Gokhan Memik

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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/APPOINTMENTS

Northwestern University

Professor, Department of Electrical and Computer Engineering and Department of Computer Science (formerly Department of EECS) — *Sept. 2015 – Present*
  Chair, Computer Engineering Division — *Feb. 2014 - Present*
  Chair, Computer Engineering and Systems Group — *Sept. 2013 - Present*
Associate Professor, Department of Electrical Engineering and Computer Science — *Sept. 2009 – Aug. 2015*
Assistant Professor, Department of Electrical Engineering and Computer Science — *Sept. 2003 – Aug. 2009*
  Lisa Wissner-Slivka and Benjamin Slivka Junior Professor of Computer Science — *Sept. 2006 – Aug. 2009*

Koc University

Visiting Associate Professor, Department of Computer Engineering — *Fall 2010*

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

- Samsung Pay Best Paper Award at WristSense Workshop (2017)
- Best Computer Engineering poster at EECS Fair (2016)
- Spotlight paper selection for the August 2013 issue of the IEEE Transactions on Mobile Computing (2013)
- 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)

Refereed Journal Publications

J1. B. Pourshirazi, M. ValadBeigi, Z. Zhu and G. Memik, "Writeback-Aware LLC Management for PCM-based Main Memory Systems", to appear at *ACM Transactions on Design Automation of Electronic Systems (TODAES)*

J2. B. Egilmez, M. Schuchhardt, G. Memik, R. Ayoub, N. Soundararajan, and M. Kishinevsky, "User-aware Frame Rate Management in Android Smartphones", *ACM Transactions on Embedded Computing Systems (TECS)* 16(5s), 131

J3. K. Zhang, A. Guliani, S. Ogrenci Memik, G. Memik, K. Yoshii, R. Sankaran, P. Beckman "Machine Learning-Based Temperature Prediction for Runtime Thermal Management across System Components", *IEEE Transactions on Parallel and Distributed Systems* (TPDS)

J4. J. Friedman, A. Girdhar, R. Gelfand, G. Memik, H. Mohseni, A. Taflove, B. Wessels, J.-P. Leburton, A. Sahakian, "Cascaded spintronic logic with low-dimensional carbon", *Nature Communications* 8, 15635

J5. A. Sahakian, J. S. Friedman ; B. W. Wessels, G. Memik, "Emitter-Coupled Spin-Transistor Logic: Cascaded Spintronic Computing Beyond 10 GHz", *IEEE Journal on Emerging and Selected Topics in Circuits and Systems* (JETCAS), 5(1): 17-27, Feb. 2015

J6. J. S. Friedman, J. A. Peters, G. Memik, B. W. Wessels, A. V. Sahakian, "Emitter-Coupled Spin-Transistor Logic", *Journal of Parallel and Distributed Computing*, 74(6): 2461-2469, 2014

J7. M. Schuchhardt, A. Das, N. Hardavellas, G. Memik, and A. Choudhary, "The Impact of Dynamic Directories on Multicore Interconnects", *IEEE Computer*, 46(10): 32-39, Sept. 2013

J8. L. Yang, R. Dick, G. Memik, P. Dinda, "HAPPE: Human and Application Driven Frequency Scaling for Processor Power Efficiency", *IEEE Transactions on Mobile Computing (TMC)*, 12(8): 1546-1557, Aug. 2013 **[Selected as Highlight Paper]**

J9. B. Pattabiraman, S. Umbreit, W-K. Liao, F. Rasio, V. Kalogera, G. Memik, and A. Choudhary, "A Parallel Monte Carlo Code for Simulating Collisional N-body Systems", *The Astrophysics Journal (ApJ)*, 204(2), Jan. 2013

J10. J. Kong, Y. Pan, S. Ozdemir, A. Mohan, G. Memik, S. W. Chung, "Fine-Grain Voltage Tuned Cache Architecture for Yield Management under Process Variations", *IEEE Transactions on VLSI (TVLSI)*, 20(8): 1532-1536, Aug. 2012

J11. A. N. Choudhary, D. Honbo, P. Kumar, B. Ozisikyilmaz, S. Misra, G. Memik, "Accelerating data mining workloads: current approaches and future challenges in system architecture design", *Wiley Interdisc. Rew.: Data Mining and Knowledge Discovery*, 1(1): 41-54, Jan. 2011

J12. D. Wang, J. Li, G. Memik, "User identification based on finger-vein patterns for consumer electronics devices", *IEEE Trans. Consumer Electronics*, 56(2): 799-804, June 2010

J13. 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)*, 18(4): 684-688, April 2010

J14. J. Long, S. O. Memik, G. Memik, R. Mukherjee, "Thermal Monitoring Mechanisms for Chip Multiprocessors", *ACM Transactions on Architecture and Code Optimization (TACO)*, 5(2), Aug. 2008

