

Dr. Shelby H. Funk

CONTACT INFORMATION

University of Georgia
Department of Computer Science
415 Boyd Graduate Studies Research Center
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RESEARCH INTERESTS

Real-time Systems, Multiprocessor and Multicore Scheduling, Embedded Systems, Scheduling Theory, Uniform Multiprocessors, Power-aware Computing, Parallel and Distributed Computing, Algorithms.

EDUCATION

University of North Carolina, Chapel Hill, NC USA

Ph.D., Computer Science, 2004

- Dissertation Title: *EDF Scheduling on Heterogeneous Multiprocessors*
- Advisor: Sanjoy K. Baruah

M.S., Computer Science, 2001

M.S., Mathematics, 2000

- Thesis Title: *Using a Modified Size Measure to Guide the Search in the Ordered Semantic Hyper-Linking Theorem Prover*
- Advisors: Jane Hawkins and David Plaisted

University of Maryland, College Park, MD USA

B.S., Mathematics, 1989

ACADEMIC EXPERIENCE

Assistant Professor, University of Georgia, Department of Computer Science **2004 - present**

Research Assistant, University of North Carolina, Department of Computer Science **1999 - 2004**

Teaching Assistant, University of North Carolina, Mathematics Department **1996 - 1999**

HONORS AND AWARDS

Recipient of Best Paper Award, EuroMicro Conference of Real-Time Systems (ECRTS) 2010 for “DP-Fair: A Simple Model for Understanding Optimal Multiprocessor Scheduling”

Faculty service award, UGA Department of Computer Science, 2009.

PUBLICATIONS

Book Chapters

1. John Carpenter, Shelby Funk, Phil Holman, Anand Srinivasan, Jim Anderson, and Sanjoy Baruah. *A Categorization of Real-time Multiprocessor Scheduling Problems and Algorithms*, in Handbook of Scheduling: Algorithms, Models, and Performance Analysis, Joseph Y-T Leung (ed.) Chapman Hall/CRC Press. 2003.

Journal Articles

2. Shelby Funk. *LRE-TL: An Optimal Multiprocessor Algorithm for Sporadic Task Sets with Unconstrained Deadlines*, Real-time Systems, to appear.
3. Shelby Funk and Sanjoy Baruah. *Restricting EDF Migration on Uniform Heterogeneous Multiprocessors*, Technique et Science Informatiques, Volume 24 Number 8, pages 917 – 938, 2005.

4. Sanjoy Baruah, Shelby Funk, and Joël Goossens. *Robustness Results Concerning EDF Scheduling upon Uniform Multiprocessors*, IEEE Transactions on Computers, Volume 52 Issue 9, pages 1185 – 1195, 2003.
5. Joël Goossens, Shelby Funk, and Sanjoy Baruah. *Priority-driven Scheduling of Periodic Task Systems on Multiprocessors*, Real-time Systems, Volume 25 Issue 2-3, pages 187 – 205, September – October, 2003.

Conference Papers

6. Greg Levin, Shelby Funk, Caitlin Sadowski, Ian Pye and Scott Brandt, *DP-Fair: A Simple Model for Understanding Optimal Multiprocessor Scheduling*, Proceedings of the 22nd Euromicro Conference on Real-Time Systems (ECRTS), Brussels, Belgium, pages 1–10, July 2010. *Recipient of the Best Paper Award.*
7. Shelby Funk and Vijaykant Nadadur. *LRE-TL: An Optimal Multiprocessor Scheduling Algorithm for Sporadic Task Sets*, 17th International Conference on Real-Time and Network Systems (RTNS), Paris, France, pages 159 – 168, October 2009.
8. Shelby Funk. *A New Task Model and Utilization Bound for Uniform Multiprocessors*, Conference on Design and Architectures for Signal and Image Processing (DASIP), Special Session on Resource Management Techniques for Real-time Operating Systems in a Co-Design Framework, Brussels, Belgium, pages 106 – 111, November 2008.
9. Barry Rountree, David K. Lowenthal, Shelby H. Funk, Vincent W. Freeh, Bronis R. de Supinski, and Martin Schulz. *Bounding Energy Consumption in Large-Scale MPI Programs*, 20th International Conference for High Performance Computing, Network, Storage and Analysis, IEEE/ACM Supercomputing 2007 (SC'07), Pages 1 – 9, November 2007.
10. Shelby Funk and Sanjoy Baruah. *Task Assignment on Uniform Heterogeneous Multiprocessors*, The 17th EuroMicro Conference on Real-Time Systems, Palma de Mallorca, Balearic Islands, Spain, Pages 219 – 226, July 2005.
11. Shelby Funk and Sanjoy Baruah. *Restricting EDF Migration on Uniform Multiprocessors*, Proceedings of the 12th International Conference on Real-Time Systems, Paris, France, March 2004.
12. Shelby Funk and Sanjoy Baruah. *Characteristics of EDF Schedulability on Uniform Multiprocessors*, Proceedings of the 15th EuroMicro Conference on Real-Time Systems, Porto, Portugal, pages 211 – 220, July 2003.
13. Joël Goossens, Shelby Funk, and Sanjoy Baruah. *EDF Scheduling on Multiprocessor Platforms: Some (Perhaps) Counterintuitive Observations*, Proceedings of the International Conference on Real-Time Computing Systems and Applications, Tokyo, Japan, pages 321 – 330, March 2002.
14. Joël Goossens, Sanjoy Baruah, and Shelby Funk. *Real-time Scheduling on Multiprocessors*, Proceedings of the 10th International Conference on Real-Time Systems, Paris, France, Pages 189 – 204, March 2002.
15. Shelby Funk, Joël Goossens, and Sanjoy Baruah. *On-line Scheduling on Uniform Multiprocessors*, Proceedings of the Real-Time Systems Symposium, London, UK, pages 36 – 41, December 2001.

