

# Feng Lyu

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Research Interests: **VANETs, Data Science, Space-Air-Ground Integrated Networks, Edge Computing**

## Working Experience

*Post-Doctoral Fellow*, Department of Electrical and Computer Engineering  
Waterloo, Ontario, Canada  
supervised by Prof. **Xuemin (Sherman) Shen** 2018.09 - Present.

## Education

*Ph.D.*, Computer Science and Technology  
Shanghai Jiao Tong University, Shanghai, China  
supervised by Prof. **Minglu Li** 2013.09 - 2018.06

*Visiting PhD (CSC)*, Computer Science and Technology  
University of Waterloo, Ontario, Canada  
supervised by Prof. **Xuemin (Sherman) Shen** 2016.10 - 2017.10

*B.S.*, Software Engineering  
Central South University, Changsha, China 2009.09 - 2013.06

## Research Project

*National Natural Science Foundation of China (NSFC)-  
International Cooperative Key Research Project* 2017.01 - 2020.12  
Research on Key Technology of Space-Air-Ground Integrated  
Vehicular Network for Immersive Driving Experience Participating

*National Natural Science Foundation of China (NSFC)* 2018.01 - 2021.12  
Research on Key Technology of Reliable and Flexible  
Broadcasting for High-Density Vehicular Networks Participating

*National Natural Science Foundation of China (NSFC)-  
International Cooperative Key Research Project* 2015.01 - 2019.12  
Research on Key Technology of VANET-Assisted  
Safety Transportatation System Participating

*National 863 Program* 2015.01 - 2017.12  
Research on Hybrid Cloud Key Technology Participating

## Publications

### *Journal Articles, (\* is corresponding author)*

1. **Feng Lyu**, Liang Fang, Guangtao Xue, Hua Xue, Minglu Li, "Large-Scale Full WiFi Coverage: Deployment and Management Strategy Based on User Spatio-Temporal Association Analytics". *IEEE Internet of Things Journal*, DOI: 10.1109/JIOT.2019.2933266. (Q1)
2. **Feng Lyu**, Hongzi Zhu, Nan Cheng, Haibo Zhou, Wenchao Xu, Minglu Li, Xuemin (Sherman) Shen, "Characterizing Urban Vehicle-to-Vehicle Communications for Reliable Safety Applications", *IEEE Transactions on Intelligent Transportation Systems*, DOI: 10.1109/TITS.2019.2920813. (Q1)
3. **Feng Lyu**, Ju Ren, Peng Yang, Nan Cheng, Wenjuan Tang, Yaoxue Zhang, and Xuemin (Sherman) Shen, "Fine-Grained TDMA MAC Design Toward Ultra-Reliable Broadcast for Autonomous Driving". *IEEE Wireless Communications*, DOI: 10.1109/MWC.2019.1800535. (Q1)
4. **Feng Lyu**, Nan Cheng, Haibo Zhou, Wenchao Xu, Weisen Shi, Jiayin Chen, Minglu Li, "DBCC: Leveraging Link Perception for Distributed Beacon Congestion Control in VANETs", *IEEE Internet of Things Journal*, vol. 5, no. 6, pp. 4237-4249, Dec. 2018. (Q1)
5. **Feng Lyu**, Nan Cheng, Hongzi Zhu, Haibo Zhou, Wenchao Xu, Minglu Li, Xuemin (Sherman) Shen, "Intelligent Context-aware Communication Paradigm Design for IOVs based on Data Analytics", *IEEE Network*, vol. 32, no. 6, pp. 74-82, Nov. 2018. (Q1)
6. **Feng Lyu**, Hongzi Zhu, Haibo Zhou, Liping Qian, Wenchao Xu, Minglu Li, Xuemin (Sherman) Shen, "MoMAC: Mobility-Aware and Collision-Avoidance MAC for Safety Applications in VANETs", *IEEE Transactions on Vehicular Technology*, vol. 67, no. 11, pp. 10590-10602, Nov. 2018. (Q1)
7. **Feng Lyu**, Hongzi Zhu, Haibo Zhou, Wenchao Xu, Ning Zhang, Minglu Li, Xuemin (Sherman) Shen, "SS-MAC: A Novel Time Slot-Sharing MAC for Safety Messages Broadcasting in VANETs", *IEEE Transactions on Vehicular Technology*, vol. 67, no. 4, pp. 3586-3597, Apr. 2018. (Q1)
8. Wenchao Xu, Weisen Shi, **Feng Lyu\***, Haibo Zhou, Nan Cheng, Xuemin (Sherman) Shen, "Throughput Analysis of Vehicular Internet Access via Roadside WiFi Hotspot". *IEEE Transactions on Vehicular Technology*, vol. 68, no. 4, pp. 3980-3991, April 2019. (Q1)
9. Shan Zhang, Jiayin Chen, **Feng Lyu\***, Nan Cheng, Weisen Shi, "Vehicular Communication Networks in Automated Driving Era". *IEEE Communications Magazine*, vol. 56, no. 9, pp. 26-32, Sept. 2018. (Q1)
10. Nan Cheng, **Feng Lyu**, Jiayin Chen, Wenchao Xu, Haibo Zhou, Shan Zhang, Xuemin (Sherman) Shen, "Big data driven vehicular networks". *IEEE Network*, vol. 32, no. 6, pp. 160-167, Dec. 2018. (Q1, Hot paper, Top 0.1%)
11. Weisen Shi, Junling Li, Nan Cheng, **Feng Lyu**, Shan Zhang, Haibo Zhou, "Multi-Drone 3D Trajectory Planning and Scheduling in Drone Assisted Radio Access Networks". *IEEE Transactions on Vehicular Technology*, to appear, 2019. (Q1)
12. Nan Cheng, **Feng Lyu**, Wei Quan, Conghao Zhou, Hongli He, Weisen Shi, Xuemin (Sherman) Shen, "Space/Aerial-Assisted Computing Offloading for IoT Applications: A Learning-Based Approach". *IEEE Journal on Selected Areas in Communications*, vol. 37, no. 5, pp. 1117-1129, May 2019. (Q1, CCF A)
13. Wenchao Xu, Haibo Zhou, Huaqing Wu, **Feng Lyu**, Nan Cheng, Xuemin (Sherman) Shen, "Intelligent Link Adaptation in 802.11 Vehicular Networks: Challenges and Solutions". *IEEE Communications Standards Magazine*, vol. 3, no. 1, pp. 12-18, Mar. 2019.

