

Behnaz Arzani

CONTACT INFORMATION

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WEBSITE

<https://www.microsoft.com/en-us/research/people/bearzani/>

CURRENT POSITION **Microsoft Research**

- ⊙ Technical advisor **February 2026**
- ⊙ Principal Researcher **February 2023**
- ⊙ Senior Researcher **August 2019**

EDUCATION

Microsoft Research

- ⊙ Post doctoral researcher **August 2017**

University of Pennsylvania Philadelphia,PA

- ⊙ PhD candidate Computer Science **August 2017**
- ⊙ PhD candidate Electrical and Systems Engineering **May 2014**

University of Pennsylvania Philadelphia,PA

- ⊙ Dual Masters degree from Electrical Engineering and Computer Science **August 2017**

Sharif University of Technology, Tehran, Iran

- ⊙ B.S., Electrical Engineering, Communications **June 2010**

RESEARCH INTERESTS

Networked systems, Datacenter Networks, Network Protocols, Distributed Systems

PUBLICATION VENUES

I have previously published my work in: SIGCOMM, NSDI, OSDI, IMC, and ICNP.

PUBLICATIONS

Refereed Publications

- ⊙ P. Karimi, S. Kakarla, P. Namyar, S. Segarra, R. Beckett, M. Alizadeh, **B. Arzani**, MetaEase: Heuristic Analysis from Source Code via Symbolic-Guided Optimization, NSDI 2026
- ⊙ O. Chabra, C. Li, K. Hsieh, S. Segarra, **B. Arzani**, P. Olsen, R. Chandra, OrbitalBrain: Harnessing Distributed Training in Space, NiNes 2026
- ⊙ R. Boostandoost, P. Namyar, S. Kakarla, R. Beckett, S. Segarra, A. Mallick, K. Hsieh, R. Fonseca, M. Hajiesmaili, **B. Arzani**, Under submission
- ⊙ **B. Arzani**, S. Taheri, P. Namyar, R. Beckett, S. Kakarla, E. Jallilipour, Raha: A General Tool to Analyze WAN Degradation, SIGCOMM 2025
- ⊙ P. Namyar, A. Ghavidel, D. Crankshaw, D. Berger, K. Hsieh, S. Kandula, R. Govindan, **B. Arzani**, Enhancing network failure mitigation with performance-aware ranking, NSDI 2025
- ⊙ A. Aloz, B. Vass, P. Namyar, **B. Arzani**, G. Rétvári, L. Vanbeaver, Everything matters in programmable packet scheduling, NSDI 2025

