

Eric J. Rozner

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RESEARCH INTERESTS

My interests are computer systems in general, with an emphasis on datacenter networking, wireless network management, and mobile computing. At IBM, my research primarily focused on datacenter network management. I built tools and platforms that can be used to ensure the operational efficiency of networks as they increase in size, speed, and complexity. I have built tools to minimize network congestion, debug the network, enforce consistent routing updates, and virtualize congestion control in multi-tenant datacenters. I also enjoy working on mobile computing projects at IBM, where I generally focussed on how to enable rich interactions between humans and their co-located devices. Before IBM, I worked on wireless network management at AT&T and in graduate school. I implemented tools to address the fundamental challenges of wireless communication. Specifically, I built tools to plan coverage areas, assign frequency, minimize loss, model interference, and reduce energy usage of mobile devices. In general, I enjoy designing simple solutions to practical issues. I strive to implement my research in realistic environments, and I appreciate studying the technical details of a system to obtain additional insights into a problem and its solution.

EDUCATION

PhD in Computer Science December 2011
Master of Sciences in Computer Science May 2008
Advisor: Professor Lili Qiu
Thesis: *Combating Loss in Wireless Networks*
The University of Texas at Austin, Austin, TX, USA

Bachelor of Science in Computer Science May 2005
Bachelor of Science in Mathematics
The University of Wisconsin-Madison, Madison, WI, USA

RESEARCH POSITIONS

University of Colorado Boulder Boulder, CO, USA
Assistant Professor August 2018 to Present
Tenure-track Assistant Professor in the Computer Science department. Research thrusts in cloud computing, mobile computing, edge computing, and network management.

IBM Research Austin, TX, USA
Research Staff Member, Master Inventor June 2013 to August 2018
Defined and lead projects in datacenter network management and mobile computing. My research built a comprehensive set of network management tools to provide insights into network behavior, enforce state changes in the network, implement policies on customer traffic, and substantially improve performance by reducing network congestion. Papers published in SIGCOMM (2014, 2015, 2016) and HotSDN (2014, x2). My interest in mobile computing investigated how technology can enable humans to more naturally interact with

their environments. Paper published in CHI. Over 65 patents filed, or to be filed, with USPTO.

AT&T Labs - Research

Senior Member of the Technical Staff

Florham Park, NJ, USA

December 2011 to May 2013

Built cellular network management tools to plan heterogenous network deployments. Specifically, developed a rapid channel-sounding system on software-defined radios to quickly and cheaply determine coverage areas of potential *small cell* access nodes (cell towers characterized by limited transmission ranges) in LTE networks. Started projects in distributed spectrum sensing and capacity planning through social media analysis. Published one paper and was granted one patent.

The University of Texas at Austin

Graduate Research Assistant

Austin, TX, USA

September 2005 to December 2011

Advisor: Lili Qiu. Built wireless network management tools to combat loss, model interference, manage spectrum, and improve performance in wireless networks. Developed wireless technologies on a variety of real platforms, including Windows Mesh Connectivity Layer, Click router, Madwifi wireless drivers, and USRP software-defined radios. Published two journal papers (TMC, ToN), seven conference papers (including ICNP, CoNEXT, SIGCOMM, SIGMETRICS, MobiHoc, and MobiCom), and four workshop papers (including HotNets).

Microsoft Research

Research Intern

Redmond, WA, USA

June 2010 to September 2010

Mentor: Ranveer Chandra. Investigated potential of 802.11n technologies for real-time, high-definition video streaming. Performed detailed study of loss under high-performance wireless links in a living room environment. Profiled next-generation 802.11n vendor solutions and modified wireless drivers to obtain insights on characteristics of wireless loss. Work completed over the summer laid the foundation for the wireless controller protocol design for the Xbox One.

Microsoft Research India

Research Intern

Bangalore, India

April 2009 to June 2009

Mentors: Vishnu Navda, Ramachandran Ramjee. Developed and implemented network-based scheduling algorithms to realize power savings for mobile devices in Wi-Fi networks. Work published in MobiSys and featured in front page article on CNN.com.

