Soheil Ghiasi

University of California
One Shields Ave
Davis, CA 95616

ghiasi@ucdavis.edu
Office: (530) 752-0836
http://www.ece.ucdavis.edu/~soheil

Professional Experience/Employment

Professor **7/2016 – Present**	University of California, Davis, CA Department of Electrical and Computer Engineering
Associate Professor **7/2010 – 6/2016**	University of California, Davis, CA Department of Electrical and Computer Engineering
Dept. Vice-Chair **8/2014-7/2016**	University of California, Davis, CA Department of Electrical and Computer Engineering
Visiting Scholar **9/2010-12/2010**	University of California, Berkeley, CA Center for Embedded and Hybrid Software Systems (CHESS)
Assistant Professor **10/2004 – 6/2010**	University of California, Davis, CA Department of Electrical and Computer Engineering

Education

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

Research Area

Design Methodologies for Wearable Computing & Embedded Devices	Embedded and Wearable Systems in health and medical applications, Signal Processing, Data Analytics and Machine Intelligence, Non-Invasive Fetal and Neonatal Monitoring, Design Methods for Data Streaming Applications

Awards and Recognitions

Senior Member of the National Academy of Inventors (NAI), 2024
NIBIB RADx Fetal Monitoring Challenge Awardee – Storx Technologies (research lab spinoff), 2024
NIH & NSF STTR Phase I & II awardee - Storx Technologies (research lab spinoff), 2020, 21 and 23
MIT Solve Awardee for Global Impact - Storx Technologies (research lab spinoff), 2020
Best Student Paper Award**,** IEEE International Mid-West Symposium on Circuits and Systems, 2015
Senior Member of ACM, 2015
Senior Member of IEEE, 2010
Best Paper Award nomination – ICCAD 2007
Harry M. Showman Prize – UCLA School of Engineering 2004

Publications

Book Chapters

B1. Matin Hashem, Kamyar Mirzazad Barijough, Soheil Ghiasi, "Throughput-Driven Parallel Embedded Software Synthesis from Synchronous Dataflow Models: Caveats and Remedies", Model-Implementation Fidelity in Cyber Physical System Design, Ed. Anca Molnos and Christian Fabre, Springer International Publishing, pp. 91-127, 2017

B2. Sachin Kumawat, Mohammad Motamedi, Soheil Ghiasi, "CNN-Agnostic Accelerator Design for Low Latency Inference on Embedded FPGAs", Hardware Architectures for Deep Learning, Ed. Masoud Daneshtalab and Mehdi Modaressi, Hardware Architectures for Deep Learning, 2020

B3. Mohammad Motamedi, Felix Portillo, Mahya Saffarpour, Daniel Fong, Soheil Ghiasi, "CNN Synthesis for Resource-Constrained Platforms", Elsevier, 2022

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

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 (TCAD),* 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. 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

J16. 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 (TCAD),* Vol 29, No. 3, pp. 414 - 425, 2010

J17. Soheil Ghiasi, "On Incremental Component Implementation Selection in System Synthesis", *IEEE Transactions on Very Large Scale Integration Systems (TVLSI),* Vol. 18, No. 11, pp. 1578 – 1589, 2010

J18. Mohammad H. Foroozannejad, Matin Hashemi, Trevor L. Hodges, Soheil Ghiasi, "Post-Scheduling Buffer Management Tradeoffs in Synthesis of Streaming Applications", *ACM Transactions on Design Automation of Electronic Systems (TODAES)*, Vol. 17, No. 3, 2012

J19. Matin Hashemi, Soheil Ghiasi, "Throughput-Memory Tradeoff in Synthesis of Streaming Software on Embedded Multiprocessors", ACM Transactions on Embedded Computing Systems (TECS), Vol. 13, No. 3, December 2013

J20. Faisal Khan, Chen-Nee Chuah, Soheil Ghiasi, "A Dynamically Reconfigurable System for Closed-Loop Measurements of Network Traffic, *IEEE Transactions on Computers (TC),* Vol. 63, No. 2, pp. 263-275, 2014

J21. Faisal Khan, Nicholas Hosein, Soheil Ghiasi, Chen-Nee Chuah, Puneet Sharma, "Streaming Solutions for Fine-Grained Network Traffic Measurements and Analysis", *IEEE Transactions on Networking (ToN),* Vol. 22, No. 2, pp. 377-390, 2014