J15. A. Das, D. Nguyen, J. Zambreno, G. Memik, A. Choudhary, "An FPGA-based Network Intrusion Detection Architecture", *IEEE Transactions on Information Forensics and Security*, 3(1): 118-132, March 2008

J16. R. Schweller, Z. Li, Y. Chen, Y. Gao, A. Gupta, E. Parasons, 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)*, 15(5): 1059-1072, October 2007

J17. A. Das, S. Ozdemir, G. Memik, J. Zambreno, A. Choudhary, "Microarchitectures for Managing Chip Revenues under Process Variations", *IEEE Computer Architecture Letters (CAL)*, 6(2): 29-32, June 2007

J18. 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)*, 15(5): 592-604, May 2007

J19. A. Mallik, B. Lin, G. Memik, P. Dinda, R. Dick, "User-Driven Frequency Scaling", *IEEE Computer Architecture Letters (CAL)*, 5(2), July-December 2006

J20. 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)*, 2(3): 349-369, August 2006

J21. G. Memik and W. H. Mangione-Smith, "Evaluating Network Processors using NetBench", *ACM Transactions on Embedded Computing Systems (TECS)*, 5(2): 453-471, May 2006

J22. A. Mallik and G. Memik, "Low Power Correlation Caches for Network Processors", *Journal of Low Power Electronics (JOLPE)*, 1(2): 108-118, August 2005

J23. A. Mallik, M. C. Wildrick, G. Memik, "Application-Level Error Measurements for Network Processors", *IEICE Transactions on Information and Systems*, E88-D(8), August 2005

J24. G. Memik, G. Reinman, W. H. Mangione-Smith, "Precise Instruction Scheduling", *Journal of Instruction-Level Parallelism (JILP)*, volume 7, January 2005

J25. 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)*, 14(12): 1262 – 1274, 2003

J26. 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)*, 61(11): 1633-1664, 2001

J27. 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*, 3(1): 45–60, 2000

Refereed Conference/Workshop Publications

C1. E. Poyraz, P. Kashinkunti, M. Schuchhardt, M. Kishinevsky, N. Soundararajan, G. Memik, "Understanding the Impact of Number of CPU Cores on User Experience in Smartphones", In Proceedings of the *16th EAI International Conference on Mobile and Ubiquitous Systems: Computing, Networking and Services (MobiQuitous)*, Houston, TX, Nov. 2019

C2. E. Poyraz, G. Memik, "Using Built-In Sensors to Predict and Utilize User Satisfaction for CPU Settings on Smartphones", In Proceedings of the *ACM Interactive, Mobile, Wearable and Ubiquitous Technologies (UbiComp)*, London, United Kingdom, Sep. 2019

C3. Y. Luo, X. Wang, S. Ogrenci-Memik, G. Memik, K. Yoshii, and P. Beckman, "Minimizing Thermal Variation in Heterogeneous HPC Systems with FPGA Nodes", In Proc. of *International Conference on Computer Design (ICCD)*, Orlando, FL, Oct. 2018

C4. M. ValadBeigi and G. Memik, "Thermal-Aware Optimizations of ReRAM-Based Neuromorphic Computing Systems", in Proc. of *Design Automation Conference (DAC)*, San Francisco, CA, June 2018

C5. M. ValadBeigi and G. Memik, "THOR: THermal-aware Optimizations for extending ReRAM lifetime", in Proc. of *International Parallel & Distributed Processing Symposium (IPDPS)*, Vancouver, Canada, May 2018

C6. B. Pourshirazi, M. ValadBeigi, Z. Zhu and G. Memik, "WALL: A Writeback-Aware LLC Management for PCM-based Main Memory Systems", in Proc. of *Design, Automation and Test in Europe (DATE)*, Dresden, Germany, Mar. 2018

C7. B. Egilmez, M. Schuchhardt, G. Memik, R. Ayoub, N. Soundararajan, and M. Kishinevsky, "User-aware Frame Rate Management in Android Smartphones", in Proc. of *International Conference on Compilers, Architecture and Synthesis for Embedded Systems (CASES)*, Seoul, South Korea, Oct. 2017

C8. Y Luo, X Wen, K Yoshii, S Ogrenci-Memik, G Memik, H Finkel, F Cappello, "Evaluating irregular memory access on OpenCL FPGA platforms: A case study with XSBench", in Proc. of *27th International Conference on Field Programmable Logic and Applications (FPL)*, Ghent, Belgium, Sep. 2017

