

Gokhan Memik

Department of Electrical Engineering and Computer Science
Northwestern University, Evanston IL 60208
Phone: (847) 467-1168, Fax: (847) 467-4144
memik@eecs.northwestern.edu, <http://www.eecs.northwestern.edu/~memik>

EDUCATION

University of California – Los Angeles

Ph.D., Electrical Engineering Department *Aug. 2003*

Northwestern University

M.S., Electrical and Computer Engineering Department *May 2000*

Bogazici University, Istanbul, Turkey

B.S., Department of Computer Engineering *July 1998*

EMPLOYMENT

Northwestern University

Assistant Professor, Department of Electrical Engineering and Computer Science *Sept. 2005 – Present*

Lisa Wissner-Slivka and Benjamin Slivka Junior Professor of Computer Science *Sept. 2006 – Present*

Assistant Professor, Department of Electrical and Computer Engineering *Sept. 2003 – Sept. 2005*

University of California, Los Angeles, CA

Research Assistant *Jan. 2001 – Aug. 2003*

Northwestern University

Research Assistant *Jan 1999 – Dec. 2000*

HP Labs, Palo Alto, CA

Research Intern *Summer 2000 and 2002*

AWARDS AND HONORS

- Best paper award nomination at the International Symposium on Microarchitecture (MICRO) (2008)
- National Science Foundation CAREER Award (2008-2013)
- Best Student Paper Award – Supercomputing (2007)
- 3rd place award at the Northwestern University Applied Research Day (2007)
- Lisa Wissner-Slivka and Benjamin Slivka Junior Professor of Computer Science (2006-2009)
- Department of Energy Early Career Principal Investigator (CAREER) Award (2005-2008)
- Best paper award nomination at the Design Automation Conference (DAC) (2005)
- Searle Center for Teaching Excellence Junior Fellow (2004-2005)
- Henry Samueli Excellence in Teaching Award (2002)
- Henry Samueli Fellowship (2001-2002)

PUBLICATIONS

Refereed Journal Publications

- J1. S. Liu, Y. Zhang, S. O. Memik, G. Memik, “An Approach for Adaptive DRAM Temperature and Power Management”, *IEEE Transactions on Transactions on Very Large Scale Integration Systems (TVLSI)*, to appear
- J2. J. Long, S. O. Memik, G. Memik, R. Mukherjee, “Thermal Monitoring Mechanisms for Chip Multiprocessors”, *ACM Transactions on Architecture and Code Optimization (TACO)*, volume 5, issue 2, 2008
- J3. D. Nguyen, A. Das, J. Zambreno, G. Memik, A. Choudhary, “An FPGA-based Network Intrusion Detection Architecture”, *IEEE Transactions on Information Forensics and Security*, volume 3, issue 1, March 2008

- J4. R. Schweller, Z. Li, Y. Chen, Y. Gao, A. Gupta, E. Parsons, Y. Zhang, P. Dinda, M. Kao, G. Memik, "Reversible Sketches: Enabling Monitoring and Analysis over High-speed Data Streams", *IEEE/ACM Transactions on Networking (ToN)*, volume 15, issue 5, October 2007
- J5. A. Das, S. Ozdemir, G. Memik, J. Zambreno, A. Choudhary, "Microarchitectures for Managing Chip Revenues under Process Variations", *IEEE Computer Architecture Letters (CAL)*, volume 6, June 2007
- J6. J. C. Ku, S. Ozdemir, G. Memik, Y. Ismail, "Thermal Management of On-Chip Caches through Power Density Minimization", *IEEE Transactions on Transactions on Very Large Scale Integration Systems (TVLSI)*, volume 15, issue 5, pp. 592-604, May 2007
- J7. A. Mallik, B. Lin, G. Memik, P. Dinda, R. Dick, "User-Driven Frequency Scaling", *IEEE Computer Architecture Letters (CAL)*, volume 5, issue 2, July-December 2006
- J8. G. Memik, M. T. Kandemir, W-K. Liao, A. Choudhary, "Multi-Collective I/O: A technique for exploiting inter-file access patterns", *ACM Transactions on Storage (TOS)*, volume 2, issue 3, pp. 349-369, August 2006
- J9. G. Memik and W. H. Mangione-Smith, "Evaluating Network Processors using NetBench", *ACM Transactions on Embedded Computing Systems (TECS)*, volume 5, issue 2, pp. 453-471, May 2006
- J10. A. Mallik and G. Memik, "Low Power Correlation Caches for Network Processors", *Journal of Low Power Electronics (JOLPE)*, volume 1, issue 2, pp. 108-118, August 2005
- J11. A. Mallik, M. C. Wildrick, G. Memik, "Application-Level Error Measurements for Network Processors", *IEICE Transactions on Information and Systems*, volume E88-D, issue 8, August 2005
- J12. G. Memik, G. Reinman, W. H. Mangione-Smith, "Precise Instruction Scheduling", *Journal of Instruction-Level Parallelism (JILP)*, volume 7, January 2005
- J13. X. Shen, W. Liao, A. Choudhary, G. Memik, M. Kandemir, "A High Performance Application Data Environment for Large-Scale Scientific Computations", *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, volume 14, issue 12, pp. 1262 – 1274, 2003
- J14. G. Memik, M. T. Kandemir, A. Choudhary, "Design and Evaluation of Smart Disk Cluster for DSS Commercial Workloads", *Journal of Parallel and Distributed Computing (JPDC)*, volume 61, issue 11, pp. 1633-1664, 2001
- J15. A. Choudhary, M. Kandemir, J. No, G. Memik, X. Shen, W. Liao, H. Nagesh, S. More, V. Taylor, R. Thakur, R. Stevens, "Data Management for Large-Scale Scientific Computations in High Performance Distributed Systems", *Cluster Computing: the Journal of Networks, Software Tools and Applications*, volume 3, issue 1, pp.45 – 60, 2000

