

SHADDI HASAN

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4205 Gilbert Place, 220 Gilbert St., Blacksburg, VA 24060

RESEARCH INTERESTS

Computer networks, ICTD, wireless networks, spectrum sharing, network management.

ACADEMIC

Assistant Professor	<i>2021 - Present</i>
Department of Computer Science Virginia Polytechnic Institute and State University	
Ph.D., Computer Science	<i>2019</i>
University of California, Berkeley <i>Thesis: Towards Scalable Community Networks</i> Advisor: Eric Brewer	
M.S., Computer Science	<i>2013</i>
University of California, Berkeley Advisor: Eric Brewer	
B.S., Computer Science	<i>2010</i>
University of North Carolina at Chapel Hill Highest Honors and Highest Distinction	

AWARDS AND HONORS

Community Award, NSDI	<i>2019, 2023</i>
Best Paper Award, ACM DEV	<i>2015</i>
Best Paper Award, IEEE DySPAN	<i>2014</i>
Outstanding Graduate Student Instructor Award	<i>2012</i>
National Science Foundation Graduate Research Fellowship	<i>2010</i>
UC Berkeley Chancellor's Fellowship for Graduate Study	<i>2010</i>
UC Berkeley Computer Science Excellence Award	<i>2010</i>
UNC-Chapel Hill Order of the Golden Fleece	<i>2010</i>
UNC-Chapel Hill Order of the Grail-Valkyries	<i>2010</i>
UNC-Chapel Hill Dunham Scholarship Nominee	<i>2008</i>
UNC-Chapel Hill Carolina Scholar	<i>2006</i>
National Merit Scholar	<i>2006</i>
Coca-Cola National Scholar	<i>2006</i>

PUBLICATIONS

Refereed Conference or Journal Publications

Building Flexible, Low-Cost Wireless Access Networks with Magma

Shaddi Hasan, Amar Padmanabhan, Bruce Davie, Jennifer Rexford, Ulas Kozat, Hunter Gatewood, Shruti Sanadhya, Nick Yurchenko, Tariq Al-Khasib, Oriol Batalla, Marie Bremner, Andrei Lee, Evgeniy Makeev, Scott Moeller, Alex Rodriguez, Pravin Shelar, Karthik Subraveti, Sudarshan Kandi, Alejandro Xoconostle, Praveen Kumar Ramakrishnan, Xiaochen Tian, Anoop Tomar. *USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, 2023. **Community Award.**

LOCA: A Location-Oblivious Cellular Architecture

Zhihong Luo, Silvery Fu, Natacha Crooks, Shaddi Hasan, Christian Maciocco, Sylvia Ratnasamy, Scott Shenker. *USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, 2023.

Democratizing Cellular Access with CellBricks

Zhihong Luo, Silvery Fu, Mark Theis, Shaddi Hasan, Sylvia Ratnasamy, Scott Shenker. *ACM SIGCOMM*, 2021.

Scaling Community Cellular Networks with CommunityCellularManager

Shaddi Hasan, Mary Claire Barela, Matthew Johnson, Eric Brewer, Kurtis Heimerl. *USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, 2019. **Community Award**.

An Investigation of Phone Upgrades in Remote Community Cellular Networks

Kushal Shah, Philip Martinez, Emre Tepedelenioglu, Shaddi Hasan, Cedric Festin, Joshua Blumenstock, Josephine Dionisio, Kurtis Heimerl. *International Conference on Information and Communication Technologies for Development (ICTD)*, 2017.

The Challenges of Scaling WISPs

Shaddi Hasan, Yahel Ben-David, Max Bittmann, Barath Raghavan. *ACM Symposium on Computing for Development (ACM DEV)*, 2015. **Best Paper Award**.

A Longitudinal Study of Local, Sustainable, Small-Scale Cellular Networks

Kurtis Heimerl, Shaddi Hasan, Kashif Ali, Eric Brewer, Tapan Parikh. *Information Technologies and International Development (ITID)*, 2015.

Analysis of Smartphone Adoption and Usage in a Rural Community Cellular Network

Kurtis Heimerl, Anuvind Menon, Shaddi Hasan, Kashif Ali, Eric Brewer, Tapan Parikh. *International Conference on Information and Communication Technologies for Development (ICTD)*, 2015.