C9. B. Egilmez, E. Poyraz, W. Zhou, N. Alshurafa, G. Memik, P. Dinda, "UStress: Understanding College Student Subjective Stress Using Wrist-Based Passive Sensing", in *IEEE WristSense Workshop (WristSense)* held in conjunction with IEEE Percom, Kona, HI, March 2017 **[Samsung Pay Best Paper Award]**

C10. M. ValadBeigi and G. Memik, "TESLA: Using Microfluidics to Thermally Stabilize 3D Stacked STT-RAM Caches", in Proc. of *International Conference on Computer Design (ICCD)*, Phoenix, AZ, Oct. 2016

C11. M. ValadBeigi and G. Memik, "TAPAS: Temperature-aware Adaptive Placement for 3D Stacked Hybrid Caches", in Proc. of *International Symposium on Memory Systems (MEMSYS)*, Washington, DC, Oct. 2016

C12. E. Poyraz and G. Memik, "Power Modeling and Characterizing User Activities on Smartwatches", in Proc. of *International Symposium on Workload Characterization (IISWC)*, Providence, RI, Sep. 2016

C13. M. ValadBeigi and G. Memik, "Therma: Thermal-aware Run-time Thread Migration for Nanophotonic Interconnects", in Proc. of *International Symposium on Low Power Electronics and Design (ISLPED)*, San Francisco, CA, Aug. 2016

C14. B. Patel, G. Memik, and N. Hardavellas, "SCP: Synergistic Cache Compression and Prefetching", in Proc. of *33rd International Conference on Computer Design (ICCD)*, New York, NY, Oct. 2015

C15. M. Schuchhardt, S. Jha, R. Ayoub, M. Kishinevsky, and G. Memik, "Optimizing Mobile Display Brightness by Leveraging Human Visual Perception", in Proc. of *International Conference on Compilers, Architecture and Synthesis for Embedded Systems (CASES)*, Amsterdam, Netherlands, Oct. 2015

C16. K. Zhang, S. Ogrenci Memik, G. Memik, K. Yoshii, R. Sankaran, P. Beckman, "Minimizing Thermal Variations Across System Components", in Proc. of *IEEE International Parallel & Distributed Processing Symposium (IPDPS)*, Hyderabad, India, May 2015

C17. B. B. Egilmez, G. Memik, S. Ogrenci-Memik, and O. Ergin, "User-Specific Skin Temperature-Aware DVFS for Smartphones", in Proc. of *Design, Automation and Test in Europe (DATE)*, Grenoble, France, Mar. 2015

C18. M. Schuchhardt, S. Jha, R. Ayoub, M. Kishinevsky, and G. Memik, "CAPED: Context-aware Personalized Display Brightness for Mobile Devices", in Proc. of *International Conference on Compilers, Architecture and Synthesis for Embedded Systems (CASES)*, New Delhi, India, Oct. 2014

C19. M. ValadBeigi and G. Memik, "MIN: A Power Efficient Mechanism to Mitigate the Impact of Process Variations on Nanophotonic Networks", in Proc. of *International Symposium on Low Power Electronics and Design (ISLPED)*, La Jolla, CA, Aug. 2014, pp. 299-302

C20. Y. Demir, Y. Pan, S. Song, N. Hardavellas, G. Memik, and J. Kim, "Galaxy: A High-Performance Energy-Efficient Multi-Chip Architecture Using Photonic Interconnects", in Proc. of *ACM International Conference on Supercomputing (ICS)*, Munich, Germany, June 2014

C21. J. S. Friedman, Y. I. Ismail, G. Memik, A. V. Sahakian, and B. W. Wessels, "Emitter-Coupled Spin-Transistor Logic", in Proc. of *IEEE/ACM International Symposium on Nanoscale Architectures (NANOARCH)*, Amsterdam, The Netherlands, July 2012

C22. M. Schuchhardt, B. Scholbrock, U. Pamuksuz, G. Memik, P. Dinda, and R. Dick, "Understanding the Impact of Laptop Power Saving Options Using Physiological Sensors", In Proc. of *International Symposium on Low Power Electronics and Design (ISLPED)*, Redondo Beach, CA, July-Aug. 2012

C23. B. Pattabiraman, S. Umbreit, W-K. Liao, F. Rasio, V. Kalogera, G. Memik, and A. Choudhary, "GPU-Accelerated Monte Carlo Simulations of Dense Stellar Systems", in Proc. of *Innovative Parallel Computing, Foundations & Applications of GPU, Manycore, and Heterogeneous Systems (InPar)*, San Jose, CA, May 2012

C24. A. Das, M. Schuchhardt, N. Hardavellas, G. Memik, A. Choudhary, "Dynamic Directories: Reducing On-Chip Interconnect Power in Multicores", in Proc. of *Design, Automation and Test in Europe (DATE)*, Dresden, Germany, Mar. 2012

