# Lingda Wang | Curriculum Vitae

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## **EDUCATION**

University of Illinois at Urbana-Champaign Urbana, IL, USA

Ph.D. Student in Electrical and Computer Engineering (GPA: 3.97/4.0) Jan. 2020- May. 2023 (Expected)

University of Illinois at Urbana-Champaign

Aug. 2017- Dec. 2019 M.S. in Electrical and Computer Engineering (GPA: 4.0/4.0)

Urbana, IL, USA

**Fudan University** Shanghai, China

B.E. in Electronic and Information Science and Technology (GPA: 3.73/4.0, Rank: 2/222) Sep. 2013- Jul. 2017

# PROFESSIONAL EXPERIENCE

University of Illinois at Urbana-Champaign

Urbana, IL, USA Graduate Research & Teaching Assistant (Advisor: Prof. Zhizhen Zhao) Aug. 2017 - Present

**Fudan University** Shanghai, China

Undergraduate Research Assistant (Advisor: Prof. Xiaolin Zhou) Aug. 2015 - Jul. 2017

# RESEARCH INTEREST

My current research focuses on the theory and applications of Machine Learning (e.g. Bandit Learning), Signal/Imgae Processing (e.g. Computational Imaging and Cryo-EM Technology), Data Science (e.g. Spectral Shrinakge based Matrix Completion), and Optimization.

# **PUBLICATIONS**

# **Preprints**

1. Lingda Wang\*, Huozhi Zhou\*, Bingcong Li, Lav R. Varshney, and Zhizhen Zhao, Nearly Optimal Algorithms for Piecewise-Stationary Cascading Bandits, arXiv preprint arXiv:1909.05886 (\* indicates equal contributions)

# **Conference Papers**

- 1. Bingcong Li, Lingda Wang, Georgios B. Giannakis, and Zhizhen Zhao, Enhancing Parameter-Free Frank Wolfe with an Extra Subproblem, Accepted by 35th AAAI Conference on Artificial Intelligence (AAAI 2021)
- 2. Lingda Wang, Bingcong Li, Huozhi Zhou, Georgios B. Giannakis, Lav R. Varshney, and Zhizhen Zhao, Adversarial Linear Contextual Bandits with Graph-Structured Side Observations, Accepted by 35th AAAI Conference on Artificial Intelligence (AAAI 2021)
- 3. Bingcong Li, Lingda Wang, and Georgios B. Giannakis, Almost Tune-Free Variance Reduction, 37th International Conference on Machine Learning (ICML 2020)
- 4. Huozhi Zhou\*, Lingda Wang\*, Lav R. Varshney, and Ee-Peng Lim, A Near-Optimal Change-Detection Based Algorithm for Piecewise-Stationary Combinatorial Semi-Bandits, 34th AAAI Conference on Artificial Intelligence (AAAI **2020**) (\* indicates equal contributions)
- 5. Lingda Wang, and Zhizhen Zhao, Two-Dimensional Tomography from Noisy Projection Tilt Series Taken at Unknown View Angles with Non-uniform Distribution, 2019 IEEE International Conference on Image Processing (ICIP 2019)
- 6. Xiaojun Yu, Xiaolin Zhou, Chongbin Xu, Lingda Wang, Dailin Shen, and Haitao Zhou, A NOMA-based Quantum Key Distribution System over Poisson Atmospheric Channels, 2019 IEEE Global Communications Conference (GLOBE-**COM 2019**)
- 7. Xiaolin Zhou, Chenjia Wei, Dailing Shen, Chongbin Xu, Lingda Wang, and Xiaojun Yu, A Shot Noise Limited Quantum Iterative Massive MIMO System over Poisson Atmospheric Channels, 2019 IEEE International Conference on Communications (ICC 2019)
- 8. Dailing Shen, Chenjia Wei, Xiaolin Zhou, Lingda Wang, and Chongbin Xu, Photon Counting Based Iterative Quantum Non-Orthogonal Multiple Access with Spatial Coupling, 2018 IEEE Global Communications Conference (GLOBECOM
- 9. Lingda Wang, Xiaolin Zhou, and Pengfei Tian, Quantum Multiuser Communication Systems with Adaptive Feedback Measurement and Chip-Interleaved Iter-PIC Receiver, 2017 IEEE 86th Vehicular Technology Conference (VTC 2017-
- 10. Chenjia Wei, Lingda Wang, Xiaolin Zhou, Pengfei Tian, and Julian Cheng, Design and Analysis of an Iterative Quantum Receiver with Photon-Number-Resolving Detector, 2017 IEEE 86th Vehicular Technology Conference (VTC 2017-Fall)

