# Vipul Harsh

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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**

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

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

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

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

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

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

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

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

**Manuscripts in preparation**

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

**Starfish: A Flat Datacenter Network**
*Anchengcheng Zhou, **Vipul Harsh**, Sangeetha A. Jyothi, P. Brighten Godfrey*

**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