Sepehr Abdous

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sepehrabdous.github.io

Researcher in Datacenter Networking and AI Infrastructure
Ph.D. @ JHU

Education

Johns Hopkins University **Baltimore**
PhD *2019-Present*
School of Computer Science

Johns Hopkins University **Baltimore**
M.Eng*, *GPA: 3.81/4 *2019-2023*
School of Computer Science

Sharif University of Technology **Tehran**
BSc*, *GPA: 17.06/20 *2014 - 2019*
School of Computer Engineering

Research Summary

My research focuses on improving the speed and reliability of modern networks. I have developed mechanisms to **detect and quantify congestion events** in **datacenter networks** — critical infrastructure at the core of the Internet. In addition, I have proposed techniques to **mitigate congestion both within individual datacenters and across interconnected datacenter fabrics**. With the rapid expansion of large-scale Artificial Intelligence (AI) training workloads, **my current work targets emerging challenges in AI datacenters**, including addressing bandwidth inefficiencies in large-scale AI training jobs and ensuring scalable, high-throughput network performance.

Work Experience

Microsoft **2024-2025**
Consulting researcher *Baltimore, USA*
Under the supervision of Dr. Kabbani and Dr. Ghalayini, I designed Uno, a unified congestion control scheme that operates both within and across large-scale datacenter networks.

CCC Intelligent Solutions **2022**
Intern *Chicago, USA*
As an intern on the AI Enablement team, I designed and implemented a high-performance data migration technique that significantly improved the speed of transfers between the company's remote storage servers.

HPDS (High Performance Data Storage) Company **2018**
Intern *Tehran, Iran*

I was responsible for automating the system update process and performing system-level FIO benchmarking tests.

Darmaneh **2016-2018**
Frontend developer *Tehran, Iran*
Darmaneh was a startup focused on building a platform for online medical consultations. I was responsible for developing and maintaining the Android and iOS applications.

Skills

- **Technical Skills:** Datacenter networking, AI networking, Network simulation and hardware implementation
- **Programming Languages:** C, C++, Python, Java, P4
- **Tools:** OMNeT++, HTSim, Git, Latex, Ansible

Publications

Papers

One to Many: Closing the Bandwidth Gap in AI Datacenters with Scalable Multicast **2025**
Sepehr Abdous, *Jinqi Lu, Jiacheng Wan, Erfan Sharafzadeh, Ying Zhang, Soudeh Ghorbani*
HotNets

Uno: A One-Stop Solution for Inter- and Intra-Datacenter Congestion Control and Reliable Connectivity **2025**
Tommaso Bonato,* ***Sepehr Abdous****, Abdul Kabbani, Ahmad Ghalayini, Nadeen Gebara, Terry Lam, Anup Agarwal, Tiancheng Chen, Zhuolong Yu, Konstantin Taranov, Mahmoud Elhaddad, Daniele De Sensi, Soudeh Ghorbani, Torsten Hoefler*
*(*Equal contribution)*
SC

Tempus: Probabilistic Network Latency Verification **2024**
Sepehr Abdous*, Senapati Diwangkara*, Soudeh Ghorbani*
*(*Equal contribution)*
IEEE Access

Practical Packet Deflection in Datacenters **2023**
Sepehr Abdous, *Erfan Sharafzadeh, Soudeh Ghorbani*
CoNEXT

Understanding the impact of the host networking elements on traffic bursts **2023**
Erfan Sharafzadeh, ***Sepehr Abdous***, *Soudeh Ghorbani*
NSDI

Burst-tolerant Datacenter Networks with Vertigo **2021**
Sepehr Abdous*, *Erfan Sharafzadeh**, *Soudeh Ghorbani*
*(*Equal contribution)*
CoNEXT

Posters

Implementable selective deflection with Canary **2023**
Sepehr Abdous, *Erfan Sharafzadeh*, *Soudeh Ghorbani*
NSDI

Vertigo: A Priority-aware Burst-tolerant Datacenter Fabric **2021**
Sepehr Abdous, *Erfan Sharafzadeh*, *Sougol Gheissi*, *Soudeh Ghorbani*
Coordinated Science Laboratory Student Conference (CSLSC)

Valinor: Transport-Agnostic Packet Prioritization and Ordering at the Edge **2021**
Erfan Sharafzadeh, ***Sepehr Abdous***, *Sougol Gheissi*, *Soudeh Ghorbani*
Coordinated Science Laboratory Student Conference (CSLSC)

Professional Service

- Journal reviewer for Computer Networks (2022-2024)
- Journal reviewer for Journal of Network and Computer Applications (2022-2024)
- Journal reviewer for Ad Hoc Networks (2022-2023)