

## John W. Sheppard, PhD, FIEEE

Department of Computer Science  
Montana State University  
EPS 357, PO Box 173880  
Bozeman, MT 59717-3880  
V: +1 406 994 4835, F: +1 406 994 4365  
E: [john.sheppard@cs.montana.edu](mailto:john.sheppard@cs.montana.edu)  
Web Site: <http://www.cs.montana.edu/sheppard>

### Research Interests and Activities

Machine Learning (Bayesian, reinforcement, evolutionary)	Decision Support (Diagnosis, prognosis)
Evolutionary and Swarm-Based Systems	System Test and Evaluation
Semantic Modeling (Ontologies, information integration)	Data Mining and Information Retrieval

### Education

*Doctor of Philosophy, Computer Science* 1997  
The Johns Hopkins University, Baltimore, Maryland.  
Dissertation: *Multi-Agent Reinforcement Learning in Markov Games*  
Advisor: Professor Steven Salzberg.  
Thesis committee: Professor Steven Salzberg, Professor Simon Kasif, and Dr. Fernando Pineda.

*Master of Science, Computer Science* 1990  
The Johns Hopkins University, Baltimore, Maryland.  
Masters Project: *Learning Diagnostic Information Using a Matrix-Based Approach to Knowledge Representation*.  
Advisor: Dr. David Zaret.

*Coursework towards Master of Divinity* 1983–1986  
Lutheran Theological Seminary, Gettysburg, Pennsylvania.

*Bachelor of Science, magna cum laude, Computer Science* 1983  
Southern Methodist University, Dallas, Texas.

### Experience

*RightNow Technologies Scholar and Associate Professor, Montana State University, Bozeman, MT* August 2012 – Present  
*RightNow Technologies Distinguished Professor, and Associate Professor Montana State University, Bozeman, MT* August 2008 – August 2012  
Department of Computer Science. Responsible for research in machine learning and systems theory. Responsible for teaching departmental undergraduate and graduate courses, including special topics courses in artificial intelligence, as well as advising graduate students. Focus on growing graduate research and PhD program in Computer Science. Director of the Numerical Intelligent Systems Laboratory, which is jointly operated between Montana State and Johns Hopkins.

*Associate Research Professor, The Johns Hopkins University, Baltimore, MD* July 2008 – Present  
*Assistant Research Professor, The Johns Hopkins University, Baltimore, MD* August 2005 – June 2008  
Department of Computer Science. Director of the Numerical Intelligent Systems Laboratory. Responsible for research in machine learning, data mining, evolutionary methods, Bayesian

methods, and systems theory. Responsible for teaching undergraduate and graduate courses in artificial intelligence as well as advising graduate students. Developed online version of graduate algorithms course. Credited with establishing formal independent study/research program for part time graduate students.

*Fellow, ARINC Incorporated, Annapolis, MD*

*December 1986 – August 2006*

Technical lead in the Surface Transportation Division performing research in information engineering, data mining, cognitive modeling, and health management. Past researcher in the Advanced Research and Development group. Developed novel model-based diagnostic system that included a patented neural network. Developed novel approaches for diagnosis in dynamic satellite networks. Developed methodology for semantic modeling for intelligence and information exchange. Originally hired as Associate Analyst. Achieved highest technical rank in corporation—Fellow.

*Lecturer, The Johns Hopkins University, Baltimore, MD*

*September 1994 – August 2005*

Responsible for teaching masters-level graduate students in part time computer science program. Taught courses in algorithms, artificial intelligence, machine learning, and evolutionary computation. Mentored seven masters students during independent studies.

## **Honors and Awards**

### *Publication Awards*

1. Best Track Paper Award (AUTOTESTCON '11)
2. Best Student Paper Award (AUTOTESTCON '11), with students Shane Strasser and Michael Schuh.
3. Special Award for a Joint Faculty Member/Student Publication, The Johns Hopkins University, Engineering Programs for Professionals, 2008.
4. Special Award for a Joint Faculty Member/Student Publication, The Johns Hopkins University, Engineering Programs for Professionals, 2007.
5. Special Award for a Joint Faculty Member/Student Publication, The Johns Hopkins University, Engineering Programs for Professionals, 2006.
6. Best Student Paper Award (AUTOTESTCON '95) with student Jonas Åstrand.
7. Best Paper Award (AUTOTESTCON '94)
8. Walter E. Peterson Award for Best New Technology Paper (AUTOTESTCON '92)

### *Professional Society Awards*

1. IEEE Fellow (2007): Elected for contributions to system-level diagnosis and prognosis
2. IEEE AUTOTESTCON Frank McGinnis Professional Achievement Award, 2007.
3. IEEE Standards Association Working Group Chair Award for IEEE Std 1232.1-1997 (1997)
4. IEEE Standards Association Working Group Chair Award for IEEE Std 1232.2-1998 (1999)
5. IEEE Standards Association Working Group Chair Award for IEEE Std 1232-2002 (2003)
6. IEEE Standards Association Working Group Chair Award for IEEE Std 1522-2004 (2005)
7. IEEE Standards Association Working Group Chair Award for IEEE Std 1636.2-2010 (2010)
8. IEEE Standards Association Working Group Chair Award for IEEE Std 1232-2010 (2011)
9. IEEE Computer Society Outstanding Contribution Award (2003)
10. IEEE Computer Society Certificate of Appreciation for Standards Activities (1999, 2000, 2002, 2004)
11. IEEE Computer Society Certificate of Appreciation for chairing System Test Workshop (1999)

### *Industrial Awards and Recognitions*

1. ARINC Technical Excellence Award for the Portable Interactive Troubleshooter, POINTER™ (1989)—The highest corporate technical award, and the first given by the corporation

2. ARINC General Manager's Award for Outstanding Performance (1989)—Granted for development of significant new product line (diagnostics) based in independent research.
3. ARINC Research Division Recognition Award (1996)
4. ARINC Incorporated Division Recognition Award (1999, 2001–2003)

*General Recognition*

1. MSU Computer Science Department Excellence in Research Award (2011)
2. MSU Computer Science Department Excellence in Teaching Award (2009)
3. Order of the Engineer (inducted May 20, 2009)
4. First recipient of Right Now Technologies Distinguished Professorship at Montana State University
5. Marquis Who's Who in America (multiple years)
6. Marquis Who's Who in Science and Technology (multiple years)
7. Marquis Who's Who in the East (multiple years)
8. Outstanding Young Men of America (1989)

**Professional Activities**

*Professional Society Memberships*

Institute for Electrical and Electronics Engineers (IEEE), Fellow

- Computer Society
- Instrumentation and Measurement Society
- Standards Association

*Technical Program Chair*

1. International Workshop on System Test and Diagnosis: 1998, 1999, 2000
2. AUTOTESTCON
  - Technical Program Chair: 2001, 2007, 2011
  - Academic Vice Chair: 2008, 2009

*Program Committees*

1. AUTOTESTCON: 1995, 2001, 2007, 2008, 2009, 2011
2. International Workshop on System Test and Diagnosis: 1992, 1998, 1999, 2000
3. Genetic and Evolutionary Computation Conference: 1999–2003
4. Congress on Evolutionary Computation: 2001, 2008
5. European Design and Test Conference: 1994
6. IEEE Board Test Workshop: 2003, 2004
7. Workshop on Principles of Diagnosis: 2007, 2008
8. IEEE International Conference on Prognostics and Health Management: 2008

*Editorial Boards*

1. International Journal of Prognostics and Health Management (Editorial Board–2009 to 2010, Co-editor in Chief, 2011 to present)
2. IEEE Transactions on Instrumentation and Measurement (Guest Editor, AUTOTESTCON 2007 Special Issue; Associate Editor, 2008–Present)
3. Journal of Electronic Testing: Theory and Applications (Associate Editor, 2007–Present)

