# Geoffrey Challen

né Werner-Allen

Department of Computer Science and Engineering
University at Buffalo, State University of New York
338 Davis Hall, Buffalo, NY 14260-2500, USA

716.645.3184 (W) / 716.464.2749 (M) / 716.645.3464 (F)

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| Email: | challen@buffalo.edu |
| Website: | https://www.bluegroup.systems |
| Online CV: | https://www.bluegroup.systems/CV |
| Google Scholar Profile: | https://www.bluegroup.systems/scholar |
| Last Updated: | 12/12/2016 |


## Current position

6/11–9/17 Assistant Professor, Department of Computer Science and Engineering, University at Buffalo

## Research overview

My research group, blue, designs, builds, and evaluates novel computer systems. Currently we are focusing on smartphones. Considered alone, smartphones represent the most capable and successful pervasive computing technology ever deployed. When considered in aggregate, the worldwide network of distributed smartphones comprises the largest distributed system ever built. We also operate PHONELAB, the world's only public smartphone platform testbed, and teach a popular public course on computer operating systems.

My group's website (https://www.bluegroup.systems) is the best source of information about my research and scholarly activities. It includes descriptions of ongoing and completed projects, copies of all of our published papers and funded grant proposals, information about the courses that we teach, and more details about group members. My online CV (https://www.bluegroup.systems/CV) is always more up to date than a paper copy and includes many useful links.

## Education

6/10 PH.D. in Computer Science, Harvard
6/03 A.B. in Physics, Harvard

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# Publications

I have published 38 papers and poster abstracts in selective conferences and workshops, 26 since beginning my position at UB, 21 with UB student co-authors, and 3 at top-tier conferences and workshops where UB had never previously published: HotOS, UbiComp, and HotNets. According to Google Scholar[1], my publications have been cited 5189 times resulting in an h-index of 14.

In the list below, top-tier systems and networking conferences and workshops where UB has never published are marked with a †. UB graduate student co-authors are marked with a ⋆ and undergraduate co-authors are marked with a ‡. Rankings are from the 2014 edition of the Computing Research and Education Association of Australasia Conference Ratings Exercise (CORE 2014), with top conferences and workshops given either an A* (highly selective) or an A (selective) rating.

[1] Google Scholar does a more effective job of indexing the conferences and workshops where computer systems and networking researchers publish their top papers than other tools, and is considered authoritative by researchers in my field.

## Peer-reviewed publications

### Under submission

2016 [4] **Lessons from Four Years of PHONELAB Experimentation**
Jinghao Shi*, Edwin Santos‡, and Geoffrey Challen
Submitted to the *15th International Conference on Mobile Systems, Applications and Services (MobiSys'17)*
CORE 2014: B

2016 [3] **QoE Inference and Enhancement Without End-Host Control**
Ashkan Nikravesh (Michigan), Xiao Zhu (Michigan), Qi Alfred Chen (Michigan), Scott Haseley*, Geoffrey Challen, and Z. Morley Mao (Michigan)
Submitted to the *15th International Conference on Mobile Systems, Applications and Services (MobiSys'17)*
CORE 2014: B

2016 [2] **Metrics for the Interactive Age**
Scott Haseley*, Ashkan Nikravesh (Michigan), David Ke Hong (Michigan), Brijesh Rakholia‡, Z. Morley Mao (Michigan), and Geoffrey Challen
Submitted to the *18th Workshop on Mobile Computing Systems and Applications (HotMobile'17)*
CORE 2014: C

2016 [1] **Separated By Birth: Hidden Differences Between Seemingly-Identical Smartphone CPUs**
Guru Prasad Srinivasa*, Rizwana Begum (Drexel), Scott Haseley*, Mark Hempstead (Tufts), and Geoffrey Challen
Submitted to the *18th Workshop on Mobile Computing Systems and Applications (HotMobile'17)*
CORE 2014: C

### Published at UB

2016 [26] **Algorithms for CPU and DRAM DVFS Under Inefficiency Constraint**
Rizwana Begum (Drexel), Guru Prasad Srinivasa*, Geoffrey Challen, and Mark Hempstead (Tufts)
Proceedings of the *34th IEEE International Conference on Computer Design (ICCD'16)*

2016 [25] **Wireless Protocol Validation Under Uncertainty**
Jinghao Shi*, Shuvendu Lahiri, Ranveer Chandra, and Geoffrey Challen
Proceedings of the *16th International Conference on Runtime Verification (RV'16)*
CORE 2014: C
**Best Paper Award**