Refereed Conference/Workshop Publications

- C1. Y. Pan, P. Kumar, J. Kim, G. Memik, Y. Zhang, A. Choudhary, "Firefly: Illuminating Future Network-on-Chip with Nanophotonics", in Proc. of *International Symposium on Computer Architecture (ISCA)*, Austin, TX, June 2009
- C2. Y. Zhang, G. Memik, J. Kim, "Analyzing the Impact of On-Chip Network Traffic on Program Phases for CMPs", in Proc. of *IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS)*, Boston, MA, April 2009
- C3. B. Lin, A. Mallik, P. Dinda, G. Memik, R. Dick, "User- and Process-Driven Dynamic Voltage and Frequency Scaling", in Proc. of *IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS)*, Boston, MA, April 2009
- C4. A. Das, B. Ozisikyilmaz, S. Ozdemir, G. Memik, J. Zambreno, A. Choudhary, "Evaluating the Effects of Cache Redundancy on Profit", in Proc. of *IEEE/ACM International Symposium on Microarchitecture (MICRO)*, Lake Como, Italy, Nov. 2008
- C5. A. Shye, Y. Pan, B. Scholbrock, J. S. Miller, G. Memik, P. Dinda, R. Dick, "Power to the People: Leveraging Human Physiological Traits to Control Microprocessor Frequency", in Proc. of *IEEE/ACM International Symposium on Microarchitecture (MICRO)*, Lake Como, Italy, Nov. 2008 [**Nominated for Best Paper Award**]
- C6. B. Leung, Y. Pan, C. Schroeder, S. Memik, G. Memik, M. Hartmann, "Towards an "Early Neural Circuit Simulator": An FPGA Implementation of Processing In the Rat Whisker System", in Proc. of *18th Intl. Conference on Field-Programmable Logic and Applications (FPL)*, Heidelberg, Germany, Sep. 2008
- C7. B. Ozisikyilmaz, G. Memik, A. Choudhary, "Machine Learning Models to Predict Performance of Computer System Design Alternatives", in Proc. of *37th International Conference on Parallel Processing (ICPP)*, Portland, OR, Sep. 2008
- C8. A. Shye, B. Ozisikyilmaz, A. Mallik, G. Memik, P. Dinda, R. Dick, A. Choudhary, "Learning and Leveraging the Relationship between Architecture-Level Measurements and Individual User Satisfaction", in Proc. of *International Symposium on Computer Architecture (ISCA)*, Beijing, China, June 2008