Short Papers

16. Chiahsun (Alex) Ho and Shelby Funk. *Analysis of Latest Defer Time for Fixed-Priority Scheduling Algorithm with Dual Priority Work in Progress* Proceedings of the Real-Time Systems Symposium (RTSS), Washington, DC, December 2009.
17. Aryabrata Basu and Shelby Funk. *An Optimal Scheme for Multiprocessor Task Scheduling: a Machine Learning Approach* Work in Progress Proceedings of the Real-Time Systems Symposium (RTSS), Washington, DC, December 2009.

18. Shelby Funk and Archana Meka. *U-LLREF: An Optimal Scheduling Algorithm for Uniform Multiprocessors* Proceedings of the Workshop on Models and Algorithms for Planning and Scheduling Problems (MAPSP), Abbey Rolduc, Kerkrade, Netherlands, June 2009.
19. Shelby Funk. *Generalized Feasibility Analysis on Uniform Multiprocessors* Work in Progress Proceedings of the 14th EuroMicro Conference on Real-Time Systems, Pisa, Italy, June 2007.
20. Shelby Funk, Sanjoy Baruah and Joël Goossens. *Heuristics for Restricting EDF Migration on Uniform Multiprocessors*, Work in Progress Proceedings of the 25th Real-Time Systems Symposium, Lisbon, Portugal, December 2004.
21. Joël Goossens, Raymond Devillers and Shelby Funk. *Tie-breaking for EDF on multiprocessor platforms*, Work in Progress Proceedings of the 22nd Real-Time Systems Symposium, Austin, TX, December 2002.
22. Shelby Funk and Joël Goossens. *Modifying EDF for Uniform Multiprocessors*, Work in Progress Proceedings of the 14th EuroMicro Conference on Real-Time Systems, Vienna, Austria, June 2002.

GRANTS

1. *BPC-AE: Collaborative Research: Strengthening and Expanding the Empowering Leadership Alliance*, Shelby Funk (PI), National Science Foundation, \$23,178, February 2010 - January 2012.
2. *Developing Algorithms for Real-Time Scheduling on Power-Aware Multiprocessors*, University of Georgia Research Foundation, \$8,000, January 2006.

COURSES TAUGHT

Discrete Mathematics for Computer Science (undergraduate only) (CSCI 2610)
 Introduction to Theory of Computation (undergraduate only) (CSCI 2670)
 Data Structures (undergraduate only) (CSCI 2720)
 Algorithms (undergraduate/graduate co-convened) (CSCI 4470 / 6470)
 Real-Time Systems (undergraduate/graduate co-convened) (CSCI 4740 / 6740)
 Automata and Formal Languages (graduate only) (CSCI 6610)
 Advanced Real-Time Systems (graduate only) (CSCI 8740)
 Computing, Ethics and Society (undergraduate only) (CSCI 3030)
 Seminar for Graduate Teaching Assistants (graduate only) (GRSC 7770)

SELECTED PROFESSIONAL ACTIVITIES

National Science Foundation Grant Review Panel Member (2008, 2009, 2010).
 Acting Undergraduate Coordinator, UGA Department of Computer Science, Summer 2009.
 Publicity Chair for the International Conference of Real-Time and Network Systems (RTNS) 2010.
 Faculty Sponsor of UGA chapter of ACM-W (2007 – 2010).
 Faculty Sponsor of UGA chapter of ACM (2008 – 2010).
 Participant in a Faculty Learning Community (FLC) on collaborative teaching at UGA.
 Technical Program Committee Member of the following conferences
 Real-Time Systems Symposium (RTSS) 2005, 2008, 2010, 2010 (WIP session).
 Real-Time Embedded Technology and Applications Symposium (RTAS) 2006, 2010 (WIP Session).

Principles of Distributed Systems (OPDIS) 2005.

EuroMicro Conference on Real-Time Systems (ECRTS) 2007, 2008 (WIP session), 2009 (WIP session), 2011.

International Conference on Embedded and Real-Time Computing systems and Applications (RTCSA) 2008, 2009.

International Conference of Real-Time and Network Systems (RTNS) 2010.

Reviewer for the EuroMicro Conference on Real-Time Systems(ECRTS), Real-time Systems Symposium (RTSS), Symposium on Operating Systems Principles (SOSP), Symposium on Applied Computing (SAC), Real-Time Embedded Technology and Applications Symposium (RTAS).

Reviewer for Journal of Systems Architecture; Journal of Scheduling; Transactions on Embedded Computing Systems; Transaction on Computers; Real-Time Systems Journal; Journal of Systems Architecture; Transactions on System, Man and Cybernetics, Part A: Systems and Humans; IEEE Transactions on Parallel and Distributed Systems.

Member of ACM.

Member of IEEE.

PROFESSIONAL
EXPERIENCE

Self-Employed Freelance Computer Programmer. **1995 – 1996**

ICF Resources Computer Programmer. **1989 – 1995**

COMMUNITY
SERVICE

Board member, Free IT Athens, a non-profit organization in Athens, GA, dedicated to providing free computer support and low-cost computers to the Athens community. **2007 – 2010**