

# Seyed Majid Zahedi — CV

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## Research Interests

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Computer Systems, Computer Architecture, Operating Systems, Distributed Systems, Algorithmic Game Theory, Multi-agent Systems.

## Education

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<b>Duke University</b> PhD in Computer Science	2012-2018
<b>University of Tehran</b> MS in Software Engineering	2009-2012
<b>University of Tehran</b> BS in Software Engineering	2005-2009

## Experience

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<b>University of Waterloo</b> Assistant Professor, <i>ECE Department, Waterloo, ON</i>	2018-Present
<b>Duke University</b> Graduate Research Assistant, <i>CS Department, Durham, NC</i>	2012-2018
<b>Qualcomm</b> Research Intern, <i>Raleigh, NC</i>	2017
<b>Institute for Research in Fundamental Sciences (IPM)</b> Research Assistant, <i>School of Computer Science, Tehran, Iran</i>	2011-2012
<b>University of Tehran</b> Graduate Research Assistant, <i>ECE Department, Tehran, Iran</i>	2009-2011

## Paper Awards

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<b>Best Paper Award, HPCA</b> Amdahl's Law in the Datacenter Era: A Market for Fair Processor Allocation	2018
<b>Research Highlight, Communications of the ACM</b> The Computational Sprinting Game	2018
<b>Top Picks Honorable Mention, IEEE Micro</b> The Computational Sprinting Game	2016

<b>Best Paper Award, ASPLOS</b> The Computational Sprinting Game	2016
<b>Top Picks, IEEE Micro</b> REF: Resource Elasticity Fairness with Sharing Incentives for Multiprocessors	2014

## Academic Honors

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<b>Outstanding Ph.D. Preliminary Exam Award</b> CS Department, <i>Duke University</i>	2015
<b>Duke University Graduate School Fellowship</b> CS Department, <i>Duke University</i>	2012
<b>3<sup>rd</sup> in Graduating Class of MS in Computer Engineering</b> ECE Department, <i>University of Tehran</i>	2012
<b>Exceptional Talents Admission to MS in Computer Engineering</b> ECE Department, <i>University of Tehran</i> University of Tehran offered MS program admission to the top 10% students in each major.	2009

## Publications

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### Journals

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<b>Malcolm: Multi-agent Learning for Cooperative Load Management at Rack Scale</b> A. H. A. Abyaneh, M. Liao, S. M. Zahedi <i>Proc. of the ACM on Measurement and Analysis of Computing Systems</i> , December 2022	POMACS
<b>A Win for Game Theory in the Data Center</b> S. M. Zahedi, B. C. Lee <i>IEEE Spectrum</i> , April, 2020 (Invited)	IEEE Spectrum
<b>Distributed Strategies for Computational Sprints</b> S. Fan*, S. M. Zahedi*, B. C. Lee (*Co-first Authors) <i>Communications of the ACM</i> , January, 2019 (Invited) <a href="#">Research Highlight</a>	CACM
<b>Dynamic Proportional Sharing: A Game-theoretic Approach</b> R. Freeman*, S. M. Zahedi*, V. Conitzer, B. C. Lee (*Co-first Authors) <i>Proc. of the ACM on Measurement and Analysis of Computing Systems</i> , March 2018	POMACS
<b>Managing Heterogeneous Datacenters with Tokens</b> S. M. Zahedi, S. Fan, B. C. Lee <i>ACM Transactions on Architecture and Code Optimization</i> , May 2018	TACO
<b>Computational Sprinting: Architecture, Dynamics, and Strategies</b> S. M. Zahedi, S. Fan, M. Faw, E. Cole, B. C. Lee <i>ACM Transactions on Computer Systems</i> , January, 2017 (Invited)	TOCS
<b>Sharing Incentives and Fair Division for Multiprocessors</b> S. M. Zahedi, B. C. Lee <i>IEEE Micro</i> , May/June, 2015 (Invited) <a href="#">Top Picks from Computer Architecture Conferences</a>	IEEE Micro

**Reliable Energy-aware Application Mapping and Voltage-frequency Island Partitioning for GALs-based NoC**

A. Mahabadi, S. M. Zahedi, A. Khonsari

JCSS

*Journal of Computer and System Sciences*, June 2013

**Conferences**.....

**IRS: An Incentive-compatible Reward Scheme for Algorand**

M. Liao, W. Golab, S. M. Zahedi

AAMAS

*Int'l. Conf. on Autonomous Agents and Multiagent Sys.*, London, UK, May 2023

**Malcolm: Multi-agent Learning for Cooperative Load Management at Rack Scale**

A. H. A. Abyaneh, M. Liao, S. M. Zahedi

SIGMETRICS

*Int'l. Conf. on Measurement & Modeling of Comp. Sys.*, Orlando, FL, June 2023

**Dynamic Proportional Sharing: A Game-theoretic Approach**

R. Freeman\*, S. M. Zahedi\*, V. Conitzer, B. C. Lee (\*Co-first Authors)

SIGMETRICS

*Int'l. Conf. on Measurement & Modeling of Comp. Sys.*, Irvine, CA, June 2018

**Amdahl's Law in the Datacenter Era: A Market for Fair Processor Allocation**

S. M. Zahedi\*, Q. Llull\*, B. C. Lee (\*Co-first Authors)

HPCA

*Int'l. Symp. on High Perf. Computer Architecture*, Vienna, Austria, February 2018

