

# Rachit Agarwal

Cornell University

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## Appointments

**Cornell University, Department of Computer Science**

Associate Professor, 2022–

Assistant Professor, 2016–2022

**UC Berkeley, Department of Computer Science**

Postdoc, 2014–2016

## Education

**University of Illinois at Urbana-Champaign, IL, USA**

PhD, Electrical and Computer Engineering

*Low latency queries on big graph data*

Advisors: P. Brighten Godfrey, Matthew Caesar

**Indian Institute of Technology (IIT) Kanpur, India**

Bachelor of Technology, Electrical Engineering

## Awards & Recognitions

- 2023 Kavli Fellow, National Academy of Sciences
- 2021 James and Mary Tien Teaching award  
(the highest award for teaching in Cornell College of Engineering)  
*for “Sustained Excellence and Innovation in Engineering Education”*
- Sloan Research Fellowship
- Google Research Scholar award  
*for “Datacenter transport design for Terabit Ethernet”*
- NSF CAREER award  
*for “Communication Synchrony”*
- 2020 Usenix Security Distinguished Paper Award  
*for “Pancake: Frequency Smoothing for Encrypted Data Stores”*
- 2018 SIGCOMM Best Student Paper Award  
*for “Sincronia: Near-Optimal Network Design for Coflows”*
- 2017 Google Faculty Research Award  
*for research on “Building Interactive Query Systems for Disaggregated Datacenters”*
- 2012 Rambus Research Fellowship, UIUC  
*for outstanding performance in Computer Science and Engineering research*
- 2010 Yi-Min Wang and Pi-Yu Chung Research Award, UIUC  
*for excellence in research in Computer Engineering*
- 2010 List of Teachers Ranked as Excellent by Their Students, UIUC  
*for excellence in teaching; Jeff Erickson’s (undergraduate) algorithms course: CS473*
- 2007 Gold Medal (Team), Irish Mathematics Intervarsity (National Senior Mathematics Olympiad)

- 2006 Selected Among Top 15 Indian Student Researchers by Intel Technologies  
2001 All India Rank 142 in IIT-JEE Entrance Examination

## Teaching

- CS6450 Advanced Computer Networks  
[Spring'23, 12 students] [Fall'19, 10 students] [Fall'18, 5 students] [Fall'17, 7 students]
- CS4450 Introduction to Computer Networks  
[Fall'22, 104 students] [Spring'21, 227 students] [Spring'20, 156 students] [Spring'19, 98 students] [Spring'18, 55 students]
- CS7420 Building Disaggregated Systems  
[Spring'22, 5 students]
- CS7490 Systems Research Seminar  
[Spring'22, 11 students] [Fall'21, 11 students]
- CS4410/5410 Operating Systems  
[Fall'21, 236 students] [Fall'16, 306 students]
- CS7450 Computer Networks in a Decade from Now  
[Fall'20, 10 students]
- CS6453 Big Data Systems: Trends and Challenges  
[Spring'17, 7 students]
- CS4411 Operating Systems Practicum  
[Fall'16, 77 students]

## Recent Publications

- 2023 [Host Congestion Control](#)  
S. Agarwal, A. Krishnamurthy, R. Agarwal  
SIGCOMM
- [Karma: Resource Allocation for Dynamic Demands](#)  
M. Vuppalapati, G. Fikioris, R. Agarwal, A. Cidon, A. Khandelwal, É. Tardos  
OSDI
- [Formal Methods for Network Performance Analysis](#)  
M. Arashloo, R. Beckett, R. Agarwal  
NSDI
- 2022 [Understanding Host Interconnect Congestion](#)  
S. Agarwal, R. Agarwal, B. Montazeri, M. Moshref, K. Elmeleegy, L. Rizzo, M. Kruijff, G. Kumar, S. Ratnasamy, D. Culler, A. Vahdat  
HotNets
- [Towards  \$\mu\$ s Tail Latency and Terabit Ethernet: Disaggregating the Host Network Stack](#)  
Q. Cai, M. Vuppalapati, J. Hwang, C. Kozyrakis, R. Agarwal  
SIGCOMM
- [dcPIM: Near-Optimal Proactive Datacenter Transport](#)  
Q. Cai, M. Arashloo, R. Agarwal  
SIGCOMM