GSM Whitespaces: An Opportunity for Rural Cellular Service

Shaddi Hasan, Kurtis Heimerl, Kate Harrison, Kashif Ali, Sean Roberts, Anant Sahai, Eric Brewer. *IEEE Symposium on Dynamic Spectrum Access Networks (IEEE DySPAN)*, 2014. **Best Paper Award**.

An Experiment in Reducing Cellular Base Station Power Draw with Virtual Coverage

Kurtis Heimerl, Shaddi Hasan, Kashif Ali, Tapan Parikh, Eric Brewer. *ACM Symposium on Computing for Development (ACM DEV)*, 2013.

Local, Sustainable, Small-Scale Cellular Networks

Kurtis Heimerl, Shaddi Hasan, Kashif Ali, Eric Brewer, Tapan Parikh. *International Conference on Information and Communication Technologies for Development (ICTD)*, 2013.

Making Middleboxes Someone Else's Problem: Network Processing in the Cloud

Justine Sherry, Shaddi Hasan, Colin Scott, Arvind Krishnamurthy, Sylvia Ratnasamy, Vyas Sekar. *ACM SIGCOMM*, 2012.

Towards Traffic Benchmarks for Empirical Networking Research: The Role of Connection Structure in Traffic Workload Modeling

Jay Aikat, Shaddi Hasan, Kevin Jeffay, F. Donelson Smith. *IEEE International Symposium On Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (IEEE MASCOTS)*, 2012.

Invited Journal Publications

Building Flexible, Low-Cost Wireless Access Networks with Magma

Shaddi Hasan, Amar Padmanabhan, Bruce Davie, Jennifer Rexford, Ulas Kozat, Hunter Gatewood, Shruti Sanadhya, Nick Yurchenko, Tariq Al-Khasib, Oriol Batalla, Marie Bremner, Andrei Lee, Evgeniy Makeev, Scott Moeller, Alex Rodriguez, Pravin Shelar, Karthik Subraveti, Sudarshan Kandi, Alejandro Xoonostle, Praveen Kumar Ramakrishnan, Xiaochen Tian, Anoop Tomar. *GetMobile: Mobile Computing and Communications*, 2023.

A Longitudinal Study of Local, Sustainable, Small-Scale Cellular Networks

Kurtis Heimerl, Shaddi Hasan, Kashif Ali, Eric Brewer, Tapan Parikh. *Information Technologies and International Development (ITID)*, 2015.

Refereed Workshop Papers

What's My Daily Value? Interpretation of Network Performance Metrics in Broadband Consumer Labels

Wesley Woo, Shaddi Hasan. *Second Workshop on Situating Network Infrastructure with People, Practices, and Beyond (SNIP2+)*, 2023.

Macroscopically Sustainable Networking: On Internet Quines

Barath Raghavan, Shaddi Hasan. *Second Workshop on Computing within Limits (LIMITS)*, 2016.

A Longitudinal Study of Local, Sustainable, Small-Scale Cellular Networks

Kurtis Heimerl, Shaddi Hasan, Kashif Ali, Eric Brewer, Tapan Parikh. *Information Technologies and International Development (ITID)*, 2015.

Building Dissent Networks: Towards Effective Countermeasures against Large-Scale Communications Blackouts

Shaddi Hasan, Yahel Ben-David, Giulia Fanti, Eric Brewer, Scott Shenker. *USENIX Workshop on Free and Open Communications on the Internet (USENIX FOCI)*, 2013.

Discrete-Approximation of Measured Round Trip Time Distributions: A Model for Network Emulation

Jay Aikat, Shaddi Hasan, Kevin Jeffay, F. Donelson Smith. *GENI Research and Education Experiment Workshop (GREE)*, 2012.

Computing Security in the Developing World: A Case for Multidisciplinary Research

Yahel Ben-David, Shaddi Hasan, Joyojeet Pal, Matthias Vallentin, Saurabh Panjwani, Philip Gutheim, Jay Chen, Eric Brewer. *ACM Workshop on Network Systems for Developing Regions (NSDR)*, 2011.

Theses

Towards Scalable Community Networks

Shaddi Hasan. PhD Dissertation, UC Berkeley, 2019. Department of Electrical Engineering and Computer Science, Technical Report UCB/EECS-2019-67.

