Hajar Falahati

School of Computer Science
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Education

Ph.D.: Computer Architecture, Sharif University of Technology Sep. 2011-Oct. 2016
Working on the energy efficiency of GPGPUs supervised by Prof. Shaahin Hessabi, Sharif University of Technology, and Prof. Amirali Baniasadi, University of Victoria, Canada.

Research Visitor: University of Southern California Apr. 2015- Apr. 2016
Working on the energy efficiency of GPGPUs supervised by Prof. Masoud Pedram and Prof. Murali Annavaram, University of Southern California.

M.Sc.: Computer Architecture, Sharif University of Technology Sep. 2009-Oct. 2011
GPA (18.47/20, 3.7/4) (rank 4/25)
Working on the architecture of reconfigurable optical network-on-Chip supervised by Prof. Shaahin Hessabi, Sharif University of Technology.

B.Sc.: Computer Engineering, Isfahan University of Technology Sep. 2005-Sep.2009
GPA (17.79/20, 3.6/4) (rank 1/58)
Working on studying DNA sequencing algorithms and their hardware implementation supervised by Prof. Kiarash Bazargan, and M.S.H. Nikaein.

Research Interests

Computer Architecture: Hardware Accelerators, GPU architecture and applications, Machine Learning, AI Accelerators, Near-Data Processing, and On-Chip Networks.
Bioinformatics: Hardware Accelerator for Bioinformatics Algorithms, Medical Devices.

Awards

- **Ph.D.: Research Scholarship** from the University of Southern California, (April. 2015-March. 2016)
- **Ph.D.: Research Assistance Scholarship** Iran's National Elites Foundation (2014-2015)
- **Ph.D.: Offer of Admission** to Computer Engineering graduate program. Talented Student Office of Sharif University of Technology, September 2011.
- **MSc: Ranked 4th** out of MSc graduated students of computer engineering. Sharif University of Technology, 2009.
- **MSc: Research Scholarship** from Telecommunication Company of Iran, Tehran, 2010.
- **MSc: Offer of Admission** to Computer Engineering graduate program. Talented Student Office of Isfahan University of Technology, September 2009.
- **MSc: Offer of Admission** to Computer Engineering graduate program. Talented Student Office of Amirkabir University of Technology, September 2009.
- **BSc: Ranked 1st** out of BSc graduated students of computer engineering and information technology. Isfahan University of Technology, 2009.
- **High School:** Ranked 2nd in Physics Laboratory Competition, Isfahan, 2003.

Publications

Conferences:

1. S. Mostofi, **H. Falahati**, N. Mahani, P. Lotfi-Kamran, H. Sarbazi-Azad, "Snake: A Variable-length Chai-based Prefetching for GPUs," MICRO, 2023.
2. A. Yazdanbakhsh, **H. Falahati**, P. J. Wolfe, K. Samadi, N. S. Kim, H. Esmaeilzadeh, "GANAX: AUnified MIMD-SIMD Acceleration for Generative Adversarial Networks," ISCA, 2018.
3. **H. Falahati**, M. Abdi, A. Baniasadi, S. Hessabi, ISP: Using Idle SMs in Hardware-based Prefetching, CADS, 2013.
4. Patooghy, M. Shafaei, S. G. Miremadi, **H. Falahati**, S. Taheri, An Efficient Crosstalk Mitigation Method for Network-on-Chips, PRDC, 2010.
5. G. Bahlakeh, M. Nikazar, A. Lashgar, **H. Falahati**, S. E. Shakeri, M. Tohidian, Modeling Local Structure and Dynamics of Aromatic Sulfonated poly (2,6-Dimethyl-1,4-Phenylene Oxide) Fuel Cell Membranes, 6th Iranian Fuel Cell Conference, 2013.

Journals:

