

Yuwen HUANG (Anthony)

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Curriculum Vitae

September 2025

Education

- 2018–2024 **PhD in Information Engineering**
Department of Information Engineering
The Chinese University of Hong Kong (CUHK), Hong Kong
Thesis supervisor: [Prof. Pascal O. Vontobel](#) [[PhD Thesis](#)]
- 2014–2018 **Bachelor of Engineering**
School of Electronic and Information Engineering
South China University of Technology (SCUT), Guangzhou, China
Thesis supervisor: [Prof. Yuan Liu](#)

Employment

- 11/2024–
11/2026 **Postdoctoral fellow**
Department of Computer Science and Engineering
The Chinese University of Hong Kong (CUHK), Hong Kong
Supervisor: [Prof. John C.S. Lui](#)
Core duties: 1) Theoretical Research: Developing novel models for distributed quantum computing via collaboration with other professors, leading to high-impact journal submissions. 2) Mentorship: Guiding PhD students through the full research lifecycle, from project ideation to publication at prestigious conferences like ICML.

Research Interests

Quantum information processing, quantum network, quantum computing, optimization theory, graphical models, information theory

Publications

Journal Papers (Submitted)

- [1] **Y. Huang** and P. O. Vontobel, “Characterizing the Bethe partition function of double-edge factor graphs via graph covers (extended version),” submitted for *IEEE Trans. on Inf. Theory*. [[arxiv](#)].

Journal Papers (In Preparation)

- [2] **Y. Huang**, Xiaojun Lin, Bin Luo and John C.S. Lui, “Factor graph-based scalable distributed quantum optimization with provable quadratic-like speedup,” in preparation for *IEEE/ACM Trans. on Networking*.
- [3] **Y. Huang** and P. O. Vontobel, “On the relationship between the global minimum of the Bethe free energy function of a factor graph and sum-product algorithm fixed points (extended version),” in preparation for *IEEE Trans. on Inf. Theory*.
- [4] **Y. Huang** and P. O. Vontobel, “Sets of marginals and Pearson-correlation-based CHSH inequalities for a two-qubit system (extended version),” in preparation for *IEEE Trans. on Inf. Theory*.

Journal Papers (Published)

- [5] **Y. Huang**, N. Kashyap and P. O. Vontobel, “Degree-M Bethe and Sinkhorn permanent based bounds on the permanent of a non-negative matrix,” *IEEE Trans. on Inf. Theory*, vol. 70, no. 4, pp. 5289–5308, Jul. 2024. [[ieeexplore](#)].

- [6] **Y. Huang**, Y. Liu, and F. Chen, "NOMA-aided mobile edge computing via user cooperation," *IEEE Trans. on Commun.*, vol. 68, no. 4, pp. 2221–2235, Apr. 2020. [[ieeexplore](#)].
- [7] **Y. Huang**, Y. Liu, and G. Y. Li, "Energy efficiency of distributed antenna systems with wireless power transfer," *IEEE J. Sel. Areas Commun.*, vol. 37, no. 1, pp. 89–99, Jan. 2019. [[ieeexplore](#)].
- [8] **Y. Huang**, M. Liu, and Y. Liu, "Energy-efficient SWIPT in IoT distributed antenna systems," *IEEE Internet Things J.*, vol. 5, no. 4, pp. 2646–2656, Aug. 2018. [[ieeexplore](#)].

Conference Papers (Published)