- C9. S. Liu, Y. Zhang, S. O. Memik, G. Memik, "Adaptive DRAM Temperature and Power Management", in Proc. of *International Conference on Supercomputing (ICS)*, Island of Kos, Greece, June 2008
- C10. B. Ozisikyilmaz, G. Memik, A. Choudhary, "Efficient System Design Space Exploration Using Machine Learning Techniques", in Proc. of *Design Automation Conference (DAC)*, Anaheim, CA, June 2008
- C11. S. Liu, Y. Zhang, S. O. Memik, G. Memik, "A Power and Temperature Aware DRAM Architecture", in Proc. of *Design Automation Conference (DAC)*, Anaheim, CA, June 2008
- C12. Z. Ye, G. Memik, J. Grosspietsch, "Energy Detection using Estimated Noise Variance for Spectrum Sensing in Cognitive Radio Networks", in Proc. of *IEEE Wireless Communications and Networking Conference (WCNC)*, Las Vegas, NV, March/April 2008
- C13. A. Das, S. Misra, J. Zambreno, G. Memik, A. Choudhary, "An Efficient FPGA Implementation of Principle Component Analysis based Network Intrusion Detection System", in Proc. of *Design, Automation and Test in Europe (DATE)*, Munich, Germany, Mar. 2008
- C14. A. Mallik, J. Cosgrove, R. Dick, G. Memik, P. Dinda, "PICSEL: Measuring User-Perceived Performance to Control Dynamic Frequency Scaling", in Proc. of *ACM Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, Seattle, WA, Mar. 2008
- C15. A. Shye, L. Yang, X. Chen, B. Ozisikyilmaz, A. Mallik, B. Lin, P. A. Dinda, G. Memik, R. P. Dick, "Empathic Computer Architectures and Systems", *ACM Architectural Support for Programming Languages and Operating Systems - Wild and Crazy Ideas VI (ASPLOS-WACI)*, Seattle, WA, Mar. 2008
- C16. A. Mallik, Y. Zhang, G. Memik, "Automated Task Distribution in Multicore Network Processors using Statistical Analysis", in Proc. of *ACM/IEEE Symposium on Architectures for Networking and Communications Systems (ANCS)*, Orlando, FL, Dec. 2007
- C17. S. Pati, R. Narayanan, G. Memik, A. Choudhary, J. Zambreno, "Design and Implementation of an FPGA Architecture for High-Speed Network Feature Extraction", in Proc. of *International Conference on Field-Programmable Technology (FPT)*, Kitakyushu, Japan, Dec. 2007
- C18. S. Ozdemir, J. C. Ku, A. Mallik, G. Memik, Y. Ismail, "Variable Latency Caches for Nanoscale Processor", in Proc. of *Conference for High Performance Computing, Networking, Storage and Analysis (Supercomputing - SC07)*, Reno, NV, Nov. 2007 [**Winner of the Best Student Paper Award**]
- C19. A. Das, S. Ozdemir, G. Memik, A. Choudhary, "Evaluating Voltage Islands in CMPs under Process Variations", in Proc. of *International Conference on Computer Design (ICCD)*, Lake Tahoe, CA, Oct. 2007
- C20. Z. Ye, J. Grosspietsch, G. Memik, "Spectrum Sensing Using Cyclostationary Spectrum Density for Cognitive Radios", in Proc. of *26th IEEE 2007 Workshop on Signal Processing Systems (SiPS)*, Shanghai, China, Oct. 2007
- C21. Z. Ye, G. Memik, J. Grosspietsch, "Digital Modulation Classification Using Temporal Waveform Features for Cognitive Radios", in Proc. of *18th Annual IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC)*, Athens, Greece, Sep. 2007
- C22. A. Das, S. Ozdemir, G. Memik, A. Choudhary, "Mitigating the Effects of Process Variations: Architectural Approaches for Improving Batch Performance", in Proc. of *Workshop on Architectural Support for Gigascale Integration (ASGI) held in conjunction with International Symposium on Computer Architecture (ISCA)*, San Diego, CA, June 2007
- C23. P. Dinda, G. Memik, R. Dick, B. Lin, A. Mallik, A. Gupta, S. Rossoff, "The User In Experimental Computer Systems Research", in Proc. of *Workshop on Experimental Computer Science (Part of FCRC)*, San Diego, CA, June 2007
- C24. B. Lin, A. Mallik, P. Dinda, G. Memik, R. Dick, "Power Reduction Through Measurement and Modeling of Users and CPUs", in Proc. of *ACM International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS)*, San Diego, CA, June 2007 (poster paper)
- C25. R. Narayanan, B. Ozisikyilmaz, G. Memik, A. Choudhary, J. Zambreno, "Quantization Error and Accuracy-Performance Tradeoffs for Embedded Data Mining Workloads", in Proc. of *High Performance Data Mining Workshop (HPDM)*, Beijing, China, May 2007
- C26. R. Narayanan, D. Honbo, G. Memik, A. Choudhary, J. Zambreno, "An FPGA Implementation of Decision Tree Classification", In Proc. of *Design, Automation, and Test in Europe (DATE)*, Nice, France, April 2007
- C27. Z. Ye, G. Memik, J. Grosspietsch, "An FPGA Based All Digital Transmitter with Radio Frequency Output for Software Defined Radio", in Proc. of *Design, Automation, and Test in Europe (DATE)*, Nice, France, April 2007
- C28. S. Ozdemir, D. Sinha, G. Memik, J. Adams, H. Zhou, "Yield-Aware Cache Architectures", In Proc. of *IEEE/ACM International Symposium on Microarchitecture (MICRO)*, Orlando, FL, Dec. 2006
- C29. B. Ozisikyilmaz, R. Narayanan, J. Zambreno, G. Memik, A. Choudhary, "An Architectural Characterization Study of Data Mining and Bioinformatics Workloads", in Proc. of *IEEE International Symposium on Workload Characterization (IISWC)*, San Jose, CA, Oct. 2006

