

Modeling & Simulation Group Publications FY2011

Journals

Published

Vickie Lynch, Meili Chen, John Cobb, Jim Kohl, Steve Miller, David Speirs, and Sudharshan Vazhkudai, "Neutron Science TeraGrid Gateway," *J. Phys.: Conf. Ser.* 251 012097 (2010).

Stephen D. Miller, Al Geist, Kenneth W. Herwig, Peter F. Peterson, Michael A. Reuter, Shelly Ren, Jean-Christophe Bilheux, Stuart I. Campbell, James A. Kohl, Sudharshan S. Vazhkudai, John W. Cobb, Vickie E. Lynch, Meili Chen, James R. Trater, Bradford C. Smith, Tom (William) Swain, Jian Huang, Ruth Mikkelson, Dennis Mikkelson, and Mark L. Green, "The SNS/HFIR Web Portal System – How Can it Help Me?" *J. Phys.: Conf. Ser.* 251 012096 (2010).

Anis Ben Aissa, Robert K. Abercrombie, Frederick T. Sheldon, and Ali Mili, "Quantifying Security Threats and Their Potential Impacts: A Case Study," *Innovations in systems and Software engineering*, **6**, No. 4, 269–281 (December 2010).

C. Rojas, R. Patton, R., and B. Beckerman, "Characterizing Mammography Reports for Health Analytics," *J. of Medical Systems*, Springer Netherlands, 1–14 (2011).

K. O. Bowman and L. R. Shenton, "Montage For The Binomial Distribution Stieltjes Transform," *Far East Journal of Theoretical Statistics*, 34(2), 123–127 (2011).

Mariam S. ElNaggar, Charlotte Barbier, Gary J. Van Berkel, "Liquid Microjunction Surface Sampling Probe Fluid Dynamics: Computational and Experimental Analysis of Coaxial Intercapillary Positioning Effects on Sample Manipulation," *J. Am. Soc. Mass Spectrom.*, **22**, 1157–1166 (2011).

Vikram Melapudi, Balasubramaniam Shanker, Sudip K. Seal and Srinivas Aluru, "A Scalable Parallel Wideband MLFMA for Efficient Electromagnetic Simulations on Large Scale Clusters," *IEEE Transactions of Antennae and Propagation*, 59(7), 2565–2577 (2011).

Jiangtian Li, Xiaosong Ma, Sirkanth Yoginath, Guruprasad Kora, and Nagiza Samatova, "Transparent Runtime Parallelization of the R Scripting Language," *J. of Distributed Computing*, 71(2), pages 157–168 (2011).

David E. Newman, Benjamin A. Carreras, Vickie E. Lynch, Ian Dobson, "Exploring Complex Systems Aspects of Blackout Risk and Mitigation," *IEEE Transactions On Reliability*, vol. 60, (1) (March 2011).

Robert K. Abercrombie, Lee M. Hively, Stacy J. Prowell, Bob G. Schlicher, and Frederick T. Sheldon, "Complex Structure Failure Forewarning System – Catastrophes & Complex systems, Transportation," *J. of Homeland Security* (June 23, 2011).

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Brandon G. Aaby, Kalyan S. Perumalla, Srikanth B. Yoginath, and Sudip K. Seal, "Towards Highly Interactive, GPU-Based Evaluation of Vehicle Transport Scenarios at State-Scale," *SIMULATION Transactions of The Society for Modeling and Simulation International* (2011).

K. O. Bowman and L. R. Shenton, Readers reaction to the paper "Confidence Intervals For Negative Binomial Random Variables Of High Dispersion," *Int. J. of Biostatistics* (2011).

Mohammed Olama, Teja Kuruganti, Stephen Smith, Xiao Ma, and Seddik Djouadi "Hybrid DS/FFH Spread-Spectrum: A Robust, Secure Transmission Technique for Communication in Harsh Environments," *IEEE MILCOM* (2011).

Shravan Garlapati, Yeashfi Hasan, Haris I. Volos, Teja Kuruganti, Stephen Smith, Mohammed Olama, R. Michael Buehrer, and Jeffrey H. Reed, "Mac And Physical Layer Security In Smart Grid Communications," *IEEE Communications Magazine* (2011).

