

Projects and Work Experience

CoLTE Project Maintainer– Seattle, WA 2017-Present
Developed a standalone LTE network for rural communities in collaboration with other researchers and community partners. Implemented software and hardware deployed in multiple field sites with partner organizations. Measured and reported long-term usage and performance metrics.

Seattle Community Network– Seattle, WA 2019-Present
Founding board member of nonprofit focused on digital equity and local empowerment in the Puget Sound. Assisted deploying and maintaining community-run CBRS LTE networks serving difficult to reach populations around anchor institutions including schools, libraries, and community centers.

(Google) X, The Moonshot Factory Intern– Mountain View, CA 2017
Developed production network diagnostic tools and services for the Project Loon backhaul network. Researched the team's network debug workflows and suggested improvements to decrease diagnostic and repair time.

TrellisWare Technologies SW Engineer– San Diego, CA 2013-16
Architected updates to an embedded networking MAC to for data rate adaptation, quality of service, and adaptive resource allocation. Implemented software in a real-time operating systems operating on OMAP3 and i.MX6. Led SW team in the expansion of radio's situational awareness subsystem.

National Instruments Hardware Intern, Austin, TX 2012
Gathered market information, then specified, designed, and prototyped hardware to interface the MyRIO platform with 3rd party daughtercards.

Rice Center for Multimedia Communication, Houston, TX 2010-2011
Designed and tested prototype GPU-based accelerators to speed up Wireless Open-Access Research Platform (WARP) data processing.

Teaching, Mentoring, and Leadership

[Planned] CSE-461 Instructor – Seattle, WA 2021
Primary instructor for the 100+ student undergraduate computer networks elective. Updating course materials and assignments for hybrid learning and re-working wireless network content to include basics of cellular networks.

ICTD Lab Undergrad Research Mentor – Seattle, WA 2016-Present
Mentored undergraduates in my lab in conducting research. Primary mentor for 4 students, supplementary mentor for 10+ additional students.

CSE-461 "Head" TA – Seattle, WA 2019
Updated course infrastructure, led discussion session, coordinated grading, and delivered 4 lectures. Provided help via office hours and message board.

Biomedical Student Training – Jimma, Ethiopia 2013
Mentored engineering students on final project designs and presentations.

Empower STEM Expo Coordinator – Houston, TX 2012-13
Managed 150 visiting students and 50+ advisors. Solicited faculty to lead age appropriate sessions inspiring interest in continuing STEM education.

MSP430 Lab Design and Teaching – Houston, TX 2010-12
Evaluated new hardware and lessons for a re-designed computer engineering lab. Wrote new labs with feedback from students.

Education

U. Washington, Seattle – CS Ph.D. 2016- [2021Sp]
GPA: 3.93
Research Areas: ICTD, Community Cellular Networking

Rice University – BS in Electrical Engineering 2009-13
GPA: 3.97, Magna Cum Laude
Specializations: Systems & Signals, Computer Engineering
Other Coursework: Poverty Justice & Human Capabilities, Technical Theater, Economics, Engineering Management

Matthew Johnson

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Programming Languages & Tools

Primary: Rust, C++, Python, SQL, Git, Latex

Some Use: Javascript, CSS, Go, Java, Erlang, Verilog, C, Bazel, P4

Areas of Interest

Information Communications Technology for Development,

Mobile Networking (LTE/5G/xG, WiFi, MANET), Education

Selected Publications

Matthew Johnson, Esther Jang, Frankie O'Rourke, Rachel Ye, and Kurtis Heimerl. *Network Capacity as Common Pool Resource: Community-Based Congestion Management in a Community Network*. ACM CSCW '21.

Matthew Johnson, Jenny Liang, Michelle X. Lin, Sudheesh Singanamalla, and Kurtis Heimerl. *Whale Watching in Inland Indonesia: Analyzing a Small, Remote, Internet-Based Community Cellular Network*. The Web Conference (WWW) '21.

Shaddi Hasan, Mary Claire Barela, Matthew Johnson, Eric Brewer, and Kurtis Heimerl. *Scaling community cellular networks with community cellular manager*. USENIX NSDI'19.

Matthew Johnson, Spencer Sevilla, Esther Jang, and Kurtis Heimerl. *DLTE: Building a more WiFi-like Cellular Network: (Instead of the Other Way Around)*. ACM HotNets '18.

Grants, Honors and Awards

NSF Graduate Research Fellowship 2018-2023
Studying network management in rural edge networks

NSDI'19 Community Award 2019
Award given to the Community Cellular Manager project for its impact on the overall research community

Gaetano Borriello Fellowship for Change 2016-17
Fellowship for study at intersection of CS and humanitarianism

McCormick Engineering President's Scholarship 2009-13
Merit based scholarship for students in the engineering school

Rice Outstanding Senior Award 2013
Given to a graduating senior for outstanding contributions to the wider university community

Speros P. Martel Service Award 2013
Recognition of service and dedication to community in one or more years, irrespective of assigned duties or activities

Eagle Scout 2008

Other Activities

Societies

ACM: SIGCAS, SIGCOMM, SIGCSE

IEEE: Communications Society, Humanitarian Technologies

Phi Beta Kappa, Tau Beta Pi, Eta Kappa Nu

Service

New Grad Mentor Program 2017-2020

Allen School Grad Committee (G5PAC) Member 2018-20

Visit Days Chair 2017

Intro Series Tutor 2016-17

Reality Changers High School Tutor 2015-16