2016 [24] **QoE-Centric Mobile Operating System Design** (Poster Abstract)
Scott Haseley* and Geoffrey Challen
Proceedings of the *14th International Conference on Mobile Systems, Applications and Services (MobiSys'16)*
CORE 2014: B

2016 [23] **A Walk on the Client Side: Monitoring Enterprise Networks Using Smartphone Channel Scans**
Jinghao Shi*, Lei Meng*, Aaron Striegel (Notre Dame), Chunming Qiao, Dimitrios Koutsonikolas, and Geoffrey Challen
*Proceedings of the 2016 IEEE International Conference on Computer Communications (INFOCOM'16)*
CORE 2014: A*, Acceptance Rate: 18%

2016 [22] **Why and How to Use PhoneLab**
Jinghao Shi*, Edwin Santos‡, and Geoffrey Challen
*GetMobile Mobile Computing and Communications Review, Volume 19 Issue 4*

2015 [21] **Robust, Cost-Effective and Scalable Localization in Large Indoor Areas**
Tong Guan*, Wen Dong, Dimitrios Koutsonikolas, Geoffrey Challen, and Chunming Qiao
*Proceedings of the IEEE 2015 Global Telecommunications Conference (GLOBECOM'15)*
CORE 2014: B

2015 [20] **Jouler: A Policy Framework Enabling Effective and Flexible Smartphone Energy Management**
Anudipa Maiti*, Yihong Chen*, and Geoffrey Challen
*Proceedings of the Seventh International Conference on Mobile Computing, Applications and Services (MobiCASE'15)*

2015 [19] **Energy-Performance Trade-offs on Energy-Constrained Devices with Multi-Component DVFS**
Rizwana Begum (Drexel), Guru Prasad Srinivasa*, David Werner (Tufts), Geoffrey Challen, and Mark Hempstead (Tufts)
*Proceedings of the 2015 IEEE Symposium on Workload Characterization (IISWC'15)*
Acceptance Rate: 33%

2015 [18] **A Little Sharing Goes a Long Way: The Case for Reciprocal Wifi Sharing**
Jinghao Shi*, Liwen Gui, Chunming Qiao, Dimitrios Koutsonikolas, and Geoffrey Challen
*Proceedings of the 2nd ACM Workshop on Hot Topics in Wireless (HotWireless'15)*
Acceptance Rate: 63%

2015 [17] **Pocket Data: The Need for TPC-MOBILE**
Oliver Kennedy, Jerry Ajay*, Geoffrey Challen, Luke Ziarek
*Proceedings of the 7th TPC Technology Conference on Performance Evaluation and Benchmarking (TPCTC'15)*

2015 [16] **`maybe` We Should Enable More Uncertain Mobile Systems Programming**
Geoffrey Challen, Jerry Ajay*, Nick DiRienzo‡, Oliver Kennedy Anudipa Maiti*, Anandatirtha Nandugudi*, Guru Prasad Srinivasa*, Sriram Shantharam*, Jinghao Shi*, and Luke Ziarek
*Proceedings of the Sixteenth Workshop on Mobile Computing Systems and Applications (HotMobile'15)*
CORE 2014: C, Acceptance Rate: 28%

2015 [15] **The Missing Numerator: Toward a Value Measure for Smartphone Apps**
Anudipa Maiti* and Geoffrey Challen
*Proceedings of the Sixteenth Workshop on Mobile Computing Systems and Applications (HotMobile'15)*
CORE 2014: C, Acceptance Rate: 28%

2015 [14] **Crowdsourcing Access Network Spectrum Allocation Using Smartphones** (Poster Abstract)
Jinghao Shi*, Zhangyu Guan, Chunming Qiao, Tommaso Melodia, Dimitrios Koutsonikolas, and Geoffrey Challen
*Proceedings of the Sixteenth Workshop on Mobile Computing Systems and Applications (HotMobile'15)*
CORE 2014: C

2014 [13] **Controlling Smartphone User Privacy via Objective-driven Context Mocking**
Nick DiRienzo‡ and Geoffrey Challen
*Proceedings of the Sixth International Conference on Mobile Computing, Applications and Services (MobiCASE'14)*
Acceptance Rate: 29%

2014 [12] **The PocketLocker Personal Cloud Storage System**
Anandatirtha Nandugudi*, Carl Nuessle*, Geoffrey Challen, Emiliano Miluzzo, and Yih-Farn Chen
*Proceedings of the Sixth International Conference on Mobile Computing, Applications and Services (MobiCASE'14)*
Acceptance Rate: 29%

