

Mahbod Afarin

PHD CANDIDATE, COMPUTER SCIENCE, UNIVERSITY OF CALIFORNIA RIVERSIDE

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RESEARCH INTERESTS

- Graph Processing Algorithms & Accelerators
- GPU Architecture & Programming
- Compiler Optimizations
- Computer Architecture

SKILLS

- **Programming Languages:** C/C++, Python, CUDA, OpenMP, OpenCL, MATLAB.
- **Compiler:** Working knowledge of LLVM based on class projects as TA.
- **Hardware Design:** VHDL, Verilog HDL, SystemC, Xilinx ISE, Altera Quartus, Celoxica Agility Compiler, Synopsys Design Compiler.
- **Simulation Tools:** Multi2Sim, GPGPU-Sim, Mentor Graphics Modelsim, HSPICE, PSPICE, IC Encounter, HSIM, Cadence SoC Encounter, The Structural Simulation Toolkit.

PUBLICATIONS

- [*EuroSys'24*] X. Jiang, **M. Afarin**, Z. Zhao, N. Abu-Ghazaleh, R. Gupta, “**Core Graph: Exploiting Edge Centrality to Speedup the Evaluation of Iterative Graph Queries**,” *2024 Proceedings of the Nineteen European Conference on Computer Systems (Acceptance Rate: 15.99%) (Contributed Equally with the First Author)*.
- [*MICRO'23*] C. Gao, **M. Afarin**, S. Rahman, N. Abu-Ghazaleh, R. Gupta, “**MEGA Evolving Graph Accelerator**,” *2023 56th Annual IEEE/ACM International Symposium on Microarchitecture (Acceptance Rate: 22%) (Contributed Equally with the First Author)*.
- [*ASPLOS'23*] **M. Afarin**, C. Gao, S. Rahman, N. Abu-Ghazaleh, R. Gupta, “**CommonGraph: Graph Analytics on Evolving Data**,” *International Conference on Architectural Support for Programming Languages and Operating Systems. (Acceptance Rate: 26.66%)*
- [*HOPC'23*] **M. Afarin** et al., “**CommonGraph: Graph Analytics on Evolving Data (Abstract)**,” *In Proceedings of the 2023 ACM Workshop on Highlights of Parallel Computing*.
- [*BigData'23*] A. Mazloumi, **M. Afarin**, R. Gupta, “**Expressway: Prioritizing Edges for Distributed Evaluation of Graph Queries**,” *2023 IEEE International Conference on Big Data*.
- [*MICRO'21*] S. Rahman, **M. Afarin**, N. Abu-Ghazaleh, R. Gupta, “**JetStream: Graph Analytics on Streaming Data with Event-Driven Hardware Accelerator**,” *2021 54th Annual IEEE/ACM International Symposium on Microarchitecture. (Acceptance Rate: 21.74%)*
- [*Submitted to PPOPP'25*] **M. Afarin** et al., “**UVVs: Identifying Unchanged Vertex Values in Evolving Graphs via Intersection-Union Analysis**,” *Proceedings of the 30th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming*.
- [*Submitted to ASPLOS'25*] C. Gao, **M. Afarin**, X. Yin, N. Abu-Ghazaleh, R. Gupta, “**Sagas: Temporally Consistent Sampling of Evolving Graphs**,” *2025 58th Annual IEEE/ACM International Symposium on Microarchitecture (Contributed Equally with the First Author)*.

AWARDS & ACHIEVEMENTS

- Received the **Excellent Service** badge in all three cycles of ASPLOS'24 Artifact Evaluation at ACM International Conference on Architectural Support for Programming Languages and Operating Systems, San Diego, 2024 (**Certificate of Appreciation**).
- Won **UCR GSA Travel Grant Award** at University of California, Riverside, 2023.
- Won **Dean's Distinguished Fellowship Award** at University of California, Riverside, 2019.
- **Ranked 7th** in terms of total GPA among 83 Computer Engineering students in Sharif University of Technology (**Top 8%**), 2018.
- Admitted as an **Exceptional Talent** at Sharif University of Technology for M.Sc, 2015.
- **1st Rank**, Achievement of the highest GPA in B.Sc among all Computer Engineering graduated students in Shahed University, 2015.