Kalyan S. Perumalla and Sudip K. Seal, "Discrete Event Modeling and Massively Parallel Execution of Epidemic Outbreak Phenomenon," *SIMULATION Transactions of The Society for Modeling and Simulation International* (2011).

Sudip K. Seal and Kalyan S. Perumalla, "Reversible Parallel Discrete Event Formulation of a TLM-Based Radio Signal Propagation Model," *ACM Transactions on Modeling and Computer Simulation* (2011).

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James Nutaro, Phani Teja Kuruganti, Vladimir Protopopescu, and Mallikarjun Shankar, "The Split System Approach To Managing Time In Simulations Of Hybrid Systems Having Continuous And Discrete Event Components," *SIMULATION*, (DOI:10.1177/0037549711401000, online first, May 10, 2011).

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James Nutaro and Vladimir Protopopescu, "Discrete Sensing And Actuation In A Simulation Model Of Frequency Responsive Loads," *IEEE Transactions on Smart Grid* (2011).

James Nutaro and Vladimir Protopopescu, "Calculating Frequency at Loads in Simulations of Electro-Mechanical Transients," *IEEE Transactions on Smart Grid* (2011).

J. C. Schryver, J. Nutaro, and M. J. Haire, “Metrics for Availability Using a Discrete Event Simulation Method,” *Simulation Modeling Practice and Theory* (2011).

J. C. Schryver, “An Extended Rationality Framework for Understanding Strategic Choice and Political Violence,” *Rationality and Society* (2011).

Sudip K. Seal, Kalyan S. Perumalla and Steven P. Hirshman, “Scaling the SIESTA Magneto-hydrodynamics Equilibrium Code,” *J. of Comp. Phy.* (2011).

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Sudip K. Seal, “Accelerating Prefix Computation-Based Block Tri-diagonal Solvers,” *Information Processing Letters* (2011).

Srikanth B. Yeginath and Kalyan S. Perumalla, “Design of a New Scheduler for Virtual Multi-core Guests on Real Multi-core Hosts in Cyber Infrastructure Simulations,” *J. of Simulation* (2011).

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Books/Chapters

Published

James J. Nutaro, “Building Software for Simulation: Theory and Algorithms with Applications in C++,” Wiley, 2010.

K. O. Bowman and L. R. Shenton, “Gamma Distribution,” International Encyclopedia of Statistical Sciences, vol. II, 573-575, Springer Heidelberg Dordrecht London New York, (Dec. 2010).

K. O. Bowman and L. R. Shenton, “Omnibus Test For Departure From Normality,” International Encyclopedia of Statistical Sciences, Vol II, 1015-1018. Springer Heidelberg Dordrecht London New York, (Dec. 2010).

R. M. Patton, B. G. Beckerman, and T. E. Potok, “Analysis and Classification of Mammography Reports Using Maximum Variation Sampling,” Chapter in *Genetic and Evolutionary Computation: Medical Applications*, Stephen L. Smith and Stefano Cagnoni (Eds.), John Wiley, West Sussex, UK, 111–131 (2011).

Conference Papers

Published

R. H. Morris and C. D. Sulfredge, "Facility Targeting, Protection and Mission Decision Making Using the VISAC Code," *MODSIM World 2010 Conference*, Hampton Roads, VA, October 13–15, 2010.

Carlos C. Rojas, Robert M. Patton, and Barbara G. Beckerman, "Characterizing Mammography Reports for Health Analytics," *Proceedings of the 1st ACM International Health Informatics (IHI) Symposium*, IHI '10, 201–209. New York, NY, USA, 2010.

Christopher D. Carothers and Kalyan S. Perumalla, "On Deciding between Conservative and Optimistic Approaches on Massively Parallel Platforms," *Winter Simulation Conference*, December 2010.

Robert K. Abercrombie, Frederick T. Sheldon, and Ali Mili, "Validating Cyber Security Requirements: A Case Study," *IEEE Proceedings of the 44th Annual Hawaii International Conference on System Sciences (HICSS-44)*, Koloa, Kauai, Hawaii, January 4–7, 2011, Computer Society Press, 1–10 (2011).