*Conference Session Chair*

1. AUTOTESTCON: 1995–2000, 2003, 2004, 2006, 2009, 2010
2. IEEE Aerospace Conference: 2010, 2011
3. International Workshop on System Test and Diagnosis: 1998–2000

*Textbook Reviewer*

1. Kevin Murphy, *Machine Learning: A Probabilistic Approach*, The MIT Press
2. Daphne Koller and Nir Friedman, *Structured Probabilistic Models*, The MIT Press
3. George F. Luger, *Artificial Intelligence*, fourth edition, Addison-Wesley
4. James Spall, *Introduction to Stochastic Search and Optimization*, Wiley

*Journal Reviewer*

1. IEEE Computer Magazine
2. IEEE Design and Test of Computers Magazine
3. IEEE Instrumentation and Measurement Magazine
4. IEEE Transactions on Aerospace and Electronic Systems
5. IEEE Transactions on Data and Knowledge Engineering
6. IEEE Transactions on Instrumentation and Measurement
7. IEEE Transactions on Systems, Man, and Cybernetics
8. IEEE Transactions on Very Large Scale Integration Systems
9. Springer Journal of Electronic Testing: Theory and Applications
10. Springer Journal of Intelligent Manufacturing

*Conference Reviewer*

1. IEEE Aerospace Conference: 2010, 2011
2. IEEE Board Test Workshop: 2003, 2004, 2005
3. IEEE International Test Conference: 1995–2001
4. Genetic and Evolutionary Computation Conference: 1999–2003
5. IEEE Congress on Evolutionary Computation: 2001, 2008, 2009
6. IEEE VLSI Test Symposium: 1996, 1997
7. IEEE International Symposium on Intelligent Control: 2003, 2005
9. Workshop on Principles of Diagnosis: 2007, 2008
10. IEEE International Conference on Prognostics and Health Management: 2008
11. Annual Conference on Prognostics and Health Management: 2009, 2010

*Standards Committees*

1. IEEE Standards Coordinating Committee 20 (Past Vice Chair and Computer Society Liaison)
2. IEEE Computer Society Standards Activities Board (Member at Large and Liaison to SCC20)
3. IEEE SCC20 Diagnostic and Maintenance Control Subcommittee (Co-Chair and Past Secretary)
4. IEC Technical Committee 93 on Design Automation (US Delegate): 1996, 1997, 1998
5. ARINC Test Equipment Guidance Subcommittee, Avionics Maintenance Conference

**Academic and Research Activities***MSU Research & Development Funding Obtained as Principal Investigator (Most Recent First)*

1. The Boeing Company, Development of a Bayesian approach to creating Dynamic Fault Isolation Manuals. \$90,115, 1/15/12–12/20/12.
2. Impact Technologies (for US Navy), Small Business Technology Transfer (STTR) program (Phase II). Develop and transition technology for combining physics-based and data-driven models for electronic fault prognostics. Base (9/1/11–1/31/13): \$199,917,83 + Option (2/1/13–9/30/13): \$87,748.24 = \$287,666.07.
3. The Boeing Company, Continue development of a proof-of-concept system for performing maturation of D-matrix-type diagnostic models based on ontology-guided data mining principles. \$39,745, 5/23/11–12/22/11.

4. Impact Technologies (for US Navy), Small Business Technology Transfer Research (STTR) program (Phase I). Develop and transition technology for combining physics-based and data-driven models for electronic fault prognostics. Base (7/31/10–1/31/11): \$32,522.82 + Option (1/31/11–4/30/11): \$13,994.49 = \$46,517.31.
5. The Boeing Company, Develop a proof-of-concept system for performing maturation of D-matrix-type diagnostic models based on ontology-guided data mining principles. \$51,157, 6/1/10–11/29/10.
6. The Boeing Company (for NASA), Develop approaches to ontology-guided data mining for purposes of supporting diagnostic maturation in vehicle level health monitoring and reasoning on commercial and military aircraft. \$59,175, 1/1/10–11/30/10.
7. The M&T Company (for US Navy, PMA-260D), Perform research in predictive health management and standardization; demonstrate standards effectiveness. \$181,300, 4/1/2009-3/31/2010.

*JHU Research & Development Funding Obtained as Principal Investigator (Most Recent First)*

1. Johns Hopkins University Applied Physics Laboratory (for US Navy, PMA-260D), Perform research in predictive health management and standardization. \$197,000, 2/1/2008–12/31/2008.
2. US Army, Redstone Arsenal (for US Navy, PMA-260D), Perform research in ATS interoperability with diagnostic systems. \$111,247, 5/1/2007–3/31/2008.
3. US Army, Redstone Arsenal, Perform research in Bayesian prognostics for predicting faults of an automatic test system. \$102,573, 1/1/2007–9/30/2007.
4. US Army, Redstone Arsenal (for US Navy, PMA-260D), Perform research in Bayesian diagnostics for automatic test systems. \$94,550, 9/1/2006–3/3/2007.
5. US Air Force and Global Strategic Solutions, LLC, Develop a model-based system synthesis and integration methodology for automatic test systems, subcontract under SBIR to GSS. \$12,000, 7/2006–12/2006.
6. NSWC Corona, Explore applications of Bayesian learning from IUID-enabled data to system diagnostics. \$80,837, 6/2006–9/2006.

*ARINC Research & Development Funding Obtained as Principal Investigator (Most Recent First)*

1. TTCI Data Radio, Transportation Technology Center, Analyze network demand and evaluate alternative data radios for positive train control applications, \$231,728, 2/2006–10/2006.
2. AAR Technical Support, Association of American Railroads, Perform research and development of messaging technologies, and develop messaging specifications for freight railroad operations, \$250,595, 1/2006–12/2006.
3. CMU Test Bed (Phase IV), Association of American Railroads, Evaluate alternative messaging architectures for onboard locomotive communications, \$249,996, 5/2005–12/2006.
4. Open Haven, US DoD, Perform research in intelligence analysis. Details classified, \$6,900,000, 4/2004–3/2007
5. Open Haven Study, US DoD, Perform research in intelligence analysis. Details classified, \$100,000, 4/2004–6/2004
6. Dark Star Secure Facility, US DoD, Build-out of special access program facility, \$67,581, 5/2004–9/2004
7. Dark Star Special Study, US DoD, Details classified, \$173,670, 5/2004–9/2004
8. Vulcan Sky II, US DoD, Perform research in information operations. Details classified, \$201,582, 9/2004–4/2004
9. Vulcan Sky I, US DoD, Perform research in information operations. Details classified, \$373,421, 4/2003–6/2004
10. MASON, US DoD, Perform research in assessing information operations effectiveness, \$249,592, 1/2003-8/2003

11. Dark Star, US DoD, Perform research in information warfare. Details classified, \$117,077, 7/2002–8/2004
12. ATC Study, US DoD, Examine design alternatives for air traffic control system for Afghanistan reconstruction, \$299,162, 5/2002–8/2003.
13. Sampler Operations and Data System, US Air Force Technical Applications Center, Perform research and development of secure, on-line health monitoring system for radio-nuclide samplers, \$124,999.00, 7/2002–3/2003.
14. Soothsayer, US Air Force, Develop multi-level secure database and web applications for intelligence data integration and intelligence production/dissemination, \$669,337, 5/2001–4/2002
15. AI-ESTATE SBIR, Hamilton Software and US Air Force, Provide expert consultation on standards-based diagnostics for automatic test systems development, \$22,502, 8/1999–7/2000.
16. ACAMS, NASA-LaRC, Perform research and development of integrated health monitoring technologies and real-time model-based diagnostics for commercial aircraft, \$1,606,091.00, 5/1999–7/2001.
17. Big Sombrero II, US Air Force, Provide information modeling and analysis for intelligence support, \$424,360.00, 5/1999–5/2000.
18. Big Sombrero, US Air Force, Perform intelligence database integration analysis, \$197,770.00, 5/1998–2/1999.
19. PERC-IPD, CSM Materialtechnik, Perform research and development for advanced, adaptive techniques in the fabrication of composite materials for aircraft. Focused on techniques from adaptive control and reinforcement learning. \$234,597.00, 7/1997–4/1998.
20. ARI, US Navy, Perform research and development for standard interfaces of automatic test equipment as member of the Automatic Test System Research and Development Integrated Product Team, \$132,660.00, 9/1996–5//1998.
21. OSA-IDD, McDonnell Douglas Aerospace and US Navy, Perform research and development in passive model-based diagnostics for F/A-18 C/D AN/APG-65 radar system, \$120,055.00, 3/1995–3/1997.