† 2014 [11] **Crowdsourcing Access Network Spectrum Allocation Using Smartphones**
Jinghao Shi⋆, Zhangyu Guan, Chunming Qiao, Tommaso Melodia, Dimitrios Koutsonikolas, and Geoffrey Challen
*Proceedings of the 13th ACM Workshop on Hot Topics in Networks (HotNets'14)*
CORE 2014: A, Acceptance Rate: 22%

2014 [10] **Should Smartphone Users Mock Apps?**
Nick DiRienzo‡ and Geoffrey Challen
*Proceedings of the 6th ACM HotPlanet Workshop (HotPlanet'14)*

† 2014 [9] **PocketParker: Pocketsourcing Parking Lot Availability**
Anandatirtha Nandugudi⋆, Taeyeon Ki⋆, Carl Nuessle⋆, and Geoffrey Challen
*Proceedings of the 2014 ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp'14)*
CORE 2014: A*, Acceptance Rate: 14%

2014 [8] **Enabling MOOC Collaborations Through Modularity**
Geoffrey Challen and Margo Seltzer
*Proceedings of Learning with MOOCs: A Practitioner's Workshop (LWMOOC'14)*

2014 [7] **The Mote is Dead. Long Live the Discarded Smartphone!**
Geoffrey Challen, Scott Haseley⋆, Anudipa Maiti⋆, Anandatirtha Nandugudi⋆, Guru Prasad Srinivasa⋆, Mukta Puri⋆, and Junfei Wang⋆
*Proceedings of the Fifteenth Workshop on Mobile Computing Systems and Applications (HotMobile'14)*
CORE 2014: C, Acceptance Rate: 31%

2014 [6] **New Interfaces for Achieving Power Agility on Mobile Devices** (Poster Abstract)
Guru Prasad Srinivasa⋆, Scott Haseley⋆, Rizwana Begum, Mark Hempstead (Tufts), and Geoffrey Challen
*Proceedings of the Fifteenth Workshop on Mobile Computing Systems and Applications (HotMobile'14)*
CORE 2014: C

2014 [5] **Smartphone Users Want to Be Mocked** (Poster Abstract)
Nick DiRienzo‡, Gino Buzzelli‡, and Geoffrey Challen
*Proceedings of the Fifteenth Workshop on Mobile Computing Systems and Applications (HotMobile'14)*
CORE 2014: C **Best Poster Award**

2013 [4] **PHONELAB: A Large Programmable Smartphone Testbed** (Invited Paper)
Anandatirtha Nandugudi⋆, Anudipa Maiti⋆, Taeyeon Ki⋆, Fatih Bulut⋆, Murat Demirbas, Tevfik Kosar, Chunming Qiao, Steven Y. Ko, and Geoffrey Challen
*Proceedings of the First International Workshop on Sensing and Big Data Mining (SenseMine'13)*

2013 [3] **Model-Free HVAC Control Using Participant Feedback**
Sean Purdon (CSIRO), Branislav Kusy (CSIRO), Raja Jurdak (CSIRO), and Geoffrey Challen
*Proceedings of the Second IEEE International Workshop on Global Trends in Smart Cities (goSmart'13)*

2013 [2] **Participant Behavior in PHONELAB**
Anandatirtha Nandugudi⋆, Anudipa Maiti⋆, Fatih Bulut⋆, Sonali Batra⋆, Taeyeon Ki⋆, Geoffrey Challen, Murat Demirbas, Steven Y. Ko, Tevfik Kosar, and Chunming Qiao
*Proceedings of the Third Conference on the Analysis of Mobile Phone Datasets (NetMob'13)*

† 2011 [1] **The Case for Power Agile Computing**
Geoffrey Challen and Mark Hempstead (Tufts)
*Proceedings of the 13th Workshop on Hot Topics in Operating Systems (HotOS'11)*
CORE 2014: A, Acceptance Rate: 25%

**Published as a Harvard Ph.D. student**

2010 [12] **IDEA: Integrated Distributed Energy Awareness for Wireless Sensor Networks**
Geoffrey Challen, Jason Waterman, and Matt Welsh
*Proceedings of the 8th Annual International Conference on Mobile Systems, Applications and Services (MobiSys'10)*
CORE 2014: B