- ⊙ P. Karimi, S. Pirelli, S. Kakarla, R. Beckett, S. Segarra, B. Li, P. Namyar, **B. Arzani**, Towards Safer Heuristics With XPlain, HotNets 2024
- ⊙ P. Namyar, M. Schapira, R. Govindan, S. Segarra, R. Beckett, S. Kakarla, **B. Arzani**, End-to-End Performance Analysis of Learning-enabled Systems, HotNets 2024
- ⊙ X. Liu, **B. Arzani**, S. Kakarla, L. Zhao, V. Liu, M. Castro, S. Kandula, L. Marshall, Rethinking machine learning collective communication as a multi-commodity flow problem, SIGCOMM 2024
- ⊙ P. Namyar, **B. Arzani**, R. Beckett, S. Segarra, H. Raj, U. Krishnaswamy, R. Govindan, S. Kandula, Finding adversarial inputs for heuristics using multi-level optimization, NSDI 2024
- ⊙ P. Hamadani, **B. Arzani**, S. Fouladi, S. Kakarla, R. Fonseca, D. Billor, A. Cheema, E. Nkposong, R. Chandra, A Holistic View of AI-driven Network Incident Management, HotNets 2023
- ⊙ P. Namyar, **B. Arzani**, S. Kandula, S. Segarra, D. Crankshaw, U. Krishnaswamy, R. Govindan, H. Raj, Solving Max-Min Fair Resource Allocations Quickly on Large Graphs, NSDI 2024
- ⊙ P. Namyar, **B. Arzani**, R. Beckett, S. Segarra, S. Kandula, Minding the gap between Fast Heuristics and their Optimal Counterparts. HotNets 2022
- ⊙ A. Mallick, K. Hsieh, **B. Arzani**, Gauri Joshi, Matchmaker: Data Drift Mitigation in Machine learning for Large Scale Systems, MLSys 2022
- ⊙ N. Yaseen, **B. Arzani**, K. Chintalapudi, V. Ranganathan, F. Frujeri, K. Hsieh, D. Berger, V. Liu, S. Kandula, Towards a Cost vs. Quality Sweet Spot for Monitoring Networks, HotNets 2021
- ⊙ **B. Arzani**, K. Hsieh, H. Chen, Interpretable Feedback for AutoML and a Proposal for Domain-customized AutoML for Networking, HotNets 2021
- ⊙ N. Yaseen, **B. Arzani**, R. Beckett, S. Ciraci, V. Liu, Aragog: Scalable runtime verification of shardable Networked Systems. OSDI 2021
- ⊙ F. Abuzaid, S. Kandula, **B. Arzani**, I. Menache, M. Zaharia, P. Bailis, Contracting Wide-area Network Topologies to Solve Flow Problems Quickly. NSDI 2021
- ⊙ S. Kesava Reddy Kakarla, R. Becket, **B. Arzani**, T. Milstein, G. Varghese, GRoot: Proactive Verification of DNS Configurations. SIGCOMM 2020. **Best student paper**
- ⊙ J. Gao, N. Yaseen, R. MacDavid, F. Vieira Frujeri, V. Liu, R. Bianchini, R. Aditya, X. Wang, H. Lee, D. Maltz, M. Yu, **B. Arzani**, Scouts: Improving The Diagnosis Process Through Domain-customized Incident Routing. SIGCOMM 2020.
- ⊙ **B. Arzani**, S. Ciraci, S. Saroiu, A. Wolman, J. Stokes, G. Outhred, L. Diwu, MadEye: Scalable Privacy-Preserving Compromise Detection In The Cloud. NSDI 2020.
- ⊙ A. Roy, D. Bansal, D. Brumley, H. K. Chandrappa, P. Sharma, R. Tewari, **B. Arzani**, A. Snoeren, Cloud Datacenter SDN Monitoring: Experiences and Challenges, IMC 2018
- ⊙ D. Yu, Y. Zhu, **B. Arzani**, R. Fonseca, T. Zhang, L. Yuan, K. Deng, dShark: A General, Easy to Program and Scalable Framework for Analyzing In-network Packet Traces, NSDI 2019
- ⊙ **B. Arzani**, S. Ciraci, L. Chamon, Y. Zhu, H. Liu, J. Padhye, B. Thau Loo, G. Outhred, 007: Democratically Finding The Cause of Packet Drops, NSDI 2018
- ⊙ **B. Arzani**, S. Ciraci, L. Chamon, Y. Zhu, H. Liu, J. Padhye, G. Outhred, B. Thau Loo, Closing the Network Diagnosis Gap with Vigil, Proceedings of SIGCOMM Posters and Demos 2017
- ⊙ **B. Arzani**, S. Ciraci, B. Thau Loo, A. Schuster, G. Outhred, Taking The Blame Game Out of Data Center Operations With NetPoirot, SIGCOMM 2016
- ⊙ **B. Arzani**, A. Gurney, S. Cheng, R. Guerin, B. Thau Loo, Deconstructing MPTCP Performance, ICNP 2014

- ⊙ **B. Arzani**, A. Gurney, S. Cheng, R. Guerin, B. Thau Loo, Impact of Path Selection and Scheduling Policies on MPTCP Performance, PAMS 2013
- ⊙ **B. Arzani**, R. Guerin, A. Rebeiro, A Distributed Routing Protocol for Predictable Rates in Wireless Mesh Networks, ICNP 2012
- ⊙ **B. Arzani** Design Of A Distributed Routing Protocol For Predictable Rates in Wireless Mesh Networks, ICNP PhD forum 2012