J22. Mohammad H. Foroozannejad, Matin Hashemi, M. Mahini, Bevan Baas, Soheil Ghiasi, "Time-Scalable Mapping for Circuit-Switched GALS-Based Chip Multiprocessor Platforms", IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), Vol. 33, No. 5, pp. 752-762, May 2014

J23. Mohammad Motamedi, Philipp Gysel, Soheil Ghiasi, "PLACID: A Platform for FPGA-Based Accelerator Creation for DCNNs", *ACM Transactions on Multimedia Computing, Communications and Applications (TOMM), Vol. 13, No. 4, 2017*

J24. Mohammad Motamedi, Daniel Fong, Soheil Ghiasi, "Machine Intelligence on Resource-Constrained IoT Devices: The Case of Thread Granularity Optimization for CNN Inference", *ACM Transactions on Embedded Computing (TECS), Vol. 16, No. 5s,* 2017

J25. Mohammad Motamedi, Daniel Fong, and Soheil Ghiasi. "Cappuccino: Efficient CNN Inference Software Synthesis for Mobile System-on-Chips", IEEE Embedded Systems Letters, 2018

J26. Philipp Gysel, Jon Pimentel, Mohammad Motamedi, and Soheil Ghiasi. "Ristretto: A Framework for Empirical Study of Resource-Efficient Inference in Convolutional Neural Networks", *IEEE Transactions on Neural Networks and Learning Systems*, vol. 29, no. 11, pp. 5784-5789, Nov. 2018.

J27. Daniel D. Fong, Xiaofan Yu, Jiageng Mao, Mahya Saffarpour, Prashant Gupta, Rami Abueshshiekh, Alejandro Velazquez Alcantar, Eric A. Kurzrock, and Soheil Ghiasi. "Restoring the Sense of Bladder Fullness for Spinal Cord Injury Patients", Elsevier Smart Health, July 2018.

J28. Daniel D. Fong, André Knoesen, Mohammad Motamedi, Terry O'Neill, and Soheil Ghiasi. "Recovering the Fetal Signal in Transabdominal Fetal Pulse Oximetry", Elsevier Smart Health, July 2018.

J29. Mohammad Motamedi, Felix Portillo, Mahya Saffarpour, Daniel Fong, and Soheil Ghiasi. "Octopus: Context-Aware CNN Inference for IoT Applications", *IEEE Embedded Systems Letters*, 2019.

J30. Mohammad Motamedi, Felix Portillo, Daniel Fong, and Soheil Ghiasi. "Distill-Net: Application-Specific Distillation of Deep Convolutional Neural Networks for Resource-Constrained IoT Platforms", *ACM Transactions on Embedded Computing Systems (TECS),* Volume 18, No. 5, 2019.

J31. Daniel D. Fong, Vivek J. Srinivasan, Kourosh Vali, and Soheil Ghiasi. "Optode Design Space Exploration for Clinically-robust Non-invasive Fetal Oximetry", *ACM Transactions on Embedded Computing Systems (TECS),* Volume 18, Number 5s, October 2019.

J32. Dong Wang, Ke Xu, Jingning Guo, and Soheil Ghiasi, "DSP-Efficient Hardware Acceleration of Convolutional Neural Network Inference on FPGAs", *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, 2020

J33. Daniel D Fong., Kaeli J. Yamashiro, Michael Austin Johnson, Kourosh Vali, Laura A. Galganski, Christopher D. Pivetti, Diana L. Farmer, Herman L. Hedriana, and Soheil Ghiasi. "Validation of a Novel Transabdominal Fetal Oximeter in a Hypoxic Fetal Lamb Model", *Reproductive Sciences* 27, no. 10, pp. 1960-1966, 2020.