X. Ma, M. M. Olama, S. M. Djouadi, and C. D. Charalambous, "Estimation And Identification Of Time-Varying Long-Term Fading Channels Via The Particle Filter And The EM Algorithm," *Proceedings of the IEEE Radio and Wireless Symposium*, 13–16, Jan. 16–19, 2011.

Robert K. Abercrombie, "Complex Structure Failure Forewarning System," *2011 Department of Homeland Security (DHS) Science Conference – 5th Annual DHS University Network Summit*, Washington, D.C., March 31, 2011.

J. M. Santos-Hernandez, B. L. Bhaduri, R. M. Medina, B. L. Preston, J. C. Schryver, X. Cui, A. W. King and C. W. Lenhardt, "Managing the Challenges of Climate Change: Social Vulnerability, Migration and Population Displacement," *Annual Meeting Association of American Geographers*, April 2011.

Robert K. Abercrombie, Erik M. Ferragut, Frederick T. Sheldon, and Michael R. Grimaila, "Addressing the Need for Independence in the CSE Model," *2011 IEEE Symposium on Computational Intelligence in Cyber Security (CICS 2011) - Symposium Series on Computational Intelligence (IEEE SSCI 2011)*, Paris, France, April 11–15, 2011.

M. M. Olama, G. O. Allgood, T. P. Kuruganti, S. R. Sukumar, S. M. Djouadi, and J. E. Lake, "Steam Distribution And Energy Delivery Optimization Using Wireless Sensors," *SPIE Defense, Security and Sensing Conference*, vol. 8024, 11 pages, Apr. 25–29, 2011.

M. M. Aulama, A. M. Natsheh, G. A. Abandah, and M. M. Olama, "Optical Character Recognition Of Handwritten Arabic Using Hidden Markov Models," *SPIE Defense, Security and Sensing Conference*, vol. 8055, 12 pages, Apr. 25–29, 2011.

L. R. Baylor, C. Barbier, S. K. Combs, R. C. Duckworth, T. D. Edgemon, S. J. Meitner, D. A. Rasmussen, R. Kersevan, “Cryogenic Viscous Compressor Development and Modeling for the ITER Vacuum System”, *64th IVUSTA Workshop on Practical Applications of Methods of Gas Dynamics for Vacuum Science and Technology*, Leinsweiler, Germany, May 16–19, 2011.

J. C. Schryver, J. Nutaro, and M. J. Haire, “Discrete Event Simulation Modeling for RAMI Analysis of Normal and Upset Plant Operation,” *American Nuclear Society 2011 Annual Meeting*, Hollywood, FL, June 2011.

Srikanth B. Yeginath and Kalyan S. Perumalla, “Efficiently Scheduling Multi-core Guest Virtual Machines on Multi-core Hosts in Network Simulation,” *International Workshop on Principles of Advanced and Distributed Simulation*, June 2011.

R. C. Duckworth, L. R. Baylor, S. J. Meitner, S. K. Combs, D. A. Rasmussen, C. N. Barbier, R. J. H. Pearce, R. Kersevan, and M. Dremel, “Development and Demonstration of a Supercritical Helium-cooled Cryogenic Viscous Compressor Prototype for the ITER Vacuum System,” *Cryogenic Engineering Conference and International Cryogenic Materials Conference*, Spokane, WA, June 13–17, 2011.

L. R. Baylor, C. Barbier, S. K. Combs, R. C. Duckworth, T. D. Edgemon, S. J. Meitner, D. A. Rasmussen, R. Kersevan, M. Dremel, R. J. H. Pearce, “Cryogenic Viscous Compressor Development and Modeling for the ITER Vacuum System,” *38th International Conference on Plasma Science (ICOPS) and 24th Symposium on Fusion Engineering (SOFE)*, Chicago, IL, June 26–30, 2011.

James Nutaro, “Designing Power System Simulators for the Smart Grid: Combining Controls, Communications, and Electro-Mechanical Dynamics,” *2011 Power Engineer Society General Meeting*, July 2011.

