Curriculum Vitae

Guofeng Zhang

1 Contact information

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2 Education

- Ph.D., 2005.08, Applied Mathematics, University of Alberta, Edmonton, Canada (Supervisor: Professor Tongwen Chen)
- M.Sc., 2000.08, Applied Mathematics, Northeastern University, Shenyang, China
- B.Sc., 1998.07, Applied Mathematics, Northeastern University, Shenyang, China

3 Career history

- 2017.07 present, Associate Professor, Hong Kong Polytechnic University
- 2011.12 2017.06, Assistant Professor, Hong Kong Polytechnic University
- 2010.04 2011.12, Research Fellow, Australian National University
- 2009.08 2011.09, University Postdoctral Fellow, Hong Kong Polytechnic University (with no-pay leave from 2010.04 to 2011.09)
- 2008.07 2009.06, Visiting Scholar, University of Western Sydney
- 2007.09 2011.12, Associate Professor, University of Electronic Science and Technology of China
- 2006.09 2007.08, Faculty Member, Hangzhou Dianzi University
- 2005.09 2006.08, Postdoctoral Fellow, University of Windsor

4 Teaching

4.1 Subjects taught at PolyU

- 2024.09-2025.12, AMA567: Quantum Computing for Date Science (postgraduate level)
- 2024.01 2024.05, AMA2112: Mathematics II
- 2024.01 2024.05, AMA1131: Calculus
- 2023.09-2023.12, AMA567: Quantum Computing for Date Science (postgraduate level)
- 2023.05-2023.08, AMA2131: Mathematics for Engineers
- 2022.09 2022.12, AMA2112: Mathematics II
- 2022.09-2022.12, AMA1130 & 1131: Calculus
- 2022.01-2022.05, AMA567: Quantum Computing for Date Science (postgraduate level)
- 2022.01-2022.05, AMA1130: Calculus for Engineers
- 2021.09 2021.12, AMA2112: Mathematics II
- 2021.01-2021.05, AMA1130: Calculus for Engineers
- 2020.09 2020.12, AMA2112: Mathematics II
- 2020.01-2020.05, AMA1130: Calculus for Engineers
- 2019.09-2019.12, AMA523: Optimal Control with Management Science Applications (postgraduate level)
- 2019.09-2019.12, AMA1100: Basic Mathematics I: Calculus and Probability & Statistics
- 2019.01-2019.05, AMA1130: Calculus for Engineers
- 2018.09-2018.12, AMA1100: Basic Mathematics I: Calculus and Probability & Statistics
- 2017.09-2017.12, AMA1100: Basic Mathematics
- 2017.09-2017.12, AMA1008: Calculus and Linear Algebra
- 2016.09-2016.12, AMA523: Optimal Control with Management Science Applications (postgraduate level)
- 2016.09-2016.12, AMA1100: Basic Mathematics

- 2016.01 2016.05, AMA2112: Mathematics II
- 2016.01 2016.05, AMA202: Mathematics II
- 2016.01 2016.05, AMA251: Further Calculus
- 2015.09 2015.12, AMA1100: Basic Mathematics
- 2015.09 2015.12, AMA251: Further Calculus (guided study)
- 2015.01 2015.05, AMA296: Mathematics II
- 2015.01 2015.05, AMA251: Further Calculus
- 2014.09 2014.12, AMA150: Calculus I
- 2014.01 2014.05, AMA296: Mathematics II
- 2014.01 2014.05, AMA164: Statistics II (guided study)
- 2013.09 2013.12, AMA150: Calculus I
- 2013.09 2013.12, AMA1102: Calculus IA
- 2013.01 2013.05, AMA523: Optimal Control with Management Science Applications (postgraduate level)
- 2013.01 2013.05, AMA296: Mathematics II
- 2013.01 2013.05, AMA164: Statistics II
- 2012.09 2012.12, AMA150: Calculus I
- 2012.01 2012.05, AMA296: Mathematics II
- 2012.01 2012.05, AMA164: Statistics II
- 2008.03 2008.07, Principles of Automatic Control, University of Electronic Science and Technology of China
- 2007.03 2007.07, Predictive Control (graduate level), Hangzhou Dianzi University
- 2007.03 2007.07, Principles of Automatic Control, Hangzhou Dianzi University
- 2006.09 2007.01, Applied Stochastic Process (graduate level), Hangzhou Dianzi University
- 2006.01 2006.05, Integral Calculus, University of Windsor

Name of student	Program	Year awarded	Institution	My role
Meixi Guo	Ph.D.		PolyU	supervisor
Zexian Li	Ph.D.		PolyU	co-supervisor
Xiaoqiang Wang	Ph.D.	2021	PolyU	co-supervisor
Lejia Gu	Ph.D.	2020	PolyU	chief supervisor
Yun Shi	Ph.D.	2018	PolyU	co-supervisor
Lei Cui	Ph.D.	2017	PolyU	co-supervisor
Zhiyuan Dong	Ph.D.	2016	PolyU	chief supervisor
Yui Chi Peter Yuen	M.Sc.	2013	PolyU	chief supervisor
Shi Wang	Ph.D.	2013	Australian National University	co-supervisor

