

Vamsi Addanki

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RESEARCH INTERESTS AND VISION

My research interests lie at the intersection of network systems and theory. In particular, I am interested in problems including but not limited to network topologies, buffer sharing, scheduling, transport protocols and packet classification. I leverage theoretical concepts (eg., online algorithms with predictions) to analyze and solve practical problems (eg., buffer sharing). More recently, I am interested in systems for large-scale distributed training and learning-augmented systems. My research vision is to drive networks close to optimal along multiple dimensions such as throughput, latency, cost effectiveness, carbon and energy efficiency.

EDUCATION

- **PhD, Computer Science** Berlin, Germany
Technische Universität Berlin (TU Berlin) Sept. 2021 – Dec. 2024 (Expected)
Thesis: Adaptive Protocols and Reconfigurable Optical Interconnects
Advisors: Prof. Stefan Schmid
- **MSc, Computer Science** Paris, France
Sorbonne University Sept. 2018 – Aug. 2020
Thesis: A Flexible Buffer Management Scheme for Data Center Networks
Advisors: Prof. Laurent Vanbever, Maria Apostolaki
- **Bachelor of Engineering, Electronics and Instrumentation** Goa, India
Birla Institute of Technology and Science Aug. 2013 – May 2017
Thesis: Performance Evaluation of Vector Packet Processor
Advisors: Prof. Dario Rossi and Prof. Nitin Sharma









RESEARCH AND WORK EXPERIENCE

- **Microsoft Research** Redmond, USA (Remote)
Internship, Part-time Contract February 2024 - June 2024
Research topic: Transport protocols for Large Language Model Training Jobs
Advisors: Prateesh Goyal, Ilias Marinos, Ranveer Chandra
- **MIT** Boston, USA
Visiting PhD Student April 2024 - May 2024
Research topic: Optical Circuit-Switched Networks
Advisors: Manya Ghobadi
- **Univeristy of Vienna** Vienna, Austria
Research Assistant, Full-time employment October 2020 - September 2021
Research topic: Reconfigurable Datacenter Networks.
Advisor: Prof. Stefan Schmid
- **ETH Zurich** Zurich, Switzerland
Master's Thesis, Full-time employment February 2020 - August 2020
Research topic: Buffer Sharing in Datacenter switches
Advisors: Prof. Laurent Vanbever, Maria Apostolaki
- **Telecom Paristech** Paris, France
Research Engineer, Half-time employment September 2018 - January 2020
Research topic: Deterministic Networks.
Advisor: Prof. Luigi Iannone
- **Telecom Paristech/Newnet@Paris** Paris, France
Research Engineer, Full-time employment September 2017 - September 2018
Research topic: Multi-Resource Fairness in Software Routers
Advisor: Prof. Dario Rossi

PUBLICATIONS

Five representative publications are marked with a star ★. Click on the symbol “ Paper” to access the online PDF.

- Vermilion: Breaking the Throughput Barrier of Periodic Circuit-Switching (A Simple Demand-Aware Optical Interconnect)**
[Vamsi Addanki](#), Chen Avin, Manya Ghobadi, Goran Dario Knabe and Stefan Schmid.
 *(Under Review)*  Paper
- Vermilion, Pt. 2: Augmenting Reconfigurable Optical Network Design with Machine-Learned Predictions**
[Vamsi Addanki](#), Maciej Pacut, Leon Kellerhals, Goran Dario Knabe and Stefan Schmid.
 *(Under Review)*  Paper
- Challenging the Need for Packet Spraying in Large-Scale Distributed Training**
[Vamsi Addanki](#), Prateesh Goyal, and Ilias Marinos.
 *(Under Review)*  Paper
- Pyrrha: Congestion-Root-Based Flow Control to Eliminate Head-of-Line Blocking in Datacenter**
Kexin Liu, Zhaochen Zhang, Chang Liu, Yizhi Wang, Qingyue Wang, [Vamsi Addanki](#), Stefan Schmid, Wei Chen, Xiaoliang Wang, Jiaqi Zheng, Wenhao Sun, Tao Wu, Ke Meng, Fei Chen, Weiguang Wang, Wanchun Dou, Guihai Chen, and Chen Tian.
 *USENIX NSDI 2025*  Paper
- Dequeue Rate-Agnostic Switch Buffer Sharing through Packet Queuing Delay**
Krishna Agrawal, [Vamsi Addanki](#), and Habib Mostafaei.
 *CoNEXT-SW 2024*  Paper
- Starlink Performance through the Edge Router Lens**
Sarah-Michelle Hammer, [Vamsi Addanki](#), Max Franke, and Stefan Schmid.
 *LEO-NET 2024*  Paper
- ★ **Credence: Augmenting Datacenter Switch Buffer Sharing with ML Predictions**
[Vamsi Addanki](#), Maciej Pacut, and Stefan Schmid.
 *USENIX NSDI 2024*  Paper  Slides  Code
- ★ **Reverie: Low Pass Filter-Based Switch Buffer Sharing for Datacenters with RDMA and TCP Traffic**
[Vamsi Addanki](#), Wei Bai, Stefan Schmid, and Maria Apostolaki.
 *USENIX NSDI 2024*  Paper  Slides  Code
- TCP’s Third-Eye: Leveraging eBPF for Telemetry-Powered Congestion Control**
Jörn-Thorben Hinz, [Vamsi Addanki](#), Csaba Györgyi, Theo Jepsen, and Stefan Schmid.
 *eBPF 2023 (SIGCOMM Workshop)*  Paper  Slides  Code
- ★ **Mars: Near-Optimal Throughput with Shallow Buffers in Reconfigurable Datacenter Networks**
[Vamsi Addanki](#), Chen Avin, and Stefan Schmid.
 *ACM SIGMETRICS 2023*  Paper  Slides
- Self-Adjusting Partially Ordered Lists**
[Vamsi Addanki](#), Maciej Pacut, Arash Pourdamghani, Gábor Rétvári, Stefan Schmid, and Juan Vanerio.
 *IEEE INFOCOM 2023*  Paper
- ★ **ABM: Active Buffer Management in Datacenters**
[Vamsi Addanki](#), Maria Apostolaki, Manya Ghobadi, Stefan Schmid, and Laurent Vanbever.
 *ACM SIGCOMM 2022*  Paper  Slides  Code
- ★ **PowerTCP: Pushing the Performance Limits of Datacenter Networks**
[Vamsi Addanki](#), Oliver Michel, and Stefan Schmid.
 *USENIX NSDI 2022*  Paper  Slides  Code

