

Computer Science Department, UTSA
One UTSA Circle
San Anotnio, TX, 78249

Tel: (210)458-7453
Fax: (210)458-4437
Email: dzhu@cs.utsa.edu

RESEARCH INTERESTS

Real-Time Systems; Low Power Computing; Embedded Systems; Fault Tolerance; Operating Systems; Parallel and Distributed Systems;

EDUCATION

- **Ph.D.** in *Computer Science*, Dec. 2004, University of Pittsburgh
Computer Science Department Pittsburgh PA, USA
Dissertation: *Energy and Reliability Management in Parallel Real-Time Systems*
Advisors: Prof. Rami Melhem and Daniel Mossé
- **M.S.** in *Computer Science*, Apr. 2001, University of Pittsburgh
Computer Science Department Pittsburgh PA, USA
- **M.E.** in *Computer Science*, Jun. 1999, Tsinghua University
Department of Computer Science and Technology Beijing, P.R.China
- **B.E.** in *Computer Science*, Jun. 1996, Xi'an Jiaotong University
Department of Computer Science and Engineering Xi'an Shanxi, P.R.China

APPOINTMENTS

- **Assistant Professor**, Jan. 2005– present
Department of Computer Science, University of Texas at San Antonio
- **Research Assistant**, Aug. 2000 – Dec. 2004
Department of Computer Science, University of Pittsburgh
- **Teaching Assistant**, Aug. 1999 – Aug. 2000
Department of Computer Science, University of Pittsburgh
- **Research Assistant**, Sep. 1996–Jun. 1999
Department of Computer Science and Technology, Tshinghua University, P.R.China

GRANTS AND AWARDS

- **UTSA Faculty Research Award** \$5,000
“Exploiting Chip-Multiprocessors (CMPs) in Real-Time Embedded Systems” 2007 – 2008
- *Collaborative Research: CSR-EHS: Towards an Integrated Framework for Low Power Reliable Real-Time Embedded Systems* PI (with Dr. Hakan Aydin at GMU)
NSF, CNS Division \$285,000 (UTSA \$180,000) 2007 – 2010
- **Andrew Mellon Fellowship** 2003 - 2004
Faculty of Arts and Sciences, University of Pittsburgh
- **Compunetix Graduate Student Research Award** 2001 - 2002
Computer Science Department, University of Pittsburgh

PUBLICATIONS

- *Book Chapters*

- B1. **Dakai Zhu**, Bruce R. Childers, Daniel Mossé and Rami Melhem, “Power Aware Mapping of Real-Time Tasks to Multiprocessors”, to appear in the *Handbook of Parallel Computing: Models, Algorithms, and Applications*, Edited by Sanguthevar Rajasekaran et al., CRC Press, 2006

- *Journal Papers*

- J3. **Dakai Zhu**, “Reliability-Aware Dynamic Energy Management in Dependable Embedded Real-Time Systems”, to appear in *ACM Transaction on Embedded Computing Systems* (accepted in May 2006)
- J2. **Dakai Zhu**, Daniel Mossé and Rami Melhem, “Power Aware Scheduling for AND/OR Graph in Real-Time Systems”, *IEEE Trans. on Parallel and Distributed Systems*, vol. 15, no. 9, pp. 849-864, 2004
- J1. **Dakai Zhu**, Rami Melhem and Bruce R. Childers, “Scheduling with Dynamic Voltage/Speed Adjustment Using Slack Reclamation in Multi-Processor Real-Time Systems”, *IEEE Trans. on Parallel and Distributed Systems*, vol. 14, no. 7, pp. 686-700, Jul. 2003