2009 [11] **Mercury: A Wearable Sensor Network Platform for High-Fidelity Motion Analysis**
Konrad Lorincz, Bor-rong Chen, Geoffrey Challen, Atanu Roy Chowdhury, Shyamal Patel, Paolo Bonato, and Matt Welsh
*Proceedings of the Seventh ACM Conference on Embedded Networked Sensor Systems (SenSys'09)*
CORE 2014: A*

2009 [10] **Peloton: Coordinated Resource Management for Sensor Networks**
Jason Waterman, Geoffrey Challen, and Matt Welsh
*Proceedings of the 12th Workshop on Hot Topics in Operating Systems (HotOS'09)*
CORE 2014: A

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Published under the name Geoffrey Werner-Allen

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2008 [9] **Lance: Optimizing High-Resolution Data Collection in Wireless Sensor Networks**
Geoffrey Werner-Allen, Stephen Dawson-Haggerty, and Matt Welsh
*Proceedings of the Sixth ACM Conference on Embedded Networked Sensor Systems (SenSys'08)*
CORE 2014: A*

2008 [8] **Resource-Aware Programming in the Pixie OS**
Konrad Lorincz, Bor-rong Chen, Jason Waterman, Geoffrey Werner-Allen, and Matt Welsh
*Proceedings of the Sixth ACM Conference on Embedded Networked Sensor Systems (SenSys'08)*
CORE 2014: A*

2008 [7] **Pixie: An Operating System for Resource-Aware Programming of Embedded Sensors**
Konrad Lorincz, Bor-rong Chen, Jason Waterman, Geoffrey Werner-Allen, and Matt Welsh
*Proceedings of the Fifth Workshop on Embedded Networked Sensors (HotEmNets'08)*
CORE 2014: C

2006 [6] **Fidelity and Yield in a Volcano Monitoring Sensor Network**
Geoffrey Werner-Allen, Konrad Lorincz, Jeff Johnson, Jonathan Lees, and Matt Welsh
*Proceedings of the Seventh USENIX Symposium on Operating Systems Design and Implementation (OSDI'06)*
CORE 2014: A*

2006 [5] **Deploying a Wireless Sensor Network on an Active Volcano**
Geoffrey Werner-Allen, Konrad Lorincz, Mario Ruiz, Omar Marcillo, Jeff Johnson, Jonathan Lees, and Matt Welsh
*IEEE Internet Computing*, Special Issue on Data-Driven Applications in Sensor Networks, March/April 2006

2005 [4] **Firefly-Inspired Sensor Network Synchronicity with Realistic Radio Effects**
Geoffrey Werner-Allen, Geetika Tewari, Ankit Patel, Radhika Nagpal, and Matt Welsh
*Proceedings of the Third ACM Conference on Embedded Networked Sensor Systems (SenSys'05)*
CORE 2014: A*

2005 [3] **MoteLab: A Wireless Sensor Network Testbed**
Geoffrey Werner-Allen, Pat Swieskowski, and Matt Welsh
*Proceedings of the Fourth International Conference on Information Processing in Sensor Networks (IPSN'05)*
CORE 2014: A*

2005 [2] **Monitoring Volcanic Eruptions with a Wireless Sensor Network**
Geoffrey Werner-Allen, Jeff Johnson, Mario Ruiz, Jonathan Lees, and Matt Welsh
*Proceedings of the Second European Workshop on Wireless Sensor Networks (EWSN'05)*
CORE 2014: A

2004 [1] **Simulating the Power Consumption of Large-Scale Sensor Network Applications**
Victor Shnayder, Mark Hempstead, Bor-rong Chen, Geoffrey Werner-Allen, and Matt Welsh
*Proceedings of the Second ACM Conference on Embedded Networked Sensor Systems (SenSys'04)*
CORE 2014: A*

### Talks

Only talks given as a faculty member are listed. Note that in computer science it is typical for student authors, rather than faculty authors, to present accepted papers at conferences and workshops.

4/28/2015 [1] **Building Less Certain Mobile Apps**
Presented at the Rochester Institute of Technology Computer Science Seminar. Invited by Peizhao Hu.

### Edited volumes

2010 **Wireless Sensor Networks: Deployments and Design Frameworks**
Edited by Elena Gaura, Mike Allen, Lewis Girod, James Brusey and Geoffrey Challen
Springer, 2010

### Book chapters

2010 **Volcano Monitoring: Addressing Data Quality Through Iterative Deployment**
Geoffrey Challen and Matt Welsh
Appears in *Wireless Sensor Networks: Deployments and Design Frameworks*, Springer, 2010, edited by Elena Gaura, Mike Allen, Lewis Girod, James Brusey and Geoffrey Challen

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## External Funding

I have applied for $12,263,722 in funding, received $2,971,256 (24% of decided or recommended submissions), and have $48,000 in pending awards.

