Ranysha Ware

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Research Interests

Network Congestion Control, Internet Measurement, Transport Protocols

Education

- **Ph.D. in Computer Science**, Carnegie Mellon University *(in-progress)*
  Co-Advisors: Justine Sherry, Srinivasan Seshan
- **M.S. in Computer Science**, University of Massachusetts Amherst, May 2015
- **B.S. in Computer Science**, State University of New York at New Paltz, May 2013

Honors and Awards

- **IRTF Applied Networking Research Prize** (2020)
- **Facebook Emerging Scholars Award** (2019)
- **SUNY New Paltz 40 Under Forty Alumni Award** (2017)
- **MS Presentation Competition, 2nd Place**, GEM Annual Board Meeting and Conference (2014)
- **National GEM Consortium MS Fellowship** (2013)
- **SUNY New Paltz Outstanding Graduate** (2013)

Referred Publications

[1] A. A. Philip, **R. Ware**, R. Athapathu, J. Sherry, and V. Sekar, Revisiting TCP Congestion Control Throughput Models & Fairness Properties at Scale. In *Proceedings of the Internet Measurement Conference*, IMC '21, pages 96-103, New York, NY, USA, 2021. ACM.

[2] **R. Ware**, M. K. Mukerjee, S. Seshan, and J. Sherry. Beyond Jain's Fairness Index: Setting the Bar For The Deployment of Congestion Control Algorithms. In *Proceedings of the 18th ACM Workshop on Hot Topics in Networks*. HotNets '19, pages 17-24, New York, NY, USA, 2019. ACM.

🏆 **IRTF Applied Networking Research Prize**

[3] **R. Ware**, M. K. Mukerjee, S. Seshan, and J. Sherry. Modeling BBRs Interactions with Loss-Based Congestion Control. In *Proceedings of the Internet Measurement Conference*, IMC '19, pages 137-143, New York, NY, USA, 2019. ACM.

Posters

[3] **Invited:** J. Slaughter, **R. Ware**, S. Seshan, and J. Sherry. Using Non-Congestive Loss to Differentiate TCP Reno and TCP Westwood. CMU ISR REUSE Poster Session, Aug 2019

[4] **Invited:** M. Pardeshi, **R. Ware**, and J. Sherry. Reverse Engineering FastTCP. CMU Spring 2019 Meeting of the Minds Symposium, May 2019

[5] **Invited: R. Ware**, A. Kholbrenner, M. K. Mukerjee, S. Seshan, and J. Sherry. Battle for Bandwidth: Fairness and Heterogeneous Congestion Control. CRA URMD Workshop 2019, March 2019

[6] **Invited: R. Ware**, A. Kholbrenner, M. K. Mukerjee, S. Seshan, and J. Sherry. Battle for Bandwidth: Fairness and Heterogeneous Congestion Control. Google Networking Research Summit, March 2019

[7] **R. Ware**, M. K. Mukerjee, J. Sherry, S. Seshan. Battle for Bandwidth: Fairness and Heterogeneous Congestion Control. NSDI 2018, April 2018.

Invited External Talks

- Battle for Bandwidth: Evaluating Congestion Control Deployability For The Internet. MIT, July 2021
- Battle for Bandwidth: Evaluating Congestion Control Deployability For The Internet. UC Santa Cruz, May 2021
- Battle for Bandwidth: Fairness and Heterogeneous Congestion Control. Facebook Networking & Communications Faculty Summit, June 2019

Research Experience

- **Research Assistant**, Carnegie Mellon University
  Aug 2017 - Present
  Leading research projects on fairness and congestion control heterogeneity.
- **Research Intern**, Microsoft Research
  May 2019 - August 2019
  Studied how to make RDMA work well in datacenter networks with 100 Gbps, 100 meter long links.
- **Associate Technical Staff**, MIT Lincoln Laboratory, Cyber Analytics and Decision Systems Group
  Jun 2015 - Aug 2017
  Built big data analysis pipelines for network logs and open-source cyber threats for predictive modeling and analytics for cyber security.
- **Research Assistant**, UMass Amherst
  Aug 2014 - May 2015
  Developed and benchmarked an efficient implementations of a theoretically optimal short division algorithm on various parallel architectures.
- **Summer Research Intern**, MIT Lincoln Laboratory, Cyber Systems and Technology Group
  May 2014 - Aug 2014
  Designed and developed a user-friendly tool for end-to-end-management and analysis of a dynamic cyber-defense protoype.
- **Summer Research Intern**, MIT Lincoln Laboratory, Computing and Analytics Group
  Jun 2013 - Aug 2013
  Designed and developed a modular software framework for graph signal processing in million-edge graphs.
- **Research Assistant**, SUNY New Paltz
  Sep 2011 - Dec 2011
  Explored applications of the Guassian Quadrature Rule to multivariate problems.