4.2 Research postgraduate students

5 Research

Research Interests: Sampled-data and networked control; Quantum control; quantum computing and tensor-based quantum computing. [H-index: 24 in Google Scholar; 19 in Scopus. Total number of citations: 1724 citations in Google Scholar (https://scholar.google.com/citations?user=H1QGkk0AAAAJ); 1147 in Scopus (https://www.scopus.com/authid/detail.uri?authorId=7405273435)]

Journal papers

- Haijin Ding, Nina H. Amini, Guofeng Zhang and John E. Gough, "Quantum coherent and measurement feedback control based on atoms coupled with a semi-infinite waveguide," SIAM Journal on Control and Optimization, 2024 (accepted).
- 2. Guofeng Zhang, Jinghao Li, Zhiyuan Dong, and Ian R. Petersen, "The quantum Kalman decomposition: a Gramian matrix approach," Automatica, 2024 (accepted).
- Shikun Zhang and Guofeng Zhang (corresponding author), "Noise suppression via coherent quantum feedback: a Schrödinger picture approach," Automatica, 2024 (accepted) (Full Paper).
- Xiaozhen Ge, Lijun Liu, Yong Wang, Yu Xiang, Guofeng Zhang, Li Li, and Shuming Chen, "Faithful geometric measures for genuine tripartite entanglement," Physical Review A, vol. 110, paper no. L010402, <u>2024</u>.
- 5. Shikun Zhang and **Guofeng Zhang** (corresponding author), "Closed-Loop designed open-Loop control of quantum systems: an error analysis," **Journal of Franklin Institute**, 2024 (accepted)

- Shaoxuan Cui, Guofeng Zhang, Hildeberto Jardon-Kojakhmetov, Ming Cao, "On discrete-time polynomial dynamical systems on hypergraphs," IEEE Control Systems Letters (L-CSS), vol. 8, pp. 1078-1083, <u>2024</u>.
- Haijin Ding and Guofeng Zhang (corresponding author), "Quantum coherent feedback control with photons," IEEE Transactions on Automatic Control, vol. 69, no. 2, pp. 856-871, <u>2024</u> (Full Paper).
- Hongbin Song (corresponding author), Guofeng Zhang (corresponding author), and Hidehiro Yonezawa (corresponding author), "Strong quantum entanglement based on two-mode photonsubtracted squeezed vacuum states," Physical Review A, vol. 108, paper no. 052420, <u>2023</u>.
- Shikun Zhang and Guofeng Zhang (corresponding author), "Attraction Domain Analysis for Steady States of Markovian Open Quantum Systems," Automatica, vol. 157, paper no. 111263, <u>2023</u>
- Tong Dou, Guofeng Zhang, and Wei Cui, "Efficient quantum feature extraction for CNN-based learning," Journal of Franklin Institute, vol. 360, pp. 7438-7456, <u>2023</u>.
- Zhiyuan Dong, Wei Cui, and Guofeng Zhang (corresponding author), "On the dynamics of a quantum coherent feedback network of cavity-mediated double quantum dot qubits," Journal of Franklin Institute, vol. 360, pp. 4572- 4596, <u>2023</u>.
- Zhiyuan Dong, Guofeng Zhang (corresponding author), Ai-Guo Wu, and Re-Bing Wu, "On the dynamics of the Tavis-Cummings model," IEEE Transactions on Automatic Control, vol. 68(4), pp. 2048-2063 <u>2023</u> (Full Paper),.
- Yu Pan, Yifan Tong, Shibei Xue, and Guofeng Zhang, "Efficient depth selection for the implementation of noisy quantum approximate optimization algorithm," Journal of Franklin Institute, vol. 359, pp. 11273-11287, <u>2022</u>.
- Wenlong Li, Xue Dong, Guofeng Zhang (corresponding author), and Re-bing Wu (corresponding author), "Flying-qubit control via a three-level atom with tunable waveguide," Physical Review B, vol. 106, paper no. 134305, 2022.
- Guofeng Zhang (corresponding author) and Zhiyuan Dong, "Linear quantum systems: a tutorial," Annual Reviews in Control, vol. 54, pp. 274-294, <u>2022</u> (Invited Tutorial Research Paper).
- Wenlong Li, Guofeng Zhang, and Re-bing Wu, "On the control of flying qubits," Automatica, vol. 143, paper no. 110338, 9 pages, <u>2022</u> (Full Paper).