Open source projects

- ⊙ **MetaOpt + Raha** Our general heuristic analyzer which allows users to quantify the performance gap of heuristic algorithms. Raha applies MetaOpt to a failure-analysis problem and finds the set of probable failures that have the worst impact on the network.
- ⊙ **Soroush** Our collection of fast max-min fair resource allocation algorithms.
- ⊙ **Aragog** Our runtime verification solution for NFVs.
- ⊙ **TECCL** Our fast collective communication scheduling algorithm.
- ⊙ **NCFlow** Our fast traffic engineering solution.
- ⊙ **oo7** Our algorithm to diagnose probabilistic packet drops in the network.

PROFESSIONAL EXPERIENCE

Microsoft., Redmond, WA, USA *Intern* **Summer 2015, Summer 2016**

- ⊙ Automated classification of communication faults using TCP statistics.

NEC Labs., Princeton, NJ, USA *Intern* **Summer 2013**

- ⊙ SDNShadow, a debugging tool for Software Defined Networks.

Micromowje Engineering Co., Tehran, Iran *Intern* **Summer 2009**

- ⊙ Producing high frequency satellite television transceivers and BTS stations

SELECTED HONORS AND AWARDS

- ⊙ ONUG Community Appreciation for Vision, Courage, and Industry Leadership in Digital Transformation Research **2021**
- ⊙ Our paper Groot: Proactive Verification of DNS Configurations won the SIGCOMM student best paper award **2020**
- ⊙ Winner of the MSR research collaboration award **2019**
- ⊙ N2Women Rising Stars in Computer Networking and Communications **2018**
- ⊙ Selected for the MIT rising stars in EECS workshop **2018**
- ⊙ Winner of The University of Pennsylvania Rubinoff dissertation award **2018**
- ⊙ Selected to participate in the NSF NeTS early-career workshop. **2017**
- ⊙ Top 1% of my class in Sharif University of Technology. **2010**
- ⊙ Top 10% of my class in the Electrical Engineering department at Sharif University of Technology. **2010**
- ⊙ Top 0.001% (ranked 57th) in the Nationwide Universities Entrance Exam in Mathematics (Konkour) **2006**
- ⊙ Top 0.001% (ranked 10th) in the Nationwide English Universities Entrance Exam **2006**

RESEARCH IMPACT

- ⊙ Concierge is a tool that allows Azure CVPs to decide whether to accept whale resource requests. It then identifies how to shape existing resource allocations to make room for requests that would otherwise be rejected.
- ⊙ Our work in Raha is set to be deployed in Azure in August 2026. Raha allows operators to identify likely failures that can cause catastrophic impact on the WAN and mitigate this impact before they cause business harm.
- ⊙ I lead the effort on MetaOpt which starts a new field in heuristic analysis through game-theoretic principles. We are currently working on enhancing production workflows through this tool.
- ⊙ Our fast max-min fair algorithm is now running as part of SWAN in production reducing solver run-times by 3×.
- ⊙ Our Scout project is now deployed and being used at Microsoft.
- ⊙ The work on 007 laid the foundation of an RDMA diagnosis system that is being deployed in Microsoft's data centers.
- ⊙ The work of NetPoirot helped Microsoft engineers identify the cause of VM reboots in Microsoft Azure for over 2 years.

