

# John PANG Zhen Fu

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*"Our greatest weakness lies in giving up. The most certain way to succeed is always to try just one more time." - Edison*

## EDUCATION

### California Institute of Technology

Pasadena, CA

*PhD in Computing and Mathematical Sciences*

*September 2014 - June 2019*

Thesis: Online Platforms in Networked Markets: Transparency, Anticipation and Demand Management

Amori Outstanding Dissertation Award for Computing and Mathematical Sciences

### Nanyang Technological University

Singapore

*Bachelor of Science in Mathematical Sciences (Pure Mathematics)*

*September 2010 - December 2013*

First Class Honors, Accelerated Bachelors Program, A\*STAR Undergraduate Scholarship

### Pioneer Junior College

Singapore

*Cambridge General Certificate of Education Advanced Levels*

*January 2006 - December 2007*

## RESEARCH EXPERIENCE

### California Institute of Technology

Pasadena, CA

*Graduate Researcher*

*September 2014 - Present*

- Analyzed and contrasted online platform designs under a networked Cournot model with regards to transparency and control.
- Designed load-side distributed secondary frequency regulation under limited control using primal-dual algorithms.
- Collaborated on multiple other projects in learning, online optimization and approximation algorithms.

### University of Illinois, Urbana-Champaign

Urbana, IL

*Visiting Researcher*

*April 2019*

- Analyzed the economic impact of demand response under a networked Stackelberg model.
- Extended previous known results for networked competition accounting for anticipation.

### Chinese University of Hong Kong

Shatin, Hong Kong

*Visiting Researcher*

*May 2018*

- Formulated a novel competitive ratio pursuit algorithm that is provably optimal.
- Applied the algorithm for generalizations of the classical one-way trading problem.

### Agency for Science, Technology and Research

Singapore

*HPC Research Engineer*

*December 2013 - August 2014*

- Contrasted different network design models from deliberate city-planning transportation networks.
- Data analysis and GUI implementation for household forecasting to reduce supply-demand gap.
- Developed and analyzed car-following models and animated "stop-and-go" phenomenon.

### Nanyang Technological University

Singapore

*Summer Undergraduate Researcher*

*June 2013 - August 2013*

- Designed Hadamard-like matrices, with applications in coding theory and cryptography.

### Agency for Science, Technology and Research

Singapore

*InfoComm Research Intern*

*June 2012 - August 2012*

- Designed Mixture of Gaussian Trees (MoGT) model for parsimonious oversampling with applications to multi-modal imbalanced time-series classification problems.

## WORK EXPERIENCE

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### Software Technology and Innovation Center, Schlumberger

Menlo Park, CA

Data Scientist

July 2019 - Present

- Machine Learning Proof-of-Concept (PoC) and Moonshot Projects

### Software Technology and Innovation Center, Schlumberger

Menlo Park, CA

Data Science/Machine Learning Intern

June 2018 - August 2018

- Developed framework for the optimal well-selection problem, incorporating information propagation and dynamic decision making. Implemented on an OpenAI gym environment.
- Designed reinforcement learning algorithms to automate simulations for decision making under uncertainty.

### Software Technology and Innovation Center, Schlumberger

Menlo Park, CA

Data Science/Machine Learning Intern

June 2017 - September 2017

- Apply machine learning and signal processing algorithms for high-resolution and high-frequency time-series classification, with applications to pump prognostics and health management.
- Implemented IT classification hackathon solution on MS Azure, currently in use by Schlumberger.

## TEACHING & MENTORING EXPERIENCE

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- Head Teaching Assistant, CS144 Network Economics and Structure, Caltech, Winter 2015-2016.
- Teaching Assistant, ACM104 Linear Operator Theory, Caltech, Fall 2015-2016.
- Teaching Assistant, Calculus for Physics and Chemistry, NTU, Semester 1, 2013-2014.
- Teaching Assistant, Programming for Scientists, NTU, Semester 2, 2012-2013.
- Research Mentor, Victoria School

## AWARDS AND ACHIEVEMENTS

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- Amori Outstanding Doctoral Prize in Computing and Mathematical Sciences
- Caltech CMS Graduate Teaching Fellow, AY 2018-2019
- Winner, STIC OWASP Security Hackathon, July 2018
- Runner-up, Southern California Citadel Datathon, November 2017
- Winner, STIC Ticket Classification Hackathon, July 2017
- National Science Scholarship — Full PhD Fellowship
- Judge and Organizer, Singapore National Science Challenge
- First Class Honors (GPA: 4.75/5.00), NTU
- Accelerated Bachelor Program, NTU
- A\*STAR Chairman's List AY 2012-2013
- Summer Undergraduate Research Fellow, NTU
- A\*STAR Undergraduate Scholarship — Full B.Sc. Fellowship
- High Distinction, Australia Mathematics Competition
- Gold Award, Singapore Mathematical Olympiad
- Programming Languages: Python, C++, Java, HTML/CSS, Matlab
- Fluent in English, conversational in Mandarin Chinese