1. **H. Falahati**, M. Sadrosadati, Q. Xu, J. G'omez-Luna, B. Saber, H. Jeon, S. Hessabi, H. Sarbazi-Azad, O. Mutlu, M. Annavaram, M. Pedram, "Cross-core Data Sharing for Energy-Efficient GPUs," To be appread in ACM TACO.
2. S. Darabi, E. Yousefzadeh-Asl-Miandoab, N. Akbarzadeh, **H. Falahati**, M. Sadrosadati, P. Lotfi-Kamran, H. Sarbazi-Azad, "OSM: Off-Chip Shared Memory for GPUs," IEEE TPDS 2022.
3. **H. Falahati**, M. Peyro, H. Amini, M. Taghian, M. Sadrosadati, P. Lotfi-Kamran, H. Sarbazi Azad, "Data-Aware Compression of Neural Networks," IEEE CAL, 2021.
4. M. Sadrosadati, A. Hajiabadi, A. Mirhosseini, S. B. Eslami, **H. Falahati**, H. Sarbazi-Azad, M. Drumond, B. Falsafi, R. Ausavarungnirun, O.Mutlu, "High Concurrency Latency Tolerant Register Files for GPUs," ACM TOCS, 2021.
5. N. Nematollahi, M. Sadrosadati, **H. Falahati**, M. Barkhordar, M. P. Drumond, H. Sarbazi-Azad, B. Falsafi, "Efficient Near-Neighbor Data Exchange in GPUs," ACM TACO, 2020.
6. M. Sadrosadati, B. Ehsani, **H. Falahati**, R. Ausavarungnirun, A. Tavakol, M. Abaei, L. Orosa, Y. Wang, H. Sarbazi-Azad, O. Mutlu, "ITAP: Idle-Time-Aware Power Management Technique for GPU Execution Units," ACM TACO, 2019.
7. **H. Falahati**, P. Lotfi-Kamran, M.Sadrosadati, H.Sarbazi-Azad, "ORIGAMI: A Heterogeneous Split Architecture for In-Memory Acceleration of Learning," arXiv 2018.
8. N. Nematollahi, M. Sadrosadati, **H. Falahati**, M. Barkhordar, H. Sarbazi-Azad, "Neda: Supporting Direct Inter-Core Neighbor Data Exchange in GPUs," IEEE CAL, 2018.
9. **H. Falahati**, S. Hessabi M. Abdi, A. Baniasadi, "Power Efficient Prefetching in GPGPUs," Journal of Supercomputing, 2015.
10. **H. Falahati**, S. Koohi, S. Hessabi, "Application Based Dynamic Reconfiguration in Optical Network on Chip, " Computers & Electrical Engineering, 2015.
11. M. M. Keshtegar, **H. Falahati**, S. Hessabi, "Cluster-based Approach for Improving GPU Performance by Inter-SMs Locality," IET Computers & Digital Techniques, 2015.

Teaching Experience

Instructor

- **Efficient Implementation of DNNs**, Sharif University of Technology, 2022-2023.
- **Multi-Core Computing**, Sharif University of Technology, 2021-2022-2023.
- **Digital System Design**, Sharif University of Technology, 2022.
- **Hardware Accelerators for Machine Learning Algorithms**, Iran University of Science and Technology, 2020
- **Advanced Computer Architecture**, Iran University of Science and Technology, 2019.
- **Logic Circuit Design**, Iran University of Science and Technology, 2018-2022.
- **Digital System Design**, Iran University of Science and Technology, 2018-2020.
- **Hardware-Software Codesign**, Iran University of Science and Technology, 2018.
- **Computer Language and Structure**, Sharif University of Technology, 2017.

Teaching Assistant

- **Advanced VLSI**, Sharif University of Technology, Dr. S. Koohi, 2014.
- **Logic Circuit Design**, Sharif University of Technology, Dr. S. Koohi, 2014.
- **Digital Electronic**, Sharif University of Technology, Dr. S. Koohi, 2013.
- **Digital System Design Laboratory**, Sharif University of Technology, Dr. M. Goudarzi, 2011-2012.
- **ESL**, **Electrical System Level**, Sharif University of Technology, Dr. M. Goudarzi, 2011.
- **Computer Architecture**, Sharif University of Technology, Dr. M. Goudarzi, 2011.
- **Testability**, Sharif University of Technology, Dr. S. Hessabi, 2011.
- **Computer Architecture Laboratory**, Sharif University of Technology, Dr. H. Asadi, 2011.
- **C Programming**, Isfahan University of Technology, Dr. F. Raji, 2008.
- **Automata theory**, Isfahan University of Technology, Dr. F. Aghaei, 2008.

Work Experience

Senior Postdoctoral Researcher at Institute for Research in Fundamental Sciences (IPM), Sep.2020-Now.
AI developer and AI consultant at Pantohealth, March 2021-Sep. 2023.

Assistant Professor at Iran University of Science and Technology, Sep. 2018-Sep.2020.
Window Driver Development, Graph company, Aug. 2016 – Oct. 2016.
Research Visiting Scholar at the University of Southern California (USC), Apr.2015-Mar.2016.
Window Driver Development, Arsh, Oct. 2012 – Oct. 2014.
Developer at supercomputers, Cluster, and Cloud computing projects in Institute for Research in Fundamental Sciences (IPM), HPC group, Mar. 2011- Jul. 2012.
Research in Institute for Research in Fundamental Sciences, IPM, 2011.
Research in Research Institute in Information and Communication. Isfahan University of Technology, 2008.
Research in Isfahan Mathematics Home. Isfahan, 2002.
Research in Research Institute in Nano, Sharif University of Technology, Tehran, 2008.

Technical Skills

Programming: C, C++, C#, Java, Windows Device Driver Developing (WDM, WDF), Python, CUDA, and Matlab.
HDL: Verilog, VHDL, SystemC
Technical software: Xilinx, Quartus, Impulse C, Modelsim, Altium Designer, LEDIT, Design Compiler, SOC Encounter, DFT compiler, Code vision.

Languages

Persian (native), **English**

Interest

Calligraphy, Poems, Music, Bicycling, Chess, Football.