

Dr. Frank Drews, Assistant Professor – Computer Science

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Professional Preparation

Technical University of Clausthal, Germany	Computer Science	Ph.D.	2002
Technical University of Clausthal, Germany	Computer Science	M.S.	1999

Awards

Ph.D. Graduation with great honor (“magna cum laude”)

Nominated by the students of the School of EECS (Ohio University) for the Russ College of Engineering and Technology Outstanding Professor Award, 2009

Appointments

2003-present	Assistant Professor, Computer Science, Ohio University
2002-2003	Postdoctoral Researcher, Center for Intelligent and Distributed Systems, Ohio University

Journal Publications

F. Drews, J. Lichtenberg, and L. Welch, “Scalable Parallel Word Search in Multicore / Multiprocessor Systems”, *Journal of Supercomputing*, Springer, DOI: 10.1007/s11227-009-0308-3, 2009.

J. Lichtenberg, E. Jacox, X. Liang, M. Q Yang, F. Drews, S. Lee, K. Ecker, L. Elnitski, and L. Welch, “Word-based Characterization of Promoters involved in Human DNA-repair Pathways”, *BMC Genomics*, Vol 10(Suppl1): S18, DOI: 10.1186/1471-2164-10-S1-S18, 2009.

J. Lichtenberg, A. Yilmaz, J. D Welch, K. Kurz, X. Liang, **F. Drews**, K. Ecker, S. S. Lee, M. Geisler, E. Grotewold, L. R. Welch, “The Word Landscape of the Non-Coding Segments of the Arabidopsis thaliana Genome”, Accepted for publication¹ in *BMC Genomics*, to appear 2009.

C. Cavanaugh, F. Drews, L. Welch, “Dynamic Resource Management in Distributed Real-Time Systems (Editorial)”, *Journal of Systems and Software*, Vol. 80, Issue 7, pp. 933-937, 2007.

D. Gu, L. Welch, F. Drews, K. Ecker, “Characterizing Robustness in Dynamic Real-Time Systems”, *Journal of Systems and Software*, Vol. 80, Issue 7, 1005-1014, 2007.

D. Juedes, F. Drews, D. Gu, L. Welch, K. Ecker and S. Schomann, "Approximation algorithm for periodic real-time tasks with workload-dependent running-time functions," *Journal of Real-time Systems*, Vol. 34, Issue 3, pp. 173-194, November 2006.

F. Drews, K. Ecker, O. Kao and S. Schomann, Strategies for Workload Balancing in Cluster-Based Image Databases, in *Parallel Processing Letters*, Vol. 14, No. 1, pp. 33 - 43, March 2004.

Book Chapters

U. Rerrer, O. Kao, and F. Drews, "Extending the Divisible Task Model for Workload Balancing in Clusters", in *Parallel Computing: Software Technology, Algorithms, Architectures and Applications*, G. Joubert, W. Nagel, F. Peters, W. Walter (Eds.), Elsevier, ISBN 0444516891, 219 – 224, 2004.

Conference Publications

K. Kurz, L. Nau, F. Drews, and L. Welch, F. Drews, "An Open Source Framework for Bioinformatics Word Enumeration and Scoring", In Proceedings of the *Bioinformatics Open Source Conference* (BOSC 2009), 2009.

L. Welch, J. Lichtenberg, F. Drews, "The WORDIFIER Pattern for Functional and Regulatory Genomics", In Proceedings of the *Bioinformatics Open Source Conference* (BOSC 2009), 2009.

J. Lichtenberg, F. Drews, L. Elnitski, E. Grotewold, E. Jacox, K. Kurz, S. S. Lee, X. Liang, P. Morris, C. Nelson, E. Stockinger, J. D. Welch, S. Wyatt, A. Yilmaz, and L. R. Welch. "Identification of Regulatory Landscapes in Genomes: Strategies and Case Studies", Proceedings of the Ohio Collaborative Conference on Bioinformatics (OCCBIO'09), IEEE Computer Society Press, 2009.