**Best Paper Award**

**Fair and Efficient Social Choice in Dynamic Settings**

R. Freeman, S. M. Zahedi, V. Conitzer

IJCAI

*Int'l. Joint Conf. on Artificial Intelligence*, Melbourne, Australia, August 2017

**Cooper: Task Colocation with Cooperative Games**

Q. Llull, S. Fan, S. M. Zahedi, B. C. Lee

HPCA

*Int'l. Symp. on High Perf. Computer Architecture*, Austin, TX, February 2017

**The Computational Sprinting Game**

S. Fan\*, S. M. Zahedi\*, B. C. Lee (\*Co-first Authors)

ASPLOS

*Int'l. Conf. on Architectural Support for Prog. Lang. & Op. Sys.*, Atlanta, GA, April 2016

**Best Paper Award, CACM Research Highlight, IEEE Micro Top Picks Honorable Mention**

**REF: Resource Elasticity Fairness with Sharing Incentives for Multiprocessors**

S. M. Zahedi, B. C. Lee

ASPLOS

*Int'l. Conf. on Architectural Support for Prog. Lang. & Op. Sys.*, Salt Lake City, UT, March 2014

**IEEE Micro Top Picks**

**Dissertation**.....

**Managing Shared Resources in the Data Center Era**

S. M. Zahedi

PhD Thesis

*Duke University*, March 2018

**Talks**

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**Multi-agent Learning for Cooperative Datacenter Load Management**

National Informatics Conference of Iran (NIC), *Tehran, Iran*

January 2022

**Keynote Speech**

**Dynamic Proportional Sharing: A Game-theoretic Approach**

INFORMS (Invited), *Phoenix, AZ*

November 2018

<b>Dynamic Proportional Sharing: A Game-theoretic Approach</b> SIGMETRICS, <i>Irvine, CA</i>	June 2018
<b>Amdahl's Law in the Datacenter Era: A Market for Fair Processor Allocation</b> HPCA, <i>Vienna, Austria</i>	February 2018
<b>The Computational Sprinting Game</b> ASPLOS, <i>Atlanta, GA</i>	April 2016
<b>REF: Resource Elasticity Fairness with Sharing Incentives for Multiprocessors</b> ASPLOS, <i>Salt Lake City, UT</i>	March 2014

## Patents

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<b>Allocating Power Between Multiple Central Processing Units (CPUs) in a Multi-CPU Processor Based on Total Current Availability and Individual CPU Quality-of-service (QoS) Requirements</b> S. Priyadarshi, S. M. Zahedi, D. R. Hower, C. A. Waldspurger, J. T. Bridges, S. B. Patel, G. M. Tarr, C. K. Lin, R. D. Wells, H. W. Cain III US Patent US10831254B2	November 2020
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## Grants

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<b>Design of Intelligent Controllers to Maximize Efficiency and Guarantee Security, Privacy, and Fairness in Heterogeneous Computing and Sensing Systems</b> Principal Investigator, <i>NSERC-Discovery, \$152.5K</i>	2019-2024
<b>Resource Management in Heterogeneous Clusters: Maximizing Efficiency and Guaranteeing Security, Privacy, and Fairness</b> Principal Investigator, <i>CFI-JELE, ORF-IR, CFI-IOF, \$180K</i>	2020-2024

## Research Advising

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### PhD Students

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Maizi Liao (UWaterloo, 2024-, Co-advised with K. Daudjee)

### Masters Students

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Ali Hossein Abbasi Abyaneh (UWaterloo, 2019-2021)

Maizi Liao (UWaterloo, 2020-2022, Co-advised with W. Golab)

Fatemeh Fardno (UWaterloo, 2020-2022)

Pouya Kananian (UWaterloo, 2021-2022)

Zehan Gao (UWaterloo, 2021-2022)

Xiaoliang Zhou (UWaterloo, 2021-2023, Co-advised with M. Crowley)

Aravind Vellora Vayalappa (UWaterloo, 2021-2023, Co-advised with N. Kapre)

Hadi Omid (UWaterloo, 2022-, Co-advised with N. Kapre)

Elly Khodaei (UWaterloo, 2022-)

Simon Wu (UWaterloo, 2023-)

Eli Propp (UWaterloo, 2024-)

## **Undergraduate Students**

Aman Arora (UWaterloo, Winter 2019)  
Anthony Elliot Weston (UWaterloo, Spring 2019)  
Leo Liu (UWaterloo, Spring 2019)  
Rahul Chakravarthy (UWaterloo, Fall 2019)  
Vichara Nimnaka Wijetunga (UWaterloo, Winter 2020)  
Bimesh De Silva (UWaterloo, Winter 2020)  
Justin Borromeo (UWaterloo, Winter 2020)  
Tiantong Hu (UWaterloo, Spring 2023)  
Jinyi Li (UWaterloo, Winter 2024)

