Mahbod Afarin

Postdoctoral Scholar, Computer Science, UC San Diego

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Education

- **Doctor of Philosophy** (Ph.D.), Computer Science, University of California Riverside, California, USA. *Jan' 20 - Jun' 25*
  - **Thesis**: *"Redundancy Removal for Accelerating Graph Processing Workloads"*
  - **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. *Sep' 15 - Jan' 18*
  - **Thesis**: *"Improving Manufacturing Yield and Life Cycle of Special Purpose SIMT Processors for Inexact Computing"* (**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. *Sep' 11 - Jun' 15*
  - **Thesis**: *"Comparative Study of SystemC-Based Design Tools Using the Mano Processor Implementation"* (**Thesis Grade**: Excellent)
  - **Advisors**: Professor Naser Mohammadzadeh
  - **GPA**: **3.63**/4 (**17.53**/20) (Ranked **1st** among all Computer Engineering students)

Research Experience

- **Postdoctoral Scholar**: Postdoctoral researcher at **UC San Diego**. (*Jun' 25 - Present*).
- **Graduate Research Assistant**: Graduate Research Assistant at the GRASP (Graph Analytics with Scalability and Performance) Center at **UC Riverside**, working under the supervision of Professor Rajiv Gupta & Professor Nael Abu-Ghazaleh (*Jan' 20 - Jun' 25*).
- **Graduate Research Assistant**: Graduate Research Assistant at the (RIPLE) RIverside Programming Language & Software Engineering Center at **UC Riverside**, working under the supervision of Professor Rajiv Gupta & Professor Nael Abu-Ghazaleh (*Jan' 20 - Jun' 25*).
- **Research Intern**: Conducting research in the Inter-procedural Identical Basic Block Folding as part of the GCC compiler optimization team under the supervision of Dr. Sriraman Tallam at Google (*Sep' 24 - Jan' 25*).
- **Graduate Research Assistant**: Graduate Research Assistant at the VLSI-Lab (Very Large Scale Integration Laboratory) at **Sharif University of Technology**, working under the supervision of Professor Shaahin Hessabi (*Dec' 15 - Jan' 18*).

Awards & Achievements

- Won **UCR Dissertation Completion Fellowship Award** at UC Riverside, 2024.
- 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.

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 (Aacceptance 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 (Aacceptance 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. (Aacceptance 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. (Aacceptance Rate: **21.74%**)*
- [***Submitted***] **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***] 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).

Teaching Experience

- 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.

Professional Services

- **Audio/Video Chair** of the ASPLOS'24 Conference.
- **Reviewing for Conferences & Journals:** CAL'23, TACO'23, IEEE Transaction on Computers'23, Parallel Comput.'23 & 25.
- **Talks:** HOPC'23 Conference, Society of Women Engineers (UC Riverside, Winter'24), Tulane University (Winter'25), and Binghamton University (Spring'25).
- **Artifact Evaluation Committee:** ASPLOS'25, ASPLOS'24, ISCA'24.

Skills

- **Programming Languages**: C/C++, Python, CUDA, OpenMP, OpenCL, MATLAB.
- **Compiler**: LLVM, LLVM-BOLT, LLVM Machine Outliner, LLVM IR Outliner, and Propeller.
- **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.