### Awarded

8/16–2/18 [6] **CI-P: Enabling Pocket-Scale Data Management Research**
NSF, $100,000
Co-PI (20%) with Oliver Kennedy and Luke Ziarek

9/16–9/17 [5] **CI-SUSTAIN: Collaborative Research: Sustaining Successful Smartphone Testbeds to Enable Diverse Mobile Experiments**
NSF, $75,000 ($75,000 to UB)
Co-PI (80%) with Chunming Qiao

8/15– [4] **Expressing Uncertainty Using the `maybe` System**
Google, $37,156
PI with Co-PIs Oliver Kennedy and Luke Ziarek

9/14–9/17 [3] **CSR: Small: Jouler: A Cross-Device Application Energy Management Framework for Smartphones**
NSF, $499,185
PI (100%)

9/14–9/17 [2] **CSR: Medium: Collaborative Research: Architecture and System Support for Power-Agile Computing**
NSF, $561,766 ($282,930 to UB)
Co-PI (100%) with Mark Hempstead (Tufts)

6/12–12/16 [1] **CI-ADDO-NEW: PHONELAB: A Programmable Participatory Smartphone Testbed**
NSF, $1,322,510; $36,000 REU supplement awarded in 2013
PI (28%) with co-PIs Steven Y. Ko, Murat Demirbas, Tevfik Kosar, and Chunming Qiao

### Expired

9/11–9/12 [1] **PHONELAB: A Participatory Smartphone Cloud Testbed**
Google, $60,994
Co-PI (20%) with Steven Y. Ko, Murat Demirbas, Tevfik Kosar and Chunming Qiao

### Recommended

9/17–9/22 [1] **CAREER: Harnessing Implementation Flexibility to Enable Runtime Adaptation**
NSF, $557,481
PI (100%)

Note that my CAREER award will be made to the University of Buffalo but transferred in its entirety to my new institution.

### Under submission

2016 [1] **Automatic Online QoE Measurement with the QoEye System**
Google, $48,000
Co-PI (50%) with Z. Morley Mao (Michigan)

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## Teaching

Over five years (2011–2016) I have taught a total of 1150 students—an average of 104 per semester—and offered four different courses to beginning undergraduates, advanced undergraduates and graduate students. Despite being extremely challenging and required for undergraduate computer science majors, my course on computer operating systems is among the most popular in the department and a favorite of both graduate and undergraduate students. My graduate seminar on rotating topics in mobile systems attracts a small group of motivated students and has recruited several new Ph.D. students into my group and given advanced undergraduates the chance to explore research topics. In Fall 2016 I am introducing a new course on the internet to freshman undergraduates.

Spring '17 [13] **CSE 421/521: Introduction to Operating Systems**

| | **421** | **521** |
|---|---|---|
| Current Enrollment | 131 | 70 |

Fall '16 [12] **CSE 199: How the Internet Works** (New Undergraduate Course)

Enrollment 440

Head instructor responsible for generating content and supervising 4 activity instructors (Jesse Hartloff, Matthew Hertz, Andrew Hughes, and Jennifer Winikus), 8 recitation instructors, and 25 undergraduate teaching assistants.

Fall '16 [11] **CSE 723: Improving Smartphone Quality of Experience** (New Graduate Seminar)

Enrollment 8

Spring '16 [10] **CSE 421/521: Introduction to Operating Systems**

| | **421** | **521** |
|---|---|---|
| Enrollment | 86 | 54 |
| Response Rate | 94% | |
| Instructor Rating | 4.37 | |
| Course Rating | 3.97 | |

Fall '15 [9] **CSE 720: Using Uncertainty to Program Mobile Systems** (New Graduate Seminar)

Enrollment 7

Spring '15 [8] **CSE 421/521: Introduction to Operating Systems**

Note that as of 2015, UB course evaluations are no longer separable by level for cross-listed courses such as CSE 421/521.

| | **421** | **521** |
|---|---|---|
| Enrollment | 88 | 56 |
| Response Rate | 94% | |
| Instructor Rating | 4.65 | |
| Course Rating | 4.24 | |