#### *University Courses Developed and Taught*

1. Artificial Intelligence (Montana State University): 2008–2010
2. Artificial Intelligence (Johns Hopkins University): 1998–2008
3. Evolutionary Computation (Johns Hopkins University): 1995, 1996–2006 (even years)
4. Foundations of Algorithms (Johns Hopkins University): 2000–2008
5. Discrete Structures (Montana State University): 2011
6. Machine Learning (Montana State University): 2010, 2012 (even years)
7. Machine Learning: Soft Computing (Montana State University): 2011
8. Machine Learning (Johns Hopkins University): 1994, 1997–2007 (odd years)
9. Online Evolutionary Computation (Johns Hopkins University): 2011 (odd years)
10. Online Foundations of Algorithms (Johns Hopkins University): 2006–2012, redesigned 2011.
11. Online Machine Learning (Johns Hopkins University): 2010–2012 (even years)
12. Reasoning Under Uncertainty, Computational Research Topics (Montana State University): 2009
13. Reasoning Under Uncertainty, Special Topics (Montana State University): 2011
14. Seminar in Machine Learning (Johns Hopkins University): 2007–2008
15. Seminar in Machine Learning (Montana State University): 2008–2011
16. System Test and Diagnosis (George Mason University): 1996

#### *Conference/Professional Tutorials/Seminars Taught*

1. Advances in Diagnostics and Prognostics (AUTOTESTCON): 2004–2006
2. Artificial Intelligence and Test (AUTOTESTCON): 1997, 1998
3. Diagnostic Modeling (Digital Avionics Systems Conference): 2001
4. Diagnostic Modeling and Application Development (AUTOTESTCON): 1999–2003, 2007–2011

5. Diagnostic Modeling in STAMP (CSELT, Torino, Italy): 1996
6. Fundamentals of Fault Diagnosis (US Navy in-service course): 2006.
7. System Test and Diagnosis (NEPCON West): 1994–1996
8. System Test and Diagnosis (International Test Conference): 1994, 1995, 1999

#### *Graduate Students Advised*

1. David Albert (1999), *Evolvable Hardware*, MS in Computer Science, The Johns Hopkins University.
2. Anthony Arnone (2010), Courses-only, MS in Computer Science, Montana State University.
3. Stephyn Butcher (2006), *No-So-Naïve Bayesian Diagnosis*, MS in Computer Science, The Johns Hopkins University.
4. Patrick Donnelly (2008), *Musical Harmonic Analysis with a Hidden Markov Model*, MSE in Computer Science, The Johns Hopkins University.
5. James Grantham (2007), *Cellular Automata and Transportation Systems*, MS in Computer Science, The Johns Hopkins University.
6. Andrew Hamilton (2011), *An Anytime Algorithm for Trust Propagation in Social Networks*, MS in Computer Science, Montana State University.
7. Brian Howard (2003), *Royal Roads Not Taken*, MS in Computer Science, The Johns Hopkins University.
8. Richard McAllister (2010, committee member), *FP-Tree Motivated System for Information Retrieval Using an Abstraction Path-Based Inverted Index*, MS in Computer Science, Montana State university.
9. Benjamin Mitchell (2008), *Computer Integrated Surgery*, MSE in Computer Science, The Johns Hopkins University.
10. Rashad Moore (2003), *Multi-Agent Learning of Airline Decision Making in Response to Airport Pricing Policies*, MS in Computer Science, The Johns Hopkins University.
11. Adam Peterson (2002), *Dynamic Motion Planning Among Uncertain Obstacles*, MS in Computer Science, The Johns Hopkins University.
12. Ramendra Ramendra (2008), *Recurrent Neural Networks for Time Series Prediction*, MSE in Computer Science, The Johns Hopkins University.
13. Scott Raymond (2002), *Evolving Alarm Calling Behavior*, MS in Computer Science, The Johns Hopkins University.
14. Charles Robertson (2009), *A Dynamic Bayesian Network Builder*, MSE in Computer Science, The Johns Hopkins University.
15. Shane Strasser (2011), Courses only en-route to PhD, MS in Computer Science, Montana State University.
16. Scott Wahl (2011), Courses only en-route to PhD, MS in Computer Science, Montana State University.
17. Mike Waters (1999), *Genetic Programming and Co-Evolution with Exogenous Fitness in an Artificial Life Environment*, MS in Computer Science, The Johns Hopkins University.

#### *Current Graduate Students*

1. Stephyn Butcher (PhD student, advisee)—Bayesian diagnosis, ontology-directed data mining
2. Patrick Donnelly (PhD student, advisee)—Music information retrieval
3. Nathan Fortier (MS student, advisee)
4. Richard McAllister (PhD student, advisee)—Text mining
5. Benjamin Mitchell, (PhD student, ABD, advisee)—Multi-resolution dimensionality reduction
6. Dennis Cole Schock (2012) Courses-only, MS in Computer Science, Montana State University.
7. Shane Strasser (PhD student, advisee)—Ontology-guided diagnostic maturation
8. Liessman Sturlaugson (PhD student, advisee)—Continuous time Bayesian networks.
9. Scott Wahl, (PhD student, ABD, advisee)—Game learning, Bayesian network simplification

*Graduate Student Committees*

1. Christopher Colson (PhD student, committee member)—Electrical and computer engineering
2. Brian Haberman (2011, committee member)—*Routing Information Verification Tool for Securing Inter-Domain Routing Information*, PhD in Computer Science, The Johns Hopkins University.
3. Timothy Hahn (2010, committee member), *Investigation of Physically Aware Routing and Wavelength Assignment (RWA) Algorithms for Next Generation Transparent Optical Networks*, PhD in Computer Science, Montana State University.
4. Douglas Galarus (PhD student, committee)—Information retrieval and text mining
5. Karthik Ganesan Pillai (PhD student, committee)
6. Isaac Griffith (PhD student, committee)
7. Lynn Kaeding (2010, committee graduate representative), *Relative Contributions of Climate Variation, Lake Trout Predation, and Other Factors to the Decline of Yellowstone Lake Cutthroat Trout During the Three Recent Decades*, PhD in Ecology and Environmental Sciences, Montana State University.
8. Michael Schuh (PhD student, committee)—Data mining and content-based image retrieval.
9. Robert Wall (PhD student, committee)—Databased versioning
10. Shen Wan (2009, committee member)—*Routing in WiMAX networks*, MS in Computer Science, Montana State University
11. Robert Watkins (PhD student, graduate representative)—Veterinary molecular biology

*Service to University, College, and Department*

1. College of Engineering Curriculum Committee, Montana State University, 2012-present.
2. Scholarship Committee, Department of Computer Science, Montana State University, 2012-present.
3. PhD Committee Graduate Representative, Division of Graduate Education, Montana State University, 2009-present.
4. Graduate Admissions Committee, Department of Computer Science, Montana State University, 2008-present.
5. Double Faculty Search Committee, Department of Computer Science, Montana State University, 2010-2011.
6. Faculty Search Committee, School of Music, Music Technology Program, Montana State University, 2010-2011.

