Ranysha Ware

Postdoctoral Teaching Fellow
Carnegie Mellon University
5000 Forbes Ave, Pittsburgh, PA 15206
rware@andrew.cmu.edu
https://www.cs.cmu.edu/~rware

Education

- **Ph.D. in Computer Science**, Carnegie Mellon University, August 2024
  Co-Advisors: Justine Sherry, Srinivasan Seshan
  Thesis: Battle for Bandwidth: On The Deployability of New Congestion Control Algorithms
- **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

- **SIGCOMM Doctoral Dissertation Award** (2025)
- **IRTF Applied Networking Research Prize** (2020)
- **Facebook Emerging Scholars Award** (2019)
- **SUNY New Paltz 40 Under Forty Alumni Award** (2017)
- **National GEM Consortium PhD Fellowship** (2017)
- **National GEM Consortium MS Fellowship** (2013)
- **SUNY New Paltz Outstanding Graduate** (2013)
- **LSAMP Outstanding Scholar's Award** (2010, 2013)

Publications

[1] Margarida Ferreira, **Ranysha Ware**, Yash Kothari, Ins Lynce, Ruben Martins, Akshay Narayan, Justine Sherry. 2024. Reverse-Engineering Congestion Control Algorithm Behavior. In Proceedings of the 2024 ACM Internet Measurement Conference (**IMC '24**), November 4-6, 2024, Madrid, Spain. Association for Computing Machinery, New York, NY, USA, 401-414.

[2] **Ranysha Ware**, Adithya Abraham Philip, Nicholas Hungria, Yash Kothari, Justine Sherry, and Srinivasan Seshan. 2024. CCAnalyzer: An Efficient and Nearly-Passive Congestion Control Classifier. In Proceedings of the ACM SIGCOMM 2024 Conference (**SIGCOMM '24**). Association for Computing Machinery, New York, NY, USA, 181-196.

[3] Adithya Abraham Philip, Rukshani Athapathu, **Ranysha Ware**, Fabian Francis Mkocheko, Alexis Schlomer, Mengrou Shou, Zili Meng, Srinivasan Seshan, and Justine Sherry. 2024. Prudentia: Findings of an Internet Fairness Watchdog. In Proceedings of the ACM SIGCOMM 2024 Conference (**SIGCOMM '24**). Association for Computing Machinery, New York, NY, USA, 506-520.

[4] Adithya Abraham Philip, **Ranysha Ware**, Rukshani Athapathu, Justine Sherry, and Vyas Sekar. 2021. Revisiting TCP congestion control throughput models & fairness properties at scale. In Proceedings of the 21st ACM Internet Measurement Conference (**IMC '21**). Association for Computing Machinery, New York, NY, USA, 96-103.

[5] **Ranysha Ware**, Matthew K. Mukerjee, Srinivasan Seshan, and Justine Sherry. 2019. 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**). Association for Computing Machinery, New York, NY, USA, 17-24.

🏆 **IRTF Applied Networking Research Prize**

[6] **Ranysha Ware**, Matthew K. Mukerjee, Srinivasan Seshan, and Justine Sherry. 2019. Modeling BBR's Interactions with Loss-Based Congestion Control. In Proceedings of the Internet Measurement Conference (**IMC '19**). Association for Computing Machinery, New York, NY, USA, 137-143.

Posters

[1] **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

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

[3] **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

[4] **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

[5] **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: On The Deployability of New Congestion Control Algorithms.** Rising Stars in Computer Science Lecture Series, *UMass Amherst*, November 2024
- **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
- **Beyond Jain's Fairness Index: Setting the Bar For The Deployment of Congestion Control Algorithms.** *IETF-109*, November 2020
- **Battle for Bandwidth: Fairness and Heterogeneous Congestion Control.** *Facebook Networking & Communications Faculty Summit*, June 2019