TEACHING EXPERIENCE

• *Substitute teacher*

University of Pennsylvania

- ⊙ Introduction to Networks & Security (Instructor: Dr. Heninger) **Fall 2017**

Teaching Assistant

University of Pennsylvania

- ⊙ Introduction to Probability-Coursera (Instructor: Prof. Venkatesh) **Summer-Fall 2014**
- ⊙ Introduction to Probability (Instructor: Prof. Venkatesh) **Spring 2014**
- ⊙ Elements of Probability (Instructor: Prof. Venkatesh) **Fall 2013**
- ⊙ Networking Theory and Fundamentals(Instructor: Prof. Sarkar) **Spring 2012**

Sharif University of Technology

- ⊙ Principles of Electronics (Instructor: Prof. Fardmanesh) **Spring 2009**
- ⊙ Electronics Engineering Principles (Instructor: Prof. Fardmanesh) **Fall 2009**

Laboratory Instructor

- ⊙ Electrical Engineering Principles (Supervisor: Prof. Fardmanesh)
 - ▷ Lab Instructor **Fall 2008**
- ⊙ Electrical Engineering Principles (Supervisor: Prof. Kaboli)
 - ▷ Lab Instructor **Fall 2009**

Physics tutor at Salam Institution, Karaj, Iran

Summer 2008

Other

- ⊙ Organized the SIGCOMM from the past session at SIGCOMM 2024. **Summer 2024**
- ⊙ Graduate Student Representative in Computer Science **Fall 2014, Spring 2015, Fall 2015**
- ⊙ Active member of Resana English Group, SUT
 - ▷ Coordinator of Free Discussion Sections
 - ▷ Active participants in the English Poetry group
- ⊙ Active member of the industrial correspondence group of the MCN national conference, SUT **Fall and Winter 2008**

MENTORING (INTERNS)

⊙ Nick Iodice (University of Pennsylvania)	2014
⊙ Da Yu (Brown University) – Joint with Yibo Zhu	2017
⊙ Robert MacDavid (Princeton University)	2018
⊙ Akshay Narayan (MIT)	2018,2019
⊙ Jiaqi Gao (Harvard)	2018,2019
⊙ Nofel Yaseen (University of Pennsylvania) – Joint with Ryan Beckett	2018,2019,2021
⊙ Zhiying Xu (Harvard)	2018,2019
⊙ Firas Abuzaid (Stanford) – Joint with Srikanth Kandula and Ishai Menachi	2019
⊙ Siva Kakarla (UCLA) – Joint with Ryan Beckett	2019
⊙ Haoxian Chen (University of Pennsylvania) – Joint with Kevin Hsieh	2020
⊙ Rahul Anand Sharma (CMU) – Joint with Ganesh Ananthanarayanan	2020
⊙ Amirhossein Mirhoseini (University of Michigan Ann Arbor)	2020
⊙ Ankur Mallick (CMU) – Joint with Kevin Hsieh	2020
⊙ Pooria Namyar (USC) – Joint with Dan Crankshaw	2021
⊙ Pooria Namyar (USC) – Joint with Ryan Beckett, Srikanth Kandula	2022
⊙ Shayan Hosseini (UBC) – Joint with Dan Crankshaw	2022
⊙ Solal Pirelli (EPFL) – Joint with Siva Kakarla, Ryan Beckett	2023
⊙ Pouya Hamedanian (MIT)– Joint with Sadjad Fouladi, Ranveer Chandra	2023
⊙ Pantea Karimi (MIT) – Joint with Siva Kakarla	2024
⊙ Roozbeh Boostandoost (UMass) – Joint with Siva Kakarla, Ryan Beckett	2024
⊙ Minhao Jin (Princeton) – Joint with Siva Kakarla	2025
⊙ Isha Chaudhary (UIUC) – Joint with Siva Kakarla, Ryan Beckett	2025
⊙ Lesley Zhou (Maryland) – Joint with Siva Kakarla, Ryan Beckett	2025
⊙ Xuting Liu (UPenn) – Joint with Siva Kakarla	2025
⊙ Adam Lechowicz (UMass) – Joint with Pooria Namyar, Konstantina Malleou	2026
⊙ Arvin Ghavidel (USC) – Joint with Pooria Namyar, Konstantina Malleou	2026