J34. Daniel Fong, Kaeli Yamashiro, Kourosh Vali, Laura Galganski, Jameson Thies, Rasta Moeinzadeh, Christopher Pivetti et al. "Design and *In Vivo* Evaluation of a Non-invasive Transabdominal Fetal Pulse Oximeter.", *IEEE Transactions on Biomedical Engineering*, 2020

J35. M. Motamedi, F. Portillo, M. Saffarpour, D. Fong and S. Ghiasi, "Scalable CNN Synthesis for Resource-Constrained Embedded Platforms," *IEEE Internet of Things Journal*, 2021

J36. Seyed Ahmad Mirsalari, Najmeh Nazari, Seyed Ali Ansarmohammadi, Mostafa E. Salehi, and Soheil Ghiasi, "E2BNet: MAC -free yet accurate 2-level binarized neural network accelerator for embedded systems", Springer *Journal of Real-Time Image Processing*, Vol. 18, pp. 1285–1299, 2021

J37. Begum Kasap, Kourosh Vali, Weitai Qian, Mahya Saffarpour and Soheil Ghiasi, "KUBAI: Sensor Fusion for Non-Invasive Fetal Heart Rate Tracking," in *IEEE Transactions on Biomedical Engineering*, vol. 70, no. 7, pp. 2193-2202, 2023

J38. Mahya Saffarpour, Debraj Basu, Fatemeh Radaei, Kourosh Vali, Jason L. Adams, Chen-Nee Chuah and Soheil Ghiasi "Physiowise: A Hybrid Approach to Dicrotic Notch Identification", ACM Transactions on Computing for Healthcare, Vol. 4, Issue 2, 2023

J39. Weitai Qian, Hongtao Zhong, Soheil Ghiasi, "Short: Prediction of fetal blood oxygen content in response to partial occlusion of maternal aorta", Elsevier Smart Health, Volume 28, 2023

J40. Rishad Joarder, Begum Kasap, Soheil Ghiasi, "RT-TRAQ: An algorithm for real-time tracking of faint quasi-periodic signals in noisy time series", Elsevier Smart Health, Volume 28, 2023

J41. Ata Vafi, Conor King, Hanyi Duan, Eric A. Kurzrock, Soheil Ghiasi, "Non-invasive bladder volume sensing via FMCW radar: Feasibility demonstration in simulated and ex-vivo bladder models", Elsevier Smart Health, Volume 29, 2023

J42. Kourosh Vali, Ata Vafi, Begum Kasap, and Soheil Ghiasi, "BASS: Safe Deep Tissue Optical Sensing for Wearable Embedded Systems", ACM Transactions on Embedded Computing Systems. Volume 22, Issue 5s, Article 122, 2023

J43. Shing-Jiuan Liu, Su Yeon Lee, Christopher Pivetti, Edwin Kulubya, Aijun Wang, Diana L. Farmer, Soheil Ghiasi, and Weijian Yang, "Recovering fetal signals transabdominally through interferometric near-infrared spectroscopy (iNIRS)," Biomedical Optics Express 14, 6031-6047 (2023)

J44. Begum Kasap, Kourosh Vali, Weitai Qian, Zhabiya Chitiwala, Lihong Mo, Anna Curtin, Herman Hedriana, and Soheil Ghiasi, "Transcutaneous Discrimination of Fetal Heart Rate from Maternal Heart Rate: A Fetal Oximetry Proof-of-Concept", *accepted for publication* in Reproductive Sciences, 2024

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. 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

C22. Taraneh Taghavi, Soheil Ghiasi, Majid Sarrafzadeh, "Routing Algorithms: Architecture Driven Rerouting Enhancement for FPGAs", *IEEE International Symposium on Circuits and Systems (ISCAS)*, May 2006

C23. 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

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, "Efficient and 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 **(nominated for best paper award)**

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, "A Programmable Architecture for Scalable 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

C35. Soheil Ghiasi, Matin Hashemi, Volodymyr Khibin, "Puzzle Solver Accelerators Make Excellent Capstone Design Projects", *IEEE International Conference on Microelectonics System Education (MSE)*, June 2011

C36. Faisal Khan, Nicholas Hosein, Chen-Nee Chuah, Soheil Ghiasi, "Streaming Solutions for Fine-Grained Network Traffic Measurements And Analysis", *ACM/IEEE Symposium on Architectures for Networking and Communication Systems (ANCS)*, October 2011

C37. Matin Hashemi, Soheil Ghiasi, "Towards scalable utilization of embedded manycores in throughput-sensitive applications", *IEEE International High Level Design Validation and Test Workshop (HLDVT)*, pp. 110-115, November 2011 (invited paper)

C38. Matin Hashemi, Mohammad H. Foroozannejad, Christoph Etzel, Soheil Ghiasi, "FORMLESS: Scalable Utilization of Embedded Manycores in Streaming Applications", *ACM SIGPLAN/SIGBED Conference on Languages, Compilers and Tools for Embedded Systems (LCTES)*, 10 pages, June 2012