Designing Networks for Large-Scale Blackout Circumvention

Shaddi Hasan. Masters Report, UC Berkeley, 2013. Department of Electrical Engineering and Computer Science, Technical Report UCB/EECS-2013-230.

What If? Scaling Network Traffic for Realistic Experimentation

Shaddi Hasan. Undergraduate Honors Thesis, UNC Chapel Hill, 2010. Department of Computer Science.

Posters

Syed Tauhidun Nabi, Miguel Alonso, and Shaddi Hasan. “Red is Sus: Automated Identification of Low Quality Service Availability Claims in the US National Broadband Map,” in *TPRC51*. 2023

Shaddi Hasan, Yahel Ben-David, Colin Scott, Eric Brewer, and Scott Shenker. “Enhancing Rural Connectivity with SDN,” in *ACM DEV*. 2013

Kristin Stephens, Shaddi Hasan, and Yahel Ben-David. “MultiWAN: WAN Aggregation for Developing Regions,” in *ACM DEV*. 2012.

Jay Aikat, Shaddi Hasan, Kevin Jeffay, and F. Donelson Smith. “Critical Choices in Measurement-Driven Traffic Generation for Empirical Networking Research,” in *UNC Chapel Hill University Research Day*. 2011.

Technical Reports

Enabling Rural Connectivity with SDN

Shaddi Hasan, Yahel Ben-David, Colin Scott, Eric Brewer, Scott Shenker. UC Berkeley Technical Report UCB/EECS-2012-201, 2012.

INDUSTRY EXPERIENCE

Software Engineer, Facebook

September 2015 - June 2021

Expanding rural Internet access with Facebook Connectivity. Started the Magma EPC project.

Co-Founder/CTO, Endaga

December 2013 - September 2015

Developed tools and services for building community cellular networks. Acquired by Facebook.

Software Engineering Intern, Nicira (now vmWare)

Summer 2012

Developed a randomized testing framework for software defined network applications and controller software.

Developer, Veer Labs / MalariaRADAR Project

August 2009 - July 2010

Developed camera driver and image processing software for a low-cost, high-throughput, microscopy-based malaria diagnostic and screening tool.

Research Intern, NASA Jet Propulsion Lab

Summer 2009

Designed and implemented a software framework for applications on a wall-sized multitouch display as part of the NASA Undergraduate Summer Research Program.

Program Manager Intern, Microsoft

Summer 2008

Designed and prototyped a chat-based mobile advertising platform.

RESEARCH FUNDING

NSF: RINGS: Reshaping the Last Mile for High Availability and Resilience

2022

Decoupling last-mile infrastructure from the network core in next-generation cellular networks. Joint with Sylvia Ratnasamy and Scott Shenker. Budget: \$900,000.

TALKS AND PRESENTATIONS

Rural Access: Lessons From the Edge

UW/MSR Summer Institute (Semiahmoo, WA)

August 2023

Building Flexible, Low-Cost Wireless Access Networks with Magma

USENIX NSDI 2023 (Boston, MA)

April 2023

Lessons From the Edge: What Rural Connectivity Teaches Us About Next-Generation Networks

Princeton Center for Information Technology Policy (Princeton, NJ)

November 2022

Making Sense of Digital Cents: The Mechanics of Digital Currencies with Potential Applications to Agriculture

Rockbridge County Farm Bureau Federation (Lexington, VA)

October 2021

Appalachian Electric Power (virtual)

March 2022

Access Networks as a Service in the Modern Internet

ARLIS Workshop on Network Sharing (virtual)

July 2021

When Community Meets Commercial

X4D Series (virtual)

December 2020

Democratizing Service Provider Networks

University of Texas at Austin (Austin, TX)

March 2020

UC Berkeley (Berkeley, CA)

March 2020

Carnegie Mellon University (Pittsburgh, PA)

March 2020

Virginia Tech (Blacksburg, VA)

February 2020

University of Maryland, College Park (College Park, MD)

February 2020

University of Tennessee, Knoxville (Knoxville, TN)

February 2020

Georgia Tech (Atlanta, GA)

January 2020

Towards Scalable Community Networks

Bahir Dar University (Bahir Dar, ET)

August 2019

UC Berkeley (Berkeley, CA)

May 2019

Rural Connectivity

Guest Lecture, CSCI499 Computing for Social Good, USC (Los Angeles, CA)