- [9] B. Luo, ***Y. Huang**, J. Allcock, X. Lin, S. Zhang, J. C.S. Lui, "Quantum algorithms for finite-horizon Markov decision processes," in *Proc. Forty-second International Conference on Machine Learning (ICML)*, 2025. [[link](#)] (* for corresponding author).
- [10] **Y. Huang** and P. O. Vontobel, "The Bethe partition function and the SPA for factor graphs based on homogeneous real stable polynomials," in *Proc. IEEE Int. Symp. Inf. Theory*, Athens, Greece, Jul. 7–12, 2024, pp. 3029–3034. [[ieeexplore](#)].
- [11] **Y. Huang** and P. O. Vontobel, "Bounding the permanent of a non-negative matrix via its degree- M Bethe and Sinkhorn permanents," in *Proc. IEEE Int. Symp. Inf. Theory*, Taipei, Taiwan, Jun. 25–30, 2023, pp. 2774–2779. [[ieeexplore](#)].
- [12] **Y. Huang** and P. O. Vontobel, "On the relationship between the global minimum of the Bethe free energy function of a factor graph and sum-product algorithm fixed points," in *Proc. IEEE Inf. Theory Workshop*, Mumbai, India, Nov. 6–9, 2022, pp. 666–671. [[ieeexplore](#)].
- [13] **Y. Huang** and P. O. Vontobel, "Sets of marginals and Pearson-correlation-based CHSH inequalities for a two-qubit system," in *Proc. IEEE Int. Symp. Inf. Theory*, Melbourne, Australia, Jul. 12–20, 2021, pp. 1338–1343. [[ieeexplore](#)].
- [14] **Y. Huang** and P. O. Vontobel, "Characterizing the Bethe partition function of double-edge factor graphs via graph covers," in *Proc. IEEE Int. Symp. Inf. Theory*, Los Angeles, CA, USA, Jun. 2020, 21–26, pp. 1331–1336. [[ieeexplore](#)].
- [15] **Y. Huang** and Y. Liu, "User cooperation for NOMA-based mobile edge computing," in *Proc. IEEE Int. Conf. Commun. Syst.*, Chengdu, China, Dec. 19–21, 2018, pp. 395–400. [[ieeexplore](#)].
- [16] **Y. Huang** and Y. Liu, "Energy-Efficient SWIPT in Distributed Antenna Systems," in *Proc. IEEE Globecom Workshops*, Singapore, Dec. 4–8, 2017, pp. 1–6. [[ieeexplore](#)].

Talks

- Feb. 2025 **The Bethe approximation for binary contingency table counting and nonnegative matrix permanents**
Seminar talk (via Zoom) in Department of Computer Science at the TU-Dortmund, Germany
- Sept. 2024 **The Bethe partition function and the SPA for factor graphs based on homogeneous real stable polynomials**
Seminar talk (via Zoom) in the School of Cyber Science and Engineering at the Southeast University, China
- Mar. 2023 **Bounding the permanent of a non-negative matrix via its degree- M Bethe and Sinkhorn permanents**
Seminar talk in the Institute of Theoretical Computer Science and Communications at CUHK
- Nov. 2022 **On the relationship between the minimum of the Bethe free energy function of a factor graph and sum-product algorithm fixed points**
Seminar talk in the Institute of Theoretical Computer Science and Communications at CUHK
- Apr. 2022 **Sets of marginals and Pearson-correlation-based CHSH inequalities for a two-qubit system**
Seminar talk (via Zoom) for Prof. Marco Tomamichel's research group at the National University of Singapore

Professional Service

- Reviewer for **Journals**: IEEE Communications Magazine, IEEE Transactions on Communications (TCOM), IEEE Journal of Selected Topics in Signal Processing (J-STSP), IEEE Communications Letters
- Reviewer for **Conferences**: IEEE International Symposium on Information Theory (ISIT), IEEE International Conference on Communications (ICC), IEEE Wireless Communications and Networking Conference (WCNC)

Awards

- 2024 **Student Travel Grant**, 2024 IEEE International Symposium Information Theory (ISIT)
- 2018 **Bachelor's Thesis Award**, South China University of Technology

Teaching Assistantship

- 2019, 2020, 2022 **Electronic Circuit Design Laboratory** at CUHK
- 2022 **Social Media and Human Information Interaction** at CUHK
- 2021 **Basic Analog and Digital Circuits** at CUHK
- 2021 **Linear Algebra for Engineers** at CUHK
- 2018, 2019, 2020 **Principles of Communication Systems** at CUHK

Languages

- Programming **Matlab, C, Latex**
- Spoken **Cantonese (Native), Mandarin (Native), English (Fluent)**

Academic Referees

1. **Prof. John C.S. Lui**
Department of Computer Science & Engineering, The Chinese University of Hong Kong (CUHK)
email: cslui@cse.cuhk.edu.hk
tel: (852) 3943-8407
2. **Prof. Pascal O. Vontobel**
Department of Information Engineering, The Chinese University of Hong Kong (CUHK)
email: pascal.vontobel@ie.cuhk.edu.hk
tel: (852) 3943-8390
3. **Prof. Yuan Liu**
School of Electronic and Information Engineering, South China University of Technology (SCUT)
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