Fall '14 [7] **CSE 720: Personal Cloud Computing** (New Graduate Seminar)

Enrollment 5

Spring '14 [6] **CSE 421/521: Introduction to Operating Systems**

| | **421** | **521** |
|---|---|---|
| Enrollment | 86 | 75 |
| Response Rate | 84% | 96% |
| Instructor Rating | 4.47 | 4.64 |
| Course Rating | 3.82 | 4.74 |

Fall '13 [5] **CSE 720: Smartphone Sustainability** (New Graduate Seminar)

Enrollment 8

Spring '13 [4] **CSE 421/521: Introduction to Operating Systems**

| | **421** | **521** |
|---|---|---|
| Enrollment | 39 | 51 |
| Response Rate | 86% | 95% |
| Instructor Rating | 4.14 | 4.59 |
| Course Rating | 4.59 | 4.68 |

Fall '12 [3] **CSE 622: Advanced Systems Research** (Co-taught with Steven Y. Ko)

| | |
|---|---|
| Enrollment | 19 |
| Response Rate | 68% |
| Instructor Rating | 3.77 |
| Course Rating | 3.15 |

Spring '12 [2] **CSE 421/521: Introduction to Operating Systems**

| | **421** | **521** |
|---|---|---|
| Enrollment | 48 | 51 |
| Response Rate | 63% | 88% |
| Instructor Rating | 3.3 | 3.8 |
| Course Rating | 4.0 | 4.0 |

Fall '11 [1] **CSE 622: Advanced Systems Research** (Co-taught with Steven Y. Ko)

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|---|---|
| Enrollment | 23 |

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# Advising

In total I have graduated 1 Ph.D. student and supervised 47 other students at UB including 10 Ph.D. students (6 current), 18 Masters students, 18 undergraduates (9 current), and 1 visiting Ph.D. student. I also supervised the PHONELAB system administrator for two years.

## Current

**Ph.D.**

I am currently supervising the following 6 Ph.D. students:

1/12– [1] **Anudipa Maiti**—leading the Jouler energy management project and investigating smartphone app value estimation. Served as course staff for CSE 421/521 in Spring 2012. Interned with Rajesh Balan and Archan Misra at LiveLabs at Singapore Management University for Summer 2014. Supported by the Jouler NSF award for 2015–2017. Expected to graduate in 2017.

8/13– [2] **Guru Prasad Srinivasa**—leading the efforts to design power-agile operating systems and improve thermal management for mobile devices. Served as course staff for CSE 421/521 in Spring 2013, 2014, 2015, and 2016. Interned with Venkat Padmanabhan at Microsoft Research India in Summer 2014. Supported by the Power Agility NSF award for for 2015–2017. Expected to graduate in 2018.

8/13– [3] **Jinghao Shi**—collaborating with Ranveer Chandra and Shuvendu Lahiri at Microsoft Research on approaches to validating wireless protocols. Also serves as the point of contact for PHONELAB researchers and maintains the PHONELAB platform build. Served as course staff for CSE 421/521 in 2014, 2015, and 2016. Co-advised with Chunming Qiao. Interned at Microsoft Research in Summer 2015 and Summer 2016. Supported by the PhoneLab NSF award in 2015–2016 and the PhoneLab extension NSF award in 2016–2017. Expected to graduate in 2018.

8/13– [4] **Carl Nuessle**—studying smartphone file system access patterns and developing new file system features. Served as course staff for CSE 421/521 in 2014, 2015, and 2016. Self-supported from 2015–2017.

1/15– [5] **Ali Ben Ali**— working on tracking use of multiple personal devices using a smart watch. Served as course staff for CSE 421/521 in 2016. Supported as a TA in 2015–2017.

9/15– [6] **Scott Haseley**—working on improving smartphone quality of experience. Served as course staff for CSE 421/521 in 2016 and built the `test161` OS/161 testing tool. Supported in 2015–2016 by the Power Agility NSF award and in 2016–2017 by the Jouler NSF award.

**Undergraduate**

I am currently supervising the following 9 undergraduates:

2/15– [1] **Brijesh Rakholia**—working on improving smartphone quality of experience. Supported from 2014–2016 by the PhoneLab REU supplement. Serving as a UTA for the `internet-class.org` first-year seminar.

6/15– [2] **Edwin Santos** —working on comparing the Android Open Source Project to Android "modder" communities and on maintaining PHONELAB. Supported from 2015–2016 by the PhoneLab REU supplement.