**Publications***In Preparation*

1. Patrick J. Donnelly and John W. Sheppard, "Classification of Monophonic Musical Instruments Using Bayesian Networks," November 2011.
2. Andrew Hamilton and John W. Sheppard, "An Anytime Algorithm for Trust Propagation in Social Networks," August 2011.
3. Shane Strasser and John W. Sheppard, "Diagnostic Maturation in Timed Failure Propagation Graphs," January 2012.
4. Shane Strasser and John W. Sheppard, "Using Dynamic Bayesian Networks as Probabilistic Timed Failure Propagation Graphs," October 2011.
5. Andre B. C. Thees, Patrick Della Croce, Clemente Izurieta, and John W. Sheppard, "Genetic Algorithms in the Application of Ecological Simulation," January 2012.
6. Scott Wahl and John W. Sheppard, "Inference Complexity after Performing Logical Closure and Transitive Reduction on Bipartite Bayesian Networks,"



*Patent*

John W. Sheppard, William R. Simpson, and Jerry L. Graham, *Method and Apparatus for Diagnostic Testing Including a Neural Network for Determining Testing Sufficiency*, U.S. Patent, No. 5,130,936, issued July 14, 1992, U.K. and French patents also issued.

*Books and Theses*

1. John W. Sheppard and William R. Simpson (eds.), *Research Perspectives and Case Studies in System Test and Diagnosis*, Kluwer Academic Publishers, Norwell, Massachusetts, 1998.
2. John W. Sheppard, *Multi-Agent Reinforcement Learning in Markov Games*, Ph.D. Dissertation, The Johns Hopkins University, Baltimore, Maryland, 1996.
3. William R. Simpson and John W. Sheppard, *System Test and Diagnosis*. Kluwer Academic Publishers, Norwell, Massachusetts, 1994.
4. John W. Sheppard, *Learning Diagnostic Information Using a Matrix-Based Approach to Knowledge Representation*, Master's Project Report, The Johns Hopkins University, Baltimore, Maryland, 1989.

*Journal Articles and Book Chapters*

1. Michael Schuh, John W. Sheppard, Shane Strasser, Rafal Angrk, and Clemente Izurieta, "A Visualization Tool for Knowledge Discovery in Maintenance Event Sequences," to appear in *IEEE Aerospace and Electronic Systems Magazine*, 2012.
2. Jesse Berwald, Tomáš Gedeon, and John Sheppard, "Using Machine Learning to Predict Catastrophes in Dynamical Systems," *Journal of Applied Computational Mathematics*, Vol. 236, Issue 9, March 2012, pp. 2235-2245.
3. Brian Haberman and John W. Sheppard, "Overlapping Particle Swarms for Energy-Efficient Routing in Sensor Networks," *Wireless Networks*, Online First, Springer, December 2011.
4. Patrick Donnelly and John Sheppard, "Evolving Four-Part Harmony Using Genetic Algorithm," *Applications of Evolutionary Computation*, Lecture Notes in Computer Science, LNCS 6625, Springer, 2011, pp. 273-282.
5. John W. Sheppard, Timothy J. Wilmering, and Mark A. Kaufman, "IEEE Standards for Prognostics and Health Management," *IEEE Aerospace and Electronic Systems Magazine*, reprinted from *IEEE AUTOTESTCON*, Vol. 24, No. 9, September 2009, pp. 34-41.
6. Kihoon Choi, Satnam Singh, Anuradha Kodali, Krishna Pattipati, John W. Sheppard, Setu Namburu, Shunsuke Chigusa, Danil Prokhorov, and Liu Qiao, "Novel Classifier Fusion Approaches for Fault Diagnosis in Automotive Systems," *IEEE Transactions on Instrumentation and Measurement*, Vol. 58, No.3, March 2009, pp. 602-611.
7. John W. Sheppard, "Guest Editorial: Special Section on the 2007 IEEE AUTOTESTCON," *IEEE Transactions on Instrumentation and Measurement*, Vol 58, No 2, , February 2009, pp. 238-239.
8. Stephyn G. W. Butcher and John W. Sheppard, "Distributional Smoothing in Bayesian Fault Diagnosis," *IEEE Transactions on Instrumentation and Measurement*, Vol 58, No 2, , February 2009, pp. 342-349.
9. John W. Sheppard and Stephyn G. W. Butcher, "A Formal Analysis of Fault Diagnosis with D-Matrices," *Journal of Electronic Testing: Theory and Applications*, Vol. 23, No. 4, 2007, pp.309-322.
10. John W. Sheppard and Mark A. Kaufman, "A Bayesian Approach to Diagnostics and Prognostics from Built In Test," *IEEE Transactions on Instrumentation and Measurement*, special issue on Built In Test, Vol. 54, No. 3, June 2005, pp. 1003-1018.
11. John W. Sheppard and William R. Simpson, "Accurate Diagnosis through Conflict Management, in *Research Perspectives and Case Studies in System Test and Diagnosis*, Kluwer Academic Publishers, Norwell, Massachusetts, 1998, pp. 103-124.

12. Lee A. Shombert and John W. Sheppard, "A Behavior Model for Next Generation Test Systems," *Journal of Electronic Testing: Theory and Applications*, Vol. 13, No. 3, December 1998, pp. 299–314.
13. John W. Sheppard, "Co-Learning in Differential Games," *Machine Learning*, Special Issue on Multi-Agent Learning, Vol. 33, No. 2/3, November/December 1998, pp. 201–233.
14. John W. Sheppard, "Inducing Diagnostic Inference Models from Case Data," in *Research Perspectives and Case Studies in System Test and Diagnosis*, Kluwer Academic Publishers, Norwell, Massachusetts, 1998, pp. 69–102.
15. John W. Sheppard and William R. Simpson, "Managing Conflict in System Diagnosis," *IEEE Computer*, Vol. 31, No. 3, March 1998.
16. John W. Sheppard and Steven L. Salzberg, "A Teaching Strategy for Memory-Based Control," *Artificial Intelligence Review*, Special Issue on Lazy Learning, Vol. 11, pp. 343–370, 1997. Also appears as chapter of book titled *Lazy Learning*.
17. John W. Sheppard and Gerald C. Hadfield, "The Object-Oriented Design of Intelligent Test Systems," *CrossTalk: The Journal of Defense Software Engineering*, September 1994.
18. William R. Simpson and John W. Sheppard, "Fault Isolation in an Integrated Diagnostics Environment," *IEEE Design and Test of Computers*, Vol. 10, No. 1, 1993.
19. John W. Sheppard and William R. Simpson, "Performing Effective Fault Isolation in Integrated Diagnostics," *IEEE Design and Test of Computers*, Vol. 10, No. 2, 1993.
20. John W. Sheppard and William R. Simpson, "Applying Testability Analysis for Integrated Diagnostics," *IEEE Design and Test of Computers*, Vol. 9, No. 3, September 1992.
21. Arnold G. Blair, John W. Sheppard, and William R. Simpson, "CALs and Computer Diagnostic Aids: A Partnership for System Support," *CALS Journal*, Vol. 1, No. 1, Spring 1992.
22. Larry V. Kirkland, John W. Sheppard, and William R. Simpson, "Evaluating AI-ESTATE Standards Compliance Using a Functional Intelligence Ratio," *CrossTalk: The Journal of Defense Software Engineering*, No. 39, December 1992.
23. John W. Sheppard and William R. Simpson, "Expert Systems for Diagnostic Testing," *Avionics Magazine*, Vol. 16, No. 10, October 1992, pp. 47-52.
24. Arnold Blair, William R. Simpson, and John W. Sheppard, "A Partnership for Systems Support: Artificially Intelligent Maintenance Aids and CALs," *Logistics Spectrum*, Vol. 26, Issue 3, Summer 1992, pp. 19-26.
25. William R. Simpson and John W. Sheppard, "System Testability Assessment for Integrated Diagnostics," *IEEE Design and Test of Computers*, Vol. 9, No. 1, 1992.
26. John W. Sheppard and William R. Simpson, "Information Fusion and the Diagnosis of Avionics Systems," Invited article for *The ITEA Journal of Test and Evaluation*, Vol. XII, No. 3, 1991.
27. William R. Simpson and John W. Sheppard, "Information Fusion and the Testability of Avionics Systems," Invited article for *The ITEA Journal of Test and Evaluation*, Vol. XII, No. 2, 1991.
28. John W. Sheppard and William R. Simpson, "A Mathematical Model for Integrated Diagnostics," *IEEE Design and Test of Computers*, Vol. 8, No. 4, 1991.
29. William R. Simpson and John W. Sheppard, "System Complexity and Integrated Diagnostics," *IEEE Design and Test of Computers*, Vol. 8, No. 3, 1991.

