

Ravi Netravali

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RESEARCH INTERESTS

Computer systems and networks, distributed applications, programming languages+systems, machine learning+systems.

EDUCATION

Massachusetts Institute of Technology *February 2015 - September 2018*

Ph.D. in Computer Science

Advisors: Hari Balakrishnan and James Mickens

Massachusetts Institute of Technology *September 2012 - February 2015*

S.M. in Computer Science

Advisor: Hari Balakrishnan

Columbia University *September 2008 - May 2012*

B.S. in Electrical Engineering

EMPLOYMENT

Princeton University *July 2021 - Present*

Assistant Professor of Computer Science

UCLA *January 2019 - July 2021*

Assistant Professor of Computer Science

MIT *September 2012 - September 2018*

Graduate Research Assistant

Hewlett-Packard Labs *May 2011 - September 2012*

Research Intern, Networking and Mobility Laboratory

Columbia University *May 2010 - May 2011*

Research Intern, Digital Video and Multimedia Laboratory

AWARDS AND HONORS

1. Sloan Research Fellowship, *2021*
2. NSF CAREER Award, *2020*
3. Google Faculty Research Award, *2020*
4. ACM SoCC Best Paper Award, *2019*
5. IRTF Applied Networking Research Prize, *2018*
6. Qualcomm Innovation Fellowship, *2017*
7. Irwin Jacobs Presidential Fellowship (MIT), *2012*

PROFESSIONAL SERVICE

1. Program Committee Member, ACM MobiCom, *2022*
2. Program Committee Chair, ACM SoCC, *2021*
3. Review-Panel Member, NSF CISE/CNS, *2021*
4. Program Committee Member, ACM MobiSys, *2021*
5. Program Committee Member, ACM SIGCOMM, *2021*
6. Program Committee Member, USENIX OSDI, *2021*
7. Program Committee Member, USENIX NSDI, *2021*
8. Program Committee Member, ACM MobiCom, *2021*
9. Program Committee Member, The Web Conference (WWW), *2021*
10. Review-Panel member, NSF CISE/CNS, *2020*
11. Topics Preview Co-Chair, ACM SIGCOMM, *2020*
12. Program Committee Member, USENIX NSDI, *2020*
13. Poster Co-Chair, USENIX NSDI, *2020*
14. Program Committee Member, USENIX ATC, *2020*
15. External Reviewer, ACM HotNets, *2019*
16. Program Committee Member, ACM CoNext ENCP Workshop, *2019*
17. External Reviewer, USENIX NSDI, *2019*
18. External Reviewer, ACM MobiCom, *2018*
19. Reviewer, IEEE Transactions on Parallel and Distributed Systems, *2018*
20. Reviewer, IEEE/ACM Transactions on Networking, *2018*

PUBLICATIONS

Refereed Conference and Workshop Publications

1. Murali Ramanujam, Harsha Madhyastha, and Ravi Netravali. “Marauder: Synergized Caching and Prefetching for Low-Risk Mobile App Acceleration,” *ACM MobiSys 2021*.
2. Shaghayegh Mardani, Ayush Goel, Ronny Ko, Harsha Madhyastha, and Ravi Netravali. “Horcrux: Automatic JavaScript Parallelism for Resource-Efficient Web Computation,” *USENIX OSDI 2021*.
3. John Thorpe, Yifan Qiao, Jonathan Eyolfson, Shen Teng, Guanzhou Hu, Zhihao Jia, Jinliang Wei, Keval Voral, Ravi Netravali, Miryung Kim, and Harry Xu. “Dorylus: Affordable, Scalable, and Accurate GNN Training over Billion-Edge Graphs,” *USENIX OSDI 2021*.
4. Nikhil Kansal, Murali Ramanujam, and Ravi Netravali. “Alohamora: Reviving HTTP/2 Push and Preload by Adapting Policies On the Fly,” *USENIX NSDI 2021*.
5. Ronny Ko, Blake Loring, Ravi Netravali, and James Mickens. “Oblique: Accelerating Page Loads Using Symbolic Execution,” *USENIX NSDI 2021*.