- *Refereed Conference Papers*

- C13. **Dakai Zhu**, Xuan Qi and Hakan Aydin, “Priority-Monotonic Energy Management for Real-Time Systems with Reliability Requirements”, to appear in the *Proc. of the 25th IEEE International Conference on Computer Design (ICCD’07)*, Lake Tahoe, CA, Oct. 2007 (**88 out of 259 33%**)
- C12. **Dakai Zhu** and Hakan Aydin, “Reliability-Aware Energy Management for Periodic Real-Time Tasks”, to appear in the *Proc. of the IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS’07)*, Bellevue WA, Apr. 2007. (**31 out of 109; 28%**)
- C11. Hakan Aydin, Vinay Devadas and **Dakai Zhu**, “System-level Energy Management for Periodic Real-Time Tasks”, in the *Proc. of the 27th IEEE Real-Time Systems Symposium (RTSS’06)*, Rio de Janeiro, Brazil, Dec. 2006. (**42 out of 173; 24%**)
- C10. **Dakai Zhu** and Hakan Aydin, “Energy Management for Real-Time Embedded Systems with Reliability Requirements”, in the *Proc. of the International Conference on Computer Aided Design (ICCAD’06)*, San Jose, CA, Nov. 2006. (**130 out of 537; 24%**)
- C9. **Dakai Zhu**, “Reliability-Aware Dynamic Energy Management in Dependable Embedded Real-Time Systems”, in the *Proc. of the IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS’06)*, pages 397 - 407, San Jose, CA, Apr. 2006. (**38 out of 128; 30%**)
- C8. Ruibin Xu, **Dakai Zhu**, Cosmin Rusu, Rami Melhem and Daniel Mossé, “Energy Efficient Policies for Embedded Clusters”, in the *Proc. of the Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES’05)*, Chicago, Jun. 2005. (**25 out of 95; 26%**)
- C7. **Dakai Zhu**, Rami Melhem and Daniel Mossé, “Energy Efficient Configuration for QoS in Reliable Parallel Servers”, in the *Proc. of the Fifth European Dependable Computing Conference (EDCC’05)*, Budapest, Hungary, Apr. 2005. (**32 out of 90; 36%**)
- C6. **Dakai Zhu**, Rami Melhem and Daniel Mossé, “The Effects of Energy Management on Reliability in Real-Time Embedded Systems”, in the *Proc. of the International Conference on Computer Aided Design (ICCAD’04)*, San Jose, CA, Nov. 2004. (**127 out of 520; 24%**)

- C5. **Dakai Zhu**, Rami Melhem, Daniel Mossé and E. (Mootaz) Elnozahy, “Analysis of an Energy Efficient Optimistic TMR Scheme”, in the *Proc. of the International Conference on Parallel and Distributed Systems (ICPADS’04)*, Newport Beach, CA, Jul. 2004. **(65 out of 212; 30%)**
 - C4. **Dakai Zhu**, Daniel Mossé and Rami Melhem, “Multiple Resource Periodic Scheduling Problem: how much fairness is necessary?”, in the *Proc. of the 24th IEEE Real-Time System Symposium (RTSS’03)*, Cancun Mexico, Dec. 2003.
 - C3. Ramesh Mishra, Namrata Rastogi, **Dakai Zhu**, Daniel Mossé and Rami Melhem, “Energy Aware Scheduling for Distributed Real-Time Systems”, in the *Proc. of the Int. Parallel & Distributed Processing Symposium (IPDPS’03)*, Nice France, Apr. 2003. **(120 out of 402; 30%)**
 - C2. **Dakai Zhu**, Nevine AbouGhazleh, Daniel Mossé and Rami Melhem, “Power Aware Scheduling for AND/OR Graph in Multi-Processor Real-Time Systems”, in the *Proc. of the Int. Conference on Parallel Processing (ICPP’02)*, Vancouver B.C. Canada, Aug. 2002. **(68 out of 188; 36%)**
 - C1. **Dakai Zhu**, Rami Melhem and Bruce R. Childers, “Scheduling with Dynamic Voltage/Speed Adjustment Using Slack Reclamation in Multi-Processor Real-Time Systems”, in the *Proc. of the 22th IEEE Real-Time System Symposium (RTSS’01)*, London England, Dec. 2001.
- *Refereed Workshop/Short Papers/Posters*
 - W4. Frederick E. Diehl, Joshua J. Curtis, Salvador J. Rodriguez, Ali S. Tosun and **Dakai Zhu**, “Power-Efficient Real-Time Data Collection using Mobile Robots”, in the *Supplement Proc. of the IEEE Real-Time System Symposium (RTSS’07) for Works In Progress (WiP) Session*, Tucson, AZ, Dec. 3-6, 2007
 - W3. **Dakai Zhu** and Hakan Aydin, “Low-Power Reliable Real-Time Embedded Systems”, in *IBM Austin Conference on Energy-Efficient Design (ACEED) - poster*, Mar. 2007.
 - W2. **Dakai Zhu** and Hakan Aydin, “Reliability Effects of Process and Thread Redundancy on Chip Multiprocessors”; in *Supplement Proc. of the Int’l Conf. on Dependable Systems and Networks (DSN) - Fast Abstracts*, pages 212-213, Philadelphia, Jun. 2006.
 - W1. Ruibin Xu, Cosmin Rusu, **Dakai Zhu**, Daniel Moss, and Rami Melhem, “Practical Energy-Efficient Policies for Server Clusters”, *Brazilian Workshop on Real-Time*, Gramado, Brazil, May 2004.
 - *Technical Reports*
 - T2. **Dakai Zhu**, Rami Melhem and Daniel Mossé, “Energy Efficient Redundant Configurations for Reliable Servers in Distributed Systems; *UTSA-CS-TR-2007-001*, Department of Computer Science, University of Texas at San Antonio, Feb. 2007
 - T1. **Dakai Zhu**, “Reliability-Aware Dynamic Energy Management in Dependable Embedded Real-Time Systems”; *UTSA-CS-TR-2006-001*, Department of Computer Science, University of Texas at San Antonio, Jan. 2006; (accepted by ACM TECS, May 2006)