C39. Mohammad H. Foroozannejad, Brent Bohnenstiehl, Soheil Ghiasi, "BAMSE: A Balanced Mapping Space Exploration Algorithm for GALS-based Manycore Platforms", *IEEE/ACM Asia-South Pacific Design Automation Conference (ASPDAC)*, pp. 479-484, 2013

C40. Kamyar Mirzazad Barijough, Matin Hashemi, Volodymyr Khibin, Soheil Ghiasi, "Implementation-Aware Buffer-Throughput Tradeoff in Embedded Stream Applications", *IEEE/ACM Design Automation and Test in Europe (DATE), Workshop on Model Implementation Fidelity*, March 2015.

C41. Kamyar Mirzazad Barijough, Matin Hashemi, Volodymyr Khibin and Soheil Ghiasi, "*Implementation-Aware Model Analysis: The Case of Buffer-Throughput Tradeoff in Streaming Applications",* ACM SIGPLAN/SIGBED Conference on Languages, Compilers and Tools for Embedded Systems (LCTES), 10 pages, June 2015

C42. Bin Liu, Mohammad H. Foroozannejad, Soheil Ghiasi, Bevan M. Baas**,** "Optimizing Power of Many-Core Systems by Exploiting Dynamic Voltage, Frequency and Core Scaling", *IEEE International Mid-West Symposium on Circuits and Systems*, August 2015 **(best student paper award, third place)**

C43. Mohammad Motamedi, Philipp Gysel, Soheil Ghiasi, "Design Space Exploration of FPGA-Based Deep Convolutional Neural Networks", *IEEE/ACM Asia-South Pacific Design Automation Conference (ASPDAC)*, 2016

C44. Philipp Gysel, Mohammad Motamedi, Soheil Ghiasi, "Hardware-Oriented Approximation of Convolutional Neural Networks", International Conference on Learning Representation (ICLR), workshop track, 2016

C45. Nicholas Hosein, Soheil Ghiasi, "Wearable Sensor Selection, Motion Representation and their Effect on Exercise Classification", IEEE Conference on Connected Health: Applications, Systems and Engineering Technologies (CHASE), 2016

C46. Brianna Myers, Jaskaran Atwal, Chai Yang, Lisa Brown, Soheil Ghiasi, Andre Knoesen. "Towards Data-Driven Pre-Operative Evaluation of Lung Cancer Patients: The Case of Smart Mask", IEEE Wireless Health Conference, October 2016

C47. Seyyed Salar Latifi Oskouei, Hossein Golestani, Matin Hashemi, Soheil Ghiasi, "CNNdroid: GPU-Accelerated Execution of Trained Deep Convolutional Neural Networks on Android", Proceedings of the ACM Multimedia, Open Source Software Competition track, October 2016

C48. Daniel Fong, André Knoesen, Soheil Ghiasi. "Transabdominal Fetal Pulse Oximetry: The Case of Fetal Signal Optimization", *IEEE International Conference on e-Health Networking, Applications and Services (HealthCom)*, October 2017.

C49. Oleksiy Budilovsky, Golnaz Alipour, André Knoesen, Lisa Brown, Soheil Ghiasi. "A Data-Driven Approach to Pre-Operative Evaluation of Lung Cancer Patients", *IEEE International Conference on e-Health Networking, Applications and Services (HealthCom)*, October 2017.

C50. Mohammad Motamedi, Daniel Fong, Soheil Ghiasi, "Machine Intelligence on Resource-Constrained IoT Devices: The Case of Thread Granularity Optimization for CNN Inference", IEEE/ACM *Hardware/Software Co-Design and System Synthesis (CODES),* 2017.

C51. Daniel Fong, Prashant Gupta, Alejandro V. Alcantar, Eric Kurzrock, Soheil Ghiasi, "Non-Invasive Bladder Volume Sensing for Neurogenic Bladder Dysfunction Management", IEEE Body Sensor Networks (BSN), 2018

C52. Daniel Fong, André Knoesen, Mohammad Motamedi, Terry O'Neill, Soheil Ghiasi. "Recovering the Fetal Signal in Transabdominal Fetal Pulse Oximetry", *IEEE/ACM 3rd International Conference on Connected Health: Applications, Systems and Engineering Technologies (CHASE)*, Washington, D.C., September 2018.