14. Wenchao Xu, Haibo Zhou, Nan Cheng, **Feng Lyu**, Weisen Shi, Jiayin Chen, Xuemin (Sherman) Shen, "Internet of vehicles in big data era". *IEEE/CAA Journal of Automatica Sinica*, vol. 5, no. 1, pp. 19-35, Jan. 2018.

### Conferences

1. **Feng Lyu**, Ju Ren, Nan Cheng, Peng Yang, Minglu Li, Yaoxue Zhang, Xuemin (Sherman) Shen, "Big Data Analytics for User Association Characterization in Large-Scale WiFi System". In *Proceedings of IEEE International Conference on Communications (ICC)*, Shanghai, China, 2019: 1 - 6. (**The Best Paper Award, CCF C**)
2. **Feng Lyu**, Ju Ren, Nan Cheng, Peng Yang, Minglu Li, Yaoxue Zhang, Xuemin (Sherman) Shen, "Demystifying Traffic Statistics for Edge Cache Deployment in Large-Scale WiFi System". In *Proceedings of IEEE International Conference on Distributed Computing Systems (ICDCS)*, Dallas, Texas, USA, 2019:1-11. (**CCF B**)
3. **Feng Lyu**, Peng Yang, Weisen Shi, Huaqing Wu, Wen Wu, Nan Cheng, Xuemin (Sherman) Shen, "Online UAV Scheduling Towards Throughput QoS Guarantee for Dynamic IoVs". In *Proceedings of IEEE International Conference on Communications (ICC)*, Shanghai, China, 2019: 1 - 6. (**CCF C**)
4. **Feng Lyu**, Hongzi Zhu, Nan Cheng, Yanmin Zhu, Haibo Zhou, Wenchao Xu, Guangtao Xue, Minglu Li, "ABC: Adaptive Beacon Control for Rear-End Collision Avoidance in VANETs". In *Proceedings of IEEE International Conference on Sensing, Communication, and Networking (SECON)*, Hong Kong, China, 2018:1-9. (**CCF B**)
5. Liang Fang, Guangtao Xue, **Feng Lyu\***, Hao Sheng, Futai Zou, Minglu Li, "Intelligent Large-Scale AP Control with Remarkable Energy Saving in Campus WiFi System". In *Proceedings of IEEE International Conference on Parallel and Distributed Systems (ICPADS)*, Singapore, 2018:69-76. (**CCF C**)
6. Renjie Jin, Guangtao Xue, **Feng Lyu\***, Hao Sheng, Gongshen Liu, Minglu Li, "Leveraging Inner-Connection of Message Sequence for Traffic Classification: A Deep Learning Approach". In *Proceedings of IEEE International Conference on Parallel and Distributed Systems (ICPADS)*, Singapore, 2018:77-84. (**CCF C**)
7. **Feng Lyu**, Hongzi Zhu, Hua Xue, Yanmin Zhu, Shan Chang, Mianxiong Dong, Minglu Li, "An empirical study on urban IEEE 802.11 p vehicle-to-vehicle communication". In *Proceedings of IEEE International Conference on Sensing, Communication, and Networking (SECON)*, London, UK, 2016:1-9. (**CCF B**)
8. Xiaofeng Cao, Yan Li, Jiarong Hany, Peng Yang, **Feng Lyu**, Deke Guo, and Xuemin (Sherman) Shen, "Online Worker Selection Towards High Quality Map Collection for Autonomous Driving", in *Proceeding of IEEE Global Communications Conference (Globecom)*, Waikoloa, HI, USA, Dec. 9-13, 2019. (**CCF C**)
9. Chonghao Zhou, Wen Wu, Hongli He, Peng Yang, **Feng Lyu**, Nan Cheng, and Xuemin (Sherman) Shen, "Delay-aware IoT Task Scheduling in Space-air-ground Integrated Network", in *Proceeding of IEEE Global Communications Conference (Globecom)*, Waikoloa, HI, USA, Dec. 9-13, 2019. (**CCF C**)

