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 Computational and Mathematical Sciences *September 2014 - June 2019*
Thesis Title: Trade-offs in Online Platform Design: Transparency, Control and Mechanisms

Nanyang Technological University **Singapore**
Bachelor of Science in Mathematical Sciences *September 2010 - December 2013*

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 and implemented load-side distributed secondary frequency regulation algorithm 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 anticipatory competition in networked markets.

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**
High Performance Computing 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 Research Fellow *June 2013 - August 2013*
- Designed Hadamard-like matrices, with applications in coding theory and cryptography.

Agency for Science, Technology and Research **Singapore**
Information Communications Research Intern *June 2012 - August 2012*
- Designed Mixture of Gaussian Trees (MoGT) model for parsimonious oversampling with applications to imbalanced time-series classification problems.

WORK EXPERIENCE

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 EXPERIENCE

- 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.

AWARDS AND ACHIEVEMENTS

- Caltech CMS Graduate Teaching Fellowship, 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
- Research Mentor, Victoria School
- 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

Publications

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.