- C30. R. Narayanan, B. Ozisikyilmaz, J. Zambreno, G. Memik, A. Choudhary, "MineBench: A Benchmark Suite for Data Mining Workloads", in Proc. of *IEEE International Symposium on Workload Characterization (IISWC)*, San Jose, CA, Oct. 2006 (benchmark submission)
- C31. D. Nguyen, A. Das, G. Memik, A. Choudhary, "A Reconfigurable Architecture for Network Intrusion Detection Using Principal Component Analysis", in Proc. of *IEEE Symposium on Field-Programmable Custom Computing Machines (FCCM)*, Napa, California, April 2006 (poster presentation)
- C32. J. C. Ku, S. Ozdemir, G. Memik, Y. Ismail, "Power Density Minimization for Highly-Associative Caches in Embedded Processors", in Proc. of *IEEE/ACM Great Lakes Symposium on VLSI (GLSVLSI)*, Philadelphia, PA, Apr.-May 2006
- C33. R. Schweller, Z. Li, Y. Chen, Y. Gao, A. Gupta, E. Parsons, Y. Zhang, P. Dinda, M. Kao, G. Memik, "Reverse Hashing for High-speed Network Monitoring: Algorithms, Evaluation, and Applications", in Proc. of *25th Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM 2006)*, Barcelona, Spain, Apr. 2006
- C34. D. Nguyen, G. Memik, A. Choudhary, "A Reconfigurable Architecture for Network Intrusion Detection using Principal Component Analysis", in Proc. of *Fourteenth ACM/SIGDA International Symposium on Field-Programmable Gate Arrays (FPGA)*, Monterey, CA, Feb. 2006 (poster presentation)
- C35. J. Zambreno, B. Ozisikyilmaz, J. Pisharath, G. Memik, A. Choudhary, "Performance Characterization of Data Mining Applications using MineBench", in Proc. of *Ninth Workshop on Computer Architecture Evaluation using Commercial Workloads (CAECW-9) held in conjunction with 12th International Symposium on High Performance Computer Architecture (HPCA)*, Austin, TX, Feb. 2006
- C36. J. C. Ku, S. Ozdemir, G. Memik, Y. Ismail, "Thermal Management of On-Chip Caches Through Power Density Minimization", in Proc. of *IEEE/ACM International Symposium on Microarchitecture (MICRO)*, Barcelona, Spain, Nov. 2005
- C37. Y. Liu, G. Memik, G. Reinman, "Reducing the Energy of Speculative Instruction Schedulers", in Proc. of *IEEE International Conference on Computer Design (ICCD)*, San Jose, CA, Oct. 2005
- C38. D. Nguyen, G. Memik, S. O. Memik, A. Choudhary, "Real-Time Feature Extraction for High Speed Networks", in Proc. of *International Conference on Field Programmable Logic and Applications (FPL)*, Tampere, Finland, Aug. 2005
- C39. R. Mukherjee, S. O. Memik, G. Memik, "Peak Temperature Control and Leakage Reduction During Binding in High Level Synthesis", in Proc. of *IEEE/ACM Int. Symposium on Low Power Electronics and Design (ISLPED)*, San Diego, CA, Aug. 2005
- C40. G. Memik, M. Chowdhury, A. Mallik, Y. Ismail, "Engineering Over-Clocking: Reliability-Performance Trade-Offs for High-Performance Register Files", in Proc. of *IEEE/ACM International Conference on Dependable Systems and Networks (DSN)*, Yokohama, Japan, June - July 2005
- C41. Y. Liu, A. Shayesteh, G. Memik, G. Reinman, "Tornado Warning: the Perils of Selective Replay in Multithreaded Processors", in Proc. of *ACM International Conference on Supercomputing (ICS)*, Cambridge, MA, June 2005
- C42. R. Mukherjee, S. O. Memik, G. Memik, "Temperature-Aware Resource Allocation and Binding in High-Level Synthesis", in Proc. of *IEEE/ACM Design Automation Conference (DAC)*, Anaheim, CA, June 2005 **[Nominated for Best Paper Award]**
- C43. G. Memik, M. Kandemir, A. Mallik, "Load Elimination for Low-Power Embedded Processors", in Proc. of *Great Lakes Symposium on VLSI (GLSVLSI)*, Chicago, IL, Apr. 2005
- C44. G. Memik, M. Kandemir, O. Ozturk, "Increasing Register File Immunity to Transient Errors", in Proc. of *Design, Automation, and Test in Europe (DATE)*, Munich, Germany, Mar. 2005
- C45. G. Mittal, D. Zaretsky, G. Memik, P. Banerjee, "Automatic Extraction of Function Bodies from Software Binaries", in Proc. of the *IEEE/ACM Asia and South Pacific Design Automation Conference (ASPDAC)*, Shanghai, China, Jan. 2005
- C46. G. Chen, M. Kandemir, M. J. Irwin, G. Memik, "Compiler-Directed Selective Data Protection Against Soft Errors", in Proc. of the *IEEE/ACM Asia and South Pacific Design Automation Conference (ASPDAC)*, Shanghai, China, Jan. 2005
- C47. Y. Liu, A. Shayesteh, G. Memik, G. Reinman, "The Calm Before the Storm: Reducing Replays in the Cyclone Scheduler", in Proc. of *P=ac2: First Watson Conference on Interaction between Architecture, Circuits, and Compilers*, Yorktown Heights, NY, Oct. 2004
- C48. A. Mallik and G. Memik, "A Case for Clumsy Packet Processors", in Proc. of *IEEE/ACM International Symposium on Microarchitecture (MICRO)*, Portland, OR, Dec. 2004

