

# Xiangxiang Xu

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## RESEARCH INTERESTS

Information theory, machine learning, data analytics

## EDUCATION

*Tsinghua University*, Beijing, China  
Ph.D. Candidate, Electronic Engineering, Aug. 2014 – Present (Expected: Jun. 2020)  
Advisors: Prof. Lin Zhang and Prof. Shao-Lun Huang

*Tsinghua University*, Beijing, China  
B.E., Electronic Engineering, Aug. 2010 – Jul. 2014.

## HONORS & AWARDS

IEEE PES Student Prize Paper Award in Honor of T. Burke Hayes Jul. 2016  
First Prize Winner of Tsinghua-DEK Scholarship Jun. 2012  
Excellence Award of EDA Practice Jun. 2011

## TEACHING EXPERIENCE

*Teaching Assistant for*  
Information Theory and Statistical Learning Autumn 2019  
Learning from Data Autumn 2018, Spring 2019  
Inference and Information Autumn 2017  
Fundamentals of Applied Information Theory (MOOC) Autumn 2016  
Calculus A Autumn 2015, Spring 2016, Autumn 2016

## CONFERENCE PUBLICATIONS

- [C1] **Xiangxiang Xu**, Pei Zhang, and Lin Zhang. “Gotcha: a mobile urban sensing system”. In: *Proceedings of the 12th ACM Conference on Embedded Network Sensor Systems*. ACM. 2014, pp. 316–317.
- [C2] **Xiangxiang Xu**, Xinlei Chen, Xinyu Liu, Hae Young Noh, Pei Zhang, and Lin Zhang. “Gotcha II: Deployment of a Vehicle-based Environmental Sensing System”. In: *Proceedings of the 14th ACM Conference on Embedded Network Sensor Systems CD-ROM*. ACM. 2016, pp. 376–377.
- [C3] Xinlei Chen, **Xiangxiang Xu**, Xinyu Liu, Hae Young Noh, Lin Zhang, and Pei Zhang. “HAP: Fine-Grained Dynamic Air Pollution Map Reconstruction by Hybrid Adaptive Particle Filter”. In: *Proceedings of the 14th ACM Conference on Embedded Network Sensor Systems CD-ROM*. ACM. 2016, pp. 336–337.
- [C4] Xinyu Liu, **Xiangxiang Xu**, Xinlei Chen, Enhao Mai, Hae Young Noh, Pei Zhang, and Lin Zhang. “Individualized Calibration of Industrial-Grade Gas Sensors in Air Quality Sensing System”. In: *Proceedings of the 15th ACM Conference on Embedded Network Sensor Systems*. ACM. 2017, p. 74.
- [C5] Xinyu Liu, Xinlei Chen, **Xiangxiang Xu**, Enhao Mai, Hae Young Noh, Pei Zhang, and Lin Zhang. “Delay Effect in Mobile Sensing System for Urban Air Pollution Monitoring”. In: *Proceedings of the 15th ACM Conference on Embedded Network Sensor Systems*. ACM. 2017, p. 73.