14. **Moving a step forward in the quest for Deterministic Networks (DetNet)**
[Vamsi Addanki](#) , and Luigi Iannone.
IFIP Networking 2020  Paper  Slides  Code
15. **Alias Resolution Based on ICMP Rate Limiting**
 Kevin Vermeulen, Burim Ljuma, [Vamsi Addanki](#) , Matthieu Gouel, Olivier Fourmaux, Timur Friedman, and Reza Rejaie.
PAM 2020  Paper
16. **Controlling software router resource sharing by fair packet dropping**
[Vamsi Addanki](#) , Leonardo Linguaglossa, James Roberts, and Dario Rossi.
IFIP Networking 2018  Paper  Code
17. **Fair dropping for multi-resource fairness in software routers: extended abstract**
[Vamsi Addanki](#) , Leonardo Linguaglossa, James Roberts, and Dario Rossi.
Poster and Demos, ACM SIGCOMM 2018  Paper  Poster

TEACHING EXPERIENCE

- Datacenter Networking and Software-defined Networks TU Berlin
Lectures Spring 2023 - 24
- Network Protocols and Architectures TU Berlin
Lectures and Tutorials Fall 2023 - 24
- Internet and Network Security TU Berlin
Teaching Assistant Spring 2022 - 23
- Network Protocols and Architectures TU Berlin
Teaching Assistant Fall 2022 - 23
- Network Protocols and Architectures TU Berlin
Teaching Assistant Fall 2021 - 22

STUDENTS

- Goran Dario Knabe TU Berlin
 1. *BSc, Computer Science* 2024 - Present
 Thesis: Evaluation of Heuristics for Demand-Aware Network Design
- Prajna Narayan Bhat Freie Universität Berlin
 2. *MSc, Computer Science* 2024 - Present
 Thesis: Graph Neural Network Architecture for MPLS Dataplane Synthesis
- Gudur Krishna Chaitanya Thapar Institute
 3. *B.E, Computer Science* June. 2024 - Aug. 2024
 Thesis: Deep Neural Network Architecture for Traffic Engineering
- Sarah-Michelle Hammer TU Berlin
 4. *BSc, Computer Science* 2023 - 2024
 Thesis: Measurements on Low Earth Orbit Satellite Networks
- Dominik Danelski TU Berlin
 5. *MSc, Computer Science* 2023 - 2024
 Topic: P4 implementation of Algorithms with Predictions
- Jörn-Thorben Hinz TU Berlin
 6. *MSc, Computer Science* 2022 - 2023
 Thesis: A Linux Kernel Implementation of PowerTCP
- Jonas Köppeler TU Berlin
 7. *BSc, Computer Science* 2022 - 2023
 Thesis: Evaluation of Self-Adjusting Packet Classification in the Linux Kernel

SERVICE

- USENIX NSDI, 2025
Pre-Review Task Force
- IEEE HSPR, NetAccel-AI, 2024
Program Committee, Reviewer
- ACM SIGCOMM Posters and Demos, 2024
Program Committee, Reviewer
- IEEE Transactions on Networking, 2024
Reviewer
- IEEE Transactions on Network Service and Management, 2024
Reviewer
- ACM SIGCOMM Posters and Demos, 2023
Program Committee, Reviewer
- IEEE Transactions on Networking, 2023
Reviewer
- ACM SIGCOMM Posters and Demos, 2022
Program Committee, Reviewer
- IEEE Transactions on Network Service and Management, 2022
Reviewer

CONFERENCES, SUMMER SCHOOLS AND SEMINARS

- ACM HotNets, Irvine, USA, November 18-19, 2024 (PhD Short Talk)
- USENIX NSDI, Santa Clara, USA, April 16-18, 2024 (Presentation)
- ACM SIGMETRICS, Orlando, USA, June 19-22, 2023 (Presentation)
- ACM SIGCOMM, Amsterdam, Netherlands, August 22–26, 2022 (Presentation)
- USENIX NSDI, Renton, USA, April 4–6, 2022 (Presentation)
- IFIP Networking, Paris, France, June 22-24, 2020 (Presentation)
- ACM SIGCOMM, Budapest, Hungary, August 2018 (Demonstration)
- IFIP Networking, Zurich, Switzerland, May 14-16, 2018 (Demonstration)
- Cisco Symposium 2018, Paris, France, April 9-10, 2018 (Attended)
- NetFPGA summer school, Telecom Paristech, July 3-5, 2017 (Attended)
- Cisco Symposium 2017, Paris, France, March 20-21, 2017 (Attended)

TECHNICAL SKILLS

- **Programming languages:** C, C++, Python, Bash, Java.
- **Tools & frameworks:** NS-3, NS-2, Omnet++, DPDK, Linux Kernel, eBPF, Gurobi.

REFEREES

Removed for privacy. Please send me an email for references. Five referees include my PhD advisor, two full-professors who are well-known within the networking community, one assistant professor at a tier-one university and one researcher cum director of a top research lab in industry.