C53. Daniel Fong, Xiaofan Yu, Jiageng Mao, Mahya Saffarpour, Prashant Gupta, Rami Abueshsheikh, Alejandro Velazquez Alcantar, Eric Kurzrock, Soheil Ghiasi. "Restoring the Sense of Bladder Fullness for Spinal Cord Injury Patients", *IEEE/ACM 3rd International Conference on Connected Health: Applications, Systems and Engineering Technologies (CHASE)*, Washington, D.C., September 2018.

C54. Dong Wang, Ke Xu, Qun Jia, Soheil Ghiasi, "ABM-SpConv: A Novel Approach to FPGA-Based Acceleration of Convolutional Neural Network Inference", IEEE/ACM Design Automation Conference (DAC), 2019

C55. Daniel D. Fong, Vivek J. Srinivasan, Kourosh Vali, and Soheil Ghiasi. "Optode Design Space Exploration for Clinically-robust Non-invasive Fetal Oximetry," *presented at Embedded Systems Week – Hardware/Software Codesign and System Synthesis (CODES+ ISSS), 2019 International Conference on.*, New York, October 2019.

C56. Kaeli Yamashiro, Laura Galganski, Daniel D. Fong, Soheil Ghiasi, Diana Lee Farmer, Jacob Stephenson, Shinjiro Hirose, Lucas Neff, Timothy Williams, M. Austin Johnson. "Fetal Tolerance of Maternal Resuscitative Endovascular Balloon Occlusion of the Aorta in a Sheep Model," *Annual Pregnancy Meeting of the Society for Maternal-Fetal Medicine*, Feb 2020.

C57. Daniel D. Fong., Kaeli Yamashiro, M. Austin Johnson, Kourosh Vali, Laura Galganski, Christopher Pivetti, Diana Lee Farmer, Herman L. Hedriana, and Soheil Ghiasi. "98: Validation of a novel transcutaneous fetal oximeter in a hypoxic fetal sheep model." *American Journal of Obstetrics & Gynecology* 222, no. 1 (2020): S80. (**oral presentation 5% acceptance rate**)

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C64. B. Kasap, Kourosh Vali, Weitai Qian, Wai Ho Chak, Ata Vafi, Naoki Saito, Soheil Ghiasi "Multi-Detector Heart Rate Extraction Method for Transabdominal Fetal Pulse Oximetry*," *2021 43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*, 2021, pp. 1072-1075

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C73. Begum Kasap, Kourosh Vali, Weitai Qian, Mahya Saffarpour, Randall Fowler and Soheil Ghiasi, "Robust Fetal Heart Rate Tracking through Fetal Electrocardiography (ECG) and Photoplethysmography (PPG) Fusion", 45th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC), 2023, pp. 1-4

C74. Kourosh Vali, Ata Vafi, Begum Kasap, and Soheil Ghiasi, "BASS: Safe Deep Tissue Optical Sensing for Wearable Embedded Systems", *IEEE/ACM CODES+ISSS: International Conference on Hardware/Software Co-design and System Synthesis*, 2023

C75. S. Liu, S. Y. Lee, C. Pivetti, E. Kulubya, A. Wang, D. L. Farmer, S. Ghiasi, and W. Yang, "Transabdominal fetal signals measurement using fiber-based frequency-modulated continuous-wave near-infrared spectroscopy in a fetal lamb model", *Biophotonics Congress: Optics in the Life Sciences*, Optica Publishing Group, 2023

C76. Rishad Joarder, Weijian Yang, Vivek Srinivasan, Soheil Ghiasi, "Inverse Modeling Approach for Fetal Oxygen Saturation Estimation with Spatial Intensity", *accepted for publication in* Optical Biophotonics Congress: Biomedical Optics, 2024

C77. Tailai Lihe, Begum Kasap, Kourosh Vali, Soheil Ghiasi, "HDFusion: Hierarchical Data Fusion for Robust Deep Tissue Sensing", *accepted as work-in-progress in* IEEE/ACM Design Automation Conference (DAC), 2024

