

## Yinan Li

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CONTACT INFORMATION	Graduate school of Mathematics Nagoya University +81 (0)52-789-5897	Yinan.Li@math.nagoya-u.ac.jp liyinan9252@gmail.com www.yinanli.com
RESEARCH INTERESTS	Classical and quantum algorithms, quantum (zero-error) information theory, graph theory, group theory,	
POSITIONS	<b>Graduate School of Mathematics, Nagoya university</b> Designated Assistant Professor Part of the QLEAP theory group lead by Dr. Francois Le Gall.	2020.11 –
	<b>Centrum Wiskunde &amp; Informatica (CWI)</b> Postdoctoral Researcher Hosted by: Prof. Ronald de Wolf & Dr. Michael Walter.	2018.6 – 2020.8
EDUCATION	<b>University of Technology Sydney</b> Ph.D. in Quantum Information, October 2018 <ul style="list-style-type: none"><li>• Thesis: Applications of Matrix Spaces in Quantum Information and Computational Complexity.</li><li>• Advisors: Prof. Runyao Duan (Principal), Dr. Youming Qiao (Joint)</li></ul>	2014.9 – 2018.6
	<b>Wuhan University</b> B.Sc. in Mathematics, June 2014 <ul style="list-style-type: none"><li>• Honor Graduate Award of Hongyi School</li><li>• Exchange Student in Department of Mathematics, Utrecht University, 2013.9 – 2014.1.</li></ul>	2010.9 – 2014.6
BOOK CHAPTERS	(B1) Shusen Liu, Xin Wang, Li Zhou, Ji Guan, Yinan Li, Yang He, Runyao Duan, Mingsheng Ying. <i>Q SI: A Quantum Programming Environment</i> . In <i>Symposium on Real-Time and Hybrid Systems</i> . Lecture Notes in Computer Science, vol 11180, 2018.	
JOURNAL PUBLICATIONS	(J1) Yinan Li, Jeroen Zuiddam. <i>Quantum asymptotic spectra of graphs and non-commutative graphs, and quantum Shannon capacities</i> . In <i>IEEE Transactions on Information Theory</i> , 2021. (J2) Sander Gribling, Yinan Li. <i>The Haemers bound of noncommutative graphs</i> . In <i>IEEE Journal on Selected Areas in Information Theory</i> , 2020. (J3) Yinan Li, Youming Qiao. <i>Group-theoretic generalisations of vertex and edge connectivities</i> . In <i>Proceedings of the American Mathematical Society</i> , 2019. (J4) Shusen Liu, Yinan Li, Runyao Duan. <i>Distinguishing unitary gates on the IBM quantum processor</i> . In <i>Science China Information Sciences</i> , 2019. (J5) Yinan Li, Youming Qiao, Xin Wang, Runyao Duan. <i>Tripartite-to-bipartite entanglement transformation by stochastic local operations and classical communication and the structure of matrix spaces</i> . In <i>Communications in Mathematical Physics</i> , 2018.	

- (J6) Yinan Li, Youming Qiao. *On rank-critical matrix spaces*. In *Differential Geometry and its Applications* (Special issue: Geometry and complexity theory), 2017.
- (J7) Yinan Li, Xin Wang, Runyao Duan. *Indistinguishability of bipartite states by positive-partial-transpose operations in the many-copy scenario*. In *Physical Review A*, 2017.

