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Research Area

Embedded Computing Systems - *Embedded Systems*
Embedded Software Synthesis and Compilation, Compositional System Synthesis, Application-Specific Programmable Processors and Modules, and Electronics Design Automation
- *Emerging Areas in Computer Engineering*
Ubiquitous and Pervasive Computing, Wearable Computing and emerging applications

Employment

Associate Professor University of California, Davis, CA
7/2010 – Present Department of Electrical and Computer Engineering
Assistant Professor University of California, Davis, CA
10/2004 – 6/2010 Department of Electrical and Computer Engineering

Education

Ph.D. in Computer Sci. University of California at Los Angeles (UCLA), Los Angeles, CA
Degree: 12/2004 Computer Science Department
12/2001 – 9/2004 *Advisor: Prof. Majid Sarrafzadeh*
MS. in Computer Sci. University of California at Los Angeles (UCLA), Los Angeles, CA
Degree: 06/2003, Computer Science Department
9/2000 – 12/2001 *Advisor: Prof. Majid Sarrafzadeh*
BS. in Computer Eng., Sharif University of Technology, Tehran, Iran
9/1994 – 06/1998 Computer Engineering Department

Publications¹

Refereed Journal Publications

- J1. Soheil Ghiasi, Ankur Srivastava, Xiaojian Yang, Majid Sarrafzadeh, "Optimal Energy Aware Clustering in Sensor Networks", *SENSORS Journal*, Vol. 2, Issue 7, pp. 258-269, July 2002
- J2. Xiaojian Yang, Maogang Wang, Ryan Kastner, Soheil Ghiasi and Majid Sarrafzadeh, "Congestion Reduction During Placement with Provably Good Approximation Bound", *ACM Transactions on Design Automation of Electronic Systems (TODAES)*, Vol. 8, No. 3, pp. 316-333, July 2003
- J3. Soheil Ghiasi, Ani Nahapetian, Majid Sarrafzadeh, "An Optimal Algorithm for Minimizing Runtime Reconfiguration Delay", *ACM Transactions on Embedded Computing Systems (TECS)*, Vol. 3, No 2, pp. 237-256, May 2004.
- J4. Elaheh Bozorgzadeh, Soheil Ghiasi, Atsushi Takahashi, Majid Sarrafzadeh, "Optimal Integer Delay Budget Assignment on Directed Acyclic Graphs", *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, Vol. 23, No 8, pp. 1184-1199, August 2004
- J5. Soheil Ghiasi, Hyun J. Moon, Ani Nahapetian, Majid Sarrafzadeh, "Collaborative and Reconfigurable Object Tracking", *Kluwer Journal of Supercomputing*, Vol. 30, No 3, pp. 213-238, December 2004
- J6. Soheil Ghiasi, Ani Nahapetian, Hyun J. Moon, Majid Sarrafzadeh, "Reconfiguration in Network of Embedded Systems: Challenges and Adaptive Tracking Case Study", *Journal of Embedded Computing (JEC)*, Vol. 1, No 1, pp. 147-166, 2005
- J7. Soheil Ghiasi, Karlene Nguyen, Elaheh Bozorgzadeh, Majid Sarrafzadeh, "Efficient Timing Budget Management for Accuracy Improvement in a Collaborative Object Tracking System", *Springer Journal of VLSI Signal Processing*, Vol. 42, No. 1, pp. 43-55, January 2006

¹ The papers indicated by "*" are still under review. Published papers are available at <http://www.ece.ucdavis.edu/~soheil>.