6/15– [3] **Kyle Schoener**—working on the Jouler energy management project. Supported from 2015–2016 by the PhoneLab REU supplement. Serving as a UTA for the `internet-class.org` first-year seminar.

9/15– [4] **Wesley Csendom**—working on the `internet-class.org` course website and tools. Serving as a volunteer UTA for the `internet-class.org` first-year seminar.

10/15– [5] **Aishani Bhalla**—working on an online quiz tool for website-based courses. Serving as a UTA for the `internet-class.org` first-year seminar.

3/16– [6] **Greg Bunyea**—serving as head UTA and developing content and tools for the `internet-class.org` first-year seminar.

6/16– [7] **Grant Wrazen**—working on smartphone database performance improvements and optimizing Wifi networks.

6/16– [8] **Vighnesh Iyer** —working on optimizing Wifi networks. Serving as a UTA for the `internet-class.org` first-year seminar.

6/16– [9] **Lakshmi Ethiraj** —working on smartphone database performance improvements. Serving as a UTA for the `internet-class.org` first-year seminar.

## Former

**Ph.D. Graduates**

I have graduated 1 Ph.D. student:

8/12–6/15 [1] **Anandatirtha Nandugudi**—worked on physical-layer Wifi modifications to improve streaming content delivery with Venkat Padmanabhan and Vishnu Navda at Microsoft Research India, the PocketParker parking lot monitoring project, the PocketLocker distributed storage system, the smartphone sustainability project, and the PHONELAB smartphone testbed. Co-advised with Chunming Qiao. Interned with Yih-Farn Chen and Emiliano Miluzzo at AT&T Labs Research for Summer 2013, and with Vishnu Navda at Microsoft Research India in Summer 2014. Supported from 2012–2015 by the PhoneLab NSF award.

**Ph.D.**

I formerly supervised the following 4 Ph.D. students:

8/11–1/13 [1] **Sonali Batra**—worked on PHONELAB and impersonating wireless access points.

8/12–1/14 [2] **Taeyeon Ki**—helped develop the PHONELAB interface and contributed to the PocketParker parking lot monitoring project. Continuing the Ph.D. program advised by Steven Y. Ko.

9/15–5/16 [3] **Jerry Ajay**—investigated smartphone database access patterns and next-generation data storage paradigms. Interned at HP Labs for Summer 2015. Continuing the Ph.D. program advised by Wenyao Xu.

1/15–5/16 [4] **Yihong Chen**—helped lead the `maybe` uncertainty-based adaptation project and contributed to the Jouler energy management effort. Served as course staff for CSE 421/521 in 2015 and 2016. Now at Twitter.

**Masters**

I formerly supervised the following 18 Masters students:

8/11–6/12 [1] **Micheal Benedict**—helped develop a PHONELAB prototype. Now at Twitter.

8/11–8/12 [2] **Vinu Charanya Athangudi Purushothaman**—helped develop a PHONELAB prototype. Now at Twitter.

1/12–5/12 [3] **Rajeshwari Adapalam**—worked on using smartphones to impersonate wireless access points. Now at Cisco.

6/12–1/13 [4] **Manoj Mylapore Chandrasekaran**—worked on PHONELAB. Now at Cerner.

6/12–8/12 [5] **Anuja Raval**—worked on designing power-agile operating systems. Now at Citi.

6/12–8/12 [6] **Bhaavya Kapoor**—worked on PHONELAB.

1/13–6/13 [7] **Denise Blady**—helped develop a prototype of the PocketMocker objective-driven context mocking system. Now at DISA.

1/13–6/13 [8] **Eric Lehner**—helped develop a prototype of the PocketMocker objective-driven context mocking system. Now at MITRE.

6/13–8/13 [9] **Gino Buzzelli**—continued developing of a prototype of the PocketMocker objective-driven context mocking system. Now at Microsoft.

1/13–8/13 [10] **Agrim Nigam**—worked on using smartphones to prepare for and survive natural disasters. Now at Holistic Labs.

1/14–6/14 [11] **John Gerber**—worked on using car-mounted discarded smartphones to create a city-scale urban monitoring network. Served as course staff for CSE 421/521 in Spring 2014.

1/14–6/14 [12] **Nishanth Vasisht**—worked on using smartphones to prepare for and survive disasters. Now at Amazon.

1/14–9/14 [13] **Scott Haseley**—worked on designing power-agile operating systems for mobile devices and on determining ways to reuse discarded smartphones. Served as course staff for CSE 421/521 in Spring 2014. Supported half-time in Summer 2014 by the PHONELAB project. Began the Ph.D. program in blue in Fall 2015.

