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

I'm part of the HopNets lab advised by Dr. Soudeh Ghobani. 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 **2025**
Control and Reliable Connectivity
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)
Codebase: https://github.com/spcl/Uno_SC25.git
SC

Tempus: Probabilistic Network Latency Verification **2024**
Sepehr Abdous*, *Senapati Diwangkara*, Soudeh Ghorbani*
(*Equal contribution)
Codebase: https://github.com/hopnets/Tempus
IEEE Access

Practical Packet Deflection in Datacenters **2023**
Sepehr Abdous, *Erfan Sharafzadeh, Soudeh Ghorbani*
Codebase: https://github.com/hopnets/practical_deflection
CoNEXT

Understanding the impact of the host networking elements on traffic bursts **2023**
*Erfan Sharafzadeh, **Sepehr Abdous**, Soudeh Ghorbani*
Codebase: https://github.com/hopnets/valinor-artifacts
NSDI

Burst-tolerant Datacenter Networks with Vertigo   **2021**
Sepehr Abdous*, *Erfan Sharafzadeh*, Soudeh Ghorbani*
(*Equal contribution)
Codebase: https://github.com/hopnets/vertigo-artifacts
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)