- J8. Roozbeh Jafari, Hyduke Noshadi, Soheil Ghiasi, Majid Sarrafzadeh, "Adaptive Electrocardiogram Feature Extraction on Distributed Embedded Systems", *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, Vol. 17, No. 8, pp. 797-807, August 2006
- J9. Soheil Ghiasi, Po-Kuan Huang, Roozbeh Jafari "Probabilistic Delay Budgeting for Soft Realtime Applications", *IEEE Transactions on Very Large Scale Integration Systems (TVLSI)*, Vol. 14, No. 8, pp. 843-853, August 2006
- J10. Soheil Ghiasi, Elaheh Bozorgzadeh, Po-Kuan Huang, Majid Sarrafzadeh, "A Unified Theory of Timing Budget Management", *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (ICAD)*, Vol. 25, No. 11, pp. 2364-2375, November 2006
- J11. Soheil Ghiasi, "An Effective Combinatorial Algorithm for Gate-Level Threshold Voltage Assignment", *ASP Journal of Low Power Electronics*, Vol. 2, No. 3, pp. 365-377, December 2006
- J12. Po-Kuan Huang, Soheil Ghiasi "Efficient and Scalable Compiler-Directed Energy Optimization for Realtime Applications", *ACM Transactions on Design Automation of Electronic Systems (TODAES)*, Vol. 12, No. 3, August 2007
- J13. Matin Hashemi, Soheil Ghiasi, "Throughput-Driven Synthesis of Embedded Software for Pipelined Execution on Multi-Core Architectures", *ACM Transactions on Embedded Computing Systems (TECS)*, Vol. 8, No. 2, January 2009
- J14. Ani Nahapetian, Philip Brisk, Soheil Ghiasi, Majid Sarrafzadeh, "An Approximation Algorithm for Scheduling on Heterogeneous Reconfigurable Resources", *ACM Transactions on Embedded Computing (TECS)*, Vol. 9, No. 1, October 2009
- J15. Soheil Ghiasi, "On Incremental Component Implementation Selection in System Synthesis", *IEEE Transactions on Very Large Scale Integration Systems (TVLSI)*, 2009
- J16. Po-Kuan Huang, Soheil Ghiasi, "Energy-Aware Compilation for Embedded Processors with Technology Scaling Considerations", *ASP Journal of Low Power Electronics*, Vol. 5, No. 4, pp. 439-453, December 2009
- J17. Matin Hashemi, Soheil Ghiasi, "A Versatile Task Assignment Algorithm for Heterogeneous Soft Dual-Processor Platforms", *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (ICAD)*, Vol 29, No. 3, pp. 414 - 425, 2010
- J18. *Mohammad H. Foroozannejad, Matin Hashemi, Trevor L. Hodges, Soheil Ghiasi, "Buffer Management Tradeoffs in Synthesis of Streaming Applications", submitted to *ACM Transactions on Embedded Computing (TECS)*

Refereed Conference Publications