C78. Mahya Saffarpour, Weitai Qian, Kourosh Vali, Begum Kasap, Herman L. Hedriana and Soheil Ghiasi, "Deep Harmonic Finesse: Signal Separation in Data-Restricted Wearable Systems", *accepted for publication in* IEEE/ACM Design Automation Conference (DAC), 2024

Patents (and pending patent applications)

1. Soheil Ghiasi, and Daniel Fong. "ROBUST, CLINICAL-GRADE TRANSABDOMINAL FETAL PULSE OXIMETRY." U.S. Patent 11,116,412
2. Golnaz A. Kivi, and Soheil Ghiasi. "SAFE AND RELIABLE TRANSABDOMINAL FETAL PULSE OXIMETRY." U.S. Patent 11,684,295
3. Soheil Ghiasi, and Daniel Fong. "CONTEXTUALLY AWARE FETAL SENSING IN TRANSABDOMINAL FETAL PULSE OXIMETRY." U.S. Patent Application 16/820,388
4. Golnaz A. Kivi, and Soheil Ghiasi. "SAFE AND RELIABLE TRANSABDOMINAL FETAL OXIMETRY", US Patent Application 18/315,057
5. Weijian Yang, Shing-Jiuan Liu, and Soheil Ghiasi, "TRANSABDOMIANL FETAL OXIMETRY THROUGH TIME-DOMAIN NEAR-INFARED SPECTROSCOPY", US Patent Application 63/118,359
6. Soheil Ghiasi, Daniel Fong, Kourosh Vali, Begum Kasap, and Weitai Qian, "TRANSABDOMINAL FETAL OXIMETRY WITHOUT EXPLICIT FETAL SIGNAL EXTRACTION", US Patent Application 17/827,628
7. Mahya Saffarpour, Soheil Ghiasi, "DEEP HARMONIC FINESSE: SIGNAL SEPARATION IN WEARABLE SYSTEMS WITH LIMITED DATA", US Provisional Patent Application 63/550,021

Sponsored Research and Education Projects

- "ACE: Accurate, Computationally-Enhanced and Equitable Intrapartum Fetal Monitoring", **PI: Ghiasi**, Co-PI: H. Hedriana, University of California-Noyce Foundation Initiative, $300K, 2023-25
- "STTR Phase II: Accurate Fetal Health Monitoring During Labor and Delivery", **PI: Ghiasi**, Co-PI: H. Hedriana, National Science Foundation, $1M, 2023-25 (transferred out PI responsibilities after securing the grant)
- "The National Center for Interventional Biophotonic Technologies (NCIBT)", PI: L. Marcu and G. Harsh, **Co-PI: Ghiasi** and other colleagues., National Institutes of Health, $8.2M, 2022-27
- "Intrapartum Transabdominal Fetal Pulse Oximetry: Demonstration in Ewe Models", **PI: Ghiasi**, Co-PI: Hedriana, A. Wang, National Institutes of Health, $300K, 2020-21
- "STTR Phase I: A Novel Device for Accurate Intrapartum Fetal Health Monitoring", **PI: Ghiasi**, Co-PI: A. Wang, National Science Foundation, $225K, 2020-21
- "HDR TRIPODS: UC Davis Tetrapod Institute of Data Science", PI: N. Saito, **Senior Personnel: Ghiasi,** National Science Foundation, $1.5M, 2019-2023
- "Validation of Transabdominal Fetal Pulse Oximetry in Hypoxic Fetal Lamb Models", **PI: Ghiasi**, Co-PI: D. Farmer, A. Wang, "National Institutes of Health, $413K, 2020-22
- "Bladder Volume Awareness for Individuals Living with Spinal Cord Injury", PI: Ghiasi, Co-PI: E. Kurzrock, L. Lai, National Science Foundation, $390K, 2020-23
- "Transabdominal Fetal Oximetry for Improved Intrapartum Fetal Monitoring", **PI: Ghiasi**, Co-PI: Farmer, Hedriana, Yang, Ross, National Science Foundation, $1.2M, 2019-2022