6. U. Naseer, T. Benson, and R. Netravali. “WebMedic: Disentangling the Memory–Functionality Tension for the Next Billion Mobile Web Users,” *ACM HotMobile 2021*.
7. A. Goel, V. Ruamviboonsuk, R. Netravali, H. Madhyastha. “Rethinking Client-Side Caching for the Mobile Web,” *ACM HotMobile 2021*.
8. Chenxi Wang, Haoran Ma, Shi Liu, Yuanqi Li, Zhenyuan Ruan, Khanh Nguyen, Michael Bond, Ravi Netravali, Miryung Kim, and Harry Xu. “Semeru: A Memory-Disaggregated Managed Runtime,” *USENIX OSDI 2020*.
9. Neil Agarwal, Matteo Varvello, Andrius Aucinas, James Newman, Fabian Bustamante, Ravi Netravali. “Mind the Delay: The Adverse Effects of Delay-Based TCP on HTTP,” *ACM CoNEXT 2020*.
10. Haneen Mohammed, Ziyun Wei, Eugene Wu, and Ravi Netravali. “Continuous Prefetch for Interactive Data Applications,” *VLDB 2020*.
11. Yuanqi Li, Arthi Padmanabhan, Pengzhan Zhao, Yufei Wang, Harry Xu, and Ravi Netravali. “Reducto: On-Camera Filtering for Resource-Efficient Real-Time Video Analytics,” *ACM SIGCOMM 2020*.
12. Lana Ramjit, Zhaoning Kong, Ravi Netravali, and Eugene Wu. “Physical Visualization Design,” *ACM SIGMOD 2020*.
13. Shaghayegh Mardani, Mayank Singh, and Ravi Netravali. “Fawkes: Faster Mobile Page Loads via App-Inspired Static Templating,” *USENIX NSDI 2020*.
14. Prateesh Goyal, Anup Agarwal, Ravi Netravali, Mohammad Alizadeh, and Hari Balakrishnan. “ABC: A Simple Explicit Congestion Controller for Wireless Networks,” *USENIX NSDI 2020*.
15. Lana Ramjit, Matteo Interlandi, Eugene Wu, and Ravi Netravali. “Acorn: Aggressive Result Caching in Distributed Data Processing Frameworks,” *ACM SoCC 2019*.
16. Pradeep Dogga, Karthik Narasimhan, Anirudh Sivaraman, and Ravi Netravali. “A System-Wide Debugging Assistant Powered by Natural Language Processing,” *ACM SoCC 2019*.
17. Ravi Netravali and James Mickens. “Reverb: Speculative Debugging for Web Applications,” *ACM SoCC 2019*.
18. Pradeep Dogga, Sandip Chakraborty, Subrata Mitra, and Ravi Netravali. “Edge-based Transcoding for Adaptive Live Video Streaming,” *USENIX HotEdge 2019*.
19. Prateesh Goyal, Ravi Netravali, Mohammed Alizadeh, and Hari Balakrishnan. “Secure Incentivization for Decentralized Content Delivery,” *USENIX HotEdge 2019*.
20. Ravi Netravali, Anirudh Sivaraman, James Mickens, and Hari Balakrishnan. “WatchTower: Fast, Secure Mobile Page Loads Using Remote Dependency Resolution,” *ACM MobiSys 2019*.
21. Ravi Netravali, Vikram Nathan, James Mickens, and Hari Balakrishnan. “Vesper: Measuring Time-to-Interactivity for Modern Web Pages,” *USENIX NSDI 2018*.
22. Ravi Netravali and James Mickens. “Prophecy: Accelerating Mobile Page Loads Using Final-state Write Logs,” *USENIX NSDI 2018*.
23. Ravi Netravali and James Mickens. “Remote-Control Caching: Proxy-based URL Rewriting to Decrease Mobile Browsing Bandwidth,” *ACM HotMobile 2018*.

24. Hongzi Mao, Ravi Netravali, and Mohammad Alizadeh. “Neural Adaptive Video Streaming with Pensieve,” *ACM SIGCOMM 2017*.
25. Vaspol Ruamviboonsuk, Ravi Netravali, Mohammad Uluyol, and Harsha Madhyastha. “Vroom: Accelerating the Mobile Web with Server-Aided Dependency Resolution,” *ACM SIGCOMM 2017*.
26. Ravi Netravali, Ameesh Goyal, James Mickens, and Hari Balakrishnan. “Polaris: Faster Page Loads Using Fine-grained Dependency Tracking,” *USENIX NSDI 2016*.
27. Peter Iannucci, Ravi Netravali, Ameesh Goyal, and Hari Balakrishnan. “Room-Area Networks,” *ACM HotNets 2015*.
28. Ravi Netravali, Anirudh Sivaraman, Keith Winstein, Somak Das, Ameesh Goyal, James Mickens, and Hari Balakrishnan. “Mahimahi: Accurate Record-and-Replay for HTTP,” *USENIX ATC 2015*.
29. Shuo Deng, Ravi Netravali, Anirudh Sivaraman, and Hari Balakrishnan. “WiFi, LTE, or Both? Measuring Multi-homed Wireless Internet Performance,” *ACM IMC 2014*.
30. Jack Brassil, Ravi Netravali, Stuart Haber, Pratyusa Manadhata, and Prasad Rao. “Authenticating a Mobile Device’s Location Using Voice Signatures,” *IEEE WiMob 2012*.

Journal Publications

1. Anirudh Sivaraman, Thomas Mason, Aurojit Panda, Ravi Netravali, and Sai Anirudh Kondaveeti. “Network Architecture in the Age of Programmability,” *ACM SIGCOMM CCR 2020*.
2. Jack Brassil, Pratyusa Manadhata, and Ravi Netravali. “Traffic Signature-Based Mobile Device Location Authentication,” *IEEE Transactions on Mobile Computing, Volume 13, 2013*.
3. Xiaopeng Huang, Ravi Netravali, Hong Man, and Victor Lawrence. “Multi-Sensor Fusion of Infrared and Electro-Optic Signals for Night Images,” *MDPI Sensors, Volume 12, 2012*.

TEACHING

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| 1. CS239: ML-Driven Video Analytics Systems (UCLA) | <i>Winter 2020, Fall 2020</i> |
| 2. CS219: Web and Mobile Systems (UCLA) | <i>Winter 2019, Fall 2019</i> |
| 3. CS134: Distributed Systems (UCLA) | <i>Spring 2019, Spring 2020</i> |

FUNDING

1. NSF CNS Core: Medium: “A Unified Prefetch Framework for Approximation-Tolerant Interactive Applications,” *co-PI, \$600,000, 2021-2024*
2. Sloan Research Fellowship, *PI, \$75,000, 2021-2023*
3. Cisco Research Gift, *PI, \$50,000, 2020-2021*
4. NSF CNS Core: Small: “Not All Cameras are Created Equal: Systems Support for Highly Adaptive Video Analytics Pipelines,” *PI, \$500,000, 2020-2023*
5. NSF CNS: CAREER: “Adaptive Web Execution: Supporting Billions of Diverse Users by Adapting Execution to Available Resources,” *PI \$500,000, 2020- 2025*
6. Google Faculty Research Award, *PI, \$80,000, 2020-2021*
7. NSF CNS CORE: Large: “Network Design Automation.” *PI, \$1,999,404, 2019-2023*