- C1. Karlene Nguyen, Gavin Yueng, Soheil Ghiasi, Majid Sarrafzadeh, "A General Framework for Tracking Objects in a Multi-Camera Environment", *International Workshop on Digital and Computational Video (DCV)*, pp. 200-204, November 2002
- C2. Soheil Ghiasi, Majid Sarrafzadeh, "Optimal Reconfiguration Sequence Management", *Asia South Pacific Design Automation Conference (ASPDAC)*, pp. 359-365, January 2003
- C3. Ram Kumar, Soheil Ghiasi, Mani Srivastava, "Dynamic Adaptation of Networked Reconfigurable Systems", *Workshop on Software Support for Reconfigurable Systems (SSRS)*, February 2003
- C4. Soheil Ghiasi, Karlene Nguyen, Elaheh Bozorgzadeh, Majid Sarrafzadeh, "On Computation and Resource Management in an FPGA-based Computing Environment", A Poster in *International Symposium on Field-Programmable Gate Arrays (FPGA)*, page 243, February 2003
- C5. Elaheh Bozorgzadeh, Soheil Ghiasi, Atsushi Takahashi, Majid Sarrafzadeh, "Optimal Integer Delay Budgeting on Directed Acyclic Graphs", *Design Automation Conference (DAC)*, pp. 920-925, June 2003
- C6. Soheil Ghiasi, Hyun J. Moon, Majid Sarrafzadeh, "Collaborative and Reconfigurable Object Tracking", *International Conference on Engineering of Reconfigurable Systems and Algorithms (ERSA)*, pp. 13-20, June 2003
- C7. Soheil Ghiasi, Hyun J. Moon, Majid Sarrafzadeh, "Improving Performance and Quality thru Hardware Reconfiguration: Potentials and Adaptive Object Tracking Case Study", *Workshop on Embedded Systems for Real-Time Multimedia (ESTIMedia)*, pp. 149-155, October 2003
- C8. Soheil Ghiasi, Karlene Nguyen, Elaheh Bozorgzadeh, Majid Sarrafzadeh, "On Computation and Resource Management in Networked Embedded Systems", *International Conference on Parallel and Distributed Computing and Systems*, pp. 445-451, November 2003
- C9. Soheil Ghiasi, Karlene Nguyen, Majid Sarrafzadeh, "Profiling Accuracy-Latency Characteristics of Collaborative Object Tracking Applications", *International Conference on Parallel and Distributed Computing and Systems*, pp. 694-701, November 2003
- C10. Ani Nahapetian, Soheil Ghiasi, Majid Sarrafzadeh, "Task Scheduling on Heterogeneous Resources with Heterogeneous Reconfiguration Costs", *International Conference on Parallel and Distributed Computing and Systems*, pp. 916-921, November 2003
- C11. Eren Kursun, Soheil Ghiasi, Majid Sarrafzadeh, "Transistor Level Budgeting for Power Optimization", *International Symposium on Quality Electronic Design (ISQED)*, pp. 116-121, 2004

