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: Dr. Yuedong Xu
Research interests: wireless networking, wireless 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. "M^3: 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 to 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 to 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

- 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)