F. Drews, W. Leal, P. K. Srinivasan, "Enabling Uniform CPU Allocation in the Presence of System Dynamics: Implementation and Experimental Evaluation", Proceedings of the *2008 International Conference on Embedded Systems and Applications* (ESA'08), 2008.

F. Drews, E. Petri, J. Lichtenberg, and L. Welch, "Scalable Parallel Word Search in Multi-Core/Multiprocessor Systems", Proceedings of *The 2008 International Conference on Bioinformatics and Computational Biology* (BIOCOMP'08), 2008.

F. Drews, K. Ecker, K. Kurz, S. S Lee, X. Liang, J. Lichtenberg, J. Welch, L. Welch, "WordSeeker, A High Performance Bioinformatics Pipeline for Computational Regulatory Genomics", *Ohio Plant Biology Consortium* (OPBC'08), 2008.

J. Lichtenberg, E. Jacox, J. Welch, K. Kurz, M. Yang, K. Ecker, F. Drews, L. Elnitski, and L. Welch, "Word-based characterization of promoters from human DNA-repair pathways", in *Genome Informatics*, Hinxton (UK), 2008.

F. Drews, "Dynamic Resource Management Architectures and Algorithms for Distributed Real-Time Applications", *First DIALOGUE Workshop: Applications-Driven Issues in Data Grids*, Columbus, Ohio, USA, 2007.

K. Ecker, F. Drews, J. Lichtenberg, "QoS-based Management of Multiple Shared Resources in Dynamic Real-Time Systems", Proceedings of the *20th IEEE International Parallel & Distributed Processing Symposium (IPDPS 2006)*, 2006.

F. Drews, K. Ecker, "QoS-based Management of Multiple Shared Resources in Dynamic Real-Time Systems", *CIRM 2006 Symposium on Scheduling Algorithms for new Emerging Applications*, 2006.

D. Gu, F. Drews, and L. Welch, "Robust Task Allocation for Dynamic Distributed Real-time Systems Subject to Multiple Environmental Parameters", Proceedings of the *25th IEEE International Conference on Distributed Computing Systems (ICDCS 2005)*, June 2005.

H. Zhao, D. Gu, L. Welch, F. Drews, and David Juedes, "Stable Allocations in Distributed Real-time Systems with Multiple Environmental Parameters and Replicable Applications", Proceedings of the *19th IEEE International Parallel and Distributed Processing Symposium (IPDPS'05)*, Volume 03, Page: 139.1, 2005.

R. Judd, F. Drews, D. Lawrence, D. Juedes, B. Leal, J. Deshpande, L. Welch, "QoS-based Resource Allocation in Dynamic Real-Time Systems", Proceedings of the *24th American Control Conference (ACC 2005)*, pp. 1745-1751, 2005.

D. Gu, F. Drews and L. Welch, "A Characterization of Task Allocation Problems for Distributed Real-time Systems," Proceedings of the *International Conference on Parallel and Distributed Computing and Systems (PDCS 2004)*, July 2004.

K. Ecker, A. Chernyk, and F. Drews, "Continuous Mode Changes in Real-Time Systems", Proceedings of the *IEEE International Conference on Parallel Computing Systems (PCS 2004)*, pp. 407-414, 2004.

F. Drews, D. Juedes, and L. Welch, "Workload Functions: A New Paradigm for Real-time Computing", Proceedings of the *10th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS2004) Work-In Progress Session*, Toronto, Canada, May 25-28,

2004.

A. Bruening, F. Drews, M. Hoefler, O. Kao, and U. Rerrer, "Towards Quality of Service Based Resource Management for Cluster-Based Image Retrieval Systems", Proceedings of the *2004 International Conference on Algorithmic Mathematics and Computer Science (AMCS'04)*, CSREA Press, ISBN 1-932415-34-3, 373-379, 2004.