J. M. Santos-Hernandez, B. L. Bhaduri, B. L. Preston, X. Cui, R. M. Medina, and J. C. Schryver, “Climate Change, Social Vulnerability to Disasters and Adaptation: Modeling Social Dissatisfaction, Displacement, and Migration,” *19th Conference on Applied Climatology: AMS Conference of Climate Adaptation*, July 2011.

B. L. Bhaduri, X. Cui, C. Liu, J. M. Santos-Hernandez, B. L. Preston, J. C. Schryver, J. Nutaro, S. W. Hadley, R. M. Medina and H. K. Kim, “Knowledge Discovery for Exploring the Relations between Climate Change and Population Dynamics,” *Geocomputation*, July 2011.

R. M. Patton, C. C. Rojas, B. G. Beckerman, and T. E. Potok, “A Computational Framework for Search, Discovery, and Trending of Patient Health in Radiology Reports,” *1st IEEE Conference on Healthcare Informatics, Imaging and Systems Biology*, San Jose, CA, July 2011.

Kalyan S. Perumalla and Alfred J. Park, “Improving Multi-Million Virtual Rank MPI Execution in $\mu\pi$,” *International Conference on Modeling and Simulation of Computing and Telecommunication Systems*, July 2011.

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M. T. Kirk, G. L. Stevens, M. Erickson and S. Yin, “A Proposal for the Maximum K_{IC} for Use in ASME Code Flaw and Fracture Toughness Evaluations,” *2011 ASME Pressure Vessels and Piping Division Conference*, PVP2011-57173, July 17–22, 2011, Baltimore, Maryland.

S. Yin, P. T. Williams, and B. R. Bass, “NESC-VII: Fracture Mechanics Analyses of WPS Experiments on Large-scale Cruciform Specimen,” *2011 ASME Pressure Vessels and Piping Division Conference*, PVP2011-57112, July 17–21, 2011, Baltimore, Maryland.

S. Yin, G. L. Stevens, B. R. Bass and M. T. Kirk, “Stress and Fracture Mechanics Analyses of Boiling Water Reactor and Pressurized Water Reactor Pressure Vessel Nozzles,” *2011 ASME Pressure Vessels and Piping Division Conference*, PVP2011-57014, July 17–21, 2011, Baltimore, Maryland.

P. T. Williams, S. Yin, H. B. Klasky, and B. R. Bass, “ORNL Pre-test Analyses of A Large-scale Experiment in STYLE,” *2011 ASME Pressure Vessels and Piping Division Conference*, PVP2011-57373, July 17–21, 2011, Baltimore, Maryland.

T. L. Dickson, M. T. Kirk, and Eric Focht, “Mechanistic Insights Into Risk-Informed Revision of ASME Section XI – Appendix G,” *2011 ASME Pressure Vessels and Piping Division Conference*, PVP2011-57009, July 17–21, 2011, Baltimore, Maryland.

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Frederick T. Sheldon, Hal Aldridge, Mike Duren, Lee M. Hively, Dipankar Dasgupta, and Robert K. Abercrombie, “Adaptive Bio-Inspired Resilient Cyber-Physical Systems: R&D Prospective,” *Int. Symposium on Resilient Control Systems, Cyber Awareness*, Boise, ID, August 9–11, 2011.

C. Chang and A. Stagg, “A Compatible Lagrangian Scheme for Multicomponent Mixing,” *Int. Conference on Numerical Methods for Multi-Material Fluid Flows*, Arcachon, France, September 2011.

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Robert K. Abercrombie and Erik M. Ferragut, “Hidden Markov Modeling for Weigh-In-Motion Estimation,” *ICWIM6 and NATMEC 2012*, Dallas, TX, June 4–7, 2012 (accepted August 8, 2011).

Robert K. Abercrombie, Frederick T. Sheldon, Hal Aldridge, Mike Duren, Tracy Ricci, Elias Bertino, Athula Kulatunga, and Uditha S. Navaratne, "Secure Cryptographic Key Management System (CKMS) Considerations for Smart Grid Devices," *Proceedings of 7th Annual Cyber Security and Information Intelligence Research Workshop (CSIIRW-2011)*, ACM International Conference Proceeding Series, Oak Ridge, TN October 12–14, 2011.