- C12. Taraneh Taghavai, Soheil Ghiasi, Abhishek Ranjan, Salil Raje, Majid Sarrafzadeh, "Innovate or Perish: FPGA Physical Design", *International Symposium on Physical Design (ISPD)*, pp. 148-155, April 2004
- C13. Elaheh Bozorgzadeh, Soheil Ghiasi, Majid Sarrafzadeh, "Incremental Timing Budget Management", *International Conference on Engineering of Reconfigurable Systems and Algorithms (ERSA)*, pages 240-246, June 2004
- C14. Soheil Ghiasi, Elaheh Bozorgzadeh, Siddharth Choudhury, Majid Sarrafzadeh, "A Unified Theory for Timing Budget Management", *International Conference on Computer-Aided Design (ICCAD)*, pp 653-659, November 2004
- C15. Taraneh Taghavi, Soheil Ghiasi, Majid Sarrafzadeh, "Routing Algorithms: Enhancing Routability & Enabling ECO", A Poster in *International Symposium on Field-Programmable Gate Arrays (FPGA)*, page 266, 2005
- C16. Soheil Ghiasi, "Efficient Implementation Selection via Time Budgeting: Complexity Analysis and Leakage Optimization Case Study", *International Conference on Computer Design (ICCD)*, pp 127-129, 2005
- C17. Venkatesh Akella, Soheil Ghiasi, "Super-FPGA: Overcoming Von Neumann to Save Moore", A poster in DARPA Workshop on High Performance Embedded Computing, 2005
- C18. Po-Kuan Huang, Soheil Ghiasi, "Power-Aware Compilation for Embedded Processors with Dynamic Voltage Scaling and Adaptive Body Biasing Capabilities", *IEEE/ACM Design Automation and Test in Europe (DATE)*, pp. 943-944, March 2006
- C19. Roozbeh Jafari, Hyduke Noshadi, George Massoud, Soheil Ghiasi, Majid Sarrafzadeh, "Adaptive Medical Feature Extraction for Resource Constrained Distributed Embedded Systems", *IEEE International Workshop on Ubiquitous and Pervasive Health Care (UbiCare)*, pp. 506-511, March 2006
- C20. Soheil Ghiasi, Po-Kuan Huang, "Probabilistic Delay Budgeting for Soft Realtime Applications", *IEEE International Symposium on Quality Electronics Design (ISQED)*, pp. 141-146, March 2006
- C21. Taraneh Taghavi, Soheil Ghiasi, Majid Sarrafzadeh, "Routing Algorithms: Architecture Driven Rerouting Enhancement for FPGAs", *IEEE International Symposium on Circuits and Systems (ISCAS)*, May 2006
- C22. Alessandro Bissacco, Soheil Ghiasi, Stefano Soatto, "Fast Visual Feature Selection and Tracking in a Hybrid Reconfigurable Architecture", *Workshop on Applications of Computer Vision (ACV)*, May 2006
- C23. Jia Ming Mar, Alessandro Bissacco, Stefano Soatto, Soheil Ghiasi, "High Performance Feature Detection on a Reconfigurable Co-Processor", *IEEE Field-Programmable Custom Computing Machines (FCCM)*, pp. 341-342, April 2006
- C24. Soheil Ghiasi, "Improved Threshold Voltage Assignment via Combinatorial Implementation Selection", *ACM International Workshop on Logic and Synthesis (IWLS)*, pp. 94-101, 2006
- C25. Po-Kuan Huang, Soheil Ghiasi, "Leakage-Aware Intraprogram Voltage Scaling for Embedded Processors", *IEEE/ACM Design Automation Conference (DAC)*, pp. 364-369, 2006
- C26. Po-Kuan Huang, Soheil Ghiasi, "Scalable Compiler-Directed Energy Optimization for Realtime Applications", *IEEE/ACM Design Automation and Test in Europe (DATE)*, pp. 785-790, 2007
- C27. Roozbeh Jafari, Soheil Ghiasi, Majid Sarrafzadeh, "Medical Embedded Systems", *International Embedded Systems Symposium*, pp. 441-444, May 2007
- C28. Po-Kuan Huang, Matin Hashemi, Soheil Ghiasi, "Joint Throughput and Energy Optimization for Pipelined Execution of Embedded Streaming Applications", *ACM Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES)*, pp. 137-139, June 2007
- C29. Soheil Ghiasi, "Incremental Component Implementation Selection: Enabling ECO in Compositional System Synthesis", *IEEE/ACM International Conference on Computer-Aided Design (ICCAD)*, pp. 131-134, Nov. 2007
- C30. Matin Hashemi, Soheil Ghiasi, "Exact and Approximate Task Assignment Algorithms for Pipelined Software Synthesis", *IEEE/ACM Design Automation and Test in Europe (DATE)*, pp. 746-751, March 2008
- C31. Po-Kuan Huang, Matin Hashemi, Soheil Ghiasi, "System-Level Performance Estimation for Application-Specific MPSoC Interconnect Synthesis", *IEEE Symposium on Application Specific Processors*, June 2008
- C32. Faisal Khan, Lihua Yuan, Chen-Nee Chuah, and Soheil Ghiasi, "Programmable and Real-time Network Traffic Measurements", *IEEE/ACM Symposium on Architecture for Networking and Communications Systems (ANCS)*, pp. 109-118, November 2008
- C33. Mohammad H. Foroozannejad, Matin Hashemi, Trevor L. Hodges, Soheil Ghiasi, "Look into details: the benefits of fine-grain streaming buffer analysis", *ACM Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES)*, pp. 27-36, April 2010
- C34. Faisal Khan, Nicholas Hosein, Soheil Ghiasi, "BURAQ: A Dynamically Reconfigurable System for Stateful Measurement of Network Traffic", *IEEE International Symposium on Field-Programmable Custom Computing Machines (FCCM)*, pp. 185-192, May 2010