- Hongbin Song (corresponding author), Guofeng Zhang (corresponding author), Xiaoqiang Wang, Hidehiro Yonezawa (corresponding author), and Kaiquan Fan, "Amplification of optical Schrödinger cat states with an implementation protocol based on a frequency comb," Physical Review A, vol. 105, paper no. 043713, 11 pages, <u>2022</u>.
- Yiwei Chen, Yu Pan (corresponding author), Guofeng Zhang (corresponding author), and Shuming Cheng (corresponding author), "Detecting quantum entanglement with unsupervised learning," Quantum Science and Technology, vol. 7, paper no. 015005, 12 pages, <u>2022</u>.
- Guofeng Zhang, "Control engineering of continuous-mode single-photon states: a review," Control Theory and Technology, vol. 19, pp. 544-562, <u>2021</u> (Invited Paper).
- Xiaoqiang Wang, Lejia Gu, Heung-wing Joseph Lee, and Guofeng Zhang (corresponding author), "Quantum tensor singular value decomposition," Journal of Physics Communications, vol. 5, paper no. 075001, 16 pages, <u>2021</u>.
- Xiaoqiang Wang, Lejia Gu, Heung-wing Joseph Lee, and Guofeng Zhang (corresponding author), "Quantum context-aware recommendation systems based on tensor singular value decomposition," Quantum Information Processing, vol. 20, no. 5, paper no. 190, 32 pages, <u>2021</u>
- Guofeng Zhang, Ian R. Petersen, and Jinghao Li, "Structural characterization of linear quantum systems with application to back-action evading measurement," IEEE Transactions on Automatic Control, vol. 65, no. 7, pp. 3157-3163, <u>2021</u>
- Guofeng Zhang and Yu Pan, "On the dynamics of two photons interacting with a two-qubit coherent feedback network," Automatica, vol. 117, paper no. 108978, 13 pages, <u>2020</u> (Full Paper)
- Mengshi Zhang, Guyan Ni and Guofeng Zhang, "Iterative methods for computing U-eigenvalues of non-symmetric complex tensors with application in quantum entanglement," Computational Optimization and Applications, vol. 75, pp. 779-798, <u>2020</u>
- Guofeng Zhang and Ian R. Petersen, "Structural decomposition for quantum two-level systems," Automatica, vol. 113, paper no. 108751, 8 pages, <u>2020</u>
- 26. Qing Gao, **Guofeng Zhang** (corresponding author), and Ian R. Petersen, "An improved quantum projection filter," **Automatica**, vol. 112, paper no. 108716, 9 pages, <u>2020</u> (Full Paper)
- Gangshan Jing, Guofeng Zhang, Heung Wing Joseph Lee, and Long Wang, "Angle-based shape determination theory of planar graphs with application to formation stabilization," Automatica, vol. 105, pp. 117-129, <u>2019</u> (Full Paper)

- Gaopeng Duan, Aming Li, Tao Meng, Guofeng Zhang, and Long Wang, "Energy cost for controlling complex networks with linear dynamics," Physical Review E, vol. 99, paper no. 052305, 12 pages. <u>2019</u>
- Zhiyuan Dong, Guofeng Zhang (corresponding author), and Nina H. Amini, "Quantum filtering for a two-level atom driven by two counter-propagating photons," Quantum information Processing, vol. 18, paper no. 136, 27 pages, <u>2019</u>
- 30. Zhiuan Dong, Guofeng Zhang (corresponding author), and Nina H. Amini, "On the response of a two-level system to two-photon inputs," SIAM Journal on Control and Optimization, vol. 57, no. 5, pp. 3445-3470, <u>2019</u> (Full Paper)
- Qing Gao, Guofeng Zhang (corresponding author), and Ian R. Petersen, "An exponential quantum projection filter for open quantum systems," Automatica, vol. 99, pp. 59-68, <u>2019</u> (Full Paper)
- Xiaofeng Wang, Guofeng Zhang, and Weijian Kong, "Evolutionary dynamics of the prisoner's dilemma with expellers," Journal of Physics Communications, vol. 3, paper no. 015011, 26 pages, <u>2019</u>.
- 33. Maolin Che, Yimin Wei, Liqun Qi, and Guofeng Zhang, "Geometric measures of entanglement in multipartite pure states via complex-valued neural networks," Neurocomputing, vol. 313, pp. 25-38, <u>2018</u>
- 34. Shi Wang, Hendra I. Nurdin, Guofeng Zhang, and Matthew R. James, "Representation and network synthesis for a class of mixed quantum-classical linear stochastic systems," Automatica, vol. 96, no. 10, pp. 84-97, <u>2018</u> (Full Paper)
- 35. Gangshan Jing, Guofeng Zhang, Heung Wing Joseph Lee, and Long Wang, "Weak rigidity theory and its application to formation stabilization," SIAM Journal on Control and Optimization, vol. 56, no.3, pp. 2248-2273, <u>2018</u> (Full Paper)
- Liqun Qi, Guofeng Zhang (corresponding author), and Guyan Ni, "How entangled can a multiparty system possibly be?" Physics Letters A, vol. 382, pp. 1465-1471, <u>2018</u>
- Guofeng Zhang, Symeon Grivopoulos, Ian R. Petersen, and John E. Gough, "The Kalman decomposition for linear quantum systems," IEEE Transactions on Automatic Control, vol. 63, no. 2, pp. 331-346, <u>2018</u> (Full Paper)
- 38. Zhiyuan Dong, Guofeng Zhang (corresponding author), and Nina H. Amini, "Single-photon quantum filtering with multiple measurements," International Journal of Adaptive Control and Signal Processing, vol. 32, pp. 3, pp. 528-546, <u>2018</u>