The University of Wisconsin-Madison

Undergraduate Research Assistant

Madison, WI, USA

January 2005 to September 2005

Mentor: Suman Banerjee. Developed systems for coordinating spectrum management in wireless networks and improving spatial reuse in 802.11 networks by utilizing partially-overlapping channels. Work published in DySPAN and IMC.

The University of Wisconsin-Madison

Undergraduate Research Assistant

Madison, WI, USA

January 2004 to January 2005

Mentor: David DeWitt. Modified API of EMC Centera fixed-content storage system to create an XML database for storage metadata. Benchmarked results and presented to company representatives.

TEACHING

The University of Colorado Boulder Boulder, CO, USA
CSCI 5273 Network Systems Spring 2019
Instructor for graduate network systems course. Responsibilities included lecturing; developing the syllabus, lecture material, and homework; and holding office hours.

The University of Colorado Boulder Boulder, CO, USA
CSCI 4/5253 Datacenter Scale Computing Fall 2018
Instructor for mixed graduate and undergraduate datacenter scale computing course. Responsibilities included lecturing; developing the syllabus, lecture material, and homework; and holding office hours. Course was last taught in Fall 2014, overhaul of syllabus and content required due to practical nature of class. Course also contained distance learning section.

The University of Texas at Austin Austin, TX, USA
CS356 Computer Networks Instructor Spring 2015
Instructor for undergraduate computer networking course. Responsibilities included lecturing twice per week; developing the syllabus, lecture material, and homework; and holding office hours.

The University of Texas at Austin Austin, TX, USA
CS386 Wireless Networks Teaching Assistant Fall 2011
Graded students' critiques of journal and conference papers and held office hours for a graduate class in wireless networking.

The University of Texas at Austin Austin, TX, USA
CS108 Intro to Linux Assistant Instructor 2009-2011
Instructor for Introduction to Linux undergraduate course. Responsibilities included lecturing once per week; developing the syllabus, lecture material, and homework; and holding office hours. Course content focused on teaching students to administer a Linux-based system and become familiar with tools to successfully use Linux as a programming environment. Student-submitted instructor ratings were 4.3, 4.4 and 4.4 out of a 5.0 scale (school average was 4.0/5.0).

The University of Texas at Austin Austin, TX, USA
CS375 Compilers Teaching Assistant Summer 2009
Graded homework and held office hours for an undergraduate class in compilers.

The University of Wisconsin-Madison Madison, WI, USA
Volunteer Tutor 2004
Provided drop-in tutoring assistance to students in mathematics and computer science.

PUBLICATIONS

Journals

1. [Eric Rozner](#), Mi Kyung Han, Lili Qiu, Yin Zhang. "Model-driven Optimization of Opportunistic Routing." *IEEE/ACM Transactions on Networking (ToN)*, 2012.
2. [Eric Rozner](#), Jayesh Seshadri, Yogita Ashok Mehta, Lili Qiu. "SOAR: Simple Oppor-

tunistic Adaptive Routing Protocol for Wireless Mesh Networks.” *IEEE Transactions on Mobile Computing (TMC)*, 2009.

