

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

- 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 [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. Vuppalapati, 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. Vuppapalapati, J. Hwang, R. Agarwal
SIGCOMM
- [Rearchitecting Linux Storage Stack for \$\mu\$ s Latency and High Throughput](#)
J. Hwang, M. Vuppapalapati, 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. Vuppapalapati, 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

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

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

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]