- 39. Yu Pan and Guofeng Zhang (corresponding author), "Scattering of few photons by a ladder-type quantum system," Journal of Physics A: Mathematical and Theoretical, vol. 50, no. 34, paper no. 345301, 16 pages, <u>2017</u>
- John E. Gough and Guofeng Zhang, "Classical and quantum stochastic models of resistive and memristive circuits," Journal of Mathematical Physics, vol. 58, paper no. 073505, 19 pages, <u>2017</u>
- 41. Guofeng Zhang, "Dynamical analysis of quantum linear systems driven by multi-channel multiphoton states," Automatica, vol. 83, pp. 186-198, <u>2017</u> (Full Paper)
- Liqun Qi, Guofeng Zhang, Daniel Braun, Fabian Bohnet-Waldraff, Olivier Giraud, "Regularly decomposable tensors and classical spin states," Communications in Mathematical Sciences, vol. 15, no, 6, pp. 1651-1665, <u>2017</u>
- 43. Lei Cui, Zhiyuan Dong, Guofeng Zhang (corresponding author), and Heung Wing Joseph Lee,
 "Mixed LQG and H_∞ coherent feedback control for linear quantum systems," International Journal of Control, vol. 90, no. 12, pp. 2575-2588, <u>2017</u>
- Liang Qiao, Qingling Zhang, and Guofeng Zhang, "Admissibility analysis and control synthesis for T-S fuzzy descriptor Systems," IEEE Transactions on Fuzzy Systems, vol. 25, no. 4, pp. 929-740, <u>2017</u> (Full Paper)
- 45. Zhiyuan Dong, Lei Cui, Guofeng Zhang (corresponding author), and Hongchen Fu, "Wigner spectrum and coherent feedback control of continuous-mode single-photon Fock states," Journal of Physics A: Mathematical and Theoretical, vol. 49, no. 43, paper no. 435301, 21 pages, 2016 (Figure 7 in the paper was used in the cover page of this issue.)
- Hongting Song, Guofeng Zhang (corresponding author), and Zairong Xi, "Continuous-mode multiphoton filtering," SIAM Journal on Control and Optimization, vol. 54, no. 3, pp.1602-1632, <u>2016</u> (Full Paper)
- 47. Yu Pan, Daoyi Dong, and Guofeng Zhang (corresponding author), "Exact analysis of the response of quantum systems to two photons using a QSDE approach," New Journal of Physics, vol. 18, paper no. 033004, 15 pages, <u>2016</u>
- 48. Yu Pan, **Guofeng Zhang**, and Matthew R. James, "Analysis and control of quantum finite-level systems driven by single-photon input states," **Automatica**, vol. 69, pp. 18-23, <u>2016</u>
- Shenglong Hu, Liqun Qi, and Guofeng Zhang (corresponding author), "Computing the geometric measure of entanglement of multipartite pure states by means of non-negative tensors," Physical Review A, vol. 93, paper no. 012304, 7 pages, <u>2016</u>

- 50. Yi Zhang, Qiaoling Zhang, and Guofeng Zhang, "H[∞] Control of T-S fuzzy fish population logistic model with the invasion of alien species," Neurocomputing, vol. 173, pp. 724-733, <u>2016</u>
- John E. Gough and Guofeng Zhang, "Generating nonclassical quantum input field states with modulating filters," EPJ Quantum Technology, vol. 2, no.1, 2:15, <u>2015</u>
- John E. Gough and Guofeng Zhang (corresponding author), "On realization theory of quantum linear Systems", Automatica, vol. 59, pp. 139-151, <u>2015</u> (Full Paper)
- 53. Shenglong Hu, Liqun Qi, Yisheng Song, and Guofeng Zhang (corresponding author), "Geometric measure of quantum entanglement for multipartite mixed states," Special Issue on Quantum Computation and Quantum Information Processing, Guest Editors Shunlong Luo, Matteo G. A. Paris, and Yun Shang, International Journal of Software and Informatics, vol. 8, no. 3-4, pp. 317-326, <u>2014</u> (Invited Paper).
- Guofeng Zhang, "Analysis of quantum linear systems' response to multi-photon states," Automatica, vol. 50, no. 2, pp. 442-451, <u>2014</u> (Full Paper)
- 55. Shi Wang, Hendra I. Nurdin, Guofeng Zhang, and Matthew R. James, "Quantum optical realization of classical linear stochastic systems," Automatica, vol. 49, no. 10, pp. 3090-3096, <u>2013</u>
- 56. Guofeng Zhang and Matthew R. James, "On the response of quantum linear systems to single photon input fields," IEEE Transactions on Automatic Control, vol. 58, no. 5, pp. 1221-1235, <u>2013</u> (Full Paper)
- 57. Guofeng Zhang, Heung-wing Joseph Lee, Bo Huang, and Hu Zhang, "Coherent feedback control of linear quantum optical systems via squeezing and phase shift," SIAM Journal on Control and Optimization, vol. 50, no. 4, pp. 2130-2150, 2012 (Full Paper)
- 58. Chuanxin Bian, Guofeng Zhang (corresponding author), and Heung-wing Joseph Lee, "Squeezing enhancement of degenerate parametric amplifiers via coherent feedback control," International Journal of Control, vol. 85, no. 12, pp. 1865-1875, <u>2012</u>
- 59. Guofeng Zhang and Matthew R. James, "Quantum feedback networks and control: a brief survey," Chinese Science Bulletin, vol. 57, no. 18, pp. 2200-2214, <u>2012</u> (Invited Paper)
- Guofeng Zhang and Matthew R. James, "Direct and indirect couplings in coherent feedback control of linear quantum systems," IEEE Transactions on Automatic Control, vol. 56, pp. 7, pp. 1535-1550, <u>2011</u> (Full Paper)