CONFERENCE  
PROCEEDINGS  
(REFEREED)

- (C1) Joran van Apeldoorn, Sander Gribling, Yinan Li, Harold Nieuwboer, Michael Walter, Ronald de Wolf. *Quantum algorithms for matrix scaling and matrix balancing*. Extended abstract: 48th International Colloquium on Automata, Languages, and Programming (ICALP), 2021. Full version: arXiv: 2011.12823, 2020.
- (C2) Peter A. Brooksbank, Yinan Li, Youming Qiao, James B. Wilson. *Improved Algorithms for Alternating Matrix Space Isometry: from Theory to Practice*. In proceedings of the European Symposium on Algorithms, 2020.
- (C3) Zhihuai Chen, Yinan Li, Xiaoming Sun, Pei Yuan, Jialin Zhang. *A Quantum-inspired classical algorithm for separable non-negative matrix factorization*. In proceedings of the 28th International Joint Conference on Artificial Intelligence, 2019.
- (C4) Yuxuan Du, Tongliang Liu, Yinan Li, Runyao Duan, Dacheng Tao. *Quantum divide-and-conquer anchoring for separable non-negative matrix factorization*. In proceedings of the 27th International Joint Conference on Artificial Intelligence, 2018.
- (C5) Yinan Li, Youming Qiao. *Linear algebraic analogues of the graph isomorphism problem and the Erdős-Rényi model*. In proceedings of the 58th Annual IEEE Symposium on Foundations of Computer Science, 2017.
- (C6) Runyao Duan, Cheng Guo, Chi-Kwong Li, Yinan Li. *Parallel distinguishability of quantum operations*. In proceedings of 2016 IEEE International Symposium on Information Theory, 2016.

PREPRINTS

- (P1) Li Gao, Sander Gribling, Yinan Li. *On a tracial version of Haemers bound*. arXiv: 2107.02567, 2021.
- (P2) Peter Bürgisser, Yinan Li, Harold Nieuwboer, Michael Walter. *Interior-point methods for unconstrained geometric programming and scaling problems*. arXiv: 2008.12110, 2020.
- (P3) Peter A. Brooksbank, Joshua A. Grochow, Yinan Li, Youming Qiao, James B. Wilson. *Incorporating Weisfeiler-Leman into algorithms for group isomorphism*. ARXIV: 1905.02518, 2019. Part of this paper has been accepted to ESA 2020 (C1).

PUBLIC TALKS

“The future of AI: Quantum Computing”, University of Chinese Academy of Sciences, 2019. (A general talk for general audiences given in Chinese.)

SEMINAR TALKS

Reading group Seminar, Research group Networks and Optimization at CWI, online, 2021.

Q-LEAP Quantum AI theory Seminar, online, 2021.

Q-LEAP Quantum AI Seminar, online, 2020.

Centre for the Mathematics of Quantum Theory (QMATH), University of Copenhagen, 2020.

School of Mathematics, Statistics & Applied Mathematics, National University Ireland Galway, 2019.

Department of Applied Mathematics and Theoretical Physics, University of Cambridge, 2019.

Korteweg-de Vries Institute for Mathematics, University of Amsterdam, 2019.

Institute of Computing Technology, Chinese Academy of Sciences, 2019.

Research Center for Quantum Software, CWI, 2019.

Department of Physics, Southern University of Science and Technology, 2018.

School of Mathematics and Statistics, Wuhan University, 2018.

Institute for Quantum Information and Matter, California Institute of Technology, 2017.

Joint Center for Quantum Information and Computer Science, University of Maryland, College Park, 2017.

#### CONFERENCE TALKS

Some of the below talks were delivered by coauthors.

Contributed talk at Beyond IID in Information Theory 9, online, 2021.

Contributed talk at the 21th Asian Quantum Information Science Conference, online, 2021.

Contributed talk at SIAM Conference on Optimization (OP), online, 2021.

Contributed talk at Theory of Quantum Computation, Communication and Cryptography (TQC), online, 2021.

Contributed talk at International Colloquium on Automata, Languages, and Programming (ICALP), online, 2021.

Invited talk at the AMSS-UTS Joint Workshop on Quantum Computing, online, 2020.

Contributed talk at the 28th Annual European Symposium on Algorithms (ESA 2020), online, 2020.

Contributed talk at the 23rd Annual Conference on Quantum Information Processing (QIP), Shenzhen, 2020.

Invited talk at the Applied Math Youth Forum, Peking University, 2019.

