DONGXIN LIU

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Shanghai Jiao Tong University

EDUCATION

Shanghai Jiao Tong University

- M.S. in Computer Science: advisor Prof. Fan Wu.   *Sep. 2014 - Present*
  Overall GAP: 2.75/3.3   Major GPA: 2.84/3.3   Rank: 2/102
- B.S. in Computer Science   *Sep. 2010 - Jun. 2014*
  Overall GPA: 87.56/100   Rank: 12/130   Major GPA: 90.87/100   Rank: 6/130

RESEARCH INTERESTS

My research interests are in the areas of wireless network, matrix completion, and optimization theory. A central theme is building a system to efficiently identify unoccupied TV spectrums in the indoor environment. I am proficient in the techniques of compressive sensing and Gaussian process.

PUBLICATIONS

- **Dongxin Liu**, Zhihao Wu, Fan Wu, Yuan Zhang, and Guihai Chen, "FIWEX: Compressive Sensing Based Cost-Efficient Indoor White Space Exploration", Proceedings of the *16th ACM International Symposium on Mobile Ad Hoc Networking and Computing (**MobiHoc**)*, Hangzhou, China, June, 2015. [Acceptance rate: **14.8%**] [PDF]
- Fan Wu, **Dongxin Liu**, Zhihao Wu, Yuan Zhang, and Guihai Chen, "Cost-Efficient Indoor White Space Exploration through Compressive Sensing", *IEEE/ACM Transactions on Networking (**ToN**)* (Accepted, the first author Fan Wu is my advisor). [PDF]
- **Dongxin Liu**, Fan Wu, Linghe Kong, Shaojie Tang, Yuan Luo, and Guihai Chen, "Training-Free Indoor White Space Exploration", *IEEE Journal on Selected Areas in Communications (**JSAC**)*, vol. 34, no. 10, 2016. [Acceptance rate: **11.5%**] [PDF]
- **Dongxin Liu**, Tianshu Liu, Xiaofeng Gao, Fan Wu, and Shaojie Tang, "Towards Fine-Grained Indoor White Space Estimation", Proceedings of the *ACM Special Interest Group for the computer systems performance evaluation community (**SIGMETRICS**)*, Urbana-Champaign, IL, June, 2017 (To be submitted). [PDF]

RESEARCH EXPERIENCES

Indoor White Space Measurement at Different Cities   *Apr. 2014 - Nov. 2015*

- Implemented an energy detector based on GNU Radio platform and USRP N210 devices.
- Deployed more than 22 USRP's to measure the RSSIs of TV spectrums in different buildings of Shanghai and Nanjing for more than one month.
- Characterized the spatial-temporal-spectral correlations among indoor TV spectrums based on roughly 3400000 samples collected during the measurement.

Compressive Sensing Based Indoor White Space Exploration System   *Apr. 2014 - Dec. 2014*

- Reconstructed the indoor white space availability map by solving a compressive sensing based non-convex optimization problem and designed a *k-medoids* clustering based sensor deployment algorithm.
- Identified 47.8% more indoor white spaces with 38.4% less false alarms compared with WISER (*MobiCom'13*).
- Published in ***MobiHoc*** 2015, corresponding journal version was accepted by *IEEE/ACM Transactions on Networking (**ToN**)*.

Training-free Indoor White Space Exploration System   *Jan. 2015 - Jul. 2015*

- Designed a training-free indoor white space exploration system based on Relevance Vector Machine (RVM) and Bayesian compressive sensing, and implemented training-free spectrum detector deployment by maximizing the differential entropy.

- Achieved competitive performance against the existing training-based systems.
- Published in *IEEE Journal on Selected Areas in Communications (**JSAC**)*, vol. 34, no. 10, 2016.

Gaussian Process Based Fine-grained Indoor White Space Estimation *Aug. 2015 - Apr. 2016*

- Characterized the spatial-temporal-spectral correlations of indoor white space by multiplying a Gaussian kernel, a period kernel, and a semi-positive matrix, and utilized multitask Gaussian process model to accurately estimate the white space availability at arbitrary indoor locations.
- Designed a sensor candidate locations selection mechanism by maximizing the mutual information.
- To be submitted to **SIGMETRICS** 2017.

Mobile Sensor Based Indoor White Space Exploration System *May 2016 - Present*

- Designed and implemented a mobile spectrum sensing platform which contains an USRP, an omni antenna, an Arduino-WiFi based mobile device and an Intel NUC.
- Devised a multi-task Gaussian process based mobile device dispatching mechanism to explore indoor white space with only one mobile sensor.
- In preparation for **MobiCom** 2017.

SCHOLARSHIPS & AWARDS

National Scholarship, China (Top 2%)	*2016*
National Scholarship, China (Top 2%)	*2015*
Outstanding Graduates Awards, SJTU	*2014*
Academic Excellence Scholarship of SJTU (Top 5%)	*2013*
Academic Excellence Scholarship of SJTU (Top 10%)	*2012*
Academic Excellence Scholarship of SJTU (Top 5%)	*2011*

SKILLS

Computer Languages	C, C++, MATLAB, Python, Java.
Math Tools	Compressive sensing, Multi-task Gaussian process, Non-convex optimization.
Platforms	USRP, GNU Radio, Gnuplot, iRobot.

EXTRACURRICULAR ACTIVITIES

- Quality Development Association, *Vice President*	*2011 - 2012*
- Volunteer at Shanghai International Marathon	*2012, 2013, 2014, 2015*