## **Member of Committees**

### **PhD Defenses (at UWaterloo)**

Chunyu Mao (2022, advisor: W. Golab)  
Alexey Karyakin (2022, advisors: K. Salem)  
Sriram Ganapathi Subramanian (2022, co-advisors: M. Crowley and K. Larson)

### **PhD Proposals (at UWaterloo)**

Ahmed Fahmy (2022, advisor: W. Golab)  
Chien-Chih Chen (2022, advisor: W. Golab)  
Sriram Ganapathi Subramanian (2021, co-advisors: M. Crowley and K. Larson)  
Chunyu Mao (2020, advisor W. Golab)

### **PhD Background Exams (at UWaterloo)**

Ahmed Fahmy (2021, advisor: W. Golab)  
Sriram Ganapathi Subramanian (2019, co-advisors: M. Crowley and K. Larson)

### **Masters Theses**

Yiqin Huang (2022, advisor M. Tripunitara)  
Alireza Mellat (2021, advisor N. Kapre)  
Harry Chan (2021, advisor N. Kapre)  
Maximilian Kahn (2021, advisor: K. Czarnecki)  
Sakib Chowdhury (2021, advisor: W. Golab)  
YiFeng Wang (2021, co-advisors: C. Nielsen and S. L. Smith)  
Diego Cepeda (2020, advisor W. Golab)  
Sahil Pereira (2020, advisor: M. Crowley)

### **PhD Seminar Examiner (at UWaterloo)**

Faruk Erkmen (2019, advisor: O. M. Ramahi)

### **PhD Thesis Examiner (outside of UWaterloo)**

Mohammad Shahrads (2020, Princeton University, advisor: D. Wentzlaff)

## Chair of Committees

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### PhD Defenses (at UWaterloo).....

Masoumeh Shafieinejad (2021, advisor: F. Kerschbaum)

Guojun Zhang (2021, co-advisors: P. Poupart and Y. Yu)

Navid Nasr Esfahani (2021, advisor: D. Stinson)

Pavel Valov (2020, advisor: K. Czarnecki)

Hemant Surale (2020, advisor: D. Vogel)

### PhD Proposals (at UWaterloo).....

Etinosa Ekomwenrenren (2020, advisor: J. Simpson-Porco)

Huanyi Chen, (2020, advisor: P. Ward)

Jamal Busnaina (2020, advisor: C. Wilson)

Haixia Peng (2019, advisor: S. X. Shen)

### Background Exam (at UWaterloo).....

Milon Islam (2021, advisor: F. Karray)

Hari Govind V K (2020, advisor: A. Gurfinkel)

Ahmed Hussein Salamah (2020, advisor: E. Yang)

Fatemeh Ahmadloo (2019, advisor: S. Azad)

## Teaching

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### University of Waterloo

Instructor, *Waterloo, ON*

- Game-theoretic Foundations of Multi-agent Systems (W'24, W'23)
- Real-time Operating Systems (W'23, W'22, S'21, W'21, F'20)
- Operating Systems (W'22, W'20, W'19)
- Game Theory with Engineering Applications (F'18, F'19)

### Tutorials

Presenter and Co-organizer

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

### Iranian National Organization for Development of Exceptional Talents

High School Computer Science Teacher, *Tehran, Iran (2011-2012)*

### Ehsan Private School

Middle School Geometry Teacher, *Tehran, Iran (2007-2011)*

## Service

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### Program Committees.....

IEEE Int'l Conf. on Cluster Computing (CLUSTER '19)

Int'l. Conf. on Autonomous Agents and Multiagent Systems (AAMAS '19)

Int'l. Conf. on Autonomous Agents and Multiagent Systems (AAMAS '20)

IEEE Int'l. Symp. on Workload Characterization (IISWC '21)  
IEEE Int'l. Conf. on Cluster Computing (CLUSTER '21)  
AAAI Conference on Artificial Intelligence (AAAI '24)  
Int'l. Conf. on Autonomous Agents and Multiagent Systems (AAMAS '24)  
Int'l. Conf. on Artificial Intelligence (IJCAI '24)

**Journal Reviews (each listed only once)**.....

ACM Trans. on Architecture and Code Optimization (TACO)  
ACM Trans. on Computer Systems (TOCS)  
ACM Trans. on Modeling & Perf. Eval. of Comp. Sys. (ToMPECS)  
Cluster Computing: The Journal of Networks, Software Tools & App.  
IEEE Access  
IEEE Communications Letters (CL)  
IEEE Trans. on Cloud Computing (TCC)  
IEEE Trans. on Parallel and Distributed Sys. (TPDS)  
Journal of Parallel and Distributed Computing (JPDC)

**External Review Committees (each listed only once)**.....

Int'l. Conf. on Architectural Support for Prog. Lang. & Op. Sys. (ASPLOS)