## **Journal Papers**

1. Chenjia Wei, Xiaolin Zhou, Lingda Wang, Pengfei Tian, and Lajos Hanzo, Soft Iterative Quantum Receivers Approaching the Helstrom Limit Using Realistic Quantum Devices, IEEE Access 6, 10197 – 10207

#### M.S. Thesis

1. Lingda Wang, On Upper Confidence Bound Algorithms for Piecewise-Stationary Stochastic Multi-Armed Bandits and the Variants, 1 – 66, 2019

#### SELECTED RESEARCH PROJECTS

#### Adversarial Graphical Contextual Bandits | UIUC&UMN

Oct. 2019 - May. 2020

- Studied a novel model for adversarial contextual multi-armed bandit (MAB) problems with graph feedback, where observations on the neighboring actions of the chosen action are possible.
- Proposed two new variants of EXP3 that overcome the bias in estimating the loss vectors under the contextual setting and take advantage of extra observations.
- Presented a novel analysis of the proposed algorithms that leads to optimal regret and tighter bound than previous work.

# Enhancing Parameter-Free Frank Wolfe with an Extra Subproblem UIUC&UMN

Ian. 2020 - May.

- Aimed to develop a novel algorithm for the convex optimization problems with structural constraints, which achieves a faster convergence rate.
- Proposed a new Frank-Wolfe (FW) variant (ExtraFW), in which each update step relies on two gradient evaluations in a novel *predict-then-correct* manner.
- Presented a novel analysis using the modified Estimated Sequence (ES) that leads to the acceleration of ExtraFW, and demonstrated even a better performance over Nesterov's accelerated gradient in numerical tests.

## Almost Tune-Free Variance Reduction (ICML 2020) | UIUC&UMN

Aug. 2019 - Jan. 2020

- Considered possible tune-free schemes in variance-reduced algorithms (e.g. SVRG and SARAH), which could improve the current painstaking tuning steps in this type of algorithms.
- Proposed an almost tune-free scheme for variance-reduced algorithms by equipping them with Barzilai-Borwein (BB) step sizes and a new averaging scheme (W-Avg).
- Presented a novel analysis using ES that leads to better performance than related work and shows averaging scheme is more than a proof trick.

#### Non-Stationary Combinatorial Semi-Bandits (AAAI 2020) | UIUC

Feb. 2019 - Aug. 2019

- Considered the non-stationary stochastic combinatorial MAB (CMAB) problems, where the distributions of the base actions may change over time.
- Proposed a novel change-point detection based algorithm for CMAB that is adaptive to the change-points.
- Proved the order optimal problem-dependent regret bound for the proposed algorithm, and derived a tighter minimax lower bound for both non-stationary CMAB and MAB.

## 2-D Tomography from Unknown View Angles (ICIP 2019) | UIUC

May. 2018 - Dec. 2018

- Considered the 2-D tomography problem from noisy projections taken at unknown view angles, where the view angles yield a non-uniform distribution.
- Proposed a novel algorithm based on the method of moments (MoM), and solved by a modified alternating direction method of multipliers (ADMM) algorithm.
- Demonstrated efficiency in large data scenario, compared with traditional methods that determine the view angles using MLE.

# **AWARDS & ACHIEVEMENTS**

SPS Student Travel Grant, IEEE Signal Processing Society	2019
Graduate Teaching Assistantship, UIUC	2018-2019
Graduate Research Assistantship, UIUC	2017-Present
• Graduation with Honor: College Graduate Excellence Award of Shanghai, Fudan University	2017
• 2nd Award, Scholarship for Outstanding Students, Fudan University	2017
• Excellent Student of School of Fudan University, Fudan University	2016
• 1st Award, Du Pont Scholarship, Fudan University	2016
• Excellent Student of School of Information School and Technology, Fudan University	2015
• 1st Award, Elite Corporation Scholarship, Fudan University	2015
• 3rd Award, Scholarship for Outstanding Students, Fudan University	2014

# **SKILLS**

• **Programming**: Python, MATLAB, C/C++