

Seyed Majid Zahedi | CV

Systems Architecture Integration Laboratory
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Research Interests

Datacenter Systems. Resource Management, Sharing Platform Design, Server Architecture, Simulation Methods
Economics and Computation. Algorithmic Game Theory, Multi-agent Markets, Mechanism Design
Computer Architecture. Power Efficiency, Allocation and Scheduling, Performance and Power Analysis

Education

Duke University

PhD in Computer Science, GPA: 4/4 2012-Present

- Advisor: Dr. Benjamin C. Lee
- Relevant Courses: Advanced Computer Architecture, Integer Linear Programming, Randomized Algorithms, Game Theory, Data Center Architecture, Computational Microeconomics, Energy-Efficient Computer Systems, Decision Making for Robotics and Autonomous Systems

University of Tehran

MS in Software Engineering, GPA: (19.27/20) 4/4 2009-2012

- Advisor: Dr. Ahmad Khonsari
- Thesis: Energy-aware Application Mapping and Task Scheduling for Heterogeneous NoCs
- Relevant Courses: Advanced Computer Networks Design, Real-time and Embedded Concurrent Systems, Advanced Algorithms, Internet Measurement, Data Mining, Modeling and Formal Verification, Reliable Software: Design and Analysis, Advanced Software Engineering

University of Tehran

BS in Software Engineering, Final Year GPA: (17.6/20) 3.87/4 2005-2009

Paper Awards

IEEE Micro, Top Picks Honorable Mention

The Computational Sprinting Game 2016

Best Paper Award, ASPLOS'16

The Computational Sprinting Game 2016

IEEE Micro, Top Picks from Computer Architecture Conferences

REF: Resource elasticity fairness with sharing incentives for multiprocessors 2014

Academic Honors

Outstanding Ph.D. Preliminary Exam Award

CS Department, Duke University 2015

Duke University Graduate School Fellowship

CS Department, Duke University 2012

3rd in Graduating Class of MS in Computer Engineering

ECE Department, University of Tehran 2012

Exceptional Talents Admission to MS in Computer Engineering

ECE Department, University of Tehran 2009

University of Tehran offered admission to MS program to top 10% of students in each major.

Excellent Student of Semester in Faculty of Engineering

ECE Department, University of Tehran 2009

Top 0.2% of Nearly 1,000,000 Participants

Iranian National University Entrance Exam 2005

Publications

Refereed Papers

- [1] **S. M. Zahedi**, Q. Llull, and B. C. Lee. Amdahl's law in the datacenter era: A market for fair processor allocation. In *Proceedings of the 24rd IEEE International Symposium on High-Performance Computer Architecture (HPCA)*. IEEE, February 2018.
- [2] R. Freeman, **S. M. Zahedi**, and V. Conitzer. Fair and efficient social choice in dynamic settings. In *Proceedings of the 26th International Joint Conference on Artificial Intelligence (IJCAI)*, August 2017.
- [3] Q. Llull, S. Fan, **S. M. Zahedi**, and B. C. Lee. Cooper: Task colocation with cooperative games. In *Proceedings of the 23rd IEEE International Symposium on High-Performance Computer Architecture (HPCA)*. IEEE, February 2017.
- [4] **S. M. Zahedi**, S. Fan, M. Faw, E. Cole, and B. C. Lee. Computational sprinting: Architecture, dynamics, and strategies. *ACM Transactions on Computer Systems (TOCS)*, 34(4):12:1–12:26, January 2017.
- [5] S. Fan*, **S. M. Zahedi***, and B. C. Lee. The computational sprinting game. In *Proceedings of the 21st International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, pages 561–575. ACM, April 2016. *Co-First Authors, **Best Paper Award, IEEE Top Picks Honorable Mentions**.
- [6] **S. M. Zahedi** and B. C. Lee. Sharing incentives and fair division for multiprocessors. *IEEE Micro, Top Picks from Computer Architecture Conferences*, 35(3):92–100, May/June 2015.
- [7] **S. M. Zahedi** and B. C. Lee. REF: Resource elasticity fairness with sharing incentives for multiprocessors. In *Proceedings of the 19th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, pages 145–160. ACM, March 2014. **IEEE Top Picks**.
- [8] A. Mahabadi, **S. M. Zahedi**, and A. Khonsari. Reliable energy-aware application mapping and voltage–frequency island partitioning for gals-based NoC. *Journal of Computer and System Sciences (JCSS)*, 79(4):457–474, 2013.