#### *Refereed Conference and Workshop Papers*

1. Richard McAllister and John W. Sheppard, "Two-Stage Text Classification Using a Bayesian Networks," submitted to the 35<sup>th</sup> International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR 2012), February 2012.
2. Liessman Sturlaugson and John W. Sheppard, "Sensitivity Analysis of Continuous Time Bayesian Networks Using Perturbation Realization," submitted to *National Conference on Artificial Intelligence*, January 2012.

3. Douglas Galarus, Rafal Angryk, and John Sheppard, "Automated Weather Sensor Quality Control," to appear in *Proceedings of the Florida Artificial Intelligence Symposium (FLAIRS)*, 2012.
4. Michael Schuh, Rafal Angryk, and John Sheppard, "Evolving Kernel Functions with Particle Swarm Optimization and Genetic Programming," to appear in *Proceedings of the Florida Artificial Intelligence Symposium (FLAIRS)*, 2012.
5. Shane Strasser and John W. Sheppard, "Diagnostic Alarm Sequence Maturation in Timed Failure Propagation Graphs," *IEEE AUTOTESTCON Conference Record*, Baltimore, MD, September, 2011, pp. 158-165, winner of Best Track Paper Award—Diagnostics and Health Assessment.
6. Mike Schuh, John Sheppard, Shane Strasser, Rafal Angryk, and Clemente Izurieta, "Ontology-Guided Knowledge Discovery Through the Generation and Visualization of Event Sequences in Maintenance Data," *IEEE AUTOTESTCON Conference Record*, Baltimore MD, September, 2011, pp. 279-285, winner of Best Student Paper Award.
7. Karthik Ganesan Pillai and John W. Sheppard, "Overlapping Swarm Intelligence for Training Artificial Neural Networks," *Proceedings of the Swarm Intelligence Symposium (SIS)*, 2011 IEEE Symposium Series on Computational Intelligence, Paris, France, April 2011.
8. Hasari Tosun and John Sheppard, "Incorporating Evidence Into Trust Propagation Models Using Markov Random Fields," *Proceedings of the 3<sup>rd</sup> International Workshop on Security and Social Networking (SESOC)*, IEEE International Conference on Pervasive Computing, March 21, 2011, pp. 336-342.
9. Shane Strasser, John Sheppard, Michael Schuh, Rafal Angryk, and Clemente Izurieta, "Graph-Based, Ontology-Guided Data Mining for D-Matrix Model Maturation," *Proceedings of the IEEE Aerospace Conference*, Big Sky, MT, March 2011.
10. Scott Wahl and John Sheppard, "Extracting Decision Trees from Diagnostic Bayesian Networks to Guide Test Selection," to appear in the Annual Conference of the PHM Society, Prognostics and Health Management Society, June 2010.
11. John W. Sheppard, Stephyn G. W. Butcher, and Patrick J. Donnelly, "Demonstrating Semantic Interoperability of Diagnostic Reasoners via AI-ESTATE," *Proceedings of the IEEE Aerospace Conference*, Big Sky, MT, March 2010.
12. John W. Sheppard, Stephyn G. W. Butcher, and Patrick J. Donnelly, "Standard Diagnostic Services for the ATS Framework," *IEEE AUTOTESTCON 2009 Conference Record*, Anaheim, CA, September 2009, pp. 393-400.
13. John W. Sheppard, Stephyn G. W. Butcher, Patrick J. Donnelly, and Benjamin R. Mitchell, "Demonstrating Semantic Interoperability of Diagnostic Models via AI-ESTATE," *Proceedings of the IEEE Aerospace Conference*, Big Sky, MT, March 2009.
14. John W. Sheppard, Timothy J. Wilmering, and Mark A. Kaufman, "IEEE Standards for Prognostics and Health Management," *IEEE AUTOTESTCON 2008 Conference Record*, Salt Lake City, UT, September 2008, pp. 97-103.
15. Edward Kao, Peter VanMaasdam, and John Sheppard, "Image-Based Tracking Utilizing Particle Swarms and Probabilistic Data Association," *Proceedings of the IEEE Swarm Intelligence Symposium*, St. Louis, MO, September 21-23, 2008.
16. Stephyn G. W. Butcher and John W. Sheppard, "Asset-Specific Bayesian Diagnostics in Mixed Contexts," *IEEE AUTOTESTCON 2007 Conference Record*, Baltimore, MD, September 2007, pp. 113-121.
17. Stephyn G. W. Butcher and John W. Sheppard, "Improving Diagnostic Accuracy by Blending Probabilities: Some Initial Experiments," *Proceedings of the 18<sup>th</sup> International Workshop on Principles of Diagnosis (DX-07)*, Nashville, TN, May 2007, pp. 235-242.
18. Kihoon Choi, Satnam Singh, Krishna Pattipati, John W. Sheppard, Setu Madhavi Namburu, Shunsuke Chigusa, Danil V. Prokhorov, and Lui Qiao, "Novel Classifier Fusion Approaches for Fault Diagnosis in Automotive Systems," *IEEE AUTOTESTCON 2007 Conference Record*, Baltimore, MD, September 2007, pp. 260-269.