April 2019

Guest Lecture, CS268 Computer Networks, UC Berkeley (Berkeley, CA)

April 2019

Alternative Infrastructures

Guest Lecture, INFO283 ICTD, UC Berkeley (Berkeley, CA)

April 2019

Scaling Community Cellular Networks with CommunityCellularManager

USC Network Systems Lab Seminar (Los Angeles, CA)

April 2019

USENIX NSDI 2019 (Boston, MA)

February 2019

Wireless Applications

Topic Preview Session, USENIX NSDI 2019 (Boston, MA)

February 2019

The Challenges of Scaling WISPs

ACM DEV 2015 (London, UK)

December 2015

Connecting Internet in Rural Areas

MIT Enterprise Forum Mexico (Guadalajara, MX)

March 2015

GSM Whitespaces: An Opportunity for Rural Cellular Service

IRTF GAIA 2014 (San Jose, CA)

December 2014

IEEE DySPAN 2014 (McLean, VA)

April 2014

How Can Regulation Accommodate Future Innovations?

Panel, Dynamic Spectrum Alliance Summit (Accra, Ghana)

December 2014

Community Cellular Networks

Berkeley EECS Annual Research Symposium (Berkeley, CA)

February 2014

Building Dissent Networks

USENIX FOCI 2013 (Washington, DC)

August 2013

Computing Security in the Developing World

ACM NSDR 2011 (Washington, DC)

June 2011

TEACHING EXPERIENCE

CS5566: Network Architecture and Protocols, Virginia Tech 2023**CS4254/5565: Computer Network Architecture and Programming**, Virginia Tech 2021, 2022, 2023**CS6204: Computing and Social Good**, Virginia Tech 2022**EE 122: Computer Networks**, Graduate Student Instructor, UC Berkeley Fall 2011, Fall 2012

Developed “reliable transport” project, now used by hundreds of students across three semesters. Received “Outstanding GSI Award” in Fall 2011.

COMP 60: Robotics with Lego, Teaching Assistant, UNC Chapel Hill Fall 2009, Spring 2010

Co-developed the curriculum and all weekly projects for an innovative general-interest introduction to programming course for first-year students. Led transition of course to instruction in Java.

ADVISING

Current Advising

Demetrius Davis (PhD) 2021 - Present

Syed Tauhidun Nabi (PhD) 2022 - Present

Wesley Woo (PhD) *ICTAS Fellowship* 2022 - Present

Jamous Bitrick (MS) 2023 - Present

Past Advising

Zahra Yazdani (BS) 2021 - 2023 (first position: Georgia Tech PhD)

Thesis Committee

Morva Saaty (advisor: Scott McCrickard) - PhD Expected 2025

André Gomes (advisors: Luiz DaSilva and Jacek Kibilda) - PhD 2023

Matthew Johnson (advisor: Kurtis Heimerl) - PhD 2022

Jaitun Patel (advisor: Scott McCrickard) - MS 2023

Kunal Gusain (advisor: Jeffery Reed) - MS 2022

Molly Hickman (advisor: Sang Won Lee) - MS 2021

SERVICE

Steering Committee, ACM COMPASS 2024

Treasurer, ACM COMPASS 2023

Sponsorship Chair, ACM COMPASS 2022

Program Committee, ACM COMPASS 2018, 2020, 2021, 2022, 2024

Program Committee, ACM CoNEXT 2024

Program Committee, ACM LIMITS 2023

Program Committee, ICCCN 2023

Program Committee, ACM ICTD 2016, 2019, 2020, 2022

Program Committee, IMC 2022, 2024

Program Committee, USENIX NSDI 2025

Reviwer, PNAS	2022
Reviwer, CSCW	2021, 2022, 2023
Merit Grant Reviewer, NTIA Tribal Broadband Connectivity Program	2021
Reviwer, ACM CHI	2018
Reviewer, ACM LIMITS	2017
Program Committee, ACM DEV	2016
Reviwer, ACM CHI Works In Progress	2013, 2014
Co-founder, UNC Technology Without Borders	2009 - 2010
Co-founder, UNC Computer Science Club Peer Tutoring program	2009 - 2010
Lead Developer, Orangemesh (first open-source mesh network management tool)	2008 - 2010