



Xin Wang

Centre for Quantum Software and Information
Faculty of Engineering and Information Technologies
University of Technology Sydney
NSW 2007, Australia

PERSONAL DETAILS

Time of Birth	June 1993
Place of Birth	Changzhou, Jiangsu, China
Nationality	Chinese
Email address	wangxinfelix@gmail.com
Homepage	xinwang.online

RESEARCH INTERESTS

Quantum Information Theory, Entanglement Theory, Optimization Theory, Quantum Cryptography, Quantum Gaussian Information, Quantum Computation.

EDUCATION

- 08/2014 – present **PhD in Quantum Information, University of Technology Sydney.**
Supervisors: Prof. Runyao Duan and Prof. Andreas Winter (UAB)
Thesis: Semidefinite Optimization for Quantum Information.
- 09/2010 – 06/2014 **Bachelor in Science, Mathematics Department, Sichuan University.**
With a honor degree from the Wu Yuzhang Honors College of Sichuan University.
Thesis: Quantum Zero-Error Communication.

REFEREED CONFERENCE TALKS

The Conference on Quantum Information Processing (QIP) is the most competitive and important conference in quantum information science (4 talks). AQIS is an international leading conference (2 long+5 short talks) and ISIT is the main event in information theory (3 talks). In the following list, (*) indicates delivery by my co-author.

- 01/2018 **QIP 2018**, *On converse bounds for classical communication over quantum channels*, QuTech, Delft University of Technology, Netherlands.
- 01/2018* **QIP 2018**, *Efficiently computable upper bounds for quantum communication*, QuTech, Delft University of Technology, Netherlands.
- 01/2017 **QIP 2017**, *Asymptotic entanglement manipulation under PPT operations: new SDP bounds and irreversibility*, Microsoft Research, Redmond, USA.
- 01/2017 **QIP 2017**, *Semidefinite programming strong converse bounds for quantum channel capacities*, Microsoft Research, Redmond, USA.
- 09/2017 **AQIS 2017** (long talk, top 10% of all submissions), *Irreversibility of Asymptotic Entanglement Manipulation Under PPT Operations*, NUS, Singapore.

- 09/2017* **AQIS 2017** (long talk, top 10% of all submissions), *Non-asymptotic entanglement distillation*, NUS, Singapore.
- 09/2017* **AQIS 2017**, *SDP converse for quantum communication*, NUS, Singapore.
- 09/2017* **AQIS 2017**, *Approximate broadcasting of quantum correlations*, NUS, Singapore.
- 06/2017 **ISIT 2017**, *Semidefinite programming converse bounds for classical communication over quantum channels*, RWTH Aachen University, Aachen.
- 08/2016 **AQIS 2016**, *Separation between quantum Lovász number and entanglement-assisted zero-error classical capacity*, Academia Sinica, Taipei.
- 08/2016* **AQIS 2016**, *Improved Semidefinite Programming Upper Bound on Distillable Entanglement and Non-additivity of Rains' Bound*, Academia Sinica, Taipei.
- 08/2016* **AQIS 2016**, *Tripartite-to-bipartite entanglement transformation by SLOCC and the classification of matrix spaces*, Academia Sinica, Taipei.
- 07/2016 **ISIT 2016**, *A semidefinite programming upper bound of quantum capacity*, Universitat Pompeu Fabra, Barcelona.
- 07/2016 **ISIT 2016**, *On the quantum no-signalling assisted zero-error simulation cost of non-commutative bipartite graphs*, Universitat Pompeu Fabra, Barcelona.

INVITED AND WORKSHOP TALKS

- 01/2018 **Asymptotic entanglement manipulation under PPT operations.**
Maths Seminar, University of Nottingham, UK.
- 01/2018 **Semidefinite optimization for quantum information processing.**
GAMP/QMATH Lecture, University of Copenhagen, Copenhagen.
- 11/2017 **Evaluating communication capabilities of quantum channels.**
QCQIP 2017, AMSS.
- 07/2017 **Semidefinite programming strong converse bounds for channel capacities.**
Beyond i.i.d. in Information Theory Workshop, NUS, Singapore.
- 06/2017 **Strong converse bounds for communication over quantum channels.**
Quantum Information Seminar, SUSTech, Shenzhen.
- 12/2015 **Activated zero-error classical communication of quantum channels.**
Sydney Quantum Information Theory Workshop, UTS, Sydney.

PUBLICATIONS

I have 8 papers published in refereed journals, 3 papers published in peer-reviewed conference proceedings and 9 preprint papers (available at arXiv).

PEER-REVIEWED JOURNAL ARTICLES

- (J1) **X. Wang**, W. Xie, and R. Duan, *Semidefinite programming strong converse bounds for classical capacity*, IEEE Transactions on Information Theory 64(1): 640-653, (Contributed talk QIP 2017).
- (J2) **X. Wang** and R. Duan, *Irreversibility of Asymptotic Entanglement Manipulation Under Quantum Operations Completely Preserving Positivity of Partial Transpose*, Physical Review Letters 119, 180506 (Contributed talk QIP 2017).