C25. B. Pattabiraman, S. Umbreit, W-K. Liao, F. Rasio, V. Kalogera, G. Memik, and A. Choudhary, "A Parallel Monte Carlo Algorithm for Modeling Dense Stellar Systems on Hybrid Architectures", in Proc. of *SIAM Conference on Parallel Processing for Scientific Computing (PP12)*, Savannah, GA, February 2012

C26. Y. Pan, J. Kim, G. Memik, " FeatherWeight: Low-cost Optical Arbitration with QoS Support", in Proc. of *International Symposium on Microarchitecture (MICRO)*, Porto Alegre, Brazil, Dec. 2011

C27. S. P. Tarzia, P. A. Dinda, R. P. Dick, G. Memik, "Demo: Indoor Localization without Infrastructure using the Acoustic Background Spectrum", in Proc. of *International Conference on Mobile Systems, Applications, and Services (MOBISYS)*, Washington, DC, June/July 2011 (demo paper)

C28. S. P. Tarzia, P. A. Dinda, R. P. Dick, G. Memik, "Indoor Localization without Infrastructure using the Acoustic Background Spectrum", in Proc. of *International Conference on Mobile Systems, Applications, and Services (MOBISYS)*, Washington, DC, June/July 2011

C29. P. Kumar, B. Özisikyilmaz, W.-K. Liao, G. Memik, A. N. Choudhary, "High Performance Data Mining Using R on Heterogeneous Platforms", in Proc. of *Workshop on Multithreaded Architectures and Applications (MTAAP)* held in conjunction with 25th IEEE International Parallel & Distributed Processing Symposium (IPDPS), Anchorage, AK, May 2011

C30. S. Liu, B. Leung, A. Neckar, S. Ogrenci Memik, G. Memik, N. Hardavellas, "Hardware/Software Techniques for DRAM Thermal Management", in Proc. of *IEEE International Symposium on High-Performance Computer Architecture (HPCA)*, San Antonio, TX, Feb. 2011

C31. Y. Pan, Y. Demir, N. Hardavellas, J. Kim, G. Memik, "Exploring Benefits and Designs of Optically Connected Disintegrated Processor Architecture", in *Workshop on the Interaction between Nanophotonic Devices and Systems (WINDS)* held in conjunction with International Symposium on Microarchitecture (MICRO), Atlanta, GA, Dec. 2010

C32. S. P. Tarzia, P. A. Dinda, R. P. Dick, G. Memik, "Display Power Management Policies in Practice", in Proc. of *International Conference on Autonomic Computing and Communications (ICAC)*, Washington, DC, June 2010

C33. S. Ozdemir, Y. Pan, A. Das, G. Memik, G. Loh, A. Choudhary, "Quantifying and Coping with Parametric Variations in 3D-Stacked Microarchitectures", in Proc. of *Design Automation Conference (DAC)*, Anaheim, CA, June 2010

C34. A. Shye, B. Scholbrock, G. Memik, P. Dinda, "Characterizing and Modeling User Activity on Smartphones", in Proc. of *International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS)*, New York, NY, June 2010 (poster paper)

C35. A. Das, G. Memik, J. Zambreno, A. Choudhary, "Detecting/Preventing Information Leakage on the Memory Bus due to Malicious Hardware", in Proc. of *Design, Automation and Test in Europe (DATE)*, Dresden, Germany, Mar. 2010

C36. P. Yan, J. Kim, G. Memik, "FlexiShare: Energy-Efficient Nanophotonic Crossbar Architecture through Channel Sharing", in Proc. of *International Symposium on High-Performance Computer Architecture (HPCA)*, Bangalore, India, Jan. 2010

C37. A. Shye, B. Scholbrock, G. Memik, "Into the Wild: Studying Real User Activity Patterns to Guide Power Optimization for Mobile Architectures", in Proc. of *International Symposium on Microarchitecture (MICRO)*, New York, NY, Dec. 2009

C38. Y. Pan, J. Kim, G. Memik, "Tuning Nanophotonic On-chip Network Designs for Improving Memory Traffic", in W*orkshop on Photonic Interconnects & Computer Architecture (PICA)* held in conjunction with International Symposium on Microarchitecture (MICRO), New York, NY, Dec. 2009

C39. S. P. Tarzia, R. P. Dick, P. A. Dinda, G. Memik, "Sonar-Based Measurement of User Presence and Attention", in Proc. of *International Conference on Ubiquitous Computing (UBICOMP)*, Orlando, FL, Sep./Oct. 2009 (notes paper)

C40. S. P. Tarzia, R. P. Dick, P. A. Dinda, G. Memik, "A Demonstration of Sonar-Based User Presence Detection", in Proc. of *International Conference on Ubiquitous Computing (UBICOMP)*, Orlando, FL, Sep./Oct. 2009 (demo paper)