- [C6] Rui Ma, **Xiangxiang Xu**, Hae Young Noh, Pei Zhang, and Lin Zhang. “Generative Model Based Fine-Grained Air Pollution Inference for Mobile Sensing Systems”. In: *Proceedings of the 16th ACM Conference on Embedded Networked Sensor Systems*. ACM. 2018, pp. 426–427.
- [C7] Xinlei Chen, **Xiangxiang Xu**, Xinyu Liu, Shijia Pan, Jiayou He, Hae Young Noh, Lin Zhang, and Pei Zhang. “PGA: Physics Guided and Adaptive Approach for Mobile Fine-Grained Air Pollution Estimation”. In: *Proceedings of the 2018 ACM International Joint Conference and 2018 International Symposium on Pervasive and Ubiquitous Computing and Wearable Computers*. ACM. 2018, pp. 1321–1330.
- [C8] **Xiangxiang Xu**, Shao-Lun Huang, Lizhong Zheng, and Lin Zhang. “The Geometric Structure of Generalized Softmax Learning”. In: *2018 IEEE Information Theory Workshop (ITW)*. IEEE. 2018, pp. 1–5.
- [C9] Rui Ma, **Xiangxiang Xu**, Yue Wang, Hae Young Noh, Pei Zhang, and Lin Zhang. “Guiding the Data Learning Process with Physical Model in Air Pollution Inference”. In: *2018 IEEE International Conference on Big Data (Big Data)*. IEEE. 2018, pp. 4475–4483.
- [C10] Lu Li, Yang Li, **Xiangxiang Xu**, and Lin Zhang. “A maximal correlation embedding method for multilabel human context recognition”. In: *Proceedings of the 18th International Conference on Information Processing in Sensor Networks*. ACM. 2019, pp. 305–306.
- [C11] Lichen Wang, Jiaxiang Wu, Shao-Lun Huang, Lizhong Zheng, **Xiangxiang Xu**, Lin Zhang, and Junzhou Huang. “An efficient approach to informative feature extraction from multimodal data”. In: *Proceedings of the AAAI Conference on Artificial Intelligence*. Vol. 33. 2019, pp. 5281–5288.
- [C12] Lu Li, Yang Li, **Xiangxiang Xu**, Shao-Lun Huang, and Lin Zhang. “Maximal Correlation Embedding Network for Multilabel Learning with Missing Labels”. In: *2019 IEEE International Conference on Multimedia and Expo (ICME)*. IEEE. 2019, pp. 393–398.
- [C13] Rui Ma, Ning Liu, **Xiangxiang Xu**, Yue Wang, Hae Young Noh, Pei Zhang, and Lin Zhang. “A deep autoencoder model for pollution map recovery with mobile sensing networks”. In: *Proceedings of the 2019 ACM International Joint Conference on Pervasive and Ubiquitous Computing and Proceedings of the 2019 ACM International Symposium on Wearable Computers*. ACM. 2019, pp. 577–583.
- [C14] Shao-Lun Huang and **Xiangxiang Xu**. “On the robustness of noisy ACE algorithm and multi-layer residual learning”. In: *2019 IEEE International Symposium on Information Theory (ISIT)*. IEEE. 2019, pp. 2474–2478.
- [C15] **Xiangxiang Xu** and Shao-Lun Huang. “On the Asymptotic Sample Complexity of HGR Maximal Correlation Functions in Semi-supervised Learning”. In: *2019 57th Annual Allerton Conference on Communication, Control, and Computing (Allerton)*. IEEE. 2019, pp. 879–886.
- [C16] Shao-Lun Huang and **Xiangxiang Xu**. “On the Sample Complexity of HGR Maximal Correlation Functions”. In: *2019 IEEE Information Theory Workshop (ITW)*. Aug. 2019, pp. 1–5. DOI: 10.1109/ITW44776.2019.8989373.

**JOURNAL  
PUBLICATIONS**

- [J1] Tianyu Yang, **Xiangxiang Xu**, Qinglai Guo, Lin Zhang, and Hongbin Sun. “EV charging behaviour analysis and modelling based on mobile crowdsensing data”. In: *IET Generation, Transmission & Distribution* 11.7 (2017), pp. 1683–1691.

- [J2] **Xiangxiang Xu** and Shao-Lun Huang. “Maximal Correlation Regression”. In: *IEEE Access* 8 (2020), pp. 26591–26601. ISSN: 2169-3536. DOI: 10.1109/ACCESS.2020.2971386.

**PREPRINTS**

- [P1] Shao-Lun Huang, **Xiangxiang Xu**, Lizhong Zheng, and Gregory W Wornell. “An Information Theoretic Interpretation to Deep Neural Networks”. arXiv preprint. 2019. URL: <http://arxiv.org/abs/1905.06600>.
- [P2] Shao-Lun Huang and **Xiangxiang Xu**. “On the Sample Complexity of HGR Maximal Correlation Functions”. arXiv preprint. 2019. URL: <http://arxiv.org/abs/1907.00393>.
- [P3] Shao-Lun Huang, **Xiangxiang Xu**, and Lizhong Zheng. “An Information-theoretic Approach to Unsupervised Feature Selection for High-Dimensional Data”. arXiv preprint. 2019. URL: <http://arxiv.org/abs/1910.03196>.

**PROFESSIONAL ACTIVITIES** Reviewer for IEEE International Symposium on Information Theory (ISIT), IEEE Information Theory Workshop (ITW), and IEEE International Conference on Sensing, Communication and Networking (SECON)