Conferences

1. Junaid Khalid, Eric Rozner, Wes Felter, Cong Xu, Karthick Rajamani, Alex Ferreira, Aditya Akella. “Iron: Isolating Network-based CPU in Container Environments.” *USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, Renton, WA, USA, 2018.
2. Keqiang He, Eric Rozner, Kanak Agarwal, Yu Gu, Wes Felter, John Carter, Aditya Akella. “AC/DC TCP: Virtual Congestion Control Enforcement for Datacenter Networks.” *ACM SIGCOMM Conference*, Florianopolis, Brazil, August 2016.
3. Chungkuk Yoo, Inseok Hwang, Eric Rozner, Yu Gu, Robert Dickerson. “SymmetriSense: Enabling Near-Surface Interactivity on Glossy Surfaces using a Single Commodity Smartphone.” *ACM CHI*, San Jose, CA, USA, May 2016.
4. Keqiang He, Eric Rozner, Kanak Agarwal, Wes Felter, John Carter, Aditya Akella. “Presto: Edge-based Load Balancing for Fast Datacenter Networks.” *ACM SIGCOMM Conference*, London, UK, August 2015.
5. Jeff Rasley, Brent Stephens, Colin Dixon, Eric Rozner, Wes Felter, Kanak Agarwal, John Carter, Rodrigo Fonseca. “Planck: Millisecond-scale Monitoring and Control for Commodity Networks.” *ACM SIGCOMM Conference*, Chicago, IL, USA, August 2014.
6. Muhammad Nazmul Islam, Byoung-Jo Kim, Paul Henry, Eric Rozner. “A Wireless Channel Sounding System for Rapid Propagation Measurements.” *IEEE International Conference on Communications (ICC)*, Budapest, Hungary, June 2013.
7. Tianji Li, Mi Kyung Han, Apurv Bhartia, Lili Qiu, Eric Rozner, Yin Zhang, Brad Zarikoff. “CRMA: Collision-Resistant Multiple Access.” *ACM International Conference on Mobile Computing and Networking (MobiCom)*, Las Vegas, NV, USA, September 2011.
8. Mi Kyung Han, Apurv Bhartia, Lili Qiu, Eric Rozner. “Optimized Overlay-based Opportunistic Routing.” *ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc)*, Paris, France, May 2011.
9. Eric Rozner, Mi Kyung Han, Lili Qiu, Yin Zhang. “Accurate Model-Driven Optimization of Opportunistic Routing.” *ACM International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS)*, San Jose, CA, USA, June 2011.
10. Eric Rozner, Vishnu Navda, Ramachandran Ramjee, Shravan Rayanchu. “NAPman: Network-Assisted Power Management for WiFi Devices.” *International Conference on Mobile Systems, Applications and Services (MobiSys)*, San Francisco, CA, USA, June 2010.
11. Yi Li, Lili Qiu, Yin Zhang, Ratul Mahajan, Eric Rozner. “Predictable Performance Optimization for Wireless Networks.” *ACM SIGCOMM Conference*, Seattle, WA, USA, August 2008.
12. Eric Rozner, Anand Padmanabha Iyer, Yogita Mehta, Lili Qiu, Mansoor Jafry. “ER: Efficient Retransmission Scheme for Wireless LANs.” *ACM International Conference on Emerging Networking Experiments and Technologies (CoNEXT)*, New York, NY, USA, December 2007.

13. Eric Rozner, Yogita Ashok Mehta, Aditya Akella, Lili Qiu. “Traffic-Aware Channel Assignment in Wireless LANs.” *IEEE International Conference on Network Protocols (ICNP)*, Beijing, China, October 2007.
14. Vladimir Brik, Eric Rozner, Suman Banerjee, Paramvir Bahl. “DSAP: A Protocol for Coordinated Spectrum Access.” *IEEE Dynamic Spectrum Access Networks (DySPAN)*, Baltimore, MD, USA, November 2005.
15. Arunesh Mishra, Eric Rozner, Suman Banerjee, William Arbaugh. “Exploiting Partially Overlapped Channels in Wireless Networks: Turning a Peril Into an Advantage.” *Internet Measurement Conference (IMC)*, Berkeley, CA, USA, October 2005.

