

Sulei Wang | Curriculum Vitae

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Education

Master Student

2016–2019(Expected)

School of Information Science and Technology, Fudan University

Shanghai, China

GPA: 3.55/4.0

Advisor: Prof. Yuedong Xu

Research interests: wireless networking/sensing/security and ubiquitous computing

Bachelor of Engineering

2012–2016

School of Information Science and Engineering, Shandong University

Jinan, China

GPA: 89.78/100 Ranking: 4/83 (Top 5%)

Research Projects

CSI Forgery Attack and Defense in MU-MIMO WLANs.....

- Discovered a potential attack named *User Selective Eavesdropping Attack* which is capable of misleading user selection in MU-MIMO and sniffing physical layer data symbols.
- Proposed a defense strategy *AngleSec* that can efficiently detect the forged CSI by evaluating the consistency between uplink AoA and downlink AoD angular spectra.
- Implemented *USE Attack* and *AngleSec* on *WARP* platform and validated the eavesdropping performance and detection accuracy.

Multipath Assisted Wi-Fi Localization with Single AP.....

- Applied the SAGE algorithm to extract channel parameters (AoA, AoD, and ToF) from channel state information (CSI) measurements with Intel 5300 commodity Wi-Fi cards.
- Designed a geometric model to obtain the location of target based on the channel parameters.
- Validated the localization accuracy in typical environments including classrooms and offices.

User Selection Algorithm Design for MU-MIMO WLANs.....

- Formulated the user and antenna selection problem as a integer programming problem.
- Employed a channel vector projection algorithm to estimate the potential SNR of users and Proposed a low-complexity branch-and-prune algorithm to select user antennas incrementally.
- Implemented the algorithm on *WARP* platform and evaluated the aggregated throughput.

Large-scale MIMO System Based on Hybrid Beamforming.....

- Designed a hybrid beamforming architecture to address the mismatching between limited RF chains and large number of antennas.
- Proposed a blind estimation method to obtain the power azimuth spectrum information of users.
- Designed an optimization framework to perform jointly beamforming and user selection.
- Implemented and evaluated the system on *WARP* platform.

Publications

1. "Enabling Practical Large-Scale MIMO in WLANs With Hybrid Beamforming"
Zhe Chen, Xu Zhang, **Sulei Wang**, Jie Xiong, Yuedong Xu, Xin Wang
submitted to IEEE/ACM Transactions on Networking (ToN)
2. "M³: Multipath Assisted Wi-Fi Localization with a Single Access Point"
Zhe Chen, Guorong Zhu, **Sulei Wang**, Jie Xiong, Yuedong Xu, Jin Zhao, Jun Luo, Xin Wang
submitted to IEEE Transactions on Mobile Computing (TMC)
3. "On User Selective Eavesdropping Attacks in MU-MIMO: CSI Forgery and Countermeasure"
Sulei Wang, Zhe Chen, Yuedong Xu, Qiben Yan, Chongbin Xu, Xin Wang
accepted by IEEE Conference on Computer Communications (INFOCOM), 2019
(288 out of 1464 submissions, acceptance ratio: 19.7%)
4. "Practical User Selection with Heterogeneous Bandwidth and Antennas for MU-MIMO WLANs"
Sulei Wang, Zhe Chen, Yuedong Xu, Xin Wang, Qingsheng Kong
accepted by IEEE Wireless Communications Letters.
5. "BUSH: Empowering Large-Scale MU-MIMO in WLANs With Hybrid Beamforming"
Zhe Chen, Xu Zhang, **Sulei Wang**, Jie Xiong, Yuedong Xu, Xin Wang
IEEE Conference on Computer Communications (INFOCOM), 2017
(292 out of 1395 submissions, acceptance ratio: 20.9%)

Awards

- Mar. 2019 IEEE INFOCOM 2019 Student Travel Grant Award, *IEEE ComSoc*.
- Dec. 2017 Award for Outstanding Students of Master's Degrees, *Fudan University*.
- Dec. 2014 Second-Class Scholarship for Outstanding Student, *Shandong University*.
- Oct. 2014 First Prize, *National Undergraduate Electronic Design Contest*.
- Dec. 2013 First-Class Scholarship for Outstanding Student, *Shandong University*.

Skills

- **Languages:** Mandarin, English
- **Programming:** Proficient in: MATLAB, Python, \LaTeX
With basic ability in: C, C++, Java
- **Hardware:** Experienced in: Wireless Open Access Research Platform (WARP)