- Guofeng Zhang, Long Wang, and Tongwen Chen, "Complexity analysis of networked-based dynamical systems," Journal of Systems Science and Complexity, vol. 24, pp. 413-432, <u>2011</u>.
- Jinliang Shao, Tingzhu Huang, and Guofeng Zhang, "Linear system based approach for solving some related problems of M-matrices," Linear Algebra and its Applications, vol. 432, no. 1, pp. 327-337, <u>2010</u>
- Guofeng Zhang and Weixing Zheng, "Stability and bifurcation analysis of a class of networked dynamical systems," IEEE Transactions on Circuits and Systems II: Express Briefs, vol. 56, no. 8. pp/ 664-668, 2009
- Junyan Yu, Long Wang, Guofeng Zhang, and Mei Yu, "Output feedback stabilisation of networked control systems via switched system approach," *International Journal of Control*, vol. 82, no. 9, pp. 1665-1677, <u>2009</u>
- Bin Wu, Long Wang, Guofeng Zhang (corresponding author), and Jing Wang, "Linguistic consensus on a circle," International Journal Information and Systems Sciences, 5(2): 219-229, <u>2009</u>.
- 66. Guofeng Zhang, Xiang Chen and Tongwen Chen, "Digital redesign via the generalised bilinear transformation," International Journal of Control, vol. 82, no. 4, pp. 741-754, <u>2009</u>
- Guofeng Zhang, Xiang Chen, and Tongwen Chen, "A mixed-integer programming approach to networked control systems," International Journal of Numerical Analysis and Modeling, vol. 5. pp. 590-611, <u>2008</u>
- Guofeng Zhang, Tongwen Chen, and Xiang Chen, "Performance recovery in digital implementation of analogue systems," SIAM Journal on Control and Optimization, vol. 45, no. 6, pp. 2207-2223, <u>2007</u> (Full Paper)
- Guofeng Zhang, Guanrong Chen, Tongwen Chen, and Maria B. D'Amico, "Dynamical analysis of a networked control system," International Journal of Bifurcation and Chaos, vol. 17, no. 1, pp. 61-83, <u>2007</u>
- Guofeng Zhang, Guanrong Chen, Tongwen Chen, and Yanping Lin, "Analysis of a type of nonsmooth dynamical systems," Chaos, Solitons & Fractals, vol. 30, pp. 1153-1164, <u>2006</u>
- 71. Guofeng Zhang and Tongwen Chen, "Networked control systems: a perspective from chaos," International Journal of Bifurcation and Chaos, vol. 15, no. 10, pp. 3075-3101, <u>2005</u>
- 72. Guofeng Zhang and Tongwen Chen, "Comparing digital implementation via the bilinear and step-invariant transformations," Automatica, vol. 40, no. 2, pp. 327-330, <u>2004</u>

 Guofeng Zhang, Qingling Zhang, Tongwen Chen, and Yanping Lin, "On Lyapunov theorems for descriptor systems," Dynamics of Continuous, Discrete and Impulsive Systems, Series B: Applications and Algorithms, 10(5):709-726, <u>2003</u>.

Conference papers

- 1. CDC2024
- Zhiyuan Dong, Guofeng Zhang, and Heung Wing Joseph Lee "On Poles and Zeros of Linear Quantum Systems," The IEEE 55th CDC, Milan, December <u>2024</u> (accepted).
- Shaoxuan CUI, Guofeng Zhang, Hildeberto Jardón-Kojakhmetov, and Ming Cao, "On Discrete-Time Polynomial Dynamical Systems on Hypergraphs," The IEEE 55th CDC, Milan, December <u>2024</u> (accepted).
- Hongbin Song, Guofeng Zhang, and Hidehiro Yonezawa, "Entanglement Generation with Schrödinger Kitten States," 2022 Asia Communications and Photonics Conference (ACP), 2135-2136, <u>2022</u>.
- 5. Zhiyuan Dong, **Guofeng Zhang**, and Ai-Guo Wu, "Covariance functions for quantum linear system driven by few photons," 39th Chinese Control Conference (CCC), pp. 5800-5804, <u>2020</u>.
- Wen-long Li, Guofeng Zhang, and Re-bing Wu. "The dynamical model of flying-qubit control systems," In 20th World Congress of The International Federation of Automatic Control (IFAC World Congress), volume 50, pp.1755-11759, <u>2020</u>.
- Lejia Gu, Xiaoqiang Wang, and Guofeng Zhang, "Quantum higher order singular value decomposition," 2019 IEEE International Conference on Systems, Man, and Cybernetics (SMC), pp. 1166-1171, Bari, Italy, 6-9 October, <u>2019</u>.
- Gaopeng Duan, Aming Li, Tao Meng, Guofeng Zhang, and Long Wang, "Upper bound of the minimum energy cost for controlling complex networks," the 38th Chinese Control Conference (CCC), pp. 5393-5398, Guangzhou, China 27-30, <u>2019</u>.
- Q. Gao and Guofeng Zhang, "Quantum projection filtering for open quantum systems," in Proc. the 56th IEEE Conference on Decision and Control (CDC), pp. 5529-5534, Melbourne, Australia, December 12-15, <u>2017</u>.
- Zhiyuan Dong, Guofeng Zhang, and Nina H. Amini, "Exact analysis of quantum filter for systems driven by two counter-propagating single-photon states," in Proc. the 20th World Congress of The International Federation of Automatic Control, pp. 12246-12251, Toulouse, France, July 9-14, <u>2017</u>.

