Yue XU

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Ph.D. Candidate August 10th, 1993

I am a fourth-year graduate student in the **School of Information and Communication Engineering (SICE)** in **Beijing University of Post and Telecommunication (BUPT)**, major in **Information Communication Engineering (ICE)**. My research interests include machine learning, large-scale data analytics and system control, data-driven wireless network management.

Education

Present – Sep. 2015 **Ph.D Candidate • ICE @ SICE • BUPT**

- Visiting Researcher with the Department of Electrical and Computer Engineering in **University of California, Davis** (from Sep. 2016 to Sep. 2018, Funded by the China Scholarship Council)
- Visiting Researcher with the **Chinese University of Hong Kong, Shenzhen (CUHKSZ)** (from Mar. 2016 to Aug. 2016)
- Visiting Researcher with the Department of Operations Research and Financial Engineering in **Princeton University** (from Jul. 2018 to Aug. 2018)

Jul. 2015 – Sep. 2011 **Bachelor's Degree • Communication Engineering @ SICE • BUPT**

- Pilot Class (Selected) • GPA: 88/100 (Top 15%)
- Outstanding Graduate Thesis Award (Top 1%)

Internships

Jun. 2019 – Oct. 2018 **Research Assistant @ Shenzhen Research Institute of Big Data (SRIBD)**

- Wireless Traffic Prediction with Scalable Gaussian Process (GP)
- Load Balancing for Ultra-Dense Networks with Deep Reinforcement Learning (DRL)
- Multi-agent Reinforcement Learning based on the linear programing form of the nonlinear Bellman equation

Publications

1. **Y. Xu**, F. Yin, W. Xu, J. Lin and S. Cui, "Wireless Traffic Prediction with Scalable Gaussian Process: Framework, Algorithms, and Verification," in *IEEE Journal on Selected Areas in Communications (**JSAC**)*, 2019. (accepted; **IF=7.172**)
2. **Y. Xu**, F. Yin, W. Xu, J. Lin and S. Cui, " Scalable Gaussian Process Using Inexact ADMM for Big Data," in *IEEE International Conference on Acoustics, Speech, and Signal Processing (**ICASSP**)*, 2019. (accepted)
3. **Y. Xu**, F. Yin, W. Xu, J. Lin and S. Cui, " Distributed Gaussian Process: New Paradigm and Application to Wireless Traffic Prediction," in *IEEE International Conference on Communications (**ICC**)*, 2019. (accepted)
4. **Y. Xu**, Z. Wang, W. Xu, J. Lin and S. Cui, " Deep Reinforcement Learning Based Mobility Load Balancing Under Multiple Behavior Policies," in *IEEE International Conference on Communications (**ICC**)*, 2019. (accepted)
5. **Y. Xu**, Z. Wang, W. Xu, J. Lin and S. Cui, " Load Balancing for Ultra-Dense Networks with Deep Reinforcement Learning under Multiple Behavior Policies," submitted to ***IEEE Internet of Things Journal***, 2019.
6. W. Xu, **Y. Xu**, Y. Xu, C. Lee, Z. Feng, P. Zhang and J. Lin, " Data-Cognition-Empowered Intelligent Wireless Networks: Data, Utilities, Cognition Brain, and Architecture," in ***IEEE Wireless Communications***, 2018. (**IF=9.202**)
7. Z. Wang, L. Li, **Y. Xu**, H. Tian and S. Cui, " Handover Control in Wireless Systems via Asynchronous Multiuser Deep Reinforcement Learning," in ***IEEE Internet of Things Journal***, 2018. (**IF=5.863**)
8. Z. Wang, L. Li, **Y. Xu**, H. Tian and S. Cui, " Handover Optimization via Asynchronous Multi-User Deep Reinforcement Learning," in *IEEE International Conference on Communications (**ICC**)*,2018.
9. **Y. Xu**, F. Yin, W. Xu, J. Lin and S. Cui, " High-Accuracy Wireless Traffic Prediction: A GP-Based Machine Learning Approach," in *IEEE Global Communications Conference (**GLOBECOM**)*, 2017.
10. W. Xu, S. Li, **Y. Xu**, X. Lin, " Underlaid-D2D-assisted cooperative multicast based on social networks," in *Peer-to-Peer Networking and Applications*, 2016. (**IF:1.514**)
11. W. Xu, S. Li, **Y. Xu**, Z. Feng, J. Lin, " Energy-efficient layered video multicast over OFDM-based cognitive radio systems," in *International Journal of Distributed Sensor Networks*, 2015. (**IF:1.78**)
12. W. Xu, B. Li, **Y. Xu** and J. Lin, " Lower-Complexity Power Allocation for LTE-U Systems: A Successive Cap-Limited Waterfilling Method," in *IEEE Vehicular Technology Conference (VTC Spring)*, 2015.
13. H. Cui, S. Tang, F. Sun, **Y. Xu**, X. Yang, " Topological embedding feature based resource allocation in network virtualization," in *Mathematical Problems in Engineering*, 2014. (**IF:1.145**)