- C49. Y. Liu, J. Pisharath, W.-K. Liao, G. Memik, A. Choudhary, "Performance Evaluation and Characterization of Scalable Data Mining Algorithms", in Proc. of *Parallel and Distributed Computing and Systems (PDCS)*, San Francisco, CA, Sep. 2004
- C50. D. Nguyen, J. Zambreno, G. Memik, "Flow Monitoring in High-Speed Networks using Two Dimensional Hash Tables", in Proc. of *Field-Programmable Logic and its Applications (FPL)*, Antwerp, Belgium, Aug.-Sep. 2004 (poster presentation)
- C51. A. Mallik and G. Memik, "Design and Evaluation of Correlating Caches", in Proc. of *IEEE/ACM Int. Symposium on Low Power Electronics and Design (ISLPED)*, New Port, CA, Aug. 2004 (poster presentation)
- C52. Y. Liu, A. Shayesteh, G. Memik, G. Reinman, "Scaling the Issue Window with Look-Ahead Latency Prediction", in Proc. of *ACM International Conference on Supercomputing (ICS)*, Saint-Malo, France, June-July 2004
- C53. G. Memik, G. Reinman, W. H. Mangione-Smith, "Reducing Energy and Delay Using Efficient Victim Caches", in Proc. of *IEEE/ACM International Symposium on Low Power Electronics and Design (ISLPED)*, Seoul, Korea, Aug. 2003
- C54. S. O. Memik, G. Memik, R. Jafari, E. Kursun, "Global Resource Sharing for Synthesis of Control Data Flow Graphs on FPGA's", in Proc. of *40th IEEE/ACM Design Automation Conference (DAC)*, Anaheim, CA, June 2003
- C55. G. Memik, M. T. Kandemir, A. Choudhary, I. Kadayif, "An Integrated Approach for Improving Cache Behavior", in Proc. of *IEEE Design Automation and Test in Europe (DATE)*, Munich, Germany, Mar. 2003.
- C56. G. Memik, G. Reinman, W. H. Mangione-Smith, "Just Say No: Benefits of Early Cache Miss Determination", in Proc. of *Ninth IEEE/ACM International Symposium on High Performance Computer Architecture (HPCA)*, Anaheim, CA, Feb. 2003
- C57. G. Memik and W. H. Mangione-Smith, "NEPAL: A Framework for Efficiently Structuring Applications for Network Processors", in Proc. of *Second Workshop on Network Processors – NP2 (held in conjunction with HPCA)*, Anaheim, CA, Feb. 2003
- C58. G. Memik and W. H. Mangione-Smith, "Improving Power Efficiency of Multi-Core Network Processors Through Data Filtering", in Proc. of *International Conference on Compilers, Architecture and Synthesis for Embedded Systems (CASES)*, Grenoble, France, Oct. 2002
- C59. G. Memik and W. H. Mangione-Smith, "A Flexible Accelerator for Layer 7 Networking Applications", in Proc. of *39th IEEE/ACM Design Automation Conference (DAC)*, New Orleans, LA, June 2002
- C60. G. Memik, S. O. Memik, W. H. Mangione-Smith, "Design and Analysis of a Layer Seven Network Processor Accelerator Using Reconfigurable Logic", in Proc. of *IEEE Symposium on Field-Programmable Custom Computing Machines (FCCM)*, Napa Valley, CA, April 2002
- C61. G. Memik, M. T. Kandemir, A. Choudhary, "Exploiting inter-file access patterns using multi-collective I/O", in Proc. of *USENIX Conference on File and Storage Technologies (FAST)*, Monterey, CA, January, 2002
- C62. G. Memik, W. H. Mangione-Smith, W. Hu, "NetBench: A Benchmarking Suite for Network Processors", in Proc. of the *IEEE/ACM International Conference on Computer-Aided Design (ICCAD)*, San Jose, CA, Nov. 2001
- C63. A. Moshovos, G. Memik, B. Falsafi, A. Choudhary, "JETTY: Snoop Filtering for Reduced Power in SMP Servers", in the Proc. of *Seventh IEEE/ACM International Symposium on High Performance Computer Architecture (HPCA)*, Monterey, Mexico, Jan. 2001
- C64. G. Memik, M. T. Kandemir, A. Choudhary, "Design and Evaluation of Smart Disk Architecture for DSS Commercial Workloads", in Proceedings of *International Conference on Parallel Processing (ICPP)*, Toronto, Canada, August 2000
- C65. G. Memik, M. T. Kandemir, A. Choudhary, "Design and Evaluation of a Compiler-directed I/O Technique", in Proceedings of *European Conference on Parallel Computing (Euro-Par)*, Munich, Germany, August 2000
- C66. G. Memik, M. T. Kandemir, A. Choudhary, V. E. Taylor, "APRIL: A Run-Time Library for Tape Resident Data", in Proceedings of *8. NASA Goddard Conference on Mass Storage Systems and Technologies (MSST) held with 17. IEEE Symposium on Mass Storage Systems (MSS)*, College Park, MD, March 2000
- C67. X. Shen, W. Liao, A. Choudhary, G. Memik, M. Kandemir, S. More, G. Thiruvathukal, A. Singh, "A Novel Application Development Environment for Large-Scale Scientific Computations", in Proceedings of *ACM International Conference on Supercomputing (ICS)*, Santa Fe, NM, May 2000
- C68. I. Gokyilmaz, S. Kutlug, G. Memik, A. B. Utku, "Trekmail: Web-Based E-mail Server", in the Proc. of the *Open System Conference*, Istanbul, Turkey, May 1998

