

Technical Reports:

1. Poulton, M., and L. Zhang, 1999, Neural network interpretation of well log data: Final Report to Baker-Atlas Logging Services, 111 pp.
2. Poulton, M., and V. Buffenmyer, 1999, Neural network approach to seismic crew noise identification in marine surveys: Final Report to CGG, 42 pp.
3. Sternberg, B., and M. Poulton, 1997, High-resolution subsurface imaging and neural network recognition: non-intrusive buried substance location: Final report on DOE contract DE-AC21-92MC29101-A001, 172 pp.
4. Geophysics Field Camp, 1996, Geophysical surveys in Hidalgo and Grant Counties, NM: LASI-96-1, 52pp.

5. Sternberg, B., and M. Poulton, 1996, LASI ellipticity survey at the Nevada Test Site: Final report on Sandia contract AS-2042-0144.
6. Birken, R., and M. Poulton, 1995, Data visualization and interpretation software: Final contract report for USBM contract J0220004, 35 pp.
7. Geophysics Field Camp, 1995, Geophysical Surveys in Pima County: LASI-95-1, University of Arizona, 77 pp.
8. Poulton, M., and D. Ashley, 1995, One-dimensional neural network interpretation of EM ellipticity data in the frequency range 1 kHz to 1 MHz: Final contract report for USBM contract J0220004, 124 pp.
9. Sternberg, B., and M. Poulton, 1995, Identifying Subsidence Hazards Using a Unique High-Resolution EM System and Neural Network Interpretation: Final contract report for USBM contract J0220004, 86 pp.
10. Geophysics Field Camp, 1994, Geophysical Surveys in Cochise County: LASI-94-1, University of Arizona, 62 pp.
11. Poulton, M., and M. Brown, 1994, Feasibility Study on the Applicability of Artificial Neural Networks for the Interpretation of Dig-Face Data: Final contract report for LITCO contract C85-110751, 151 pp.
12. Sternberg, B., M. Miletto, D. Labrecque, S. Thomas, and M. Poulton, 1991, The Avra Valley Geophysical Test Site: LASI-91-2, University of Arizona, 56 pp.
13. Swindle, T., C. Glass, and M. Poulton, 1990, Mining Lunar Soils for He³: NASA Space Engineering Research Center Report TM-90/1, University of Arizona, 99 pp.
14. Sternberg, B., J. Esher, and M. Poulton, 1988, Report on Seismic Surveys During December 1987 and January 1988 for the Arizona SSC Maricopa Site: LASI-88-1, University of Arizona, 253 pp.

Invited Presentations (non-conference related)

1. New Jersey Department of Environmental Protection, NJ Geological Survey, September 8, 2003
2. Norwegian University of Science and Technology, Trondheim, Norway, December 2, 2002
3. Geosciences Department Seminar, University of Arizona, October 31, 2002

4. Applied Math Seminar, University of Arizona, April 25, 2002
5. University of Arizona Assessment Symposium "Measuring Success: Taking Responsibility for Learning at the University of Arizona", Case Studies at the Department Level Session. Presentation on accreditation process in MGE Department, March 28, 2002
6. Methane Hydrate: A new source of natural gas, Women's Auxiliary of AIME, January 17, 2002
7. Geophysics Applications of Neural Network Research, Idaho National Engineering and Environmental Laboratory, July 31, 2001
8. Introduction to neural networks, and reservoir characterization with neural networks, Petrobel (Egyptian National Oil Company), Cairo, Egypt, March 29, 2001
9. Michigan Technological University Department of Geological Engineering and Sciences, February 1,2, 2001
10. Oklahoma University Department of Geology and Geophysics, November 14, 2000
11. State of Minerals Education at the UA, Mining and Metallurgical Society of America, Arizona Section, October 18, 2000
12. 1999 Arizona Wakonse Teaching Retreat – The UA Teaching Teams Program, June 4, 1999.
13. 1999 Arizona Wakonse Teaching Retreat – Webpage design for a general education science course, June 5, 1999.
14. Technology-enabled learning – Can we get there from here, presented at UA Technology in Education Forum, April 27, 1998.
15. Graduate Seminar, Department of Material Science and Mineral Engineering, UC Berkeley, September 11, 1997.
16. Engineering 196h, December 1, 1997.
17. Minerals, Where and Why – USA, Fifth Annual International Minerals Education Conference, Scottsdale, June 22, 1996.
18. Lawrence Berkeley Laboratory, Berkeley, CA, June 7, 1996.

19. UA Science Teachers' Colloquium Series, UA, (3 hour presentation on neural networks), April 25, 1996.
20. Bechtel/INEL Joint Workshop on Advanced Simulation and Training, San Francisco, CA, April 4-5, 1995.
21. Naval Surface Warfare Center, Indian Head, MD, Sept. 28, 1993.
22. Idaho National Engineering Laboratory, Idaho Falls, ID, Jan. 28, 1993.
23. Department of Energy, Morgantown, WVA, Dec. 2, 1992.
24. Seminar for visitors from Leningrad Mining Institute, Dec. 17, 1991.
25. Leningrad Mining Institute, Leningrad, USSR, May 22, 1991.