

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

2021 - Present

Department of Computer Science

Virginia Polytechnic Institute and State University

Ph.D., Computer Science

2019

University of California, Berkeley

Thesis: Towards Scalable Community Networks

Advisor: Eric Brewer

M.S., Computer Science

2013

University of California, Berkeley

Advisor: Eric Brewer

B.S., Computer Science

2010

University of North Carolina at Chapel Hill

Highest Honors and Highest Distinction

AWARDS AND HONORS

Community Award, NSDI

2019, 2023

Best Paper Award, ACM DEV

2015

Best Paper Award, IEEE DySPAN

2014

Outstanding Graduate Student Instructor Award

2012

National Science Foundation Graduate Research Fellowship

2010

UC Berkeley Chancellor's Fellowship for Graduate Study

2010

UC Berkeley Computer Science Excellence Award

2010

UNC-Chapel Hill Order of the Golden Fleece

2010

UNC-Chapel Hill Order of the Grail-Valkyries

2010

UNC-Chapel Hill Dunham Scholarship Nominee

2008

UNC-Chapel Hill Carolina Scholar

2006

National Merit Scholar

2006

Coca-Cola National Scholar

2006

PUBLICATIONS

Refereed Conference or Journal Publications

Red is Sus: Automated Identification of Low-Quality Service Availability Claims in the US National Broadband Map

Syed Tauhidun Nabi, Zhuowei Wen, Brooke Ritter, Shaddi Hasan. *ACM Internet Measurement Conference (IMC)*, 2024.

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**.

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 Xoconostle, 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.

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

3D-CHESS FO: Autonomous sensor web for inland water ecosystem monitoring

Sponsor: NASA

Investigator(s): George ALlen, Cayelan Carey, Cedric David, Huilin Gao, Shaddi Hasan, Ankur Mehta, Vinay Ravindra, Daniel Selva (PI), Robert Quinn Thomas

Amount: \$1,398,092 for 2 years

Awarded: 2024

Conference: ReDDoT Phase 1: Workshop: Situating Network Infrastructure with People, Practices, and Beyond

Sponsor: National Science Foundation

Investigator(s): Shaddi Hasan (PI) (*Co-organized with Kurtis Heimerl and Morgan Vigil-Hayes*)

Amount: \$74,773 for 1 year

Awarded: 2024

CIVIC-PG Track B: Enhancing Digital Inclusion in Rural Tribal Communities with Dynamically Reliable Mobile Broadband

Sponsor: National Science Foundation

Investigator(s): Shaddi Hasan (PI) (*Collaboration with the Nez Perce Tribe*)

Amount: \$74,992 for 1 year

Awarded: 2024

RINGS: Reshaping the Last Mile for High Availability and Resilience

Sponsor: National Science Foundation

Investigator(s): Shaddi Hasan, Sylvia Ratnasamy (PI), Scott Shenker

Amount: \$900,000 for 3 years

Awarded: 2022

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****CS6204: Computing and Social Good**, Virginia Tech*2022, 2024***CS5566: Network Architecture and Protocols**, Virginia Tech*2023***CS4254/5565: Computer Network Architecture and Programming**, Virginia Tech*2021, 2022, 2023***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

Syed Tauhidun Nabi (PhD)	2022 - Present
Wesley Woo (PhD) <i>ICTAS Fellowship</i>	2022 - Present
Zhuowei Wen (MS)	2024 - Present
Jamous Bitrick (MS)	2023 - Present

Past Advising

Zahra Yazdani (BS)	2021 - 2023 (next: Georgia Tech PhD)
Jonathan Waldrep (BS)	2024 (next: Virginia Tech Division of IT)

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 Chair, ACM COMPASS	2024 - Present
Steering Committee, ACM COMPASS	2023 - Present
Treasurer, ACM COMPASS	2023
Sponsorship Chair, ACM COMPASS	2022
Technical Advisory Board Member, Linux Foundation Connectivity	2023 - Present
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
Reviewer, PNAS	2022
Reviewer, CSCW	2021, 2022, 2023
Merit Grant Reviewer, NTIA Tribal Broadband Connectivity Program	2021
Reviewer, ACM CHI	2018
Reviewer, ACM LIMITS	2017
Program Committee, ACM DEV	2016
Reviewer, 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