Vipul Harsh

Conviva
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Interests

Current interests: Failure diagnosis in networked systems, reliability of AI agents, network topology
Broad interests: Networked and Distributed Systems, ML for Systems, Algorithms

Experience

Postdoctoral researcher, Conviva, Foster City, California — July 2024 - Ongoing
Visiting researcher, CMU
Advisors: Vyas Sekar, Hui Zhang

Research intern, VMware Research, Palo Alto, California (remote) — June 2020 - Sept. 2020
Advisors: Sujata Banerjee, Radhika N. Mysore

Software engineering intern, Google, Sunnyvale, California — May 2018 - August 2018
Advisors: Gautam Kumar, Nandita Dukkipati

Education

University of Illinois at Urbana-Champaign — 2017 - 2024
Ph.D., Computer Science
Advisor: P. Brighten Godfrey

University of Illinois at Urbana-Champaign — 2015 - 2017
M.S., Computer Science
Advisor: Laxmikant Kale

Indian Institute of Technology, Bombay — 2011 - 2015
B.Tech. (Honors), Computer Science and Engineering

Publications

MoCE: A Mixture of Context Aware Experts Framework for Troubleshooting Internet-scale Services
Vipul Harsh, Sayan Sinha, Henry Milner, B. Aditya Prakash, Vyas Sekar, Hui Zhang
NSDI 2026

Starfish: A Topology-Routing Co-Design for Small-Scale Data Centers
Anchengcheng Zhou, **Vipul Harsh**, Sangeetha A. Jyothi, Maria Apostolaki, P. Brighten Godfrey
NSDI 2026

Automatically Surfacing Opportunities for Improvements In Internet-Scale Applications
Vipul Harsh, Sayan Sinha, Henry Milner, Haijie Wu, B. Aditya Prakash, Vyas Sekar, Hui Zhang
HotNets 2025

TraceWeaver: Distributed Request Tracing for Microservices Without Application Modification
Sachin Ashok, **Vipul Harsh**, P. Brighten Godfrey , Radhika Mittal, Srinivasan Parthasarathy, Larisa Shwartz
SIGCOMM 2024

Murphy: Performance Diagnosis of Distributed Cloud Applications
Vipul Harsh, Wenxuan Zhou, Sachin Ashok, Radhika N. Mysore, P. Brighten Godfrey, Sujata Banerjee
SIGCOMM 2023

- VMware's blog post about product adoption: https://shorturl.at/efvT2

Flock: Accurate Datacenter Fault Localization at Scale
Vipul Harsh, Tong Meng, Kapil Agrawal, P. Brighten Godfrey
CoNEXT 2023

Optimal Round and Sample-Size Complexity for Partitioning in Parallel Sorting
Wentao Yang*, **Vipul Harsh***, Edgar Solomonik (*: equal contribution)
SPAA 2023

Spineless Datacenters
Vipul Harsh, Sangeetha A. Jyothi, P. Brighten Godfrey
HotNets 2020

Histogram Sort with Sampling
Vipul Harsh, Laxmikant Kale, Edgar Solomonik
SPAA 2019

Manuscripts in preparation

There's Waldo: Localizing failures among symmetric components
Vipul Harsh, Rahul Bothra, P. Brighten Godfrey

Building Reliable Troubleshooting Agents for Internet-scale Services Using Structured Creativity
Sayan Sinha, **Vipul Harsh**, B. Aditya Prakash, Vyas Sekar, Hui Zhang

Patents

- **On-demand Network Incident Graph Generation** *(US Patent App. 18/094,378)*
  Vipul Harsh, Wenxuan Zhou, Radhika Niranjan Mysore, Philip Brighten Godfrey, Sujata Banerjee
- **Network Incident Root-Cause Analysis** *(US Patent App. 18/094,379)*
  Vipul Harsh, Wenxuan Zhou, Radhika Niranjan Mysore, Philip Brighten Godfrey, Sujata Banerjee
- **Providing Explanation of Network Incident Root Causes** *(US Patent App. 18/094,380)*
  Vipul Harsh, Wenxuan Zhou, Radhika Niranjan Mysore, Philip Brighten Godfrey, Sujata Banerjee

Awards

- Selected for the NSF-NetS early career workshop, January 2025 at Alexandria, VA, USA
- Represented IIT Bombay at the ACM ICPC World Finals 2015. Highest ranked team from India
- Ranked 49 in IIT-JEE 2011, amongst 500,000 candidates
- Rank 1 in International Mathematics Olympiad, 2009 conducted by Science Olympiad Foundation

Internships

- **Research Internship, UC Berkeley** June 2019 - August 2019
  Distributed garbage collection for actor-based systems
- **Research Internship, Georgia Tech** May 2014 - July 2014
  Large scale simulations for polydisperse hydrodynamic particle systems
- **Research Internship, LaBRI, France** May 2013 - July 2013
  Algorithms for computing coverability sets of Petri Nets

Teaching

- Teaching Assistant, Cloud Networking, UIUC (Spring 2024)
- Teaching Assistant, Probability and Statistics for Computer Science, UIUC (Spring 2022)
- Teaching Assistant, Discrete Mathematics, IIT Bombay
- Teaching Assistant, GPU Programming and Applications Workshop (GPA), IIT Bombay

Talks

- **HotNets 2025**, College Park, Maryland November 2025
  Automatically Surfacing Opportunities for Improvements In Internet-Scale Applications
- **CMU**, Pittsburgh, Pennsylvania November 2025
  Abstractions for high-coverage, extensible and scalable root cause analysis (RCA)
  Hosted by Prof. Vyas Sekar
- **MIT**, Cambridge, Massachusetts July 2024
  Failure Diagnosis in Networked systems
  Hosted by Prof. Christina Delimitrou
- **Conviva**, Foster city, California March 2024
  Failure Diagnosis in Networked systems
  Hosted by Prof. Vyas Sekar
- **CoNEXT 2023**, Paris December 2023
  Flock: Accurate Network Fault Localization at Scale
- **SIGCOMM 2023**, New York City September 2023
  Murphy: Performance Diagnosis of Distributed Cloud Applications
- **SPAA 2023**, Orlando, Florida June 2023
  Optimal Round and Sample-Size Complexity for Partitioning in Parallel Sorting
- **EnvoyCon at KubeCon**, Detroit, Michigan October 2022
  Distributed Tracing without the pain

- **VMware Research**, Palo Alto, California — August 2022
  Murphy: Performance diagnosis of Distributed Cloud Applications
- **VMware RADIO**, San Francisco, California — May 2022
  Murphy: Performance diagnosis of Distributed Cloud Applications
- **HotNets 2020**, Chicago, Illinois — November 2020
  Spineless Data Centers
- **VMware**, Palo Alto, California — February 2020
  Fast and accurate datacenter fault localization
- **Google**, Sunnyvale, California — August 2019
  Fast and accurate datacenter fault localization
- **SPAA 2019**, Phoenix, Arizona — June 2019
  Histogram sort with sampling
- **Charm++ Workshop**, Urbana, Illinois — April 2017
  Histogram sort with sampling

References
(on request)

- **Vyas Sekar**, CMU, Conviva
- **Hui Zhang**, CMU, Conviva
- **Brighten Godfrey**, UIUC
- **Sujata Banerjee**, Microsoft Research
- **Edgar Solomonik**, UIUC

Service

- Program Committee, Conext 2025