Teaching Experience

- **Instructor**, Fundamentals of Programming and Computer Science (15-112), Carnegie Mellon University
  Semesters: Summer 2023
  Course Website: https://www.cs.cmu.edu/~112-n23/
  Created and lead daily classes for 6 weeks. Managed staff of 20 TAs.
- **Teaching Assistant**, Fundamentals of Programming and Computer Science (15-112), Carnegie Mellon University
  Semesters: Spring 2023
  Led weekly recitations, held weekly office hours, and graded assignments
- **Teaching Assistant**, Research and Innovation in Computer Science (07-300), Carnegie Mellon University
  Semesters: Fall 2022
  Only TA. Led weekly recitations, created rubrics and graded assignments
- **Teaching Assistant & Guest Lecturer**, Computer Networks (15-441/641), Carnegie Mellon University
  Semesters: Spring 2019

Led weekly recitations, held weekly office hours, and graded assignments.
Led guest lecture: "TCP Part 2: Performance, Fairness, & Modern Congestion Controllers."

- **Guest Lecturer**, Computer Networks (15-441/641), Carnegie Mellon University
  Semesters: Fall 2017
  Led guest lecture: "Battle for Bandwidth: Fairness and Congestion Control Heterogeneity."
- **Guest Lecturer**, Machine Learning (SDS 293), Smith College
  Semesters: Fall 2016
  Led guest lecture: "Data Wrangling with Python".
- **Grader**, Programming with Data Structures (CMPSCI 187), UMass Amherst
  Semesters: Fall 2013, Spring 2014
  Graded homework and exams.
- **Tutor**, SUNY New Paltz , Mathematics Laboratory
  Semesters: Fall 2010, Spring 2011, Fall 2011, Spring 2012, Fall 2012, Spring 2013
  Assisted students in walk-in tutoring center with algebra and calculus courses.
- **Tutor**, SUNY New Paltz , AMP/CSTEP Community
  Semesters: Spring 2010, Fall 2010, Spring 2011, Fall 2011, Spring 2012, Fall 2012, Spring 2013
  Tutored underrepresented STEM students taking calculus and computer science courses.

Advising and Mentoring

Undergraduate student projects supervised at CMU.

- 2019: Monica Pardeshi, Megan Yu, Joshua Slaughter (CMU ISR REUSE student from Univ. Maryland Baltimore County)

Service

- **CMU SCS Committee For Improving Doctoral Student Advising** (2021)
- **CMU Counseling and Psychological Services (CaPs) Student Advisory Board** (2021)
- **CMU ISR REUSE Admissions Committee** (2020)
- **Introductory Programming in Python through Robotics Workshop Co-Facilitator**, Black in Robotics (June 128, 2023)
- **Python Introductory Workshop Co-Facilitator**, Carnegie Library of Pittsburgh (July - August 2018)
- **Network Reading Group Coordinator**, Carnegie Mellon University (Fall 2017 - Summer 2018)
- **Membership Chair**, GEM Alumni Association (2015)

Media Coverage

- **Asia Pacific Network Information Centre (APNIC) blog:** Modelling BBRs interactions with loss-based congestion control. January 24, 2020.
- **Packet Pushers podcast:** Heavy Networking 489: Is BBR Too Unfair An Algorithm For The Internet?. November 27, 2019.
- **Vice Motherboard:** Google's network congestion control algorithm isn't fair, researchers say. October 31, 2019
- **Wired Italian:** Un algoritmo di Google "monopolizza" il traffico web. October 28, 2019.
- **Telegraph:** Google algorithm 'hogs' internet traffic, researchers show. October 10, 2019.

Last updated: November 2023