Invited Papers

- II. A. Choudhary, R. Narayanan, B. Ozisikyilmaz, G. Memik, J. Zambreno, J. Pisharath, "Optimizing Data Mining Workloads using Hardware Accelerators", in Proc. of Tenth Workshop on Computer Architecture Evaluation

using Commercial Workloads (CAECW) held in conjunction with 13th International Symposium on High Performance Computer Architecture (HPCA-13), Phoenix, Arizona, Feb. 2007

- I2. A. Mallik, M. C. Wildrick, G. Memik, “Measuring Application Error Rates for Network Processors”, in Proc. of IEEE International Midwest Symposium on Circuits and Systems (MWSCAS), Hiroshima, Japan, July 2004

Book Chapters

- B1. Gokhan Memik, Mahmut T. Kandemir, Alok Choudhary, Ismail Kadayif, “Hardware/Software Techniques for Improving Cache Performance in Embedded Systems”, In Embedded Software for SoC, A. A. Jerraya, S. Yoo, N. Wehn, D. Verkest (editors), Kluwer Academic Publishers, June 2003
- B2. Gokhan Memik and William H. Mangione-Smith, “NEPAL: A Framework for Efficiently Structuring Applications for Network Processors”, in Network Processor Design: Issues and Practices, Volume 2, Patrick Crowley, Mark A. Franklin, Haldun Hadimioglu, Peter Z. Onufryk (editors), Morgan Kaufman, 2003

PATENT DISCLOSURES

- P1. Yehea Ismail, Gokhan Memik, Ja Chun Ku, Serkan Ozdemir, “Thermal Management of On-Chip Caches Through Power Density Minimization” United States Patent Application No. 60/865,272
- P2. Peter Dinda, Gokhan Memik, Robert P. Dick, Arindam Mallik, and Bin Lin, “Customized Power Management Software”, NU 26078
- P3. Lei Yang, Robert Dick, Xi Chen, Gokhan Memik, Peter Dinda, “HAPPE: Human and Application Driven Frequency Scaling for Processor Power Efficiency”, NU 28060
- P4. John Cosgrove, Arindam Mallik, Robert Dick, Gokhan Memik, Peter Dinda, “Method to Estimate Computer System Performance Using the Computer System’s Visual Output”, NU 28064

GRANTS

Research Grants

1. “CAREER: Holistic Computer Architectures for Nanoscale Processors”; NSF CCF-0747201 (*NSF CAREER Award*); 04/2008 – 03/2013; \$400,000; single investigator
2. “CRI: CRD Collaborative Research: Archer - Seeding a Community-based Computing Infrastructure for Computer Architecture Research and Education”; NSF CNS-0750847; 04/2008 – 04/2011; this is a collaborative work with University of Florida (lead inst.), University of Wisconsin-Madison, University of Minnesota, Northeastern University, Florida State University, University of Texas-Austin, and Cornell University - Northwestern amount: \$67,631; single investigator
3. “Support for the 40th Annual ACM/IEEE International Symposium on Microarchitecture, 2007”; NSF CCF-0753225; 12/2007 – 12/2008; \$10,000; Investigators: Russ Joseph (PI) and Gokhan Memik
4. “CSR-PDOS: Optimizing the Client/Server Environment Subject to User Satisfaction”; NSF CNS-0720691; 09/2007 – 09/2010; \$737,000 (including a \$12,000 REU); Investigators: Peter Dinda (PI), Robert Dick, and Gokhan Memik
5. “Computational and Hardware Models of Active Sensing Behaviors”; NSF IIS-0613568; 09/2006 – 09/2009; \$350,000; Investigators: Mitra Hartmann (PI), Gokhan Memik, and Seda O. Memik
6. “Self-Adjusting Architectures/Circuits for Improved Performance and Reduced Design Complexity”; NSF CCF-0541337; 04/2006 – 04/2009; \$450,000; Investigators: Gokhan Memik (PI), Yehea Ismail, Russ Joseph, and Seda O. Memik
7. “Collaborative Research: CRI - Scalable Benchmarks, Software and Data for Data Mining, Analytics and Scientific Discoveries”; NSF CNS-0551639; 03/2006 – 03/2009; this is a collaborative work with University of Minnesota - Northwestern amount: \$220,000; Investigators: Alok Choudhary (PI) and Gokhan Memik
8. “Collaborative Research: High-Performance Techniques, Design and Implementation of Software Infrastructure for Change Detection and Mining”; NSF IIS-0536994; 09/2005 – 09/2008; this is a collaborative work with Indiana University; Northwestern amount: \$514,450; Investigators: Alok Choudhary (PI), Aggelos Katsaggelos, Gokhan Memik, Seda O. Memik, and Ying Wu
9. “High Performance Networking Hardware Design”; Department of Energy (*DoE CAREER Award*); 08/2005 – 08/2008; \$300,000; single investigator
10. “Collaborative Research: Ultra-scalable system software and tools for data-intensive computing”; NSF CCF-0444405; 10/2004 – 09/2008; this is a collaborative work with Pennsylvania State University and DePaul University - Northwestern amount: \$259,521; Investigators: Alok Choudhary (PI), Gokhan Memik, and Seda O. Memik
11. Four Motorola Undergraduate Research Grants to support the research of undergraduate students Steve