Teaching Experience

- **Instructor**, Introduction to Computer Systems (15-213), Carnegie Mellon University
  Semesters: Spring 2025
  Course Website: https://www.cs.cmu.edu/afs/cs/academic/class/15213-s25/www/
  Co-instructor with Professor David Andersen and Professor Nathan Beckmann. (∼250 students, 17 TAs)
- **Instructor**, Principles of Computing (15-110), Carnegie Mellon University
  Semesters: Fall 2024
  Course Website: https://www.cs.cmu.edu/~15110-f24/
  Co-instructor with Professor Mike Taylor. Led lecture section 2. (∼250 students, ∼30 TAs)
- **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 led daily lectures for 6 weeks. (∼80 students, ∼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.

Pedagogical Training

- Completed: **CMU Future Faculty Program**

  The Future Faculty Program helps graduate students develop and document their teaching skills in preparation for a faculty career. Participants in this program learn the principles of effective course design and pedagogy through our seminars, receive feedback on their teaching through teaching feedback consultations, and apply what they have learned in completing a course & syllabus design project and a statement of teaching philosophy project.

- CMU Course: **CS Pedagogy (15-890)**

  Course description: This course is a broad introduction to Computer Science Pedagogy. This course is targeted toward students who are interested in improving their ability to teach computer science and who are interested in the science of teaching and learning. This course is primarily organized like a Ph.D.-level seminar on computer science pedagogy but with an extensive experiential component: Students will get substantial practice developing, implementing, and testing course materials as if the instructor of a college-level computer science course. Students will also gain experience writing and preparing teaching philosophy statements and will have the opportunity to develop and enrich their teaching portfolios for applying in the academic job market.

- CMU Course: **Evidence-Based Teaching in STEM (38-801)**

  Course description: This course is designed to prepare Ph.D. students from math, science, and engineering disciplines to: (1) teach effectively and efficiently as future faculty members; (2) critically read and apply peer-reviewed, STEM-based educational research; and (3) adapt approaches from the Scholarship of Teaching and Learning (SoTL) to formatively assess student learning and iteratively improve teaching and course design. Together, we will explore the research on teaching and student learning, identifying and challenging our assumptions regarding how college students learn best in science disciplines. Participants will leverage this research to cultivate a diverse toolkit of evidence-based, student-centered strategies for teaching and course design that may be applied to face-to-face, blended, or online courses, both within and across STEM disciplines.

- Attended **SIGSCE TS 2023**, **Illionis Computer Science Summer Teaching Workshop** (2023), **SIGSCE TS 2024** (in March 2024)

- Member of **CS Teaching Slack** (cs-teaching.slack.com)

  A community of CS faculty primarily from North America. I attend monthly meetings.

- Member of **Community for Teaching and CS Education at CMU**(cmuteachingcommunity.slack.com)

  A community for teaching and CS Education at CMU. I attend bi-weekly meetings.

Research Experience

- **Research Assistant**, Carnegie Mellon University
  Aug 2017 - August 2024
  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 cybersecurity.
- **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 prototype.
- **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 Gaussian Quadrature Rule to multivariate problems.

Advising and Mentoring

Undergraduate and master student projects supervised at CMU.

- 2018: Anne Kohlbrenner, now Assistant Teaching Professor at CMU
- 2019: Monica Pardeshi, CS MS at CMU
- 2019: Megan Yu, now Senior Software Engineer at Oscar Health
- 2019: Joshua Slaughter (CMU ISR REUSE student from Univ. Maryland Baltimore County), now PhD candidate studying Biomedical Artificial Intelligence at the University of Edinburg
- 2024: Nicholas Hungria, now Software Engineer at Meta
- 2024: Darshil Kaneria, supervising MS Thesis: *Congestion Control Identification for Video Streaming Platforms*

Service

- **CMU Computer Science Department Faculty Hiring Committee** (2024)
- **CMU Academic Advising Award Committee** (2024)
- **Introductory Programming in Python through Robotics Workshop Co-Facilitator**, Black in Robotics (June 2023, July 2024, August 2024)
- **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)
- **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: June 2025