

Yanxiao Liu

 [yanxiaoliu-mike.github.io](https://github.com/yanxiaoliu-mike)

 yanxiaoliu@link.cuhk.edu.hk

Education

The Chinese University of Hong Kong

2021.8–2025.7 (estimated)

Ph.D. candidate, Department of Information Engineering

Advisors: Prof. [Cheuk Ting Li](#) and Prof. [Raymond W. Yeung](#)

Stanford University

2024.1–2024.6

Visiting Student Researcher, Department of Electrical Engineering

Advisor: Prof. [Ayfer Özgür](#)

The Chinese University of Hong Kong, Shenzhen

2017–2021

B.Eng. in Electronic Information Engineering and minor in Philosophy

Advisor: Prof. [Shenghao Yang](#)

Research

- **One-shot/finite-blocklength network information theory:** achievability proofs, second-order results and low-complexity coding of classical network information theory problems.
- **Machine learning and privacy:** theoretic limits of channel simulation, and applications on differential privacy, distributed learning and algorithms' generalization/stability.
- **Modern wireless communications:** fundamental limits and practical algorithms for large-scale networks: multiframe, scheduling, function computation and network coding.

Awards

- CUHK PhD International Mobility for Partnerships and Collaborations Award 2023-24.
- NeurIPS Scholar Award (2024).
- ISIT Travel Award (2024).

Publications

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Publications

Preprints

- [1] **Yanxiao Liu** and Cheuk Ting Li. “One-Shot Coding over General Noisy Networks”. In: *Submitted to IEEE Transactions on Information Theory* (2024).
- [2] **Yanxiao Liu**, Chih Wei Ling, and Cheuk Ting Li. “Weighted Polar Codes for Channels with State”. In: (2024).
- [3] **Yanxiao Liu**, Shenghao Yang, and Cheuk Ting Li. “Joint Scheduling and Multiflow Maximization in Wireless Networks”. In: *to be submitted* (2024).

Journal Articles

- [4] Chih Wei Ling, **Yanxiao Liu**, and Cheuk Ting Li. “Weighted Parity-Check Codes for Channels with State and Asymmetric Channels”. In: *IEEE Transactions on Information Theory* 70.8 (2024), pp. 5573–5588.
- [5] Shenghao Yang, Jun Ma, and **Yanxiao Liu**. “Wireless Network Scheduling with Discrete Propagation Delays: Theorems and Algorithms”. In: *IEEE Transactions on Information Theory* 70.3 (2024), pp. 1852–1875.

Conference Proceedings

- [6] **Yanxiao Liu**, Wei-Ning Chen, Ayfer Özgür, and Cheuk Ting Li. “Universal Exact Compression of Differentially Private Mechanisms”. In: *The Thirty-Eighth Annual Conference on Neural Information Processing Systems (NeurIPS)*. 2024.
- [7] **Yanxiao Liu** and Cheuk Ting Li. “One-Shot Coding over General Noisy Networks”. In: *2024 IEEE International Symposium on Information Theory (ISIT)*. 2024.
- [8] **Yanxiao Liu** and Cheuk Ting Li. “One-Shot Information Hiding”. In: *2024 IEEE Information Theory Workshop (ITW)*. 2024.
- [9] Yijun Fan, **Yanxiao Liu**, Yi Chen, Shenghao Yang, and Raymond W. Yeung. “Reliable Throughput of Generalized Collision Channel Without Synchronization”. In: *2023 IEEE International Symposium on Information Theory (ISIT)*. 2023.
- [10] Yijun Fan, **Yanxiao Liu**, and Shenghao Yang. “Continuity of Link Scheduling Rate Region for Wireless Networks with Propagation Delays”. In: *2022 IEEE International Symposium on Information Theory (ISIT)*. 2022.
- [11] Chih Wei Ling, **Yanxiao Liu**, and Cheuk Ting Li. “Weighted Parity-Check Codes for Channels with State and Asymmetric Channels”. In: *2022 IEEE International Symposium on Information Theory (ISIT)*. 2022.
- [12] Jun Ma, **Yanxiao Liu**, and Shenghao Yang. “Rate Region of Scheduling a Wireless Network with Discrete Propagation Delays”. In: *IEEE INFOCOM 2021-IEEE Conference on Computer Communications (INFOCOM)*. 2021.

Teaching Assistance

I have served as a teaching assistant for 9 courses, 8 of which were unique, including 2 at the graduate level. My areas of assistance spanned information theory, optimization, probability theory, statistics, discrete mathematics, electronic circuits, and practical computer network laboratories.

Graduate School Courses:

- ENGG5301: Information Theory (Fall 2022-23, Instructor: Prof. Cheuk Ting Li)
 - I was the **sole TA for this PhD-level course (≈ 60 students)**. I prepare materials, give weekly tutorials, hold weekly office hours, and grade homework and exams.
- CIE/DDA6010(At CUHKSZ): Optimization Theory and Examples (Fall 2019-20, Instructor: Prof. Stark Draper)
 - **I build up, organize and compile lecture notes (155 pages) from scratch, click → [Notes]**.

Undergraduate Courses:

- IERG2060-ESTR2304: Basic Analog and Digital Circuits (Fall 2021-22, Instructor: Dr. Marco Ho)
- IERG2470-ESTR2308: Probability Models and Applications (Spring 2021-22, Instructor: Prof. Raymond W. Yeung)
- IERG2470-ESTR2308: Probability Models and Applications (Spring 2022-23, Instructor: Prof. Cheuk Ting Li)
- IERG3800: Information Infrastructure Design Lab (Fall 2023-24, Instructor: Prof. Yiu Bun Lee)
- IERG3050: Simulation and Statistical Analysis (Fall 2023-24, Instructor: Prof. Cheuk Ting Li)
- ENGG2440: Discrete Mathematics for Engineers (Fall 2024-25, Instructor: Prof. Cheuk Ting Li)
- MIEG2440-ESTR2362: Discrete Structures and Probability (Spring 2024-25, Instructor: Prof. Cheuk Ting Li)

Industrial Experience

Pingan Technology
Software Engineer

2020.8–2020.10