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J. C. Schryver, J. Nutaro, M. J. Haire, and D. Lee, "Using Throughput, Reliability, Availability, and Maintainability (TRAM) Methodology to Predict and Relieve 'Gridlock' in Process Plant Material Flow," *American Nuclear Society 2011 Winter Meeting*, Washington, D. C., November 2011.

Kalyan S. Perumalla, James J. Nutaro and Srikanth B. Yogninath, "Towards High Performance Discrete Event Simulations of Smart Electric Grids," *International Workshop on High Performance Computing, Networking and Analytics for the Power Grid*, November 2011.

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Reports/TMs/Letter Reports

S. D. Boone, H. D. Haynes, R. W. Lee, and R. L. Schmoyer “Embedded Platform Logistics System (EPLS) Data Analysis,” ORNL/USMC/LAV/EPLS/OCT10, Oak Ridge National Laboratory, Oak Ridge, TN, Oct. 2010.

S. Yin, B. R. Bass and G. L. Stevens, “Stress and Fracture Mechanics Analyses of Boiling Water Reactor and Pressurized Water Reactor Pressure Vessel Nozzles,” ORNL/TM-2010/246, Oak Ridge National Laboratory, Oak Ridge, Tennessee, October 2010.

C. N. Barbier, L. M. Hively, B. G. Schlicher, A. K. Stagg, and T. Warren, “Simulation of Sludge Mixing in Horizontal Cylindrical Tanks,” ORNL/TM-2011/114, Oak Ridge National Laboratory, Oak Ridge, TN, 2011.

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R. H. Morris and C. D. Sulfredge, “Facility Targeting, Protection and Mission Decision Making Using the VISAC Code,” Selected Papers and Presentations Presented at MODSIM World 2010 Conference & Expo, NASA/TM-2011-217069, pp. 23–29, March 2011.

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Dissertation

Kevin R. Birdwell, Dissertation (ORNL PTS #30109), Wind Regimes in Complex Terrain of the Great Valley of Eastern Tennessee, May 2011.

Patents

Robert K. Abercrombie and Lee M. Hively, "Method for Forewarning of Critical Condition Changes in Monitoring Civil Structures," U.S. Patent Pending, December 8, 2010.

Robert K. Abercrombie, "System and Method for Normalizing Data for Analysis of Search Results," U.S. Patent Pending, February 2, 2011.

Robert K. Abercrombie and Erik M. Ferragut, "Cyberspace Security Econometrics System (CSES) Expansion to Address Dependent Events," U.S. Patent Pending, February 15, 2011.

Robert Patton, Thomas Potok, and Barbara Beckerman, "Method and System for Determining Precursors of Health Abnormalities from Processing Medical Records," Docket #1824.091, US Patent Pending February 18, 2011.

Robert Patton, Thomas Potok, Barbara Beckerman, "Method for Learning Phrase patterns from Textual Documents," UT-Battelle ID Number 2235, Application #61/310351, March 4, 2010 (this technology was licensed to TextOre, Spring 2011).

Intellectual Property

Robert K. Abercrombie and Frederick T. Sheldon, Invention Disclosure Number: 201002514, DOE S-Number 124,068, "Cyber Security Econometrics System (CSES) for Assessing/Ranking Threats," December 3, 2010.

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Robert K. Abercrombie and Frederick T. Sheldon, Invention Disclosure Number: 201102583, DOE S-124,139, “Enhanced Methods for Normalizing Data for Analysis of Search Results,” March 28, 2011.

Robert K. Abercrombie and Bob G. Schlicher, Invention Disclosure Number: 201102584, DOE S-Number: S-124,140, “Determination of Emergence from Transition Technology Level Indicators,” March 28, 2011.

Robert K. Abercrombie, Bob G. Schlicher, and Lawrence P. MacIntyre, Invention Disclosure Number: 201102625, DOE S-Number: S-124,183, “Enhanced Tracking and Location Identification with Audit Trail,” June 21, 2011.

Robert K. Abercrombie, Lawrence P. MacIntyre, and Bob G. Schlicher, Invention Disclosure Number: 201102659, DOE S-Number: S-124-217, “Protection of Data in Virtual and Physical Computing Environments,” July 26, 2011.

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Software Copyright

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