Jinghao Shi

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Education

2013.9–present	**University at Buffalo**.
	PhD student. Dept. of Computer Science & Engineering
	Advisors: Dr. Geoffrey Challen, Prof. Chunming Qiao
2011.9–2013.8	**The University of Hong Kong**.
	PhD program (dropout), Dept. of Computer Science
	Advisor: Prof. Cho-Li Wang
2007.9–2011.6	**University of Science and Technology of China**.
	B.S. School of Computer Science and Technology

Research Interests

- Wireless Networks
- Mobile Systems

Research Projects

Ongoing

2015.6–Present **Wireless Protocol Validation Under Uncertainty**.

Abstract   In this project, we try to answer this question: how to verify that an implementation is compliant to the wireless protocol specification? We propose to perform formal verification on packet traces collected using sniffers. The main challenges are: 1) how to collect packet traces that covers different aspect of the protocol? and 2) how to cope with sniffer imperfection (e.g., miss packets)?

2013.8–Present **PhoneLab: A Large Scale Smartphone Platform Testbed**.

Abstract   PhoneLab has more than 200 participants that carry Nexus 5 smartphones as their primary device. We build the smartphone platform based on Android Open Source Project (AOSP), and introduce various instrumentation to Android framework and Linux Kernel to study how the phone works in the wild. The ability of OTA updates enables us to facilitate further experimental platform changes.

Previous

2013.8–Present **PocketSniffer: A Measurement Offloading Framework for WLAN Spectrum Allocation**, [6, 8].
Abstract Client-side measurements have been proved valuable for spectrum allocation, yet collecting them from active devices is disruptive. We propose a new framework to offload such measurements to colocated idle smartphones. We implement a prototype system on Nexus 5 smartphones and OpenWRT router.

2015.1–2015.6 **WiseFi: Enabling Reciprocal Wifi Sharing**, [4].
Abstract Using PhoneLab Wifi dataset, we investigate the reciprocal Wifi sharing opportunities, where two users can improve their network performance by allowing each other to access their private Wifi networks. We design the WiseFi system to enable reciprocal Wifi sharing without exchange network credentials.

2011.8–2013.1 **Share Virtual Memory for Non-Coherent Manycore architecture**, [3].
Abstract Hardware cache coherence is getting more complex and expensive to implement as the core count per processor keeps increasing. We explore software enforced cache coherence in Intel Single-Chip-Cloud (SCC) manycore chip. We implement a prototype Share Virtual Memory (SVM) system for Barrelfish OS.

2010.10–2011.5 **SLIM: Cloud Backed Data Structures for Mobile Systems**, [7].
Abstract SLIM is a data structure library that provides familiar STL-like interfaces and abstractions while accommodates the storage hierarchy that transcends device/cloud boundary behind the scene.

Research Experience

2016.6–2016.8 **Intern**, *Microsoft Research Redmond*, Mentor: Ranveer Chandra.
Worked on Xbox wireless protocol verification.

2015.6–2015.8 **Intern**, *Microsoft Research Redmond*, Mentor: Ranveer Chandra.
Worked on Xbox wireless protocol verification.

2015.9–Present **Research Assistant**, *University at Buffalo*, Advisor: Geoffrey Challen.
Working on PhoneLab project.

2010.10–2011.5 **Intern**, *Microsoft Research Asia*, Mentor: Lintao Zhang.
Worked on SLIM project [7].

Publications

Conference Papers

[1] **Jinghao Shi**, Shuvendu K Lahiri, Ranveer Chandra, and Geoffrey Challen. Wireless protocol validation under uncertainty. In *International Conference on Runtime Verification*, **RV'16**, pages 351–367. Springer, 2016.

[2] **Jinghao Shi**, Lei Meng, Aaron Striegel, Chunming Qiao, Dimitrios Koutsonikolas, and Geoffrey Challen. A Walk on the Client Side: Monitoring Enterprise Wifi Networks Using Smartphone Channel Scans. In *Proceedings of the 35th IEEE Conference on Computer Communications*, **INFOCOM'16**, 2016.

