James M. McCollum

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EDUCATION

Ph.D.	Computer Engineering (2006). University of Tennessee, Knoxville, TN.
M.S.	Electrical Engineering (2004). University of Tennessee, Knoxville, TN.
B.S.	Computer Science (2001). University of Dayton, Dayton, OH.
B.E.E.	Electrical Engineering (2001). University of Dayton, Dayton, OH.

EXPERIENCE

Assistant Professor (2006 – Present)
Department of Electrical and Computer Engineering, Miami University, Oxford, OH.
Research Assistant (2005 –2006)
Department of Electrical and Computer Engineering, Univ. of Tennessee, Knoxville, TN
Research Associate (2004 – 2005)
Computer Science and Mathematics Division, Oak Ridge National Lab, Oak Ridge, TN.
Research Assistant (2002 –2004)
Department of Electrical and Computer Engineering, Univ. of Tennessee, Knoxville, TN
Software Engineer (2001 –2002)
Neolinear Inc., Pittsburgh, PA. (Acquired by Cadence Design Systems)

AWARDS

National Academies of Science Keck Futures Initiative Grant – Mike Simpson, PI (2004)
University of Tennessee Bodenheimer Fellowship (2004)
University of Dayton Honors Program (1997-2001)
University of Dayton Presidential Scholarship (1997)
PPG Industries Foundation Scholarship (1997)

PROFESSIONAL ACTIVITIES

IEEE Member (2003 – Present)
Reviewer, 48th IEEE International Midwest Symposium on Circuits and Systems (2005)
Reviewer, 39th Annual Simulation Symposium (2005)
Program Committee, 19th International Conf. on Parallel and Distributed Systems (2006)
Software Developer, NSF/DARPA Bio-SPICE Open Source Platform (2001 – 2005)

SELECTED PUBLICATIONS AND PRESENTATIONS

J. M. McCollum, C. D. Cox, G. D. Peterson, M. L. Simpson, and N. F. Samatova, "The sorting direct method for stochastic simulation of biochemical systems with varying reaction execution behavior," *Computational Biology and Chemistry*, 30 (1): 39-49, 2006.

C. D. Cox, J. M. McCollum, D. W. Austin, M. S. Allen, R. D. Roy and M. L. Simpson, "Frequency domain analysis of noise in simple gene circuits," *Chaos* 16: 026102, 2006.

D. W. Austin, M. S. Allen, J. M. McCollum, R. D. Dar, J. R. Wilgus, G. S. Sayler, N. F. Samatova, C. D. Cox, and M. L. Simpson, "Gene network shaping of inherent noise spectra," *Nature*, 439 (7076): 608-611, 2006.

C. D. Cox, J. M. McCollum, D. Austin, R. D. Dar, M. S. Allen, N. F. Samatova, G.D. Peterson, and M.L. Simpson. "Gene circuit inference by analysis of single cell reporter protein expression data," Poster, *6th Annual International Conference on Systems Biology*, Boston, MA, 2005.

C. D. Cox, J. M. McCollum, D. W. Austin, R. D. Dar, M. S. Allen, N. F. Samatova, and M. L. Simpson, "Estimation of Spectral Properties and Molecular Biokinetic Parameters from Stochastic Gene Expression Data," Conference Paper, *Foundations of Systems Biology and Engineering*, Santa Barbara, CA, 2005.

B. P. Thurmon, J. M. McCollum, G. D. Peterson, C. D. Cox, N. F. Samatova, G. S. Sayler, and M. L. Simpson, "Accelerating Exact Stochastic Simulation using Reconfigurable Computing," Conference Paper, *Proceedings of the International Conference on Engineering of Reconfigurable Systems and Algorithms*, 2005.

J. M. McCollum, G. D. Peterson, C. D. Cox, M. L. Simpson, and N. F. Samatova, "Accelerating Exact Stochastic Simulation using Parallel Supercomputing," Poster, *Computational Methods in Systems Biology*, Edinburgh, Scotland, 2005.

J. M. McCollum, G. D. Peterson, C. D. Cox, M. L. Simpson, and N. F. Samatova, "A Parallel Implementation of Gillespie's Exact Stochastic Simulation Algorithm," Poster, *Third International Symposium on Computational and Cellular Biology*, Lenox, MA, 2005.

J. M. McCollum, G. D. Peterson, C. D. Cox, M. L. Simpson, and N. F. Samatova, "BioSpreadsheet: A Biological Model Design, Simulation, and Analysis Tool," Software Demonstration, *Third International Symposium on Computational and Cellular Biology*, Lenox, MA, 2005.

J. M. McCollum, X. Li, and I. Elhanany, "A Multi-Stage Pipelined Memory Management Algorithm for Parallel Shared Memory Switches," *Proceedings of the 48th IEEE International Midwest Symposium on Circuits and Systems*, Cincinnati, OH, 2005.

J. M. McCollum, C. D. Cox, M. L. Simpson, and G. D. Peterson. "Accelerating gene regulatory network modeling using grid based simulation," *Simulation*, 80 (4-5): 231-241, 2004.

C. D. Cox, G. D. Peterson, J. M. McCollum, M. Allen, D. Austin, G.S. Sayler, and M. L. Simpson, "The Functional Role of Stochastic Fluctuations in Information Processing in Cell-Cell Communications," Poster, *Mathematical Methods in Signaling Systems*, Vanderbilt University, Nashville, TN, 2004.

J. M. McCollum, G. D. Peterson, C. D. Cox, and M. L. Simpson, "Accelerating Exact Stochastic Simulation of Coupled Chemical Reactions," Presentation, *Mathematical Methods in Signaling Systems*, Nashville, TN, 2004.

D. W. Austin, J. M. McCollum, G. D. Peterson, C. D. Cox, G. S. Sayler, and M. L. Simpson, "Frequency Domain Analysis of a Complete Model for Autoregulated Gene Expression,"

Poster, *Synthetic Biology 1.0: The First International Meeting on Synthetic Biology*, Cambridge, MA, 2004.

J. M. McCollum, G. D. Peterson, C. D. Cox, and M. L. Simpson, "Accelerating Exact Stochastic Simulation of Coupled Chemical Reactions," Poster, *Synthetic Biology 1.0: The First International Meeting on Synthetic Biology*, Cambridge, MA, 2004.

J. M. McCollum, J. M. Lancaster, and G. D. Peterson, "Using Reconfigurable Computing to Accelerate Simulation Applications," *Proceedings of the International Conference on Engineering of Reconfigurable Systems and Algorithms*, 308-311, 2003.

J. M. McCollum, J. M. Lancaster, D. W. Bouldin, and G. D. Peterson, "Hardware Acceleration of Pseudo-Random Number Generation for Simulation Applications." *Proceedings of the 35th Southeastern Symposium on System Theory*, 299-303, 2003.

C. D. Cox, G. D. Peterson, M. S. Allen, J. M. Lancaster, J. M. McCollum, D. Austin, L. Yan, G. S. Sayler, M. L. Simpson. "Analysis of noise in quorum sensing," *OMICS: A Journal of Integrative Biology*, 7 (3): 317-334, 2003.