W. Leal, F. Drews, C. Liu, L. Welch, "Toward Model-Based Verification of Adaptive Allocation Managers," Proceedings of the *2nd IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS2004) Workshop on Model-Driven Embedded Systems*, May 2004.

F. Drews, L. Welch, D. Juedes, D. Fleeman, A. Bruening, K. Ecker and M. Hoefler, "Utility-Function based Resource Allocation for Adaptable Applications in Dynamic Distributed Real-Time Systems", in *Proceedings of the 18th IEEE International Parallel and Distributed Processing Symposium (IPDPS 2004)*, pp. 123-128, April 2004.

D. Juedes, F. Drews, L. Welch, and D. Fleeman, "Heuristic Resource Allocation Algorithms for Maximizing Allowable Workload in Dynamic, Distributed Real-Time Systems", Proceedings of the *18th IEEE International Parallel and Distributed Processing Symposium (IPDPS 2004)*, pp. 117-122, April 2004.

U. Rerrer, O. Kao, and F. Drews, "Extending the Divisible Task Model for Workload Balancing in Clusters", In *Proceedings of Conference on Parallel Computing (PARCO 2003)*, Elsevier, ISBN 0-444-51689-1, 219-224, 2004.

E. Aber, F. Drews, D. Gu, D. Juedes, A. Lenharth, D. Parrott, L. Welch, H. Zhao, D. Fleeman, "Experimental Comparison of Heuristic and Optimal Resource Allocation Algorithms for Maximizing Allowable Workload in Dynamic, Distributed Real-Time Systems", Proceedings of the *6th Brazilian Workshop on Real-Time Systems (WTR 2004)*, May 2004.

F. Drews, D. Juedes, L. Welch, and K. Ecker, "An Approximation Algorithm for Periodic Real-Time Tasks with Workload-Dependant Running Times", *Dagstuhl Seminar Proceedings No. 04231*, Schloss Dagstuhl, International Conference and Research Center for Computer Science, Germany, 2004.

K. Ecker, F. Drews, D. Juedes, L. Welch, D. Chelberg, D. Fleeman, D. Parrott, and B. Pfarr, "An Optimization Framework for Dynamic, Distributed Real-Time Systems", Proceedings of the *17th IEEE International Parallel and Distributed Processing Symposium (IPDPS 2003)*, pp.111b, April 2003.

F. Drews, L. Welch, "An Architecture and a General Optimization Framework for Resource Management in Dynamic, Distributed Real-Time Systems", Proceedings of the *9th IEEE*

International Workshop on Object-Oriented Real-Time Dependable Systems (WORDS 2003), IEEE Computer Society, ISBN 0-7695-2054-5, 118-124, 2003.

F. Drews, K. Ecker, O. Kao and U. Rerrer, “Extending the Divisible Task Model for Load Balancing in Parallel and Distributed Systems”, Proceedings of the *International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA 2003)*, CSREA Press, Vol. 1 pp. 493-497, 2003.

S. Schomann, F. Drews, and O. Kao, “Evolutionary Algorithms for Scheduling in the Extended LogGP Model”, Proceedings of the *International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA 2003)*, CSREA Press, Vol. 1 pp. 286-292, 2003.

D. Parrott, D. Fleeman, L. Welch, D. Chelberg, C. Bruggeman, F. Drews and Z. Tan, “Autonomous Satellite Systems Operating in Dynamic, Real-Time Environments.” Proceedings of the *International Conference of Artificial Intelligence*, Las Vegas, Nevada, June 2003.

D. Chelberg, F. Drews, D. Fleeman, L. Welch, J. Marquart and B. Pfarr, “Obtaining the Greatest Scientific Benefit from Observational Platforms by Consideration of the Relative Benefit of Observations”, *International Conference on Space Mission Challenges for Information Technology (SMC-IT 2003)*, Pasadena, CA, July 2003.

F. Drews, “Incorporating Multitasking into a Static Scheduling Model”, Schloss Dagstuhl, International Conference and Research Center for Computer Science, *Dagstuhl Seminar Report*, 2002.

