Lingda Wang | Curriculum Vitae

☎ (+1)217-693-9393 ● ✉ lingdaw2@illinois.edu

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   **Urbana, IL, USA**
M.S. in Electrical and Computer Engineering (GPA: 4.0/4.0)   *Aug. 2017- Dec. 2019*
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/Image Processing** (e.g. Computational Imaging and Cryo-EM Technology), **Data Science** (e.g. Spectral Shrinkage 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 (GLOBECOM 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 2018)*

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-Fall)*

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   *Jan. 2020 - May. 2020*
- 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++