- S. Grivopoulos, Guofeng Zhang, I. R. Petersen, and J. E. Gough, "The Kalman decomposition for linear quantum stochastic systems," in Proc. the 2017 American Control Conference (ACC), pp. 1073-1078, Seattle, WA, USA, May 2017.
- Zhiyuan Dong, Guofeng Zhang, and Nina H. Amini, "Quantum filtering for multiple measurements driven by fields in single-photon states," in Proc. the 2016 American Control Conference (ACC), pp. 4754-4759, Boston, MA, USA, July 6-8, <u>2016</u>.
- Zhiyuan Dong, Guofeng Zhang, and Nina H. Amini, "Quantum filtering for multiple measurements driven by two single-photon states," in Proc. 12th World Congress on Intelligent Control and Automation (WCICA), pp. 3011-3015, Guilin, China, June 12-15, <u>2016</u>.
- Yu Pan, Guofeng Zhang, Wei Cui, and Matthew R. James, "Single photon inverting pulse for an atom in a cavity," in Proc. 54th IEEE Conference on Decision and Control (CDC), pp. 6429-6433, Osaka, Japan, December 15-18, 2015.
- Chuanxin Bian, Guofeng Zhang, and Heung-wing Joseph Lee, "LQG | H_∞ control of linear quantum stochastic systems," in Proc. 34th Chinese Control Conference (CCC), pp. 8303-8308, Hangzhou, China, July 28-30, <u>2015</u>.
- Shi Wang, Hendra I. Nurdin, Guofeng Zhang, and Matthew R. James, "Synthesis and structure of mixed quantum-classical linear systems," in Proc. 51st IEEE Conference on Decision and Control (CDC), pp. 1093-1098, Maui, Hawaii, USA, December 10-13, <u>2012</u>.
- Guofeng Zhang and Matthew R. James, "On the response of linear quantum stochastic systems to single-photon inputs and pulse shaping of photon wave packets," in Proc. 2011 Australian Control Conference (AUCC), Engineers Australia, Australia, pp. 62-67, <u>2011</u>.
- Shi Wang, Hendra I. Nurdin, Guofeng Zhang, and Matthew R. James, "Implementation of classical linear stochastic systems using quantum optical components," in Proc. 2011 Australian Control Conference (AUCC), Engineers Australia, Australia, pp. 351-356, 2011.
- Guofeng Zhang, Xiang Chen, and Tongwen Chen, "ℓ_p-equivalence of discretizations of analog controllers," in Proc. the 17th IFAC World Congress, pp. 15232-15237, Seoul, Korea, July 6-11, 2008.
- Guofeng Zhang, Xiang Chen, and Tongwen Chen, "Performance comparison of digital implementation of analog systems," in Proc. 46th Conference on Decision and Control (CDC), pp. 785-790, New Orleans, December 12-14, <u>2007</u>
- Guofeng Zhang, Xiang Chen, and Tongwen Chen, "A model predictive control approach to networked control systems," in Proc. 46th Conference on Decision and Control (CDC), pp. 3339-3344, New Orleans, December 12-14, 2007.

Book chapters

 Guofeng Zhang, "Single-photon coherent feedback control and filtering," In: Baillieul J., Samad T. (eds) *Encyclopedia of Systems and Control*, Springer, London, <u>2020</u> (Invited Paper) [https: //link.springer.com/referenceworkentry/10.1007/978-1-4471-5102-9_100156-1].