- [ShortStack: Distributed, Fault-Tolerant, Oblivious Data Access](#)  
M. Vuppapapati, K. Babel, A. Khandelwal, R. Agarwal  
OSDI
- [Optimal Oblivious Reconfigurable Networks](#)  
D. Amir, T. Wilson, V. Shrivastav, H. Weatherspoon, R. Kleinberg, R. Agarwal  
STOC
- [From Switch Scheduling to Datacenter Scheduling: Matching-Coordinated Greed is Good](#)  
R. Agarwal, S. Rajakrishnan, D. Shmoys  
PODC
- [Jiffy: Statistical Multiplexing of Disaggregated Memory](#)  
A. Khandelwal, Y. Tang, R. Agarwal, A. Akella, I. Stoica  
EuroSys
- 2021 [Understanding Host Network Stack Overheads](#)  
Q. Cai, S. Chaudhary, M. Vuppapapati, J. Hwang, R. Agarwal  
SIGCOMM
- [Rearchitecting Linux Storage Stack for  \$\mu\$ s Latency and High Throughput](#)  
J. Hwang, M. Vuppapapati, S. Peter, R. Agarwal  
OSDI
- [Inter-datacenter Bulk Transfers with CodedBulk](#)  
S. Tseng, S. Agarwal, R. Agarwal, H. Ballani, A. Tang  
NSDI
- 2020 [Pancake: Frequency Smoothing for Encrypted Data Stores](#)  
P. Grubbs, A. Khandelwal, M. Lacharité, L. Brown, L. Li, R. Agarwal, T. Ristenpart  
Usenix Security (**Distinguished Paper Award**)
- [TCP  \$\approx\$  RDMA: CPU-efficient Remote Storage Access with i10](#)  
J. Hwang, Q. Cai, A. Tang, R. Agarwal  
NSDI
- [Building An Elastic SQL Engine on Disaggregated Storage](#)  
M. Vuppapapati, J. Miron, R. Agarwal, D. Truong, A. Motivala, T. Cruanes  
NSDI
- 2019 [Shoal: A Network Architecture for Disaggregated Racks](#)  
V. Shrivastav, A. Valadarsky, H. Ballani, P. Costa, K. S. Lee, H. Wang, R. Agarwal, H. Weatherspoon  
NSDI
- [Confluo: Distributed Monitoring and Diagnosis Stack for High-speed Networks](#)  
A. Khandelwal, R. Agarwal, I. Stoica  
NSDI
- 2018 [Sincronia: Near-Optimal Network Design for Coflows](#)  
S. Agarwal, S. Rajakrishnan, A. Narayan, R. Agarwal, D. Shmoys, A. Vahdat  
SIGCOMM (**Best Student Paper Award**)
- [Obladi: Oblivious Serializable Transactions in the Cloud](#)  
N. Crooks, M. Burke, S. Harel, E. Ceccetti, R. Agarwal, L. Alvisi  
OSDI
- [Distributed Network Monitoring and Debugging with SwitchPointer](#)  
P. Tammana, R. Agarwal, M. Lee  
NSDI

