Yu Yang

Postdoctoral Scholar
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■ Education

2018.08-present **Postdoc, Berkeley Education Alliance for Research in Singapore Limited (BEARS), UC Berkeley**

- Collaborate with Prof. Costas J. Spanos (Supervisor, UC Berkeley) and Prof. Guoqiang Hu (NTU)

2013.09-2018.07 **Ph. D., Department of Automation, Tsinghua University, Beijing, China**

- Collaborate with Prof. Xiaohong Guan (Supervisor) and Prof. (Samuel) Qing-Shan Jia

2009.09-2013.07 **B. S., School of Artificial Intelligent and Automation, Huazhong University of Science and Technology (HUST), Wuhan, China.**

- GPA: 91.83/100

■ Academic Experience and Programs

2018-present **Building Efficiency and Sustainability in the Tropics 2 (National Research Foundation of Singapore, headed by Prof. Costas J. Spanos)**
Theme B. Smart Technologies for Agile, Intelligent, Efficient and Resilient Buildings

- Develop a stochastic control method for ACMV system, which can manage uncertain thermal loads of occupants and better guarantee indoor thermal comfort.
- Develop decentralized control methods for ACMV system in large multi-zone buildings, which can achieve comfortable indoor environment quality (IEQ) by jointly incorporating thermal comfort and indoor air quality (IAQ).
- Motivated by the management of building energy system, we develop a consensus-based decentralized method for nonconvex problems with general coupled nonlinear constraints, which can guarantee the convergence to critical points.
- Experimental resolution and evaluation of control methods for buildings' ACMV system on Test-bed.

2015-2018 **Modeling and Simulation of Energy Internet (EI) (National Key R&D Project of China)**

- Analyze and explore stochastic characteristics of electric vehicle (EV) charging demand and behaviors based on real data.
- Establish a joint scheduling and simulation model for the coordination of EV charging with distributed renewable energy in a microgrid.
- Develop a simulation-based distributed policy improvement method to improve from heuristic and experienced-based charging policies.
- Develop an EV-based decentralized charging policy with provable convergence and favorable scalability, which can achieve the dynamic balance of demand and supply in micro-grids

2015-2018 **Multi-scale policy optimization of networked discrete event dynamic system (National Natural Science Foundation of China)**

- Explore the multi-spatial and temporal resolution for the coordination of EV charging with local distributed renewable generation.
- Establish a hierarchical stochastic coordination method for EV charging demand and the distributed renewable generation in a micro-grid of buildings.

2014-2015 **Data-Driven Analysis of Energy Consumption of Occupant (Support in part by National Natural Science Foundation of China)**

- Build a platform to collect real-time information of individual occupants, which relates to the energy consumption of occupants in buildings.
- A data-driven model is developed based on the collected data, which can improve the prediction accuracy of occupant's energy consumption by incorporating the multi-dimensional information of the occupants.

■ Research Interest

Mainly focus on optimization-based control methods for Large-scale dynamic systems with application to smart buildings, smart grids and cyber physical systems including

- Decentralize or distributed optimization, decentralized decision-making, game
- Event-based optimization
- Stochastic optimization, Markov decision process, reinforcement learning
- Data-driven analysis and control of complex dynamic systems

■ Honors & Awards

2013.07	Outstanding Graduate
2012.05	National Encouragement Scholarship, No. 1 of the ADI Electronic Technology Design Contest
2011.09	National Scholarship, Scholarship of Academic Excellence
2010.09	Scholarship of Academic Excellence, National Encouragement Scholarship
2010.03	Self-Improvement Scholarship for Freshman

■ Publications

Journal Papers

- **Yu Yang**, Qing-Shan Jia, Geert Deconinck, Xiaohong Guan, Zhifeng Qiu, and Zechun Hu, "Distributed Coordination of EV Charging with Renewable Energy in a Microgrid of Buildings," *IEEE Transactions on Smart Grid*, 2017.
- **Yu Yang**, Qing-Shan Jia, Xiaohong Guan, Xuan Zhang, Zhifeng Qiu, and Geert Deconinck, "Decentralized EV-based Charging Optimization With Building Integrated Wind Energy,"*IEEE Transactions on Automation Science and Engineering*, 2018.
- Qing-Shan Jia, **Yu Yang**, Li Xia, and Xiaohong Guan, "A Tutorial on Event-Based Optimization With Application in Energy Internet," *Control Theory & Applications*, vo. 35, no. 1, pp. 32-40, 2018.

Conference Papers

- **Yu Yang**, Qing-Shan Jia, and Xiaohong Guan, "Improving the Prediction Accuracy of Building Energy Consumption using Location of Occupant-A Case Study," *IEEE International Conference on Industrial Technology*, pp.1550-1555, 2016.
- **Yu Yang**, Qing-Shan Jia, and Xiaohong Guan, "The joint scheduling of EV charging load with building mounted wind power using simulation-based policy improvement," *IEEE International Symposium on Flexible Automation*, pp. 165-170, 2016.
- **Yu Yang**, Qing-Shan Jia, and Xiaohong Guan, "Stochastic Coordination of Aggregated Electric Vehicle Charging With On-site Wind Power at Multiple Buildings," *56th IEEE Conference on Decision and Control*, 2017.

Other Papers

- **Yu Yang**, Seshadhri Srinivasan, Guoqiang Hu, and Costas J. Spanos, "Decentralized Control of Multi-zone HVAC Systems Considering Indoor Air Quality," submitted to *IEEE Transactions on Control Systems Technology*, 2019.
- **Yu Yang**, Seshadhri Srinivasan, Guoqiang Hu, and Costas J. Spanos, "Stochastic Optimal Control of HVAC system for Energy-efficient Buildings", submitted to *IEEE Transactions on Control Systems Technology*, 2019.
- **Yu Yang**, Seshadhri Srinivasan, Guoqiang Hu, and Costas J. Spanos, "HVAC Energy Cost Optimization for a Multi-zone Building via A Decentralized Approach", submitted to *IEEE Transactions on Automation Science and Engineering*, 2019.
- **Yu Yang**, Seshadhri Srinivasan, Guoqiang Hu, and Costas J. Spanos**, "**A Consensus-based Decentralized Method for Nonconvex Problems with Coupled Nonlinear Constraints**",** planned to submit to *IEEE Transactions on Automatic Control* (in draft).

■ Academic Activities

2017.12	56th IEEE Conference on Decision and Control (CDC2017)	Conference talk
2017.06	The medium term of National energy Internet key R&D program	Conference talk
2017.05	Doctoral Forum of Department of Automation, Tsinghua University	Poster
2016.03	Doctoral Forum of Department of Automation, Tsinghua University	Conference talk
2016.03	IEEE International Energy Conference (EnergyCon2016)	attend

2013-present **Reviewers of International journals and Conferences**

IEEE Transactions on Smart Grid
IEEE Transactions on Automation Science and Engineering
IEEE Transactions on Automatic Control
IEEE Conference on Decision and Control
American Control Conference
IEEE International Conference on Automation Science and Engineering

■ Social Practice

2017.07-2017.10	JD's Company (E-commerce)
2016.01-2016.01	China Electronics Technology Group 28
2015.07-2015.08	Foshan Zhongming Electronic Industrial Company
2013.09-2016.09	Teaching Assistant of courses including《C++ Program Design》,《Data Structure》and《Computer Network's Theory and Applications》

■ Visiting Experience

2016.03-2016.05	Visiting Prof. Geert Deconinck, Department of Electrical Engineering, University of Leuven, Belgium

■ Interests

Reading, music, and sports