6 External research grants

- 1. Guofeng Zhang (PI), Quantum Linear Control Systems: Mathematical Structure and Physical Properties, the Hong Kong Research Grant Council, 15213924, 2024.10 206.10, HK\$782,038.
- Guofeng Zhang (Co-I), Study of critical nanomagnetism using diamond-based quantum sensing, Innovation Program for Quantum Science and Technology, No. 2023ZD0300600, China Ministry of Science and Technology of the People's Republic of China (MOST), Chinese ¥1,8000,000. (PolyU got Chinese ¥700,000 out of 4,100,000 for the theoretical part)
- Guofeng Zhang (Co-I), Structural Analysis and Control Design of Linear Quantum Systems Based on Kalman Decomposition, National Natural Science Foundation of China (NSFC), No. 62473117, 2025-2028, Chinese ¥500,000.
- Guofeng Zhang (PI), Dynamical Analysis of the Tavis-Cummings Model, National Natural Science Foundation of China (NSFC), No. 62173288, 2022-2025, Chinese ¥570,000.
- Hongbin Song and Guofeng Zhang (Co-I), Performance Optimization of a Quantum Teleportation System for Continuous Variables, Shenzhen Fundamental Research Fund under Grant No. JCYJ20190813165207290, 2020.02-2023.02, Chinese ¥400,000.
- 6. Estimation and Control of Open Quantum Systems Q-COAST, ANR, France, Co-I, 01/10/2019-30/09/2023, 230,911 Euros.
- Guofeng Zhang (PI) and Ian R. Petersen, Quantum Finite-level Systems: Structure Analysis, Feedback Control, and Filtering, the Hong Kong Research Grant Council, 15203619, 2020 - 2023, HK\$695,919.
- 8. **Guofeng Zhang** (PI) and Ian R. Petersen, Quantum Linear Systems: Structure Analysis and Applications, the Hong Kong Research Grant Council, 15208418, 2018 2021, HK\$623,386.
- 9. Guofeng Zhang (PI) and Ian R. Petersen, Control-oriented Quantum Systems analysis, the Hong Kong Research Grant Council, 15206915, 2015 2018, HK\$695,854.
- Guofeng Zhang (PI), John E. Gough, and Matthew R. James, Analysis and feedback Control of Quantum linear Systems, the Hong Kong Research Grant Council, RGC PolyU 531213, 2013 -2016, HK\$645,000.

- 11. John E. Gough (UK side) and **Guofeng Zhang** (China side), Royal Academy of Engineering UK-China Exchange grant, 2013 2015, UK £16,000.
- Guofeng Zhang (PI), Mixed LQG/H[∞] Control and sampled-data Control of networked Quantum Control Systems, National Natural Science Foundation of China (NSFC), No. 61374057, 2014 2017, Chinese ¥790,000.
- Heung-wing Joseph Lee, Matthew R. James, and Guofeng Zhang (Co-I) Coherent feedback Control of Quantum optical Systems, the Hong Kong Research Grant Council, RGC PolyU 5203/10E, 2010 - 2012, HK\$420,000.
- Guofeng Zhang (PI), Complexity analysis and Control of network-based hybrid Systems, National Natural Science Foundation of China (NSFC), 2009 - 2011, Chinese ¥200,000.

7 Keynote talks and distinguished Lectures

- Distinguished Lecturer, the 36 Chinese Conference on Decision and Control, Xi'an, China, May 25-27, 2024
- Keynote Speaker, Quantum Technologies Awareness Programme in HK & Greater Bay Area, Hong Kong, October 14, 2022
- Keynote Speaker, International Conference on Quantum Computing & Applications (ICQCA 2021), Hong Kong, March 27, 2021
- Plenary Speaker, The 3rd Chinese Conference on Intelligent Networks of Things, Guangzhou, China, December 1-3, 2015
- Invited Speaker, Hong Kong satellite meeting, APS March Meeting 2024, March 8, 2024

8 Invited conference talks

- Mini-symposium on Numerical methods for the quantum many-body problem, SIAM Conference on Computational Science and Engineering (CSE25), Fort Worth, TX, March 3-7, 2025 (confirmed)
- The 2024 Hong Kong Summer Workshop on Spin-based Quantum Science and Technology, The Chinese University of Hong Kong, August 4-7, 2024
- The 11th International Workshops on Solid State Quantum Computing (IWSSQC2023), Guangzhou, December 13-16, 2023

- 2023 International Conference on the Cooperation and Integration of Industry, Education, Research, and Application, Haikou, November 8-9, 2023
- Workshop on Quantum Systems Theory, IFAC World Congress, Yokohama, July 9, 2023
- Workshop on Complex Networks, Control, and Games, Xi'an, China, May 12-14, 2023,
- The 10th TCCT Chinese Control Workshop, Chengdu, China, May 12-14, 2023
- The Fifth International Academic Forum on Process Control and Optimization, 21-22 August 2022, China University of Petroleum (online)
- The International Academic Forum on Artificial Intelligence, 6 August 2022, Beijing (One of the three invited speakers)
- Q-coast : Estimation and Control of open Quantum Systems, 16-18 May 2022, Paris, France
- The 10th International Workshops on Solid State Quantum Computing (IWSSQC2021), Hong Kong, December 2021
- The 9th TCCT Quantum Control Workshop, July 15 17, 2021, Changsha, China.
- Summer School on Quantum Control and Quantum Machine Learning, Nanjing, China, July 2019
- Pre-workshop for the 1st Quantum Science, Engineering and Technology Conference, Canberra, Australia, 8-11 April 2019
- The Mathematics of Quantum Information, March 18-21, 2019, University of Siegen, Germany
- The 2nd workshop on Quantum Machine Learning and Quantum Simulation, Chengdu, 2019
- The 1st International Workshop on Quantum Cybernetics and Machine Learning & 6th TCCT Quantum Control Workshop, June 23-24, 2018, Hangzhou
- Seminar Series on Complex Systems, Networks, Control and Applications, City University of Hong Kong, April 2018
- Principle and Application of Control in Quantum Systems (PRACQSYS), Seattle, July 17-20, 2017. (declined due to visa issue)
- Joint workshop organized by AMSS-AMA, January 2017.
- The 4th China-Australia Workshop on Quantum Control, Hefei, China, September 25-28, 2016 (declined due to time conflict with teaching)
- The 2016 Workshop of Stochastic Optimization and Tensor Analysis, Changsha, China, March 26-29, 2016

