Behnaz Arzani

CONTACT
INFORMATION

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WEBSITE

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

CURRENT POSITION **Microsoft Research**

- ⊙ 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. 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. Hamadanian, **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

Select Patents

- ⊙ **B. Arzani**, P. Namyar, DS Crankshaw, DS Berger, T Hsieh, S Kandula, Impact-aware mitigation for computer networks, US patent, 2023

- ⊙ **B. Arzani**, G. Ananthanarayanan. Using data reduction to accelerate machine learning for networking, US patent application, 2023

- ⊙ A. Mallick, K. Hsieh, **B. Arzani**, Matchmaker: Data Drift Mitigation in Machine learning for Large Scale Systems, US pattent application, 2021

- ⊙ **B. Arzani**, J. Gao, R. Bianchini, F. FRUJERI, X. Wang, H. Lee, D, Maltz, Systems and methods for distributed incident classification and routing, US patent application, 2021

- ⊙ S. Raindel, J. Padhye, A. Levy, M. Elhaddad, A. Monfared, B. Zill, **B. Arzani**, X. Guo, Link Fault Isolation Using RDMA Latencies, US Pattent, 2020

- ⊙ **B. Arzani**, S. Ciraci, S. Saroiu, A. Wolman, J. Stokes, G. Outhred, Methods and systems for scalable privacy preserving compromise detection in the cloud, US patent application, 2020

- ⊙ **B. Arzani**, B. Rouhani Darvish, Automated Generation of Machine Learning Models For Network Evaluation, US pattent application 2020

- ⊙ H. Zhang, **B. Arzani**, F. Ivancic, J. Rhee, N. Arora, G. Jiang, OFFLINE QUERIES IN SOFTWARE DEFINED NETWORKS, US Pattent, 2014

Technical Reports

- ⊙ **B. Arzani**, K Hsieh, H. Chen, Interpret-able feedback for AutoML systems. arxiv 2021

- ⊙ **B. Arzani**, B. Rouhani Darvish, Towards a Domain Customized Machine Learning Framework For Networks and Systems. arxiv 2020

- ⊙ **B. Arzani**, N. Iodice, S Hwang, P Venkataramanan, R Gurney, BT Loo, Sunstar: A cost effective Multi-Server Solution for Reliable Video Delivery. arxiv, 2018

- ⊙ **B. Arzani**, A. Gurney B. Thau Loo, R. Guerin, FixRoute: Automated Router Configuration Repair with Traffic Engineering Optimizations, arxiv 2015

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 (Konkoor) **2006**

- ⊙ Top 0.001% (ranked 10th) in the Nationwide English Universities Entrance Exam **2006**

RESEARCH IMPACT

- ⊙ 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 $3\times$.

- ⊙ 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 Fundementals(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

- ⊙ Feature. A Conversation with Behnaz Arzani: Shaping the future of network management. **2024**
- ⊙ 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**

INVITED TALKS

- ⊙ 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 Comittee NSDI 2026

- ⊙ Program Comittee ATC, NSF NeTS panel 2025

- ⊙ Program Comittee co-chair, HotNets 2024

- ⊙ Program Comittee member, MLSys, SIGCOMM, 2024

- ⊙ Reviewer CCR, 2024

- ⊙ Program Comittee member, NSDI, SIGCOMM 2023

- ⊙ Program Comittee member, OSDI and NSDI, SIGCOMM 2022

- ⊙ Co-Chair ONUG academic workshop, May 2021

- ⊙ Program Comittee 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 Optimzation, 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