Working Papers

- [1] **S. M. Zahedi**, S. Fan, and B. C. Lee. Managing heterogeneous datacenters with tokens. Submitted to **TACO**.
- [2] R. Freeman*, **S. M. Zahedi***, V. Conitzer, and B. C. Lee. Dynamic proportional sharing: A game-theoretic approach. Submitted to **SIGMETRICS'18**. *Co-First Authors.
- [3] **S. M. Zahedi**, S. Priyadarshi, C. A. Waldspurger, D. Hower, and B. C. Lee. Fine-grained QoS-aware multi-core power management. Submitted to **ISCA'18**.
- [4] Y. Li, D. Sun, **S. M. Zahedi**, and B. C. Lee. Dynamic colocation policies with reinforcement learning. Submitted to **ISCA'18**.

Talks

The Computational Sprinting Game

ASPLOS, Atlanta, GA

April 2016

REF: Resource elasticity fairness with sharing incentives for multiprocessors

ASPLOS, Salt Lake City, UT

March 2014

Experience

Research

Qualcomm

Research Intern

Summer 2017

- Worked on QoS-aware fine-grained clock and power management for multiprocessors

Systems Architecture Integration Laboratory, Duke University

Graduate Research Assistant

2012–Present

- Working on resource management mechanisms that provably guarantee game-theoretic desiderata

School of Computer Science, Institute for Research in Fundamental Sciences (IPM)

Research Assistant

2011–2012

- Worked on energy efficient resource allocation mechanisms for green computing
- Conducted research on cooling-aware workload placement for HPC data centers

Computer Networks Laboratory, University of Tehran

Graduate Research Assistant

2009-2011

- Worked on reliability- and temperature-aware voltage-frequency island partitioning for GALS-based Network-on-Chips

Teaching

Duke University

Teaching Assistant

- Algorithm Design (Spring 2014)
- Computer Architecture (Spring 2013)

Tutorials

Presenter and Co-organizer

- Datacenter Simulation Methodologies (MICRO'14), (ISPASS'15), and (ISCA'15)
With Benjamin C. Lee, Qiuyun Wang, and Tamara Silbergleit Lehman

University of Tehran

Teaching Assistant

- Computer Network Simulation (Spring 2011)
- Advanced Computer Networks Design (Fall 2010)
- Programming Language Design (Fall 2009 and 2010)
- Computer Networks (Fall 2010 and 2011)
- Performance Evaluation of Computer Networks (Spring 2010 and 2011)
- Database Systems (Spring 2009)

Iranian National Organization for Development of Exceptional Talents

High School Teacher

2011-2012

- Programming in C and C++
- Introduction to Machine Learning
- Introduction to Discrete-Event System Simulation

Ehsan Private School

Middle School Teacher

2007-2011

- Geometry

Technical

The Grid at IPM

Research Developer

2009

- Worked in a team to connect a computing cluster to IPM's grid infrastructure using gLite (a service oriented grid middle-ware)

FANAP ICT

Intern

2009

- Worked in a team to develop an insurance software system

Mouood Institute

Software Developer

2007

- Developed a novel advertising application which was a combination of art and programming

Service

Journal Reviews

ACM Transactions on Architecture and Code Optimization (TACO)

IEEE Transactions on Parallel and Distributed Systems (TPDS)

ACM Transactions on Modeling and Performance Evaluation of Computing Systems (ToMPECS)

Journal of Parallel and Distributed Computing (JPDC)

Cluster Computing: The Journal of Networks, Software Tools and Applications

Mentoring

Yuhao Li, PhD student in CS at Duke University

- Working on dynamics of colocating latency-sensitive and batch workloads

Matthew Faw, BSE, student in ECE at Duke University

- Worked on analyzing total cost of ownership for computational sprinting policies

Abhimanyu Yadav, BTech student in CSE at Indian Institute of Technology

- Worked on developing analytical model for optimal cooperative sprinting policy

Henri M. Demoulin, MS student in CS at Duke University, joined University of Pennsylvania for PhD

- Worked on allocating resources to Apache Spark executors using recommendation systems

Paul Kim, B.S.E. student in ECE at Duke University, joined University of Chicago for PhD

- Worked on multi-resource allocation mechanisms for systems with multiple machines

Technical Knowledge

Tools: gcc, Spark, CPLEX, AMPL, MATLAB, CVX, R

Languages: C/C++, Java, Scala, \LaTeX

Simulators: MARSSx86, DramSim2, CloudSim