C41. Y. Pan, J. Kong, S. Ozdemir, G. Memik, S. W. Chung, "Selective Wordline Voltage Boosting for Caches to Manage Yield under Process Variations", in Proc. of *Design Automation Conference (DAC)*, San Francisco, CA, July 2009

C42. 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

C43. P. Kumar, Y. Pan, J. Kim, G. Memik, A. Choudhary, "Exploring Concentration and Channel Slicing in On-Chip Network Router", in Proc. of *International Symposium on Networks-on-Chip (NOCS)*, San Diego, CA, May 2009

C44. S. P. Tarzia, R. P. Dick, P. A. Dinda, G. Memik, "Sonar-Based Measurement of User Attention", in Proc. of *USENIX Annual Technical Conference (USENIX)*, San Diego, CA, June 2009 (poster paper)

C45. 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

C46. 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

C47. 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

C48. 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]**

C49. 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

C50. 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

C51. 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

C52. 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

C53. 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

C54. 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

C55. 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

C56. 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

C57. 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

C58. 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

C59. 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

C60. 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

C61. 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]**

C62. A. Das, S. Ozdemir, G. Memik, A. Choudhary, "Evaluating Voltage Islands in CMPs under Process Variations", i Proc. of *International Conference on Computer Design (ICCD)*, Lake Tahoe, CA, Oct. 2007

C63. 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

C64. 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

C65. 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

C66. 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

C67. 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)

C68. 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

C69. 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

C70. 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

C71. 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

C72. 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

C73. 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)

C74. 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)

C75. 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

C76. 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

C77. 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)

C78. 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

C79. 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

C80. 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

C81. 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

C82. 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

C83. 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

C84. 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

C85. 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]**

C86. 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

C87. 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

C88. 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

C89. 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

C90. 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

C91. 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

C92. 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

C93. 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)

C94. 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)

C95. 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

C96. 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

C97. 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 *IEEE/ACM Design Automation Conference (DAC)*, Anaheim, CA, June 2003

C98. 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.

C99. 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

C100. 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

C101. 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

C102. 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

C103. 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

C104. 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

C105. 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

C106. 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

C107. 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

C108. 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

C109. 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

C110. 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

C111. 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

I1. Renato J. O. Figueiredo, P. Oscar Boykin, Jose A. B. Fortes, Tao Li, Jie-Kwon Peir, David Wolinsky, Lizy K. John, David R. Kaeli, David J. Lilja, Sally A. McKee, Gokhan Memik, Alain Roy, Gary S. Tyson, "Archer: A Community Distributed Computing Infrastructure for Computer Architecture Research and Education", in 4th International Conference on Collaborative Computing: Networking, Applications and Worksharing, (CollaborateCom), Orlando, FL, USA, November 13-16, 2008, Revised Selected Papers

I2. A. Choudhary, R. Narayanan, B. Ozısıkyılmaz, 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

I3. 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

PATENTS

P1. Joseph S. Friedman, Gokhan Memik, and Bruce W. Wessels, "Emitter-Coupled Spin-Transistor Logic", US Patent 9,780,791. Oct. 2017

P2. Joseph S. Friedman, Gokhan Memik, and Bruce W. Wessels, "Emitter-Coupled Spin-Transistor Logic", US Patent 9,270,277. Feb. 2016

P3. Lei Yang, Xi Chen, Alex Shye, Berkin Ozisikyilmaz, Arindam Mallik, Peter Dinda, Gokhan Memik, Robert Dick, Alok Choudhary, "System and Method for Controlling Power Consumption in a Computer System Based on User Satisfaction", US Patent 8,706,652, April 2014

P4. Alex Shye, Yan Pan, Benjamin Scholbrock, J. Scott Miller, Gokhan Memik, Peter Dinda, Robert Dick, "System and Method for Leveraging Human Physiological Traits to Control Microprocessor Frequency", US Patent 8,683,242, March 2014

P5. Arindam Mallik, Bin Lin, Gokhan Memik, Peter Dinda, Robert P. Dick, "Systems and Methods for Process and User Driven Dynamic Voltage and Frequency Scaling", US Patent 7,913,071, March 2011

P6. Stephen Tarzia, Peter Dinda, Robert Dick, Gokhan Memik, "Apparatus, Systems and Methods of Determining a Location Using Acoustic Fingerprints", App. No. 61/497685, July 2011

P7. Yehea Ismail, Gokhan Memik, Ja Chun Ku, Serkan Ozdemir, "Thermal Management of On-Chip Caches Through Power Density Minimization" App. No. 11/938040, Nov. 2007