F. Drews, K. Ecker, O. Kao and S. Schomann, “Simulated Annealing Strategy for Workload Balancing in Parallel Image Databases”, Proceedings of the *International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA 2002)*, Special Session on Parallel and Distributed Retrieval of Multimedia Data, CSREA Publishing, pp. 734-740, 2002.

F. Drews, “Scheduling and Performance Prediction of I/O intensive Tasks in parallel Time-Sharing Systems”, Proceedings of the *International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA 2001)*, CSREA Publishing, June 25-28 2001.

F. Drews, O. Kao, Randomized Block Size Scheduling Strategy for Cluster-Based Image Databases, Proceedings of the *International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA 2001)*, CSREA Publishing, pp. 2116-2123, 2001.

O. Kao, G. Steinert, F. Drews, “Scheduling Aspects for Image Retrieval in Cluster-Based Image Databases”, Proceedings of the *IEEE/ACM International Symposium on Cluster Computing and the Grid (CCGrid 2001)*, pp. 329-336, IEEE Society Press, 2001.

Journal Editorships

Associate Editor and Member of the Editorial Board of the *International Journal of Computational Bioscience* (2008 – present)

Guest Editor of a Special Issue of the *International Journal of Computational Bioscience* on “Word-Space Enumeration Algorithms” (2009)

Guest Editor of a Special Issue of the *Journal of Systems and Software* on Resource Management for Real-Time and Distributed Systems (2007)

Conference Organization

Member of the Organizing Committee, 8th Annual Bioinformatics Open Source Conference (BOSC 2009), Stockholm, Sweden, June 2009.

General Chair, 16th IEEE International Workshop on Parallel and Distributed Real-Time Systems (WPDRTS 2008), Miami, FL, April 2008.

Program Chair, 15th IEEE International Workshop on Parallel and Distributed Real-Time Systems (WPDRTS 2007), Long Beach, CA, March 2007.

Publication Chair, 1st Ohio Collaborative Conference on Bioinformatics and its Applications in the Life Sciences (OCCBIO 2006), Ohio University, June 2006.

Special Session Organizer, 14th IEEE IPDPS International Workshop on Parallel and Distributed Real-Time Systems (WPDRTS2005), Athens, Greece, April 2006.

Special Session Organizer, 13th IEEE IPDPS International Workshop on Parallel and Distributed Real-Time Systems (WPDRTS2005), Denver, Colorado, April 2005.

Publicity Chair, 12th IEEE International Workshop on Parallel and Distributed Real-Time Systems (WPDRTS2004), Santa Fee, NM, April 2004.

Program Committee Memberships

Program Committee Member - The 2009 IEEE International Joint Conference on Computational Sciences and Optimization (CSO 2009)

Program Co-Chair – The Second IEEE International Symposium on Applied Computing and Computational Sciences (ACCS 2009)

Program Committee Member – 4th Ohio Collaborative Conference on Bioinformatics and its Applications in the Life Sciences (OCCBIO 2009).

Program Committee Member – IEEE Real-Time and Embedded Technology and Applications Symposium 2007 (RTAS 2007).

Program Committee Member – IEEE International Symposium of Object-oriented Real-Time Computing 2007 (ISORC 2007).

Program Committee Member – IEEE Real-Time Systems Symposium 2006 (RTSS 2006).

Grants

Air Force Research Laboratory Campus Challenge Competition, December 2007 – December 2008, Award: \$ 150,000.00, Role: Co-Lead Investigator in Cybertronics.

A Minor Program in Computation Sciences, National Science Foundation (NSF) Subcontract, August 2008 – September 2008, Award: \$ 5,000.00, NSF Subcontractor.

Bringing Together the Cell and the Computer: A Proposal for a Research Program in Bioinformatics, Ohio University 1804 Research Fund, July 2005 – June 2006, Award: \$36,000.00, Co-Principal Investigator.