19. John W. Sheppard, Mark A. Kaufman, and Timothy J. Wilmering, "Model-Based Standards for Diagnostic and Maintenance Information Integration," *IEEE AUTOTESTCON 2007 Conference Record*, Baltimore, MD, September 2007, pp. 304–310.
20. Sean R. Martin, Steve E. Wright, and John W. Sheppard, "Offline and Online Evolutionary Bi-Directional RRT Algorithms for Efficient Re-Planning in Environments with Moving Obstacles," *Proceedings of the 3<sup>rd</sup> annual IEEE Conference on Automation Science and Engineering*, New York: IEEE Press, September 2007, pp. 1131–1336.
21. Satnam Singh, Kihoon Choi, Anuradha Kodali, Krishna Pattipati, John Sheppard, Setu Madhavi Namburu, Shunsuke Chigusa, Danil V. Prokhorov, and Liu Qiao, "Dynamic Multiple Fault Diagnosis: Mathematical Formulations and Solution Techniques," *Proceedings of the 18<sup>th</sup> International Workshop on Principles of Diagnosis (DX-07)*, Nashville, TN, May 2007, pp. 383–390.
22. Timothy J. Wilmering and John W. Sheppard, "Ontologies for Data Mining and Knowledge Discovery to Support Diagnostic Maturation," *Proceedings of the 18<sup>th</sup> International Workshop on Principles of Diagnosis (DX-07)*, Nashville, TN, May 2007, pp. 210–217.
23. Stephen G. W. Butcher, John W. Sheppard, Mark A. Kaufman, Hanh Ha, and Craig MacDougall, "Experiments in Bayesian Diagnostics with IUID-Enabled Data," *IEEE AUTOTESTCON 2006 Conference Record*, Anaheim, California, September 2006, pp. 605–614.
24. John W. Sheppard, Stephyn G. W. Butcher, Mark A. Kaufman, and Craig MacDougall, "Not-So-Naïve Bayesian Networks and Unique Identification in Developing Advanced Diagnostics," *Proceedings of the IEEE Aerospace Conference*, Big Sky, Montana, March 2006.
25. John W. Sheppard and Stephyn G. W. Butcher, "On the Linear Separability of Diagnostic Models," *IEEE AUTOTESTCON 2006 Conference Record*, Anaheim, California, September 2006, pp. 626–635.
26. John W. Sheppard and Timothy J. Wilmering, "Recent Advances in IEEE Standards for Diagnosis and Diagnostic Maturation," *Proceedings of the IEEE Aerospace Conference*, Big Sky, Montana, March 2006.
27. John W. Sheppard and Mark A. Kaufman, "Bayesian Diagnosis and Prognosis Using Instrument Uncertainty," *IEEE AUTOTESTCON 2005 Conference Record*, Orlando, Florida, September 2005.
28. John W. Sheppard and Mark A. Kaufman, "Bayesian Modeling: An Amendment to the AI-ESTATE Standard," *IEEE AUTOTESTCON 2005 Conference Record*, Orlando, Florida, September 2005.
29. Brian Howard and John W. Sheppard, "The Royal Road Not Taken: A Re-Examination of the Reasons for GA Failure on R1," *Proceedings of the Genetic and Evolutionary Computation Conference*, Seattle, Washington, June 2004.
30. Rashad Moore, John W. Sheppard, and Ashley Williams, "Multi-Agent Simulation of Airline Travel Markets," *Proceedings of the Genetic and Evolutionary Computation Conference*, Seattle, Washington, June 2004.
31. John W. Sheppard, "Accounting for False Indication in a Bayesian Diagnostics Framework," *IEEE AUTOTESTCON 2003 Conference Record*, Anaheim, California, September 2003.
32. John W. Sheppard and Mark A. Kaufman, "An Integrated View of Test and Diagnostic Information Standards," *IEEE AUTOTESTCON '02 Conference Record*, Huntsville, Alabama, October 2002.
33. Antony Bartolini, John W. Sheppard, and Thomas E. Munns, "An Application of Diagnostic Inference Modeling in Vehicle Health Management," *IEEE AUTOTESTCON 01 Conference Record*, Valley Forge, Pennsylvania, August 2001.
34. John W. Sheppard and Mark A. Kaufman, "Formal Specification of Testability Metrics in P1522," *IEEE AUTOTESTCON 01 Conference Record*, Valley Forge, Pennsylvania, August 2001.

35. John W. Sheppard, "System Prognostics with Non-Linear Time Series Prediction: Preliminary Results," *IEEE International Workshop on System Test and Diagnosis Digest*, October 2000, Atlantic City, New Jersey.
36. Mike Waters and John W. Sheppard, "Genetic Programming and Co-evolution with Exogenous Fitness in an Artificial Life Environment," *Proceedings of the Congress on Evolutionary Computation*, May 1999.
37. John W. Sheppard, "Information Superiority through Intelligent Information Operations," *Proceedings of the Joint Aerospace Weapon System, Support, and Simulation Symposium*, San Diego, California, May 1999.
38. John W. Sheppard, "Inducing Information Models from Case Data," *IEEE International Workshop on System Test and Diagnosis*, Alexandria, Virginia, April 1998.
39. John W. Sheppard and William R. Simpson, "Standardized Representations of Diagnostic Models," *Proceedings of the IEEE International Conference on System, Man, and Cybernetics*, La Jolla, California, October 1998.
40. John W. Sheppard and Leslie A. Orlidge, "Artificial Intelligence Exchange and Service Tie to All Test Environments (AI-ESTATE)—A New Standard for System Diagnostics," *Proceedings of the International Test Conference*, Washington, DC, October 1997.
41. John W. Sheppard and William R. Simpson, "Improving the Accuracy of Diagnostics Provided by Fault Dictionaries," *Proceedings of the 14th VLSI Test Symposium*, Princeton, New Jersey, April 1996.
42. John W. Sheppard and Steven L. Salzberg, "Combining Genetic Algorithms with Memory-Based Reasoning," *Proceedings of the 6th International Conference on Genetic Algorithms*, Pittsburgh, Pennsylvania, July 1995.
43. John W. Sheppard and Steven L. Salzberg, "Bootstrapping Memory-Based Learning with Genetic Algorithms," *1994 AAAI Case-Based Reasoning Workshop*, Seattle, WA, August 1994.
44. William R. Simpson and John W. Sheppard, "The Impact of Commercial Off-the-Shelf (COTS) Equipment on System Test and Diagnosis," *Proceedings of the International Test Conference*, Baltimore, MD, September 1993.
45. John W. Sheppard, "Inducing Classification Rules for Public Health Data," *Proceedings of the Second International Workshop on Multistrategy Learning*, Harpers Ferry, West Virginia, May 1993.
46. John W. Sheppard and William R. Simpson, "Elements of Machine Learning is a Field Diagnostic Maintenance Aid," *Proceedings of the ADPA Symposium on Artificial Intelligence Applications for Acquisition Management, Logistics Management, and Personnel Management*, Williamsburg, Virginia, March 1992.
47. William R. Simpson and John W. Sheppard, "An Intelligent Approach to Automatic Test Equipment," *Proceedings of the International Test Conference*, Nashville, Tennessee, October 1991.
48. John W. Sheppard and William R. Simpson, "Using a Competitive Learning Neural Network to Evaluate Software Complexity," *Proceedings of the 1990 ACM Symposium on Personal and Small Computers*, Crystal City, Virginia, March 1990.
49. William R. Simpson, Brian A. Kelly, and John W. Sheppard, "Clinical Protocol Development: An Information Theoretic Approach," *Sixth World Congress on Medical Informatics*, Part a - Beijing, China, October, 1989, Part b - Raffle City, Singapore, December, 1989.
50. John W. Sheppard and William R. Simpson, "Functional Path Analysis: An Approach to Software Verification," *Proceedings of the 1988 ACM Computer Science Conference*, Atlanta, Georgia, February 1988.

*Invited Papers and Talks*

1. John W. Sheppard and Michael Malesich, "DoD ATS Framework—Diagnostic and Prognostic Elements," Invited Plenary Panelist, IEEE AUTOTESTCON 2008, Salt Lake City, Utah, September 2008.
2. John W. Sheppard, "Design for Test—The Integrated Diagnostics Perspective," Invited Panelist, AUTOTESTCON 2006, Anaheim, California, September 2006.
3. John W. Sheppard, "Information-Based Standards and Diagnostic Component Technology," Invited Paper and Plenary Talk for 2<sup>nd</sup> IEEE International Workshop on System Test and Diagnosis, Atlantic City, New Jersey, September 1999.
4. John W. Sheppard, "Artificial Intelligence in Diagnosis," Invited Seminar, Institute for Information Industry, Taipei, Taiwan, February 1998.
5. John W. Sheppard, "The Role of Information Modeling in Developing Standards," Invited Seminar for Computer Science Department, Florida State University, March 1998.
6. John W. Sheppard, "System Test and Diagnosis," Invited Seminar, Institute for Information Industry, Taipei, Taiwan, February 1998.
7. John W. Sheppard, "Is ROI Sufficient Justification for DFT?" Keynote Address, 1993 Economics of Test Workshop, Austin, Texas, May 1993.
8. John W. Sheppard, "Testing Fully Testable Systems: A Case Study," Invited Panel Presentation for the International Test Conference, Baltimore, Maryland, September 1993.
9. William R. Simpson and John W. Sheppard, "Design for Testability and Diagnosis at the System Level," Invited Paper for *Proceedings of the NASA Space Operations, Applications, and Research (SOAR) Conference*, Houston, Texas, August 1992.
10. William R. Simpson and John W. Sheppard, "A Model Based Approach to System Test and Diagnosis," Invited Presentation for the International Conference on Computer Design, Cambridge, Massachusetts, October 1992.
11. John W. Sheppard, "System Perspective on Diagnostic Testing," Invited Panel Presentation for the International Test Conference, Baltimore, Maryland, September 1992.
12. Eugene A. Esker, Jean-Paul Martin, William R. Simpson, and John W. Sheppard, "Integrating Design for Testability and Automated Testing Approaches," *IEEE AUTOTESTCON '90 Conference Record*, San Antonio, Texas, September 1990.
13. John W. Sheppard, "An Approach to Verifying Expert System Rule Bases," Invited Paper for 1989 International Conference on Systems, Man, and Cybernetics, Boston, Massachusetts, November 1989.