GRANTS

Research Grants

1. "COOLR: A New System for Dynamic Thermal-Aware Computing", DoE, 09/2014 – 08/2017; $500,000 (Northwestern Amount: $250,000); Investigators: Seda Ogrenci Memik (Northwestern PI), Gokhan Memik, Pete Beckman (Argonne PI), Kazutomo Yoshii

2. "Predicting and Utilizing User Satisfaction to Improve Smartphone Efficiency", Intel, 10/2013 – 09/2017; $300,000; Investigators: Gokhan Memik (PI), Peter Dinda

3. "New GK-12: Reach for the Stars: Computational Models for Teaching and Learning in Physics, Astronomy and Computer Science", NSF, 03/2010 – 03/2015; $2,722,371; Investigators: Vassiliki Kalogera (PI), Justine M Cassell, Kemi Jona; Senior Personnel: Fred Rasio, Davis Meyer, Alok Choudhary, and Gokhan Memik

4. "SHF: Small: Thermal-Aware High-Performance DRAM Architectures in Multicore Technologies"; NSF CCF-0916746; 09/2009 – 08/2014; $450,000; Investigators: Seda O. Memik (PI), Gokhan Memik

5. "CAREER: Holistic Computer Architectures for Nanoscale Processors"; NSF CCF-0747201 (**NSF CAREER Award**); 04/2008 – 03/2014; $400,000; single investigator

6. "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

7. "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

8. "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

9. "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

10. "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

11. "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

12. "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 Ogrenci Memik, Mary Phillips, Alan Sahakian, and Chi-Haur Wu

13. "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

14. "High Performance Networking Hardware Design"; Department of Energy (**DoE CAREER Award**); 08/2005 – 08/2008; $300,000; single investigator

15. "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

16. Four Motorola Undergraduate Research Grants to support the research of undergraduate students Steve Lieberman, Eddie Kim, Matthew Wildrick, and Ryan Bunn

17. Sun Microsystems Equipment donation (PI), 2008. T2000 SPARC Server, list price: $21,000.

18. Xilinx Equipment donation (PI), 2006. M310 FPGA boards, list price $10,000.

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 Dr. Berkin Ozisikyilmaz), 2006 - present

  MineBench is a benchmarking suite for data mining applications.

PROFESSIONAL ACTIVITIES

Professional Service

- Editorial Board

  - International Journal of Reconfigurable Computing (2011 - present)

- Board of Distinguished Reviewers

  - ACM Transactions on Architecture and Code Optimization (TACO) (2014 - present)

- Organizing Committee

  - Vice Chair of the Architecture Track of IEEE International Parallel & Distributed Processing Symposium (IPDPS) (2018)
  - 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

  - IEEE International Parallel & Distributed Processing Symposium (IPDPS) (2020)
  - Design, Automation and Test in Europe (DATE) (2020)
  - International Conference on Compilers, Architecture, and Synthesis of Embedded Systems (CASES) (2019)
  - International Symposium on Computer Architecture (ISCA) (2019)
  - International Conference on Computer Design (ICCD) (2019)
  - Design, Automation and Test in Europe (DATE) (2019)
  - International Conference on Compilers, Architecture, and Synthesis of Embedded Systems (CASES) (2018)
  - International Symposium on Low Power Electronics and Design (ISLPED) (2018)
  - Design, Automation and Test in Europe (DATE) (2018)
  - International Symposium on Low Power Electronics and Design (ISLPED) (2017)
  - International Symposium on Multicore Embedded SoCs (MCSoC) (2017)

- Design, Automation and Test in Europe (DATE) (2017)
- International Conference on Computer Design (ICCD) (2016)
- International Symposium on Multicore Embedded SoCs (MCSoC) (2016)
- International Workshop on Advanced Interconnect Solutions and Technologies for Emerging Computing Systems (AISTECS) (2016)
- IEEE International Parallel & Distributed Processing Symposium (IPDPS) (2016)
- IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS) (2016)
- International Conference on Computer Design (ICCD) (2015)
- 18th International Symposium on Computer Architecture & Digital Systems (CADS) (2015)
- ASPLOS ACM Student Research Competition Committee (ACM SrC) (2015)
- 2nd Exploiting Silicon Photonics for Energy-efficient Heterogeneous Parallel Architectures Workshop (associated with HiPEAC) (2015)
- IEEE International Parallel & Distributed Processing Symposium (IPDPS) (2015)
- IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS) (2015)
- International Conference on Computer Design (ICCD) (2014)
- International Symposium on Multicore Embedded SoCs (MCSoC) (2014)
- Workshop on Exploiting Silicon Photonics for Energy-efficient Heterogeneous Parallel Architectures (associated with HiPEAC) (2014)
- Design, Automation and Test in Europe (DATE) (2013)
- International Symposium on Computer Architecture (ISCA) (2012)
- Design, Automation and Test in Europe (DATE) (2012)
- International Symposium on Microarchitecture (MICRO) (2011)
- International Symposium on Computer Architecture (ISCA) (2011)
- Design, Automation and Test in Europe (DATE) (2011)
- Workshop on Arch. and Systems Support for Mobile Applications held in conjunction with ASPLOS (2011)
- IEEE International Parallel & Distributed Processing Symposium (IPDPS) (2011)
- International Conference on Networking, Architecture, and Storage (NAS) (2010)
- Design, Automation and Test in Europe (DATE) (2010)
- International Conference on Parallel Processing (ICPP) (2009)
- 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) (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)