Grants

- "The Capstone of the Curriculum: Improving Senior Design Project Courses at UC-Davis ECE Department", **PI: Ghiasi**, Co-PI: Amirtharajah, Knoesen, Lewis. Intel Corp, \$30K, 2010-11

- “Physically-Coupled Systems for Sport Medicine Applications: Building Blocks and ACL Injury Case Study”, **PI: Ghiasi**, Co-PI: Casazza and El-Farra. Center for Information Technology in the Interest of Society (CITRIS), \$75K, 2010-01
- “Architectures for Highly-Efficient 1000+ Core Chips for Compute and Data-Intensive Applications”, PI: Baas, **Co-PI: Ghiasi**, National Science Foundation (NSF), \$317K, 2009-2012
- “Architectures for Highly-Efficient 1000+ Core Chips for Compute and Data-Intensive Applications”, PI: Baas, **Co-PI: Ghiasi**, Semiconductor Research Corporation (SRC), \$120K, 2009-2012
- “Data Center 2020: Energy Efficient Large Scale Computing Platform using Nanophotonic Interconnects”, PI: B. Yoo, Co-PI: Akella, Amirtharajah, Baas, **Ghiasi** and Islam, Center for Information Technology in the Interest of Society (CITRIS), \$75K, 2008-09
- “Programmable Real-time Traffic Analysis on Many-Core Architectures”, **PI: Ghiasi**, Co-PI: C. Chuah, Center for Information Technology in the Interest of Society (CITRIS), \$75K, 2008-09
- “CEEL: Computer Engineering Education Laboratories with Wireless Networking Extension at UC Davis”, PI: C. Chuah, **Co-PI: Ghiasi**, Owens, Wilken, Mohapatra, Intel Inc. equipment donation (\$84K value), 2006
- Altera Inc, equipment donation (\$7000 value), 2008
- Xilinx Inc. equipment donation (\$5000 value), 2009
- Xilinx Inc. equipment donation (\$5869 value), 2005
- Xilinx Inc. equipment donation (\$5675 value), 2007
- Xilinx Inc. equipment donation (\$4990 value), 2007

Awards

- Best Paper Award Nomination for the paper “Incremental Component Implementation Selection: Enabling ECO in Compositional System Synthesis”, *IEEE/ACM International Conference on Computer-Aided Design (ICCAD)*, 2007
- ACM SIGDA Outstanding PhD Dissertation Award nominee, 2004
- Harry M. Showman Prize, Henry Samueli School of Engineering and Applied Sciences (HSSEAS), UCLA. (Received the very only award given to the outstanding graduating student of class 2004).
- “Outstanding PhD student” award by Association of Professors and Scholars of Iranian Heritage (APSIH), 2004
- 3rd prize poster presentation award at the annual research review of Computer Science Dept. of UCLA, April 2002.
- Honored to be exempted from the nationwide university entrance examination, with more than 1.3 million participants, due to extraordinary performance in national Olympiad competitions, Iran, August 1994.

Professional Service

Technical Program Committee (member)	IEEE/ACM Design Automation Conference (DAC) PhD forum, 2009, 2010 IEEE/ACM Asia South-Pacific Design Automation Conference (ASPDAC), 2009, 2010 IEEE Symposium on Circuits and Systems (ISCAS), 2006, 07, 08, 09 IEEE International Conference on Computer Design (ICCD), 2007, 08, 09, 10 IEEE/ACM International Conference on Computer-Aided Design (ICCAD), 2006, 07, 08
Associate Editor	ACM Special Interest Group in Design Automation (SIGDA) newsletter Engineering Letters
Organized Tutorials	“Medical Embedded Systems”, presented at International Embedded Systems Symposium, May 2007, Co-organized with colleagues from UCLA and UC-Berkeley.
Proposal Review	University of California, France-Berkeley research program, 2009 National Science Foundation, Eng and CISE directorates, 2009 National Science Foundation, Eng and CISE directorates, 2010
Paper Review	IEEE Transactions on Computers (TC) IEEE Transactions on Computer Aided Design of Integrated Circuits and Systems (TCAD) IEEE Transactions on Very Large Scale Integration Systems (TVLSI) ACM Transactions on Embedded Computing Systems (TECS) ACM Transactions on Design Automation of Embedded Systems (TODAES) Elsevier Journal of Design Automation for Embedded System Elsevier Integration, the VLSI journal IEEE/ACM Design Automation Conference (DAC)

IEEE/ACM International Conference on Computer Aided Design (ICCAD)
IEEE/ACM Int'l Conference on HW/SW Co-design and System Synthesis (CODES+ISSS)
ACM International Symposium on Field Programmable Gate Arrays (FPGA)
ACM International Symposium on Circuits and Systems (ISCAS)

Graduate Students

PhD students: Matin Hashemi (joined 9/05)
Faisal Khan (joined 9/06)
Mohammad Foroozannejad (joined 1/09)

MS students: Nicholas Hosein (joined 10/08)

Alumni

MS students supervised: Adam Harbor (8/07) joined Spansion after graduation
Trevor Hodges (12/08) joined Serra after graduation

Undergraduate student researchers: Jia Ming Mar, Zachary Graham, Jeffery Wurz, Hunter Lee, Roubinder Singh