- "Doctoral Education in Electrical and Computer Engineering Graduate Program", PI: Ghiasi, Co-PI: Chuah, Lai, Abdel-Ghaffar, Rashtian, Department of Education GAANN (Graduate Assistance in the Areas of National Need) program, $1.4M, 2018-2022
- "Bladder Fill Awareness for Individuals Living with Spinal Cord Injury", **PI: Ghiasi,** Co-PI: Kurzrock, Lai, UCDavis Interdisciplinary Initiatives and STAIR grants, $68K, 2018-2019
- "To Cath or Not to Cath: Timely Alerts for Patients with Spinal Cord Injury", **PI: Ghiasi,** Co-PI: Kurzrock and Momeni, $40K, Center for Information Technology in the Interest of Society (CITRIS), 2017-18
- "Efficient Implementation of Convolutional Neural Networks", **PI: Ghiasi**, $48K, unrestricted gift by the Seattle Foundation, 2016
- "Avoiding Unnecessary Cesarean Section Deliveries: Informing the Decision via Transabdominal Fetal Oximetry", **PI: Ghiasi**, Co-PI: Ray and Knoesen, $50K, Center for Information Technology in the Interest of Society (CITRIS), 2016-18
- "Big Data in Agriculture: Automated Fruit Detection in Orchards", **PI: Ghiasi,** Co-PI: Vougioukas, Lee, UCDavis Grants for Interdisciplinary Initiatives, $16K, 2015-2016
- REU Supplement for "EAGER: Productive and Scalable Utilization of Manycores in Big Data Applications", **PI: Ghiasi,** National Science Foundation, $32K, 2014-16
- "EAGER: Productive and Scalable Utilization of Manycores in Big Data Applications", **PI: Ghiasi,** National Science Foundation, $128K, 2013-15
- "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, 2010-12
- "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

Technology Transfer

Storx Technologies — Cofounded a medical device startup that aims to impact intrapartum patient care through commercialization of technology developed in my research lab. Storx is a winner of NSF STTR Phase I and II, NIH STTR Phase I, was a finalist in MIT Solve competition in 2020, and currently competes as one of the finalists in the NIBIB-sponsored RADx Technical Fetal Monitoring Challenge.

Professional Service

Technical Program Committee (member)

IEEE/ACM International Conference on Cyber-Physical Systems 2023-24
IEEE/ACM Conference on Connected Health: Applications, Systems and Engineering Technologies (CHASE), 2023-24
ACM International Workshop on Software and Compilers for Embedded Systems (SCOPES) 2012-2020
IEEE-NIH Healthcare Innovations and Point-of-Care Technologies, 2019
IEEE Healthcom 2015-2018

	IEEE Asia Symposium on Quality Electronic Design (ASQED) 2011-2020 IEEE International Conference on Body Area Networks (BSN), 2013-2020 IEEE/ACM Design Automation Conference (DAC) PhD forum, 2009-10 IEEE/ACM Asia South-Pacific Design Automation Conference (ASPDAC), 2009-10 IEEE Symposium on Circuits and Systems (ISCAS), 2006-09 IEEE International Conference on Computer Design (ICCD), 2007-16 IEEE/ACM International Conference on Computer-Aided Design (ICCAD), 2006-08 IEEE Interdisciplinary Engineering Design Education Conference, 2012-13
Associate Editor	ACM Special Interest Group in Design Automation (SIGDA) newsletter 2008-2011 International Journal of Reconfigurable Computing, 2011 – 2016
Organized Tutorials	"Medical Embedded Systems", presented at International Embedded Systems Symposium, May 2007, Co-organized with colleagues from UCLA and UC-Berkeley.
Proposal Referee	National Science Foundation, ENG, CISE and directorates National Institute of Health (NIH) Government of Quebec (Canada) State of Washington, Life Sciences Discovery Fund (LSDF) University of California, France-Berkeley research program
Paper Reviewer	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)

Mentored Graduate Students

Current PhD Students	Mahya Saffarpour, Kourosh Vali, Begum Kasap, Weitai Qian, Ata Vafi, Rishad J. Raiyan, Tailai (Lambert) Lihe, Randall Fowler, Conor King
PhD alumni	Matin Hashemi (first employment after graduation: assistant professor @Sharif University of Technology), Faisal Khan (Intel), Mohammad Foroozannejad (Intel), Mohammad Motamedi (NVIDIA), Daniel Fong (Certus Critical Care)
MS alumni	Po-Kuan Huang, Adam Harbour, Trevor Hodges, Nicholas Hosein, Bo Wu, Philipp Gysel, Alejandro V. Alcantar, Prashant Gupta, Sachin Kumawat, Jameson Theis, Rasta Moeinzadeh