Lieberman, Eddie Kim, Matthew Wildrick, and Ryan Bunn

12. Sun Microsystems Equipment donation (PI), 2008. T2000 SPARC Server, list price: \$21,000.
13. Xilinx Equipment donation (PI), 2006. M310 FPGA boards, list price \$10,000.

Educational Grants

14. "Proposal for Modern Circuits and Signals Laboratory Development"; Murphy Society; 11/2005 – 11/2006; \$45,000; Investigators: Lawrence J. Henschen (PI), Robert Dick, Yehea Ismail, Russ Joseph, Gokhan Memik, Seda Ogresci Memik, Mary Phillips, Alan Sahakian, and Chi-Haur Wu

SOFTWARE/TOOLS

- NetBench (with Prof. Mangione-Smith), 2002 - present
NetBench is one of the most frequently used benchmarking suites for network processors. It has a wide user base including a large number of academic and industrial institutions.
- MineBench (with Prof. Choudhary, Dr. Jay Pisharath, and Berkin Ozisikyilmaz), 2006 - present
MineBench is a benchmarking suite for data mining applications. Since its inception in 2006, it has been downloaded for over 1500 times.

PROFESSIONAL ACTIVITIES

Professional Service

- Organizing Committee
 - Program Co-Chair for International Symposium on Microarchitecture (MICRO-40) (2007)
 - Co-Chair for the Advanced Networking and Communications Hardware Workshop (ANCHOR) held in conjunction with ISCA (2004, 2005, and 2006)
 - Publication Chair for International Symposium on Microarchitecture (MICRO) (2003)
 - Advisory board member of Annual Workshop on Methodologies in Low Power Design (MLPD) (2004)
- Technical Program Committees
 - Design, Automation and Test in Europe (DATE) (2009)
 - ACM Symposium on Applied Computing (SAC) - Embedded Systems Track (2008)
 - IEEE International Symposium on Workload Characterization (IISWC) (2007)
 - Design, Automation and Test in Europe (DATE) (2007)
 - ACM Symposium on Applied Computing (SAC) - Embedded Systems Track (2007)
 - Great Lakes Symposium on VLSI (GLSVLSI) (2007)
 - International Symposium on Microarchitecture (MICRO-39) (2006)
 - Workshop on Architectural Reliability (WAR) held in conjunction with MICRO (2006)
 - IFIP International Conference on Embedded and Ubiquitous Computing (EUC) (2006)
 - Workshop on Complexity-Effective Design (WCED) held in conjunction with ISCA (2006)
 - Workshop on Modeling, Benchmarking and Simulation (MoBS) held in conjunction with ISCA (2006)
 - Design, Automation and Test in Europe (DATE) (2006)
 - International Symposium on Performance Analysis of Systems and Software (ISPASS) (2006)
 - ACM Symposium on Applied Computing (SAC) - Embedded Systems Track (2006)
 - Great Lakes Symposium on VLSI (GLSVLSI) (2006)
 - Workshop on Architectural Reliability (WAR) held in conjunction with MICRO (2005)
 - Conference on Compilers, Architecture, and Synthesis for Embedded Systems (CASES) (2005)
 - Design, Automation and Test in Europe (DATE) (2005)
 - Workshop on Complexity-Effective Design (WCED) held in conjunction with ISCA (2005)
 - ACM Symposium on Applied Computing (SAC) - Embedded Systems Track (2005)
 - Great Lakes Symposium on VLSI (GLSVLSI) (2005)
 - Workshop on Complexity-Effective Design (WCED) held in conjunction with ISCA (2004)
 - ACM Symposium on Applied Computing (SAC) - Embedded Systems Track (2004)
 - Great Lakes Symposium on VLSI (GLSVLSI) (2004)
 - Workshop on Complexity-Effective Design (WCED) held in conjunction with ISCA (2003)

- Constraint-Aware Embedded Software Workshop held in conjunction with IEEE Real-Time Systems Symposium (2003)
- Workshop on Complexity-Effective Design (WCED) held in conjunction with ISCA (2002)
- Served on one DoE and three NSF Panels
- Reviewed articles for various venues including all the premier conferences/journals in computer architecture, VLSI, and CAD.