RESEARCH EXPERIENCE	<ul style="list-style-type: none"> • Graduate research Assistant: Member of the GRaph Analytics with Scalability & Performance (GRASP) research group under supervision of Prof. Rajiv Gupta & Prof. Nael Abu-Ghazaleh (<i>Jan' 20 - Present</i>). • Graduate research Assistant: Member of the RIverside Programming Language & Software Engineering (RIPLE) research group under supervision of Prof. Rajiv Gupta & Prof. Nael Abu-Ghazaleh (<i>Jan' 20 - Present</i>). • Member of Very Large Scale Integration Laboratory (VLSI-Lab) under supervision of Prof. Shaahin Hessabi (<i>Dec' 15 - Jan' 18</i>).
EDUCATION	<ul style="list-style-type: none"> • Doctor of Philosophy (Ph.D.), Computer Science, University of California Riverside, California, USA. <i>Jan' 20 - Present</i> <ul style="list-style-type: none"> – Thesis: <i>"Hardware-Software Approaches for Accelerating Graph Processing Workloads"</i> – Advisors: Professor Rajiv Gupta & Professor Nael Abu-Ghazaleh – GPA: 3.86/4 • Master of Science (M.Sc.), Computer Engineering (Computer System Architecture), Sharif University of Technology, Tehran, Iran. <i>Sep' 15 - Jan' 18</i> <ul style="list-style-type: none"> – Thesis: <i>"Improving Manufacturing Yield and Life Cycle of Special Purpose SIMT Processors for Inexact Computing"</i> (Thesis Grade: Excellent) – Advisors: Professor Shaahin Hessabi – GPA: 4/4 (19.03/20) (Ranked 7th among 83 Computer Engineering students) • Bachelor of Science (B.Sc.), Computer Engineering (Computer System Architecture), Shahed University, Tehran, Iran. <i>Sep' 11 - Jun' 15</i> <ul style="list-style-type: none"> – Thesis: <i>"Comparing different types of software for designing with SystemC and implementing Mano processor with SystemC"</i> (Thesis Grade: Excellent) – Advisors: Professor Naser Mohammadzadeh – GPA: 3.63/4 (17.53/20) (Ranked 1st among all Computer Engineering students)
REVIEWING FOR CONFERENCES & JOURNALS	<ul style="list-style-type: none"> • Conferences: CGO'25, MICRO'25, ISPASS'24, PPOPP'24, MICRO'23, ICDCS'23, ACM ICS'23, ISPASS'23, ICDCS'22, ISPASS'22, CGO'20, MICRO'20, PACT'20. • Journals: CAL'23, TACO'23, IEEE Transaction on Computers'23, Parallel Computing'23.
PROFESSIONAL SERVICES	<ul style="list-style-type: none"> • Audio/Video Chair of the ASPLOS'24 Conference. • Artifact Evaluation Committee: ASPLOS'25, ASPLOS'24, ISCA'24.
TEACHING EXPERIENCE	<ul style="list-style-type: none"> • Teaching Assistant, Compiler Design (Summer'21/22/23 and Spring'21/22), University of California, Riverside, Department of Computer Science & Engineering, Prof. Rajiv Gupta. • Teaching Assistant, System on Chip (Spring'18) Testability (Fall'17) Advanced VLSI (Spring'17) VLSI (Fall'16), Sharif University of Technology, CE Dep., Prof. Shaahin Hessabi. • Lab Instructor, Logic Design Lab, Sharif University of Technology, Department of Computer Engineering, Summer 2017, Prof. Siavash Bayat-Sarmadi. • Lab Instructor, Digital System Design Lab, Sharif University of Technology, Department of Computer Engineering, Summer 2016, Prof. Maziar Goudarzi. • Teaching Assistant, VLSI Design (Fall'19) Computer Architecture (Spring'19/Fall'19) Digital Electronic (Spring'19) Logic Design Lab (Spring'19) Digital System Design Lab (Spring'19), Shahed University, CE Department, Prof. Naser Mohammadzadeh.
REFERENCES	<ul style="list-style-type: none"> • Professor Rajiv Gupta (My Ph.D. Supervisor – Email Homepage) • Professor Nael Abu-Ghazaleh (My Ph.D. Supervisor – Email Homepage) • Professor Shaahin Hessabi (My M.Sc. Supervisor – Email Homepage)