STUDENTS AND COMMITTEES

Master Students:

- **Nirali Patel** *MS Thesis: “Fixed-Priority Based Reliability-Aware Power Management for Periodic Real-Time Tasks”*; Dec. 2007;

Master Thesis Committees:

- Frederick Eugene Diehl (Advisor: Ali S. Tosun) *Data Collection In a Wireless Sensor Network Using a Mobile Data Collection Agent*, graduated Dec. 2007;

- Luis Ortiz (Advisor: Chia-Tien Dan Lo) *A New Traffic Worm Generator*, graduated Dec. 2007;

Ph.D. dissertation committees:

- Yi-Gang Tai (Advisor: Dr. Chia-Tien Dan Lo), *Acceleration of Scientific Applications on Reconfigurable Computing Systems*;
- Satish Penmatsa (Advisor: Dr. Anthony T. Chronopoulos), *Game Theory Based Job Allocation/Load Balancing in Distributed Systems with Communication and Applications to Grid Computing*, graduated Dec. 2007;
- Mayumi Kato (Advisor: Dr. Chia-Tien Dan Lo), *Java Memory Compression*, graduated May 2007;

COURSES TAUGHT

- CS 1063, *Introduction to Computer Programming*, Fall 2007;
- CS 4953, *SS: Embedded Systems*, Summer 2007;
- CS 5523, *Operating Systems*, Spring 2005, Spring 2006, Spring 2007;
- CS 1713, *Introduction to Computer Science*, Fall 2005, Fall 2006, Spring 2007;

PROFESSIONAL SERVICE

Chair positions in conferences:

- Web Chair of the IEEE Real-Time and Embedded Technology and Applications Symposium, 2007,2008;
- Program Co-Chair of the First Int'l Workshop on Wireless Mesh and Ad-hoc Networks (WiMan) 2007
- Guest Co-Editor of the special issue of *International Journal of Embedded Systems (IJES)* on *Low-Power Real-Time Embedded Computing*, 2006;
- Program Co-Chair of the Int'l Workshop on Scheduling Techniques for Real-Time Systems 2005;
- Program Co-Chair of the Second Int'l Workshop on Power-Aware Real-time Computing (PARC) 2005;

Program committee positions:

- IEEE Real-Time System Symposium (RTSS), 2005,2006;
- IEEE Real-Time Technology and Applications Symposium (RTAS), 2006,2007;
- Int'l Conference on Embedded Software and Systems (ICCESS), 2004,2005,2007;
- The 4th Int'l Symposium on Embedded Computing (SEC) 2007;
- IFIP Int'l Conference on Embedded And Ubiquitous Computing (EUC), 2005,2007;
- Int'l Conference on Intelligent Pervasive Computing (IPC) 2007;
- The 2nd Int'l Symposium on Smart Home (SH'07) 2007;
- 2006 International Workshop on Embedded Software Optimization (ESO 2006) (with EUC'06);
- 3rd International Workshop on Embedded Computing, 2006 (with ICPP'06);

Reviewing, Refereeing:

- IEEE Transactions on Computers, 2006,2007;
- IEEE Transactions on Parallel and Distributed Systems, 2007;
- IEEE Transactions on Industrial Informatics, 2007;
- IEEE Transactions on Very Large Scale Integration Systems, 2007;
- ACM Transactions on Embedded Computing Systems, 2006, 2007;
- Journal of Real-Time Systems (JRTS), 2006, 2007
- Journal of Parallel and Distributed Computing (JPDC), 2005,2007;
- Information Processing Letter (JPL), 2006

- Journal of Systems and Software (JSS), 2005, 2006, 2007;
- Euromicro Conference on Real-Time Systems (ECRTS), 2004, 2005;
- ACM International Conference on Supercomputing 2006;
- ACM SIGPLAN/SIGBED Conference on Language, Compilers, and Tools for Embedded Systems (LCTES) 2003, 2004, 2005;
- Design Automation Conference (DAC) 2004, 2005;