Tutorials and Invited Talks

1. Power to the People: Learning and Leveraging the Relationship between Architectural Properties and User Satisfaction (Cornell University – Oct. 2008)
2. Power to the People: Learning and Leveraging the Relationship between Architectural Properties and User Satisfaction (EPFL - Ecole Polytechnique Fédérale de Lausanne – Sep. 2008)
3. Holistic Computer Architectures (University of Illinois at Urbana-Champaign – Apr. 2007)
4. Holistic Design Methodologies for Nanoscale Processors (Toyota Technological Institute – Chicago, Feb. 2006)
5. Providing Application-Specific Reliability at the Microarchitecture Level (University of Wisconsin, Apr. 2005)
6. Application-Specific Microarchitecture Optimizations (University of Toronto, Feb. 2005)
7. Using Semantic Information in Application-Specific Processors (UIC, Jan. 2005)
8. Overview of Architecture Research at Northwestern University (Motorola Labs, May 2004)
9. Risk Management for Sensor Networks (Motorola Labs, June 2004)
10. Network Processor Technologies (Conexant, Feb. 2002)
11. Network Processing: Applications, Architectures and Examples. Tutorial at 34th International Symposium on Microarchitecture, Austin / TX, Dec. 2001
12. Network Processing Applications (HP Labs, Nov. 2001)

ADVISING, TEACHING, AND UNIVERSITY SERVICE

Current Graduate Students

- Abhishek Das*, PhD, expected graduation: 2010
 Prabhat Kumar*, PhD, expected graduation: 2011
 Serkan Ozdemir, PhD, expected graduation: 2009 (proposal: May 2007)
 Berkin Ozisikyilmaz*, PhD, expected graduation: 2009 (proposal: February 2008)
 Benjamin Scholbrock, MS/PhD, expected graduation: 2013
 Alex Shye, PhD, expected graduation: 2011
 Pan Yan, PhD, expected graduation: 2012
 Zhuan Ye, PhD, expected graduation: 2010
 Yu Zhang, PhD, expected graduation: 2010
 * co-advised w/ Prof. Alok Choudhary

Alumni

- PhD
 - Arindam Mallik, 2008. Thesis title: Holistic Computer Architectures based on Application, User, and Process Characteristics. Position: Research Scientist, IMEC (Interuniversity Microelectronics Centre)
- MS
 - Matthew Erler (co-advised with Prof. Ismail), 2007. Thesis Title: TAP Cache: Temperature-Aware Placement for Caches. Position: Software Engineer, SandForce Inc.
 - David Nguyen, 2005. Thesis Title: Reconfigurable Architectures For Network Intrusion Detection. Position: Design Engineer, SanDisk Corp.
- Undergraduate projects supervised: Jonathan Adams, Ryan Bunn, Ross Clements, Andrew Collins, Jeff Conroy, Eddie Kim, Steve Lieberman, Hyerim Shin, Benjamin Scholbrock, Matthew Wildrick, Anthony Williams

Defense Committees

- PhD committee

Avery Ching, Steve Chiu, Kenin Coloma, Hui Ding, Ja Chun Ku, Ying Liu, Arindam Mallik (chair), Ke Meng, Gaurav Mittal, Somshubra Mondal, Rajarshi Mukherjee, Jayaprakah Pisharath, Lei Yang, Joseph Zambreno

- MS committee
Hui Ding, Oliviu Ghica, Matthew Erler (co-chair), David Nguyen (chair), Lei Yang

University Committees

- Computer Engineering Undergraduate Curriculum Committee (2003-2004, 2004-2005, and 2008-2009)
- Computer Science Undergraduate Curriculum Committee (2007-2008, 2008-2009)
- Computing Facilities Committee (2003-2004, 2004-2005, 2005-2006, 2006-2007, 2007-2008, 2008-2009)
- Admissions Committee – CBB Program (2004-2005, 2005-2006, 2006-2007, 2007-2008)
- Computing Cluster Management – CBB Program (2004-2005, 2005-2006)
- Graduate Committee (2008-2009)
- Distinguished Seminar Committee (2008-2009)
- Committee for the Program in Computing and Information Systems (2008-2009)

Teaching

Since joining Northwestern University, Gokhan Memik taught the EECS 361 – Introduction to Computer Architecture class in the Winter 2004 (CTEC: 4.0), Winter 2005 (CTEC: 5.1), Winter 2006 (CTEC: 4.8), Winter 2007 (CTEC: 5.4), Winter 2008 (CTEC: 5.2), and Fall 2008 (CTEC: 5.1) quarters; ECE 358 – Introduction to Parallel Programming in the Fall 2004 (CTEC: 4.7), Fall 2005 (CTEC: 4.6), Fall 2006 (CTEC: 5.1), and Fall 2007 (CTEC: 5.3) quarters; and ECE 452 – Advanced Computer Architecture in the Spring 2004 (CTEC: 5.6), Spring 2005 (CTEC: 6.0), Spring 2006 (CTEC: 5.1), and Spring 2008 (CTEC: 5.4) quarters. The provided CTEC scores are the overall instruction ratings on a scale of 6.0.