Workshops

1. Zaid Al-Ali, Sepideh Goodarzy, Ethan Hunter, Sangtae Ha, Richard Han, Eric Keller, Eric Rozner. “Making Serverless Computing More Serverless.” *International Workshop on Serverless Computing (WoSC)*, San Francisco, CA, USA, July 2018.
2. Kanak Agarwal, Colin Dixon, Eric Rozner, John Carter. “Shadow MACs: Scalable Label-switching for Commodity Ethernet.” *ACM SIGCOMM Workshop on Hot Topics in Software Defined Networking (HotSDN)*, Chicago, IL, USA, August 2014.
3. Kanak Agarwal, Eric Rozner, Colin Dixon, John Carter. “SDN traceroute: Tracing SDN Forwarding without Changing Network Behavior.” *ACM SIGCOMM Workshop on Hot Topics in Software Defined Networking (HotSDN)*, Chicago, IL, USA, August 2014.
4. Jeff Rasley, Brent Stephens, Colin Dixon, Eric Rozner, Wes Felter, Kanak Agarwal, John Carter, Rodrigo Fonseca. “Low-latency Network Monitoring via Oversubscribed Port Mirroring.” *Open Networking Summit (Research Track)*, Santa Clara, CA, USA, March 2014.
5. Anand Padmanabha Iyer, Gaurav Deshpande, Eric Rozner, Apurv Bhartia, Lili Qiu. “Fast Resilient Jumbo Frames in Wireless LANs.” *IEEE International Workshop on Quality of Service (IWQoS)*, Charleston, SC, USA, July 2009.
6. Yi Li, Lili Qiu, Yin Zhang, Ratul Mahajan, Zifei Zhong, Gaurav Deshpande, Eric Rozner. “Effects of Interference on Throughput of Wireless Mesh Networks: Pathologies and a Preliminary Solution.” *ACM Workshop on Hot Topics in Networks (HotNets-VI)*, Atlanta, GA, USA, November 2007.
7. Eric Rozner, Jayesh Seshadri, Yogita Ashok Mehta, Lili Qiu. “SOAR: Simple Opportunistic Routing in Wireless Mesh Networks.” *IEEE Workshop on Wireless Mesh Networks (WiMesh)*, Reston, VA, USA, September 2006.
8. Eric Rozner, Yogita Ashok Mehta, Aditya Akella, Lili Qiu. “Traffic-Aware Channel Assignment in Wireless LANs.” *ACM Mobile Computing and Communications Review (MC2R), Special Feature on MobiCom 2006 SRC Posters*, September 2006.

AWARDS

- IEEE INFOCOM Distinguished TPC Member Award, 2017-2019.
- IBM 20th Level Plateau Award, 2018.
- IBM Invention Development Team (IDT) Award, 2017.
- Master Inventor, IBM, 2016.

- Manager's Choice Award, IBM, 2015-2017.
- Technical Recognition Award, IBM, 2015.
- Vice President Labs Recognition Award, AT&T, 2012.
- James C. Browne Graduate Fellowship, UT-Austin, 2010.
- Graduate Student Professional Development Award, UT-Austin, 2007, 2011.
- Micro-electronics and Computer Development (MCD) Fellowship, UT-Austin, 2005.
- Dean's Excellence Award, UT-Austin, 2005.

MEDIA COVERAGE

- **How Wi-Fi Drains Your Cell Phone**, MIT Technology Review, June 2010.
(<http://www.technologyreview.com/communications/25651/page1/?a=f>)
- **New Ways To Double Phone Battery Life**, CNN.com, June 2010.
(<http://www.cnn.com/2010/TECH/innovation/06/24/mobile.phone.battery.life/>)

ACTIVITIES

Service

- Computer Science Computing Committee Co-chair, University of Colorado, 2018-2019.
- Participant and Scribe, NSF Extreme Wireless Visioning Workshop, 2017.
- Invention Development Team, IBM, 2016-2018.
- NSF Proposal Review Panel (2015, 2018).
- New Hire Committee, AT&T, 2012 (Core member), 2013 (Chair).
- Masters Admissions Committee, UT-Austin Computer Sciences (UTCS), 2010.
- Executive Committee, UTCS Graduate Representative Association, 2005-2006.
- Organizer, UTCS GradFest, 2006 (visitation weekend for accepted graduate students).
- Volunteer: Blue Dog Rescue, Austin Pets Alive, Divine Canines Therapy Dog Team.

General Chair

- ACM Symposium on SDN Research (SOSR 2019).

Co-Organizer

- PhD Forum on Mobile Systems, Applications, and Services. ACM MobiSys 2011.

Technical Program Committee

- ACM Symposium on SDN Research (SOSR 2017, 2019).
- ACM Workshop on Mobile Computing Systems and Applications (HotMobile 2016, 2019).
- IEEE Conference on Computer Communications (INFOCOM 2016, 2017, 2018, 2019).
- ACM International Conference on emerging Networking EXperiments and Technologies (CoNext 2018).
- ACM Conference on Mobile Computing and Networking (MobiCom 2013, 2015, 2017, 2018).