9/15–6/15 [14] **Jerry Ajay**—contributed to using uncertainty to enable adaptation in mobile systems. Entered the Ph.D. program in Fall 2015.

1/14–6/15 [15] **Sriram Shantharam**—worked on using discarded smartphone to create a city-scale slowly-moving car-mounted sensor network and using smartphones to prepare for and survive disasters. Supported full-time in Summer 2014 and part-time in Fall 2014 by the PHONELAB CRI NSF award. Now at Bak.

6/15–9/15 [16] **Rakesh Balasubramanian**—contributed to using smartphones to create a city-scale sensing platform and also helped use smartphones to adapt Wifi networks. Supported in Summer 2015 by the PhoneLab NSF award. Now at FactSet.

6/15–9/15 [17] **Ramya Rao**—contributed to using uncertainty to enable adaptation in mobile systems. Supported in Summer 2015 by the PhoneLab NSF award. Now at FactSet.

1/16–5/15 [18] **Miraj Kheni**—worked on improving smartphone app database performance.

**Undergraduates**

I formerly supervised the following 9 undergraduates:

1/12–8/12 [1] **Sean Zawicki**—worked on PHONELAB. Now at Voxer.

6/12–8/12 [2] **Mitch Nguyen**—worked on PHONELAB.

8/13–6/14 [3] **Frank Rossi**—worked on the PocketLocker distributed storage project.

8/13–6/15 [4] **Nick DiRienzo**—worked on using interface events to detect bugs and user-facing latency and the PocketMocker objective-driven context mocking system. Supported during the 2013–2014 and 2014–2015 academic years by the PHONELAB REU supplement NSF award. Now at Optimizely.

10/14–6/15 [5] **Michael Ferris**—worked next-generation file system interfaces for mobile devices. Supported during the 2014–2015 academic year by the PHONELAB REU supplement NSF award.

2/15–9/15 [6] **Gino Notto**—worked on detecting transition between personal devices. Supported during the 2014–2015 academic year by the PhoneLab REU supplement.

9/15–12/15 [7] **Er An Khoo**—worked on using interface events to detect bugs and user-facing latency.

7/15–9/15 [8] **John Cherry**—worked on studying smartphone file system access patterns.

9/15–12/15 [9] **Corey Kress**—worked on the `internet-class.org` course website and tools.

**Visiting students**

5/13–7/13 [1] **Aslak Johansen**—visiting Ph.D. student from ITU Copenhagen. Worked on interfacing new sensors to PHONELAB devices. Completed his Ph.D. at ITU in the fall of 2013.

**Research staff**

6/13–6/15 [1] **Maulik Dave**—PHONELAB testbed administrator. Worked on PHONELAB development and assisting participants with smartphone and service problems. Now working at UB IT.

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## Artifacts

My group has built and maintains several important infrastructure and software artifacts, described in more detail below.

9/16– **`internet-class.org`: A Course on the Internet That's Like the Internet**
`https://www.internet-class.org`

`internet-class.org` is a collaborative open-source course on how the internet works. Almost 300 online videos and several dozen in-class activities have already been developed to support the first offering of the course in a flipped format. In the years to come the goal is for multiple external instructors to adopt and begin contributing to the course materials. `internet-class.org` represents the first attempt at developing a modular open-source course.

1/16– **`ops-class.org`: An Online Operating Systems Instructional Framework**
`https://www.ops-class.org` and `https://test161.ops-class.org`

`ops-class.org` is an online framework providing automated access to operating system programming assignments that use the OS/161 instructional operating system developed at Harvard University. `ops-class.org` is used to support operating system courses at the University at Buffalo and as a collaborative instructional platform designed to engage instructors at other universities. It provides the `test161` automated grading tool for the OS/161 programming assignments, as well as hundreds of hours of videotaped lectures, slides, and exams from CSE 421/521 courses.

9/12–2/17 **PhoneLab: A Public Programmable Smartphone Testbed**
`https://www.phone-lab.org`

PHONELAB is a NSF-funded public smartphone testbed used by researchers at the University at Buffalo and multiple other research institutions across the United States. Approximately 150 UB students, faculty, and staff carry instrumented smartphones and received subsidized service from Sprint in exchange for participating in smartphone experiments.

## Awards

2016 SEAS Early Career Teacher of the Year

2009 Siebel Scholar