Tutorials and Invited Talks

1. Human Emotion Prediction and Activity Monitoring to Manage Computational Resources (Intel Labs, June 2013)

2. Humans and Bits: Designing Holistic Computer Architectures (Distinguished Lecture at University of Pennsylvania, Feb. 2012)

3. Power to the People: Learning and Leveraging the Relationship between Architectural Properties and User Satisfaction to Optimize Mobile Architectures and Smartphones (IMEC, Nov. 2010)

4. Power to the People: Learning and Leveraging the Relationship between Architectural Properties and User Satisfaction (Sabanci University – September 2009)

5. Power to the People: Learning and Leveraging the Relationship between Architectural Properties and User Satisfaction (IBM T.J. Watson – Apr. 2009)

6. Power to the People: Learning and Leveraging the Relationship between Architectural Properties and User Satisfaction (Cornell University – Oct. 2008)

7. Power to the People: Learning and Leveraging the Relationship between Architectural Properties and User Satisfaction (EPFL - Ecole Polytechnique Fédérale de Lausanne – Sep. 2008)

8. Holistic Computer Architectures (University of Illinois at Urbana-Champaign – Apr. 2007)

9. Holistic Design Methodologies for Nanoscale Processors (Toyota Technological Institute – Chicago, Feb. 2006)

10. Providing Application-Specific Reliability at the Microarchitecture Level (University of Wisconsin, Apr. 2005)

11. Application-Specific Microarchitecture Optimizations (University of Toronto, Feb. 2005)

12. Using Semantic Information in Application-Specific Processors (UIC, Jan. 2005)

13. Overview of Architecture Research at Northwestern University (Motorola Labs, May 2004)

14. Risk Management for Sensor Networks (Motorola Labs, June 2004)

15. Network Processor Technologies (Conexant, Feb. 2002)

16. Network Processing: Applications, Architectures and Examples. Tutorial at 34th International Symposium on Microarchitecture, Austin / TX, Dec. 2001

17. Network Processing Applications (HP Labs, Nov. 2001)

ADVISING

Current Graduate Students

Majed Valad Beigi, PhD, expected graduation: 2019
Begum Birsen Egilmez, PhD, expected graduation: 2020
Emirhan Poyraz, PhD, expected graduation: 2021
David Nguyen, PhD, expected graduation: 2021

Alumni

- PhD

    - Kaicheng Zhang (co-advised with Prof S. Ogrenci-Memik), 2017, Thesis title: Thermal-Aware Task Management for High-Performance Systems. Position: Two Sigma

    - Matthew Schuchhardt, 2015, Thesis title: User-Aware System Design and Optimization. Position: 4C

    - Benjamin Scholbrock, 2013, Thesis title: User-Centric Computer System Analysis. Position: Intel

    - Prabhat Kumar (co-advised with Prof. A. Choudhary), 2012, Thesis title: High Performance Data Mining on Heterogeneous Platforms. Position: nVIDIA

    - Pan Yan, 2011, Thesis title: Leveraging Nanophotonics in Future Many-core Processors. Position: Technology Department at Globalfoundries, Inc.

    - Abhishek Das (co-advised with Prof. A. Choudhary), 2010, Thesis title: Microarchitectural Approaches for Optimizing Power and Profitability in Multicore Processors. Position: Intel

    - Alex Shye, 2010, Thesis title: Incorporating the End User in Computer Design and Optimization. Position: Qualcomm Research, Bay Area R&D.

