ZESEN ZHANG

Homepage: www.zesenzhang.net ◇ E-mail: 625382031@sjtu.edu.cn

EDUCATION

Shanghai Jiao Tong University *Sep 2015 - Present*
Zhiyuan Honors Program of Engineering (Highly Seletive: **Top 5%)**, School of Cyber Security
B.S in Information Security

1st Year GPA: **86.8/100**; 2nd Year GPA: **89.2/100**; 3rd Year GPA: **90.4/100**; Total GPA:**89/100**

AREAS OF INTERESTS

Network Security, System Security and Reliability, Mobile Security
Blockchain Network, Probability Theory

PUBLICATIONS

[1] Fu, Luoyi; Fu, Xinzhe; **Zhang, Zesen;** Xu, Zhiying; Wu, Xudong; Wang, Xinbing; Lu, Songwu,"Joint Optimization of Multicast Energy in Delay-constrained Mobile Wireless Networks" accepted by the *IEEE/ACM Transactions on Networking.*

[2] **Zesen Zhang,** Dongrui Lu, YinYou Li, Luoyi Fu, Guihai Chen"Evolving Information Cascading: Late Bird Matters" submitted to *IEEE INFOCOM 2019*

[3] Xiaoying Gan, **Zesen Zhang**, Luoyi Fu, Xinbing Wang "Unraveling Impact of Critical Sensing Range on Mobile Camera Sensor Networks" submitted to *the Transactions on Mobile Computing.*

RESEARCH EXPERIENCES

Intelligent Internet of Things
Core Member Supervisors: **Prof. Xinbing Wang, Prof. Luoyi Fu**
Asymptotic Analysis and Privacy Protection in Social Networks *Aug 2018 - Present*

- Description: This study shows how to de-anonymize the identity of a person in an anonymized network using the mapping between two networks.
- Implemented the preferential attachment(PA) model to show the evolving character of social networks and discover the degree character.
- Showed the relationship between the subgraphs and the super-graph (a great index in the seedless method) via MAP index (made by Maximum Posterior Probability).
- Trying to use the single-arm bandit method to form the modified function contributed by the evolving characteristic of the network.

The Percolation of Rumor In the Evolving Social Network *Jan 2018 - Jul 2018*

- Description: This study shows the critical scale of "seed" that we need to percolate the influence to the whole network that is evloving.
- Used the reduction method to prove that finding the critical scale of "seed" to diffuse to the whole network in the general evolving network is an N-P hard problem.
- Applied the Markov process to portray the evolving process under the preferential attachment (PA) model and the Erdos-Renyi (ER) model which can form each step recursively. Then, applied the Taylor formula, the Stirling formula and the Azumas inequality to prove that ln n (n is the number of vertexes in the network) seed is the only influence to the whole network.
- Verified the results of theoretical deduction in large-scale academic network.
- Submitted to IEEE INFOCOM 2019.

Unraveling Impact of Critical Sensing Range on Mobile CSNs *Aug 2017 - Dec 2017*

- Description: This study uses equivalent sensing radius (ESR) to unravel the critical requirement for asymptotic full view coverage in both static and mobile heterogeneous Camera Sensor Networks (CSNs).
- Derived the critical sensing range for full view coverage under static model, 2-dimensional random walk mobility, 1-dimensional random walk and random rotating model.
- Analyzed the numerical results to validate the theoretical results on critical ESR to achieve full view coverage and investigated the relationship between ESR and the percentage of full view coverage.
- Submitted to Transactions on Mobile Computing.

Optimizing Multicast Energy in Mobile Wireless Networks *Mar 2017 - July 2017*

- Description: This study proposes ConMap, a novel and general framework for efficient transmission scheme design that jointly optimizes both the transmitting and receiving energy.
- Helped develop the algorithm which especially focus on optimize the energy on both spread and receive sides. It makes a step to first add the energy of receive side into consideration and use Steiner tree to get the optimization result of designing minimum energy transmission scheme (DeMEM) problem.
- Evaluated the performance and flexibility of ConMap framework based on three real datasets through SPT heuristic, MST heuristic and approximation algorithm.
- Accepted by IEEE/ACM Transaction on Networking.

SELECTED PROJECTS

Intelligent Mobile Gray Software Detection and Analysis System *Mar 2018-May 2018*

- Developed and implemented the detection and analysis system for different users.
- Applied 3 progressive methods to predict the possibility of gray apps and obtained 92% accuracy.
  ·Decompiled the APK, analyzed user permission, intent action and category, then applied KNN for classification training.
  ·Transformed the binary code into the gray graph and used Neural Network to learn the graph.
  ·Installed the app in virtual machine for dynamic analysis based on Xposed.

Encrypted Communication System Based on netfilter *Sep 2017 - Jan 2018*

- Designed a Firewall encryption system for data encryption and transfer in Linux.
- Used DH, AES and RSA to encrypt and decrypt the information transfer between the client and server.
- Established the visualization system for users to choose different encryption algorithms and encrypt the words based on a specific network protocol (Like TCP or UDP).

SERVICES

Reviewer of: China Communications, Wireless Network, Transaction on Sensor Network
Secretary of Cuhural and Sports Center, Student Union, SJTU
Secretary of the Ministry of Coach, Table Tennis Association, SJTU

HONORS & AWARDS

Chuntsung Programme Scholarship	*2018*
First prize, National Mathematical Contest in Modeling (Country level) (**Top 1%**)	*2017*
Zhiyuan Honours Programme Scholarship	*2015-2017*
Zhiyuan ABC scholarship (**Top 5%**)	*2015-2017*
Merit Student in Shanghai Jiao Tong University	*2017*
Third prize, National Physics Competition	*2016*
Third prize, National Table Tennis Competition for College Students	*2016*

TECHNICAL STRENGTHS

Computer Languages	C/C++, Java, Python, html;
Language for Hardware	C, Verilog VHDL
Other Tools	MATLAB, LaTeX, Multisim