## REVIEW SERVICE

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- ACM Transactions on Modeling and Performance Evaluation of Computing Systems (TOMPECS)
- Elsevier Physica A
- IEEE American Control Conference (ACC)
- IEEE Conference for Decision and Control (CDC)
- IEEE Conference on Industrial Electronics and Applications (ICIEA)
- IEEE Transactions on Intelligent Transportation Systems (T-ITS)
- IEEE Transactions on Networking (ToN)
- IET Cyber Physical Systems (CPS)
- T&F Applied Economics Letters (AEL)
- T&F Emerging Markets, Finance & Trade (EMFT)

## Publications

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Qiulin Lin, Hanling Yi, John ZF Pang, Minghua Chen, Adam Wierman, Michael Honig, and Yuanzhang Xiao. Competitive online optimization under inventory constraints. In *ACM Sigmetrics*, 2019.

Zhaojian Wang, Feng Liu, John ZF Pang, Steven H Low, and Shengwei Mei. Distributed optimal frequency control considering a nonlinear network-preserving model. *IEEE Transactions on Power Systems*, 34(1):76–86, 2019.

John ZF Pang, Pengcheng You, and Minghua Chen. Temporally networked cournot platform markets. In *Proceedings of the 51st Hawaii International Conference on System Sciences*, 2018.

Linqi Guo, John ZF Pang, and Anwar Walid. Joint placement and routing of network function chains in data centers. In *IEEE INFOCOM 2018-IEEE Conference on Computer Communications*, pages 612–620. IEEE, 2018.

Pengcheng You, Peng Cheng, John ZF Pang, and Steven H Low. Efficient online station assignment for electric vehicle battery swapping. In *Proceedings of the ACM e-Energy Conference*, 2018.

Pengcheng You, John ZF Pang, and Enoch Yeung. Deep koopman controller synthesis for cyber-resilient market-based frequency regulation. *IFAC-PapersOnLine*, 51(28):720–725, 2018.

Pengcheng You, John ZF Pang, and Enoch Yeung. Stabilization of power networks via market dynamics. In *Proceedings of the ACM e-Energy Conference*, 2018.

John ZF Pang, Hu Fu, Won I Lee, and Adam Wierman. The efficiency of open access in platforms for networked cournot markets. In *IEEE INFOCOM 2017-IEEE Conference on Computer Communications*, pages 1–9. IEEE, 2017.

John ZF Pang, Linqi Guo, and Steven H Low. Optimal load control for frequency regulation under limited control coverage. In *IREP2017 Symposium*, pages 1–7, 2017.

Weixuan Lin, John ZF Pang, Eilyan Bitar, and Adam Wierman. Networked cournot competition in platform markets: Access control and efficiency loss. In *2017 IEEE 56th Annual Conference on Decision and Control (CDC)*, pages 4606–4611. IEEE, 2017.

Pengcheng You, John ZF Pang, Minghua Chen, Steven H Low, and Youxian Sun. Battery swapping assignment for electric vehicles: A bipartite matching approach. In *2017 IEEE 56th Annual Conference on Decision and Control (CDC)*, pages 1421–1426. IEEE, 2017.

Bo Yang, Xihua Xu, John ZF Pang, and Christopher Monterola. Cluster statistics and quasisoliton dynamics in microscopic optimal-velocity models. *Physical Review E*, 93(4):042212, 2016.

Linqi Guo, John ZF Pang, and Anwar Walid. Dynamic service function chaining in sdn-enabled networks with middleboxes. In *2016 IEEE 24th International Conference on Network Protocols (ICNP)*, pages 1–10. IEEE, 2016.

Xihua Xu, John ZF Pang, and Christopher Monterola. Asymmetric optimal-velocity car-following model. *Physica A: Statistical Mechanics and its Applications*, 436:565–571, 2015.

John ZF Pang, Nasri Bin Othman, Keng Meng Ng, and Christopher Monterola. Efficiency and robustness of different bus network designs. *International Journal of Modern Physics C*, 26(03):1550024, 2015.

Hong Cao, Vincent YF Tan, and John ZF Pang. A parsimonious mixture of gaussian trees model for oversampling in imbalanced and multimodal time-series classification. *IEEE Transactions on Neural Networks and Learning Systems*, 25(12):2226–2239, 2014.

John ZF Pang, Hong Cao, and Vincent YF Tan. Mogt: oversampling with a parsimonious mixture of gaussian trees model for imbalanced time-series classification. In *2013 IEEE International Workshop on Machine Learning for Signal Processing (MLSP)*, pages 1–6. IEEE, 2013.