- (J3) **X. Wang** and R. Duan, *Separation between quantum Lovász number and entanglement-assisted zero-error classical capacity*, IEEE Transactions on Information Theory 64(3): 1454-1460 (2018).
- (J4) **X. Wang** and R. Duan, *Improved semidefinite programming upper bound on distillable entanglement*, Physical Review A 94, 050301 (Rapid communication) (2016).
- (J5) **X. Wang** and R. Duan, *Nonadditivity of Rains bound for distillable entanglement*, Physical Review A 95, 062322 (2017).
- (J6) Y. Li, Y. Qiao, **X. Wang**, and R. Duan, *Tripartite-to-bipartite Entanglement Transformation by Stochastic Local Operations and Classical Communication and the Classification of Matrix Spaces*, Communications in Mathematical Physics 358(2): 791-814 (2018).
- (J7) Y. Li, **X. Wang**, R. Duan, *Indistinguishability of bipartite states by positive-partial-transpose operations in the many-copy scenario*, Physical Review A 95, 052346 (2017).
- (J8) W. Xie, K. Fang, **X. Wang**, and R. Duan, *Approximate broadcasting of quantum correlations*, Physical Review A 96, 022302 (2017).

PEER-REVIEWED CONFERENCE PROCEEDINGS

- (C1) **X. Wang**, W. Xie, and R. Duan, *Semidefinite programming converse bounds for classical communication over quantum channels*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2017).
- (C2) **X. Wang** and R. Duan, *A semidefinite programming upper bound of quantum capacity*, Proceedings of IEEE International Symposium on Information Theory (ISIT 2016).
- (C3) **X. Wang** and Runyao Duan, *On the quantum no-signalling assisted zero-error simulation cost of non-commutative bipartite graphs*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2016).

PREPRINTS

- (P1) **X. Wang**, K. Fang, and M. Tomamichel, *On converse bounds for classical communication over quantum channels*, submitted to IEEE Transactions on Information Theory, available at arXiv:1709.05258, (**Contributed talk QIP 2018**).
- (P2) **X. Wang**, K. Fang, and R. Duan, *Semidefinite programming converse bounds for quantum communication*, submitted to IEEE Transactions on Information Theory, available at arXiv:1709.00200, (**Contributed talk QIP 2018**).
- (P3) K. Fang, **X. Wang**, M. Tomamichel, and R. Duan, *Non-asymptotic entanglement distillation*, available at arXiv:1706.06221.
- (P4) R. Duan and **X. Wang**, *Activated zero-error classical capacity of quantum channels in the presence of quantum no-signalling correlations*, available at arXiv:1510.05437.
- (P5) B. Regula, K. Fang, **X. Wang**, and G. Adesso, *One-shot coherence distillation*, available at arXiv:1711.10512.
- (P6) L. Lami, B. Regula, **X. Wang**, R. Nichols, A. Winter, and G. Adesso, *Gaussian quantum resource theories*, available at arXiv:1801.05450.

- (P7) W. Xie, **X. Wang**, and R. Duan, *Converse bounds for classical communication over quantum networks*, available at arXiv:1712.05637.
- (P8) K. Fang, **X. Wang**, L. Lami, B. Regula, and G. Adesso, *Probabilistic distillation of quantum coherence*, available at arXiv:1804.09500.
- (P9) S. Liu, **X. Wang**, L. Zhou, J. Guan, Y. Li, Y. He, R. Duan, and M. Ying, *Q|SI): A Quantum Programming Environment*, available at arXiv:1710.09500. (Technique report of the project “Q|SI): A Quantum Programming Environment” [link].)

PROFESSIONAL SERVICE

- ◇ Reviewer for the following journals
 - Communications in Mathematical Physics
 - IEEE Transactions on Information Theory
- ◇ Reviewer for the following conferences
 - Conference on Quantum Information Processing (QIP).
 - Asian Quantum Information Science Conference (AQIS)
 - IEEE Information Theory Workshop (ITW)
- ◇ Coordinator of the following conferences or workshops
 - QIP 2015 (Sydney)
 - Workshop on Quantum Computing and Quantum Information Processing 2017.

AWARDS AND SCHOLARSHIPS

2017	UTS FEIT Higher Degree by Research Publication Award
2014	Australian Research Council Discovery Scholarship (until 2017)
2014	UTS International Research Scholarship (until 2018)
2013	Comprehensive Merit Scholarship, Sichuan University
2011	Excellent Student, Sichuan University

ACADAMIC VISITS

2018	Quantum Correlations Group, University of Nottingham, hosted by Prof. Gerardo Adesso (January 26 - January 31).
2018	Department of Computing, Imperial College London, hosted by Prof. Mario Berta (January 22 - January 25).
2018	QMATH, University of Copenhagen, hosted by Prof. Matthias Christandl (January 8 - January 12).

- 2017 Institute for Interdisciplinary Information Sciences, Tsinghua University,
hosted by Prof. Xiongfeng Ma (June 13 - June 21).
- 2017 Department of Physics, Southern University of Science and Technology,
hosted by Prof. Man-Hong Yung (June 7 - June 12).

REFERENCES

Prof. Runyao Duan

ARC Future Fellow and Professor
Director of Center for Quantum Software and Information
University of Technology Sydney
NSW 2007, Australia
☎ +61 2 9514 4619
✉ runyao.duan@uts.edu.au

Prof. Andreas Winter

ICREA Research Professor
ICREA & Universitat Autònoma de Barcelona
ES-08193 Barcelona, Spain
☎ +34 93 581 4736
✉ andreas.winter@uab.cat

Dr. Marco Tomamichel

ARC DECRA fellow and Senior Lecturer
University of Technology Sydney
NSW 2007, Australia
☎ tomamichelm (skype)
✉ marco.tomamichel@uts.edu.au

(More references upon request.)