INVITED TALKS

⊙ Invited guest lecture Host: Ramesh Govindan	Fall 2025
⊙ Invited to debate on the future of AI in networking Host: Akshay Narayan	Summer 2024
⊙ Invited to N2Women panel Hosted at: SIGCOMM 2024	Summer 2024
⊙ Invited panel on AI for networking Host: Sanjay Rao	Summer 2024
⊙ Invited industry spotlight talk Hosted at: APNet 2024	Summer 2024
⊙ Invited talk at Princeton University Host: Jennifer Rexford	Spring 2024

- ⊙ Invited talk at University of Southern California
Host: Ramesh Govindan **Spring 2023**
- ⊙ Invited guest lecture at Austin University
Host: Neeraja Yadwadkar **Spring 2023**
- ⊙ Invited guest lecture at John Hopkins University
Host: Soudeh Ghorbani **Fall 2020**
- ⊙ Invited guest lecture at Brown University
Host: Theo Benson **Fall 2018 & Spring 2019**
- ⊙ Invited talk at Princeton University
Host: Mina Tahmasbi **Spring 2019**
- ⊙ Invited talk at University of Pennsylvania
Host: Boon Thau Loo **Spring 2019**
- ⊙ Invited talk at Georgia Institute of Technology
Host: Ellen Zegura **Spring 2019**
- ⊙ Invited talk at Cornell University
Host: Nate Foster **Spring 2019**
- ⊙ Invited talk at University of Massachusetts Amherst
Host: Arun Venkataramani **Spring 2019**
- ⊙ Invited talk at University of Santa Barbara **Spring 2019**
- ⊙ Invited talk at Boston University
Host: Wenchao Li **Spring 2019**

PROFESSIONAL
SERVICE

- ⊙ Program Committee NSDI, 2027
- ⊙ Program Committee NSDI, ASPLOS (EC), OSDI, 2026
- ⊙ Program Committee ATC 2025
- ⊙ Program Committee co-chair, HotNets 2024
- ⊙ Program Committee member, MLSys, SIGCOMM, 2024
- ⊙ Reviewer CCR, 2024
- ⊙ Program Committee member, NSDI, SIGCOMM 2023
- ⊙ Program Committee member, OSDI and NSDI, SIGCOMM 2022
- ⊙ Co-Chair ONUG academic workshop, May 2021
- ⊙ Program Committee member, SigComm and HotNets 2021
- ⊙ Co-PC chair for the NetAI 2020 workshop, co-located with SigComm 2020
- ⊙ Co-organizer of the first workshop on "Context Aware AutoML for networking and distributed systems" co-located with MLSys 2020
- ⊙ Program Committee Member, NSDI, ATC, ICNP, HotCloud, SOSR 2020
- ⊙ Program Committee Member, HotNets, CoNext, NetAI, SOSR, 2019
- ⊙ Program Committee Member, ACM CoNext, ApSys 2018
- ⊙ Reviewer for IEEE Transactions on Networking, 2017

SELECT GRADUATE COURSES Digital Communications, Networking Theory and Fundamentals, Advanced Programing, Introduction to Algorithms, Advanced Algorithms, Convex Optimization, Optimal Design of Wireless Networks, Game Theory (Audited), Graduate level Probability, Advanced Networking Protocols(Audited), Embeded Systems, Network and Infrastructure Threats: Attacks, Defenses, and Incentives, Machine Learning, Academic Writing, Software Systems, Mathematical Statistics, Beyond MapReduce

FUN PROJECTS

- ⦿ **Using LLMs to model heuristics as optimizations.** Exploring the use of large language models to automatically translate hand-written heuristic code into formal optimization formulations, bridging the gap between practical algorithms and their theoretical counterparts.
- ⦿ **Using LLMs to write novel sequels through an agentic architecture.** Building a multi-agent system where specialized LLM agents collaborate to plan plot arcs, develop characters, and generate coherent long-form fiction that continues existing novels.