*Unrefereed Conference and Workshop Papers*

1. John W. Sheppard and Mark A. Kaufman, "IEEE 1232 and 1522 Standards," *IEEE AUTOTESTCON 2000 Conference Record*, Anaheim, California, September 2000.
2. John W. Sheppard and Mark A. Kaufman, "IEEE Test and Diagnosis Standards," *Proceedings of the 19<sup>th</sup> Digital Avionics Systems Conference*, August 2000.
3. John W. Sheppard and Amanda Jane Giarla, "Information-Based Standards and Component Technology," *IEEE AUTOTESTCON 2000 Conference Record*, Anaheim, California, September 2000.
4. John W. Sheppard and Mark A. Kaufman, "AI-ESTATE—The Next Generation," *IEEE AUTOTESTCON 99 Conference Record*, San Antonio, Texas, September 1999.
5. Mark A. Kaufman and John W. Sheppard, "P1522: A Formal Standard for Testability and Diagnosability Standards," *IEEE AUTOTESTCON 99 Conference Record*, San Antonio, Texas, September 1999.
6. John W. Sheppard and William R. Simpson, "Prototyping a Diagnostic Interface," *IEEE AUTOTESTCON '98*, Salt Lake City, Utah, August 1998.

7. John W. Sheppard, Antony Bartolini, and Leslie A. Orlidge, "Standardizing Diagnostic Information Using IEEE AI-ESTATE," *IEEE AUTOTESTCON 97 Conference Record*, Anaheim, California, September 1997.
8. Richard L. Maguire and John W. Sheppard, "Application Scenarios for AI-ESTATE Services," *IEEE AUTOTESTCON '96 Conference Record*, Dayton, Ohio, September 1996.
9. William R. Simpson and John W. Sheppard, "Diagnosis: Art versus Science," *Proceedings of NEPCON West*, Anaheim, California, February 1996.
10. William R. Simpson and John W. Sheppard, "Encapsulation and Diagnosis with Fault Dictionaries," *IEEE AUTOTESTCON '96 Conference Record*, Dayton, Ohio, September 1996.
11. Don Gartner and John W. Sheppard, "An Experiment in Encapsulation in System Diagnosis," *IEEE AUTOTESTCON '96 Conference Record*, Dayton, Ohio, September 1996.
12. John W. Sheppard, "Maintaining Diagnostic Truth with Information Flow Models," *IEEE AUTOTESTCON '96 Conference Record*, Dayton, Ohio, September 1996.
13. John W. Sheppard and William R. Simpson, "A Systems View of Test Standardization," *IEEE AUTOTESTCON '96 Conference Record*, Dayton, Ohio, September 1996.
14. John W. Sheppard and Jonas Åstrand, "Modeling Diagnostic Constraints with AI-ESTATE," *IEEE AUTOTESTCON '95 Conference Record*, Atlanta, Georgia, August 1995, winner of Best Student Paper award.
15. John W. Sheppard and William R. Simpson, "A View of the ABBET™ Upper Layers," *IEEE AUTOTESTCON '95 Conference Record*, Atlanta, Georgia, August 1995.
16. William R. Simpson and John W. Sheppard, "Dependency Modeling Pitfalls," *IEEE AUTOTESTCON 94 Conference Record*, Anaheim, CA, September 1994.
17. John W. Sheppard and William R. Simpson, "Multiple Failure Diagnosis," *IEEE AUTOTESTCON 94*, Anaheim, CA, September 1994, winner of Best Paper award.
18. John W. Sheppard, "Standardizing Diagnostic Models for System Test and Diagnosis," *IEEE AUTOTESTCON 94 Conference Record*, Anaheim, CA, September 1994.
19. William R. Simpson and John W. Sheppard, "A Data Fusion Approach to Integrated Diagnostics," *Proceedings of the Test Facility Working Group Conference*, Las Vegas, Nevada, June 1993.
20. Jean-Luc Larraga, William R. Simpson, and John W. Sheppard, "Intelligent Automatic Test Equipment for the Improvement of Avionics Maintenance," *Proceedings of ToolDiag 93*, Toulouse, France, 1993.
21. William R. Simpson and John W. Sheppard, "The Multicriterion Nature of Diagnosis," *IEEE AUTOTESTCON 93*, San Antonio, TX, September 1993, co-authored with William R. Simpson.
22. John W. Sheppard and Gerald C. Hadfield, "The Object-Oriented Design of Intelligent Test Systems," *IEEE AUTOTESTCON 93 Conference Record*, San Antonio, Texas, September 1993.
23. John W. Sheppard and William R. Simpson, "A Systems Approach to Specifying Built-in Tests," *Proceedings of the Test Facility Working Group Conference*, Las Vegas, Nevada, June 1993.
24. William R. Simpson and John W. Sheppard, "Analysis of False Alarms During System Design," *Proceedings of the 1992 National Aerospace Electronics Conference*, Dayton, Ohio, May 1992.
25. John W. Sheppard, and William R. Simpson, "Automated Production of Information Models for Use in Model-Based Diagnosis," *Proceedings of the 1992 National Aerospace Electronics Conference*, Dayton, Ohio, May 1992, co-authored with William R. Simpson.
26. Larry V. Kirkland, John W. Sheppard, and William R. Simpson, "Evaluating AI-ESTATE Standards Compliance Using a Functional Intelligence Ratio," *IEEE AUTOTESTCON 92 Conference Record*, Dayton, Ohio, September 1992, winner of Walter E. Peterson Award for Best New Technology Paper.
27. John W. Sheppard, "Explanation Based Learning With Diagnostic Models," *IEEE AUTOTESTCON 92 Conference Record*, Dayton, Ohio, September 1992.
28. John W. Sheppard and William R. Simpson, "Fault Diagnosis Under Temporal Constraints," *IEEE AUTOTESTCON 92 Conference Record*, Dayton, Ohio, September 1992.