- 2017 [ZipG: Memory-Efficient Graph Store for Interactive Queries](#)  
A. Khandelwal, R. Agarwal, I. Stoica  
SIGMOD
- [MiniCrypt: Reconciling Compression and Encryption for Big Data Stores](#)  
W. Zheng, F. Li, R. Popa, I. Stoica R. Agarwal  
Eurosys
- 2016 [Network Requirements for Resource Disaggregation](#)  
P. Gao, A. Narayan, S. Karandikar, J. Carreira, R. Agarwal, S. Ratnasamy, S. Shenker  
OSDI
- [Simplifying Datacenter Network Debugging with PathDump](#)  
P. Tammana, R. Agarwal, M. Lee  
OSDI
- [BlowFish: Dynamic Storage-Performance Tradeoff in Data Stores](#)  
A. Khandelwal, R. Agarwal, I. Stoica  
NSDI
- [Universal Packet Scheduling](#)  
R. Mittal, R. Agarwal, S. Ratnasamy, S. Shenker  
NSDI
- 2015 [Succinct: Enabling Queries on Compressed Data](#)  
R. Agarwal, A. Khandelwal, I. Stoica  
NSDI
- [pHost: Distributed Near-optimal Datacenter Transport Over Commodity Network Fabric](#)  
P. Gao, A. Narayan, G. Kumar, R. Agarwal, S. Ratnasamy, S. Shenker  
CoNext
- [CherryPick: Tracing Packet Trajectory in Software-Defined Datacenter Networks](#)  
P. Tammana, R. Agarwal, M. Lee  
SOSR
- [FastLane: Making Short Flows Shorter with Agile Drop Notification](#)  
D. Zats, A. Iyer, G. Ananthanarayanan, R. Agarwal, R. Katz, I. Stoica, A. Vahdat  
SoCC
- [Universal Packet Scheduling](#)  
R. Mittal, R. Agarwal, S. Ratnasamy, S. Shenker  
HotNets
- [On the Scalability of Routing With Policies](#)  
A. Gulyas, G. Retvari, Z. Heszberger, R. Agarwal  
ToN
- 2014 [The Space-Stretch-Time Tradeoff in Distance Oracles](#)  
R. Agarwal  
ESA
- 2013 [Distance Oracles for Stretch Less Than 2](#)  
R. Agarwal, P. B. Godfrey  
SODA
- [Brief Announcement: A Simple Stetch-2 Distance Oracle](#)  
R. Agarwal, P. B. Godfrey  
PODC

- 2011 [Debugging the Data Plane with Anteater](#)  
H. Mai, A. Khurshid, R. Agarwal, M. Caesar, P. B. Godfrey, S. T. King  
SIGCOMM
- [Approximate Distance Queries and Compact Routing in Sparse Graphs](#)  
R. Agarwal, P. B. Godfrey, S. Har-Peled  
INFOCOM
- [Slick Packets](#)  
G. Nguyen, R. Agarwal, J. Liu, M. Caesar, P. B. Godfrey, S. Shenker  
SIGMETRICS

## Current Group

PhD            Saksham Agarwal  
                  Qizhe Cai  
                  Midhul Vuppalapati  
                  Shreyas Kharbanda  
                  Shouxu Lin

## Group Alumni

Sujaya Maiyya (Postdoc, 2022) → *Assistant Professor, University of Waterloo*  
Mina Tahmasbi Arashloo (Postdoc, 2020-22) → *Assistant Professor, University of Waterloo*  
Jaehyun Hwang (Postdoc, 2019-21) → *Assistant Professor, Sungkyunkwan University*  
Ali Munir [Postdoc, 2019-20] → *Researcher, Huawei Canada Research Center*  
Anurag Khandelwal [Postdoc, 2019] → *Assistant Professor, Yale University*  
Katherine Gioioso [MS, 2019-21] → *PhD Student, Stanford*

## Conference Program Committee

OSDI	[2023] [2020] [2018]
NSDI	[2023] [2021] [2020] [2018]
SIGMETRICS	[2020] [2019] [2018]
SIGCOMM	[2020]
ATC	[2020] [2018] [2017]
APoCS	[2020]
SOSR	[2017]
CoNext	[2016]
HotCloud	[2016]
ICDCS	[2016]
HotOS	[2017 (Co-chair)]

## Community Service

Co-organizer	NSF Community workshop on long-term research directions in wired networking
Panel speaker	[NSF NeTS Early Career Workshop, 2021]
CCC Workshop	[Co-organizer, 2019]
SIGMETRICS	[Conference Development Committee, 2019-2020]
NSF Panel	[2021 × 3] [2020 × 2] [2019] [2018] [2017] [2016]
NSDI	[Poster Chair, 2018]
HotOS	[General Co-chair, 2017]

## Department Service

IT committee	[Fall 2023]
Chair, Colloquium committee	[Fall 2022]
PhD Admissions Committee	[2022, 2020, 2019, 2018, 2017]
Colloquium committee	[Fall 2021]
Systems lunch organizer	[Spring 2022, Fall 2021]
Lunch & Learn organizer	[Fall 2020]
Seminars	[Fellowship applications, 2020] [PhD application review, 2019]