Research Experiences

Project on **Distributed and Parallel Gaussian Process (Regression Analysis)**
Work with CUHKSZ & BUPT
Introduction We proposed a GP based wireless traffic prediction model with a specified kernel function, which can attain up to 97% accuracy when predicting real 4G traffic to outperform the state-of-the-art algorithms considerably. **(Paper: High-Accuracy Wireless Traffic Prediction: A GP-Based Machine Learning Approach).** We further proposed the distributed GP model **(Paper: Distributed Gaussian Process: New Paradigm and Application to Wireless Traffic Prediction)** and the parallel GP model **(Paper: Scalable Gaussian Process Using Inexact ADMM for Big Data)** based on the alternating direction method of multipliers (ADMM) and cross-validation to largely reduce the computational complexity with acceptable performance loss. We also proposed a C-RAN based scalable GP prediction architecture to well-support the data-driven network scheduling and resource configuration **(Paper: Wireless Traffic Prediction with Scalable Gaussian Process: Framework, Algorithms, and Verification)**.

Project on **Deep Reinforcement Learning based Large-scale Wireless Network Management**
Work with UC Davis & BUPT
Introduction We proposed an off-policy DRL-based mobility load balancing (MLB) algorithm to solve the large-scale load balancing problem for ultra-dense networks (UDNs). The algorithm employs multiple behavior policies for joint exploration under an asynchronous parallel learning framework, where the traditional methods could be used to guided the learning process to improve the learning efficiency **(Paper: Deep Reinforcement Learning Based Mobility Load Balancing Under Multiple Behavior Policies)**. We further proposed a two-layer MLB architecture to handle the large-scale load balancing problem for UDNs in a self-organized manner **(Paper: Load Balancing for Ultra-Dense Networks with Deep Reinforcement Learning under Multiple Behavior Policies).**

Project on **Voting Based Multi-Agent Reinforcement Learning**
Work with Princeton University & Chinese University of Hong Kong & CUHKSZ & BUPT
Introduction We consider a voting based multi-agent reinforcement learning (MARL) problem, where the agents vote to make group decisions and aim at maximizing the globally averaged returns. **(Paper: Voting Based Multi-Agent Reinforcement Learning, in preparation)**.

Awards & Activities

- BUPT Outstanding Graduate Thesis Award (2015), Silver Award in Beijing "Challenge Cup" College Student Business Plan Competition (2014), Silver Award in National College Student Business Plan Competition (2014), Meritorious (First) Prize in Mathematical Contest in Modeling (2014), Second Prize in BUPT College Student Business Plan Competition (2014), BUPT National College Student Innovation Project (2013)
- The Union Minister of Liaison Department in BUPT, Leader of the Pilot Class, Host of the Graduation Party, Host of the Campus Singer Competition, Member of the Glee Club

Skills

- **Programming and Framework:** Python, Matlab, Tensorflow
- **Languages**: English, Chinese (native speaker)