### In submission

1. **Feng Lyu**, Ju Ren, Nan Cheng, Peng Yang, Minglu Li, Yaoxue Zhang, Xuemin (Sherman) Shen, "LEAD: Large-Scale Edge Cache Deployment Based on Spatio-Temporal WiFi Traffic Statistics", *IEEE Transactions on Mobile Computing*, **in submission** (submitted on Jun. 2019).

2. Weihua Zhuang, Qiang Ye, **Feng Lyu**, Nan Cheng, Ju Ren, "SDN/NFV Empowered Future IoV with Enhanced Communication, Computing, and Caching", *Proceedings of the IEEE*, **in submission** (submitted on Jul. 2019).
3. **Feng Lyu**, Peng Yang, Nan Cheng, Wenchao Xu, Huaqing Wu, Xuemin (Sherman) Shen, "Service-Oriented Dynamic Resource Slicing and Optimization for Space-Air-Ground Integrated Vehicular Networks", *IEEE Journal on Selected Areas in Communications*, **in submission** (submitted on Apr. 2019).
4. **Feng Lyu**, Nan Cheng, Hongzi Zhu, Haibo Zhou, Wenchao Xu, Minglu Li, Xuemin (Sherman) Shen, "Towards Rear-End Collision Avoidance: Adaptive Beaconing for Connected Vehicles", *IEEE Transactions on Intelligent Transportation Systems*, **in submission** (submitted on Jan. 2019).
5. **Feng Lyu**, Ju Ren, Peng Yang, Nan Cheng, Yaoxue Zhang, Xuemin (Sherman) Shen, "SoSA: Socializing Static APs for Edge Resource Pooling in Large-Scale WiFi System", *IEEE INFOCOM2020*, **in submission**.
6. Xiaofeng Cao, Deke Guo, **Feng Lyu**, Peng Yang, Weiming Zhang, Xuemin (Sherman) Shen, "Customizing Urban Caching Strategy for HD Map Provisioning with Spatio-Temporal GPS Trace", *IEEE INFOCOM2020*, **in submission**.

## Research Awards

Best Paper Award of IEEE ICC 2019 (out of 2590 submissions)

## Professional Services

Invited TPC Member for:

- IEEE International Conference on Computing, Networking and Communications (ICNC)'20
- IEEE International Conference on Big Data Science and Engineering (BigDataSE)'19
- IEEE Cyber Science and Technology Congress (CyberSciTech)'19
- IEEE Vehicular Technology Conference Fall (VTC-Fall)'19
- IEEE Vehicular Technology Conference Fall (VTC-Fall)'19

Invited Reviewers for:

- IEEE Transactions on Mobile Computing
- IEEE Internet of Things Journal
- IEEE Transactions on Industrial Informatics
- IEEE Transactions on Vehicular Technology
- IEEE Network Magazine
- IEEE Communications Letters
- IET Communications