[3] King Tin Lam, **Jinghao Shi**, Dominic Hung, Cho-Li Wang, Zhiquan Lai, Wangbin Zhu, and Youliang Yan. Rhymes: A Shared Virtual Memory System

for Non-Coherent Tiled Many-Core Architectures. In *The 20th IEEE International Conference on Parallel and Distributed Systems*, **ICPADS'14**. IEEE., 2014.

Workshop Papers

[4] **Jinghao Shi**, Liwen Gui, Dimitrios Koutsonikolas, Chunming Qiao, and Geoffrey Challen. A little sharing goes a long way: The case for reciprocal wifi sharing. In *Proceedings of the 2Nd International Workshop on Hot Topics in Wireless*, **HotWireless'15**, pages 6–10, New York, NY, USA, 2015. ACM.

[5] Geoffrey Challen, Jerry Antony Ajay, Nick DiRienzo, Oliver Kennedy, Anudipa Maiti, Anandatirtha Nandugudi, Guru Prasad, Sriram Shantharam, **Jinghao Shi**, and Lukasz Ziarek. maybe We Should Enable More Uncertain Mobile App Programming. In *Proceedings of the 16th Workshop on Mobile Computing Systems and Applications*, **HotMobile'15**. ACM, 2015.

[6] **Jinghao Shi**, Zhangyu Guan, Chunming Qiao, Tommaso Melodia, Dimitrios Koutsonikolas, and Geoffrey Challen. Crowdsourcing Access Network Spectrum Allocation Using Smartphones. In *Proceedings of the 13th ACM Workshop on Hot Topics in Networks*, **HotNets'14**, page 17. ACM, 2014.

[7] **Jinghao Shi**, Mingyuan Xia, Ming Wu, Lintao Zhang, and Zheng Zhang. SLIM: Mmap from the Cloud to Device, and Back. In *Proceedings of the Second Asia-Pacific Workshop on Systems*, **APSys'11**, pages 16:1–16:5, New York, NY, USA, 2011. ACM.

Posters & Demos

[8] **Jinghao Shi**, Zhangyu Guan, Chunming Qiao, Tommaso Melodia, Dimitrios Koutsonikolas, and Geoffrey Challen. Crowdsourcing Access Network Spectrum Allocation Using Smartphones. Poster presented in *16th Workshop on Mobile Computing Systems and Applications*, **HotMobile'15**. ACM, 2015.

Awards

09/28/2016 **Best Paper Award of RV'16**.
Paper: Wireless Protocol Validation Under Uncertainty

Talks

09/28/2016 **Paper presentation at RV'16**.
Title: Wireless Protocol Validation Under Uncertainty

04/13/2016 **Paper presentation at INFOCOM'16**.
Title: A Walk on the Client Side: Monitoring Enterprise Wifi Networks Using Smartphone Channel Scans

10/28/2014 **Paper presentation at HotNets'14**.
Title: Crowdsourcing Access Network Spectrum Allocation Using Smartphones

Teaching Experience

Spring 2015 **Teaching Assistant**, *CSE421/521: Introduction to Operating Systems.*
Instructor: Dr. Geoffrey Challen

Spring 2014 **Teaching Assistant**, *CSE421/521: Introduction to Operating Systems.*
Instructor: Dr. Geoffrey Challen

Fall 2013 **Teaching Assistant**, *CSE241: Digital Systems.*
Instructor: Dr. Bina Ramamurthy

Technical Skills

Languages Python, Java, C, Verilog.

Platforms Android Open Source Project (AOSP), OpenWRT, Linux.

Frameworks Django.

Tools Vim, Git, LaTeX.

References

○ Dr. Geoffrey Challen (co-advisor) Assistant Professor
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Dept. of Computer Science & Engineering, University at Buffalo

○ Prof. Chunming Qiao (co-advisor) Professor
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Dept. of Computer Science & Engineering, University at Buffalo

○ Dr. Dimitrios Koutsonikolas (collaborator) Assistant Professor
dimitrio@buffalo.edu
Dept. of Computer Science & Engineering, University at Buffalo

○ Ranveer Chandra (collaborator) Principal Researcher
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Microsoft Research Redmond

○ Shuvendu Lahiri (collaborator) Senior Researcher
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