- IEEE International Conference on Computer Communication and Networks (ICCCN 2018).
- IEEE Conference on Sensing, Communication, and Networking (SECON 2015, 2018).
- IEEE International Conference on Distributed Computing Systems (ICDCS 2018).
- IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing (CCGrid 2018).
- IEEE Conference on Communication Systems and Networks (COMSNETS 2015, 2016, 2018).
- IEEE International Conference on Network Protocols (ICNP 2016, 2017, 2018).
- ACM Workshop on Challenged Networks (CHANTS 2016, 2017).
- International Teletraffic Congress (ITC 2017).
- ACM Workshop for Context Sensing and Activity Recognition (2015).
- IEEE Symposium on New Frontiers in Dynamic Spectrum Access Networks (DySPAN 2012). Demonstrations Committee.

External Review Committee

- ACM International Conference on Mobile Systems, Applications, and Services (MobiSys 2018).

Invited Panelist

- Future of Serverless in Industry and Academia, Workshop on Serverless Computing (2018).
- Emerging Directions in Communications, Texas Wireless Summit (2017).

Finance Chair

- ACM Conference on Mobile Computing and Networking (MobiCom 2019).

Publicity/Social Media Chair

- ACM Conference on Embedded Networked Sensor Systems (SenSys 2015).
- IEEE Symposium on Local and Metropolitan Area Networks (LANMAN 2014).
- ACM Workshop on Wireless Network Testbeds, Experimental Evaluation and Characterization (WiNTECH 2012).
- IEEE International Conference on Network Protocols (ICNP 2012).

Publications Chair

- IEEE Conference on Sensing, Communication, and Networking (SECON 2016).

Web Chair

- IEEE Conference on Sensing, Communication, and Networking (SECON 2012, 2013).
- ACM Workshop on Wireless Network Testbeds, Experimental Evaluation and Characterization (WiNTECH 2012).

Poster/Demo Chair

- ACM Workshop on Mobile Computing Systems and Applications (HotMobile 2016).

PATENTS

65 patents filed, or to be filed, with USPTO at IBM. One patent granted at AT&T.

STUDENT INTERNS

- IBM
 - Chungkuk Yoo (2015, 2017), KAIST, *Google PhD Fellowship*.
 - Junaid Khalid (2016), UW-Madison.
 - Wenzhi Cui (2015), UT-Austin.
 - Keqiang He (2014, 2015), UW-Madison, *Lawrence Landweber NCR Fellowship*.
 - Brent Stephens (2013), Rice University, *IBM PhD Fellowship*.
 - Jeff Rasley (2013), Brown University, *NSF Graduate Research Fellowship*.
- AT&T
 - Muhammad Nazmul Islam (2012), Rutgers University.

INVITED TALKS

- Hardening Isolation and Generalizing Abstractions in Serverless Environments. UW-Madison Datacenter Networking Workshop. 2018.
- Making Serverless Computing More Serverless. Workshop on Serverless Computing. 2018.
- Network Management for Multi-Tenant Cloud Environments. KAIST, UT Austin. 2018.
- Comprehensive Network Management. CU-Boulder, UW-Madison, UC-Davis, University of Minnesota. 2017.
- Edge-based Network Management to Support High Bandwidth, Low Latency Applications in the Datacenter. Duke University. 2016.

THESIS AND DISSERTATION COMMITTEES

- Doctoral Dissertation Committee
 - Blake Caldwell, CU-Boulder, “FluidMem: Open Source Full Memory Disaggregation”, 2019.
 - Rahat Ibn Rafiq, CU-Boulder, “Scalable and Timely Detection of Cyberbullying in Online Social Networks”, 2018.
 - Junaid Khalid, UW-Madison, “Paving the Way for NFV”, 2018.
 - Chungkuk Yoo, KAIST, “Mobile-crowd Service for In-situ Instant Collective Visualization of a Massively Packed Crowd”, 2018.
 - Keqiang He, UW-Madison, “Improving Datacenter Network Performance via Intelligent Network Edge”, 2017.
- Senior Capstone
 - Derek Richards, Dustin Martin, Samuel Flanagan, Shelby Unger, Texas A&M, “IBM Senior Assistant”, 2018, *Capstone Best Project Award*.

FUNDING

- Amazon AWS credits for course, 2018. (\$8,300)
- Google Cloud credits for course, 2018. (\$5,400)

CITIZENSHIP

United States of America.