Contributed talk at Analytical and combinatorial aspects of quantum information theory, International Centre for Mathematical Sciences, 2019.

Contributed talk at the 22nd Conference of the International Linear Algebra Society (ILAS), Fundação Getulio Vargas, 2019.

Invited talk at Tensors: Algebra-Computation-Applications (TACA), Colorado State University, Rocky Mountain Campus, 2019.

Invited talk at China Theory Week, Tsinghua University, 2018.

Contributed talk at 1st Australian Algebra Conference (AAC), University of Technology Sydney, 2017.

Contributed talk at the 58th Annual IEEE Symposium on Foundations of Computer Science (FOCS), Berkeley, 2017

Contributed talk at the 16th Asian Quantum Information Science Conference (AQIS), Academia Sinica, 2016

Contributed talk at the IEEE International Symposium on Information Theory (ISIT), Universitat Pompeu Fabra, 2016.

ACADEMIC VISIT 2.2–2.4, 2020, Centre for the Mathematics of Quantum Theory (QMATH), University of Copenhagen.

Hosted by: Assoc. Prof. Laura Mančinska

1.14, 2020, School of Mathematics, University of Bristol.

Hosted by: Assoc. Prof. Ashley Montanaro and Prof. Noah Linden

12.23–27, 2019, Institute of Quantum Computing, Baidu Inc..

Hosted by: Prof. Runyao Duan

11.20–22, 2019. School of Mathematics, Statistics & Applied Mathematics, National University Ireland, Galway.

Hosted by: Dr. Tobias Rossmann

11.18–20, 2019. School of Mathematics and Physics, Queen's University Belfast.

Hosted by: Prof. Ivan Todorov

10.30–11.1, 2019. Department of Applied Mathematics and Theoretical Physics, University of Cambridge.

Hosted by: Prof. Richard Jozsa

5.20–25, 2019, Institute of Quantum Computing, Baidu Inc..

Hosted by: Prof. Runyao Duan

9.21–28, 2018, Institute of Quantum Computing, Baidu Inc..

Hosted by: Prof. Runyao Duan

3.4–9, 2018, Department of Physics, Southern University of Science and Technology.

Hosted by: Assoc. Prof. Man-Hong Yung

10.18–26, 2017, Institute for Quantum Information and Matter, California Institute of Technology.

Hosted by: Assoc. Prof. Xie Chen

10.9–13, 2017, Joint Center for Quantum Information and Computer Science, University of Maryland, College Park.

Hosted by: Prof. Andrew Childs

HONORS AND AWARDS

2018.3–2018.5 FEIT PhD Post Thesis Publication Scholarship  
2014.9–2018.2 UTS President’s Scholarship  
2014.9–2018.2 UTS International Research Scholarship

PROFESSIONAL ACTIVITIES

Organizer of the QLEAP theory seminar.

Co-organizer of the reading group: From Euclidean to Geodesic Convex Optimization.

Journals Review

- Illinois Journal of Mathematics
- ACM Transactions on Quantum Computing
- Quantum
- Frontiers of Computer Science
- Mathematical Programming
- IEEE Transactions on Neural Networks and Learning Systems
- Quantum Information and Computation
- Science China Information Sciences
- Journal of Combinatorial Theory, Series A
- The Electronic Journal of Linear Algebra

Conferences/Workshops Review

- AAAI 2018
- AQIS 2019, 2021
- COCOON 2017, 2018, 2019
- FOCS 2020
- ICALP 2020
- MFCS 2020, 2021
- QIP 2020, 2021
- STACS 2021

Reviewer for Mathscinet.

REFERENCES

**Prof. Runyao Duan**

Director, Institute for Quantum Computing, Baidu Inc.  
Professor, University of Technology Sydney.

duanrunyao@baidu.com

**Prof. Ronald de Wolf**

Scientific Staff Member, Centrum Wiskunde & Informatica (CWI) and Professor, Universiteit van Amsterdam

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(More references available upon request)