29. Russell Crowe, William R. Simpson, and John W. Sheppard, "A Hierarchical Modeling Approach to System-Level Testability and Diagnosis," *Proceedings of the ASNE Product Engineering Symposium*, Louisville, Kentucky, September 1992.
30. Leonard Haynes, Sharon Goodall, Floyd Phillips, William R. Simpson, and John W. Sheppard, "Test Strategy Component of an Open Architecture for Electronics Design and Support Tools," *IEEE AUTOTESTCON 92 Conference Record*, Dayton, Ohio, September 1992.
31. William R. Simpson and John W. Sheppard, "A Data Fusion Approach to Integrated Diagnostics," *Proceedings of the Symposium on Artificial Intelligence for Military Logistics*, Williamsburg, Virginia, March 1991.
32. William R. Simpson and John W. Sheppard, "Developing Intelligent Automatic Test Equipment," *Proceedings of the 1991 National Aerospace and Electronics Conference*, Dayton, Ohio, May 1991.
33. John W. Sheppard and William R. Simpson, "A Neural Network for Evaluating Diagnostic Evidence," *Proceedings of the 1991 National Aerospace and Electronics Conference*, Dayton, Ohio, May 1991.
34. William R. Simpson and John W. Sheppard, "Partitioning Large Diagnostic Problems," *IEEE AUTOTESTCON '91 Conference Record*, Anaheim, California, September 1991.
35. Arnold G. Blair, John W. Sheppard, and William R. Simpson, "Reducing Logistics Costs Through Improved Field Maintenance," Society of Logistics Engineers, *Proceedings of the 26th Annual International Logistics Symposium*, Dallas, Texas, August 1991.
36. John W. Sheppard and William R. Simpson, "Uncertainty Calculations in Model-Based Reasoning," *IEEE AUTOTESTCON '91 Conference Record*, Anaheim, California, September 1991.
37. William R. Simpson and John W. Sheppard, "The Application of Evidential Reasoning in a Portable Maintenance Aid," *AUTOTESTCON '90 Conference Record*, San Antonio, Texas, September 1990.
38. Eugene A. Esker, William R. Simpson, and John W. Sheppard, "An Embedded Maintenance Subsystem," *IEEE AUTOTESTCON '90 Conference Record*, San Antonio, Texas, September 1990.
39. John W. Sheppard and William R. Simpson, "Experiences with a Model-Based Approach to the Fault Detection and Isolation of Complex Systems," *Symposium on Artificial Intelligence Applications for Military Logistics*, March 1990.
40. William R. Simpson and John W. Sheppard, "A Hierarchical Approach to System-Level Diagnostics," *Proceedings of the 9th Digital Avionics Systems Conference*, Virginia Beach, VA, October 1990.
41. John W. Sheppard and William R. Simpson, "Incorporating Model-Based Reasoning in Interactive Maintenance Aids," *Proceedings of the 1990 National Aerospace and Electronics Conference*, Dayton, Ohio, May 1990.
42. John W. Sheppard and William R. Simpson, "Integrated Diagnosis -- A Hierarchical Approach," *IEEE AUTOTESTCON '90 Conference Record*, San Antonio, Texas, September 1990.
43. William R. Simpson, John W. Sheppard, and C. Richard Unkle, "POINTER - An Intelligent Maintenance Assistant," *IEEE AUTOTESTCON '89 Conference Record*, Philadelphia, Pennsylvania, September 1989.

#### *Technical Reports and Notes*

1. Patrick Kalgren, Sashank Nanduri, Scott Wahl, and John Sheppard, "Dynamic Physical/Data-Driven Models for System-Level Prognostics and Health Management," MSU-NISL-11-001, February 2011.
2. Liessman Sturlaugson, Patrick Donnelly, Richard McAllister, and John W. Sheppard, "Data-Driven Power Supply Prognostics," MSU-NISL-11-002, July 2011.



3. Shane Strasser and John W. Sheppard, "An Analysis of Dynamic Fault Isolation Manuals and Diagnostic Model Maturation," MSU-NISL-11-003, December 2011.
4. John W. Sheppard, "Demonstration of IEEE P1232 AI-ESTATE to Satisfy the Diagnostic Services (DIAS) Framework Element," MSU-NISL-10-001, May 19, 2010.
5. John Sheppard, Stephyn Butcher, Patrick Donnelly, and Benjamin Mitchell, "Predictive Health Management and Advanced Diagnostics for Automated Test Systems," JHU-NISL-08-004, October 31, 2008.
6. John W. Sheppard and Stephyn G. W. Butcher, "Interoperable Adaptive Diagnostics in Automatic Test Systems: Experimental Results and Standardization Progress," JHU-NISL-07-001, March 3, 2007.
7. John W. Sheppard, Stephyn G. W. Butcher, and Ramendra Chauhan, "Electronic Systems Bayesian Stochastic Prognosis: Algorithm Development," JHU-NISL-07-002, September 14, 2007.
8. John W. Sheppard, "An Evaluation of the Waikato Environment for Knowledge Analysis (WEKA) and BayesiaLab Software Tools for Developing and Deploying Diagnostic Bayesian Networks," JHU-NISL-06-001, September 29, 2006.
9. Adam Peterson and John W. Sheppard, "Using Probabilistic Configuration Spaces in Dynamic Motion Planning under Uncertainty," Johns Hopkins University, Part Time Engineering Research Report, 2002.
10. Renee Kent, John W. Sheppard, Dennis Murphy, F. Dang, and R. Gatenbee, "Definition of Requirements for the Performance Enhancement and Reduction of Cost by Integrated Process Design (PERC-IPD)," under contract to CSM Materialteknik, Sweden, December 1997.
11. John W. Sheppard, "A Framework for Intelligent Process Control," ARINC Spot Report, ARINC Incorporated, November 1997.
12. John W. Sheppard and Steven L. Salzberg, "Bootstrapping Memory-Based Learning with Genetic Algorithms," Technical Report JHU-94/11, Department of Computer Science, The Johns Hopkins University, Baltimore, Maryland, February 1994.
13. John W. Sheppard, Jacqueline A. Schaefer, and William R. Simpson, "Design Alternatives for an Expert Communication Link Manager," ARINC Research Corporation, DAAB07-90-G-H007, March 1993.
14. John W. Sheppard, "POINTER for Gyro Test and Diagnosis," STAMP Technical Note, No. 861, ARINC Research Corporation, July 1993.
15. John W. Sheppard and Steven L. Salzberg, "Sequential Decision Making: An Empirical Analysis of Three Learning Algorithms," Technical Report JHU-93/02, Department of Computer Science, The Johns Hopkins University, Baltimore, Maryland, January 1993.
16. John W. Sheppard, "Verifying IFM-Based Diagnostic Systems," STAMP Technical Note, No. 509, July 1993.
17. John W. Sheppard and Roy T. Oishi, "Model Based System Diagnosis Using the Portable Maintenance Access Terminal," STAMP Technical Note, No. 507, July 1992.
18. John W. Sheppard, "Adaptive Resonance Theory and Software Complexity Evaluation," Artificial Intelligence Technical Note, No. 1324, ARINC Research Corporation, January 1991.
19. John W. Sheppard, "POINTER Neural Network Survey Results," STAMP Technical Note, No. 860, ARINC Research Corporation, May 1990.
20. John W. Sheppard, "Terminating Evidential Fault Isolation: A Neural Network Approach," STAMP Technical Note, No. 353, ARINC Research Corporation, May 1990.
21. John W. Sheppard, "An Approach to Rule Base Verification," Artificial Intelligence Technical Note, No. 1322, ARINC Research Corporation, December 1989.
22. John W. Sheppard, "An Introduction to Neural Networks," Artificial Intelligence Technical Note, No. 1321, ARINC Research Corporation, July 1989.

23. John W. Sheppard and William R. Simpson, "Matrix Method Approaches to the Animals Problem," ASA Laboratory Technical Note, No. 9401, ARINC Research Corporation, March 1989.
24. John W. Sheppard, "Software Analysis Using Neural Networks," Artificial Intelligence Technical Note, No. 1500, ARINC Research Corporation, October 1989.
25. Rodney Bond and John W. Sheppard, "Structural Analysis Methods to Aid in Software Debugging and Maintenance," Software Engineering Technical Note, No. 2402, ARINC Research Corporation, June 1989.
26. John W. Sheppard, "Applying Propositional Calculus to Temporal Reasoning," Artificial Intelligence Technical Note, No. 1320, ARINC Research Corporation, May 1988.
27. John W. Sheppard and William R. Simpson, "Excess Tests," STAMP Technical Note, No. 231, ARINC Research Corporation, January 1988.
28. William R. Simpson and John W. Sheppard, "Notes on Asymmetric Tests," STAMP Technical Note, No. 342.1, ARINC Research Corporation, June 1988.
29. John W. Sheppard, "Notes on Closure," STAMP Technical Note, No. 340, ARINC Research Corporation, July 1988.
30. John W. Sheppard, "Notes on Partitioning by Articulation Points," STAMP Technical Note, No. 346, ARINC Research Corporation, November 1988.
31. William R. Simpson, Brian A. Kelley, Jerry L. Graham, and John W. Sheppard, "Testability Prediction Report: Joint STARS Radar Subsystem," ARINC Research Corporation, No. 1518-21-01-4689, May 1988.
32. John W. Sheppard, "Multi-Criterion Optimization with Emphasis," STAMP Technical Note, No. 332.1, ARINC Research Corporation, April 1987.