# 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.

**Johns Hopkins University** **2019-Present**
*Teacher Assistant* *Baltimore, USA*

During my Ph.D., I served as a TA 3 times across the following courses: "Computer Networks" and "Cloud Computing".

### 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.

### Sharif University of Technology   2015-2019
*Teacher Assistant*   *Tehran, Iran*
As an undergraduate, I served as a teaching assistant 14 times across the following courses: "Fundamentals of Programming", "Advanced Programming", "Data Structures", "Operating Systems", "Numerical Methods", "Computer Structure", and "Mathematical Statistics".

## 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)*
*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)