- Principle and Application of Control in Quantum Systems (PRACQSYS) Sydney, July 20-24, 2015
- The 3rd China-Australia Workshop on Quantum Control, Brisbane, Australia, September 29-October 3, 2014
- Quantum Control Engineering: Mathematical Principles and Application, Cambridge, July 21-August 15, 2014
- Seminar Series on Chaos, Control and Complex Systems, City University of Hong Kong, March 2014
- Workshop on quantum information and control, Chinese Academy of Science, Beijing, October 2013
- 2013 Quantum Control Spring Meeting, Institute of Intelligent Machines (IIM), Chinese Academy of Sciences (CAS), Hefei, April 2013.
- The 2nd China-Australia Workshop on Quantum Control, Beijing, China, November 5-8, 2012
- Workshop on Quantum Information and Quantum Control, National University of Defense Technology, April 2012

9 Summer Schools

- 1. Summer School on **Quantum Computation**, The Hong Kong Polytechnic University, 25 July, <u>2024</u>.
- Principal Lecturer, Summer School on Quantum Information and Quantum Computation, Tianyuan Mathematical Center in Northeast China, Harbin, 21-30, July, <u>2023</u> (12.5 hours)
- Principal Lecturer, Summer School on Quantum Algorithms, organized by National University of Defense Technology, Hunan University, and the Operational Research Society, Hunan Province, 2-6 August, <u>2022</u> (20 hours)
- Lecturer, Summer School on Quantum Control and Quantum Machine Learning, Nanjing, China, July <u>2019</u> (3 hours)
- Principal Lecturer, Summer School on Quantum Control and Single-Photon Pulse Shaping, Tsinghua University, 29 April - 3 May, <u>2019</u> (18 hours).

10 Awards

• 2018/19, Best Paper Award, Department of Applied Mathematics, The Hong Kong Polytechnic University

11 Service

Journal Editorship

- 2022, Lead Guest Editor for the Special Issue on Control, Estimation, and Machine Learning in a Quantum Framework for Journal of The Franklin Institute
- 2010 present, Guest Associate Editor, International Journal of Bifurcation and Chaos
- 2021 present, Associate Editor for IET Control Theory & Applications
- Associate Editor, the 2015 IEEE Multi-Conference on Systems and Control, Sydney, Australia, September 21-23, 2015

Conference programme committee membership

- General Chair, 2025 IEEE International Conference on Quantum Control, Computing, and Learning (IEEE qCCL2025), Hong Kong, June 25-28, 2025. (Confirmed)
- Steering Committee member, International Conference on Quantum Errors, Sensing and Control: Principles, Applications and Engineering (Q-ESCAPE), Shenzhen, July 21-24, 2024
- General Chair of the 13th Workshop on Principle and Application of Control in Quantum Systems (PRACQSYS), Hong Kong, December 14-18, 2019 (All the preparation has been done, but unfortunately due to social activity, the workshop was cancelled on November 16, 2019)
- Student Activities Co-Chair, IEEE Conference on Control Technology and Applications (IEEE CCTA) , Hong Kong, August 19-21, 2019
- General Co-chair, the 23rd International Symposium on Mathematical Theory of Networks and Systems (MTNS 2018), Hong Kong, July 16-20, 2018
- Presiders of The 13th Pacific Rim Conference on Lasers and Electro-Optics (CLEO Pacific Rim, CLEO-PR 2018), Hong Kong, July 29-August 3, 2018
- Co-organizer of the 4th and 5th Workshops on Quantum Information, jointly held by PolyU and the University of Hong Kong

- Member, IEEE SMC Technical Committee on Quantum Cybernetics
- Board Member, the Hong Kong Automatic Control Association (HKACA)

External examiner of PhD dissertations for

- The University of New South Wales (2012, 2015)
- The University of Hong Kong (2013, 2015, 2018)
- The Australian National University (2015,2019)
- The University of Western Australia (2015)
- The City University of Hong Kong (2018, 2023)
- The Chinese University of Hong Kong (2019, 2020)
- The University of Science and Technology of Hong Kong (2021 for two Ph.D. candidates, 2022, 2023 for two PhD candidates, and 2024 for two PhD candidates)

<u>Reviewer for journals</u>: Annual Reviews in Control, SIAM Journal on Control and Optimization, International Journal of Bifurcation and Chaos, IEEE Transactions on Automatic Control, Automatica, IEEE Transactions on Control Systems Technology, IEEE Transactions on Circuits and Systems I: Full Papers, and IEEE Transactions on Circuits and Systems II: Express Briefs, Quantum Information Processing, Mathematics of Control, Signals, and Systems, etc..