- Yu Zhang, 2010, Thesis title: Adaptive On-Chip Networks and Their Impact on Processor Architectures. Position: Google

- Serkan Ozdemir, 2009, Thesis Title: Mitigating the Effects of Process Variations through Microarchitectural Techniques. Position: Intel Barcelona Research Center

- Berkin Ozisikyilmaz (co-advised with Prof. A. Choudhary), 2009, Thesis title: Analysis, Characterization and Design of Data Mining Applications and Applications to Computer Architecture. Position: NetApp

- Arindam Mallik, 2008, Thesis Title: Holistic Computer Architectures based on Application, User, and Process Characteristics. Position: IMEC (Interuniversity Microelectronics Centre)

- MS Thesis

- Ajit M. Hunsur, 2014, Thesis title: Memory Mapping in Heterogeneous Multi-Core Architectures

- Bhargavraj Patel, 2013, Thesis title: Exploring Compressed Cache to Implement Efficient Hardware Prefetcher for Multicore Processors

- Emre Karaman, 2012, Thesis title: GPU Implementation of Action Potential Cardiac Computer Simulations

- Utku Pamuksuz, 2011, Thesis title: EasyPupil: A Poor Man's Pupil Dilation Measurement System

- Anitha Mohan (co-advised with Prof. Ogrenci Memik), 2009. Thesis title: Yield improvement using cache SRAM array supply lowering and selective wordline voltage boosting mechanisms

- Matthew Erler (co-advised with Prof. Ismail), 2007. Thesis title: TAP Cache: Temperature-Aware Placement for Caches

- David Nguyen, 2005. Thesis title: Reconfigurable Architectures For Network Intrusion Detection

Visiting Scholars

Prof. Chong Fu, UESTC (Jan. 2015 – Dec. 2016)

Prof. Fei Chen, Southwest University of Science and Technology, China (Jan. 2015 – Dec. 2016)

Prof. Sung Woo Chung, Korea University (Jan. 2009 – Aug. 2009)

Pre-Doctoral Fellows: Chong Fu, UESTC (2007); Desong Wang, UESTC (2008 – 2009); Jian Wu, UESTC (2008 – 2010)

UNIVERSITY SERVICE AND TEACHING

University Committees

- Director of the Computer Engineering Division (2014-present)
- Director of the Computer Engineering and Systems Research Interest Group (2014-present)
- Chair of the Computer Engineering and Systems Division (2013)
- Co-chair of the Computer Engineering and Systems Division (2011-2012)
- Computer Engineering Undergraduate Curriculum Committee (2003-2005, 2008-2010, 2013-present)
- Computer Science Undergraduate Curriculum Committee (2007-2014)
- Computing Facilities Committee (2003-present, chair: 2009-2010)
- Admissions Committee – CBB Program (2004-2008)
- Computing Cluster Management – CBB Program (2004-2006)
- Graduate Committee (2008-2009, 2010-present, co-chair: 2011-2014)
- Distinguished Seminar Committee (2008-present)
- Committee for the Program in Computing and Information Systems (2008-2009)
- Faculty Search Committee (2004-2005, 2008-2009, 2009-2010, 2010-2011, 2011-2012 (chair), 2013-2014 (co-chair), 2016-2017 (chair))
- McCormick Promotion and Tenure Committee (2016-2017)

Teaching

Since joining Northwestern University, taught the EECS 358 – Introduction to Parallel Programming in the Fall 2004 (CTEC: 4.7), Fall 2005 (CTEC: 4.6), Fall 2006 (CTEC: 5.1), Fall 2007 (CTEC: 5.3), Winter 2009 (CTEC: 5.2), Winter 2010 (CTEC: 5.1), Winter 2011 (CTEC: 4.2), Winter 2012 (CTEC: 4.6), Winter 2013 (CTEC: 4.9), Winter 2014 (CTEC: 4.8), Spring 2015 (CTEC: 5.0), Spring 2016 (CTEC: 5.3), Spring 2017 (CTEC: 5.1), and Spring 2018 (CTEC: 4.8) quarters; 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), Fall 2008 (CTEC: 5.1), Fall 2009 (CTEC: 4.9), Fall 2011 (CTEC: 5.0), Fall 2012 (CTEC: 4.3), Fall 2013 (CTEC: 4.9), Fall 2014 (CTEC: 4.2),

Fall 2015 (CTEC: 4.1), Fall 2016 (CTEC: 5.3), Fall 2017 (CTEC: 4.8), and Fall 2018 (CTEC: 4.5) quarters; EECS 362 – Computer Architecture Projects class in the Winter 2009 (CTEC: 5.5) quarter; and EECS 452 – Advanced Computer Architecture in the Spring 2004 (CTEC: 5.6), Spring 2005 (CTEC: 6.0), Spring 2006 (CTEC: 5.1), Spring 2008 (CTEC: 5.4), Spring 2009 (CTEC: 5.3), Spring 2011 (CTEC: 5.1), Winter 2012 (CTEC: 5.0), Winter 2013 (CTEC: 5.6), Winter 2014 (CTEC: 5.5), Winter 2015 (CTEC: 5.3), Winter 2016 (CTEC: 5.3), Winter 2017 (CTEC: 5.7), and Winter 2018 (CTEC: 5.9) quarters. The provided CTEC scores are the overall instruction ratings on a scale of 6.0.