YANAN LIU

PERSONAL INFORMATION

Name	**Gender**	**Residency**
Yanan Liu	Female	Australia

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yaananliu@gmail.com	(+61)460 928 301	Chinese

EDUCATION

University of New South Wales (UNSW) Aug. 2017 - Jan. 2021
Doctor of Philosophy in Electrical Engineering
Research direction: On several feedback control strategies for quantum systems.
Supervised by: Daoyi Dong, Hidehiro Yonezawa, and Ian R. Petersen.

University of Science and Technology of China (USTC) Sep. 2014 - May 2017
Master of Control Science and Engineering
Research direction: Stochastic quantum feedback control based on Lyapunov method.
Supervised by: Sen Kuang.

Anhui University Sep. 2010 - Jun. 2014
Bachelor of Measuring and Control Technology Instrument

EMPLOYMENT HISTORY

Mar. 2024-	Lecturer (ongoing), School of Engineering, University of Newcastle
Jun. 2022- Feb. 2024	Research Fellow, Centre for Quantum Dynamics, Griffith Uni
Mar. 2021-May. 2022	Postdoctoral Scholar, Okinawa Institute of Science and Technology
Dec. 2020-Feb. 2021	Research Associate, University of New South Wales Canberra

GRANTS AND AWARDS

Grants

· Griffith Sciences Advancing Women Grant (AUD 5000) 2022

Awards

· Recipient of the Dean's Award for Outstanding PhD Theses from UNSW 2021
· Tuition Fee Scholarship and University College PG Top-up scholarship for my PhD 2017-2021
· National Scholarship of Graduate Students in University of Science and Technology of China 2016

TALKS AND PROFESSIONAL EXPERIENCE

Invited Talks

1. Title"Quantum feedback control", invited by Professor Sen Kuang in University of Science and Technology of China, 2019.

2. Title"How do you plan a PhD thesis?" invited by IEEE ACT student branch, 2022.

Contributed Conference Talks

1. Title "Quantum self-oscillation using time-delay feedback", at the Australian Institute of Physics Congress 2022.

2. Title "Feedback preparation of Bell states for two-qubit systems with time delay", at American Control Conference 2019.

3. Title "Control allocation based sliding mode fault tolerant control", at American Control Conference 2019.

4. Title "Filter-based feedback control for a class of Markovian open quantum systems", at IEEE Conference on Decision and Control 2019.

5. Title "Coherent H^∞ control for Markobian jump linear quantum systems", at International Federation of Automatic Control (IFAC) World Congress 2020, virtual.

Contributed Conference Posters

1. Title "Lyapunov-based feedback control for quantum stochastic systems with time delay", at the first Quantum Science, Engineering, and Technologies Conference, 8-11 April 2019, UNSW Canberra, Australia.

2. Title "A perfect quantum ticking clock using delayed feedback ", at the 29th International Conference on Low Temperature Physics, 18-24 August 2022, Sapporo, Japan.

3. Title "Random telegraph noise mitigation using spectator qubits", at WE-Heraeus-Seminar Series 778 *Coping with Errors in Scalable Quantum Computing Systems*, 8-11 January 2023, Bad Honnef, Germany. **The Wilhelm and Else Heraeus-Foundation bears the cost of full-board accommodation for my participation.**

4. Title "Imperfections analysis for Random Telegraph Noise mitigation by spectator qubits", at the annual workshop of Centre for Quantum Computation and Communication Technology, 28 May-1 June 2023, Hunter Valley, Australia.

Academic Visit

1. Visiting AKS in the University of Duisburg-Essen, led by Professor Steven Ding, 17-18 January 2023.

Reviewing
NPJ Quantum Information
Annual Reviews in Control
Journal of the Franklin Institute
IEEE Conference on Decision and Control
IEEE Conference on Systems, Man, and Cybernetics (SMC)
IEEE Conference on Networking, Sensing and Control
American Control Conference

Conference and Seminars Organizing

1 I was one of the organizers for the 1st Quantum Science, Engineering and Technology Conference (qSET2019), which was held in Canberra, Australia, 8-11 April 2019.

2 I am the seminar convener of Centre for Quantum Dynamics at Griffith University.

Teaching Activities

1. Lab demonstrator for "Power and Machines" at UNSW Canberra, 2018-2019.

2. Tutor of "Linear Systems Theory" at USTC, 2015.

3. Mentor of a master student (Mingcheng Zhao) in the UNSW Career Discovery Mentoring Program, 2023.

PUBLICATIONS

Journal articles and preprints

1. <u>Yanan Liu</u>, William J. Munro, and Jason Twamley, "A quantum ticking self-oscillator using delayed feedback," accepted by New Journal of Physics. 2023

2. Behnam Tonekaboni, Areeya Chantasri, Hongting Song, <u>Yanan Liu</u>, and Howard M. Wiseman, " Greedy versus map-based optimized adaptive algorithms for random-telegraph-noise mitigation by spectator qubits," Physical Review A, 107(3), 032401, 2023.

3. Xin Cheng, Xiujuan Lu, <u>Yanan Liu</u>, and Sen Kuang. "Comparison of differential evolution, particle swarm optimization, quantum-behaved particle swarm optimization, and quantum evolutionary algorithm for preparation of quantum states," Chinese Physics B, 32(2), 2023.

4. <u>Yanan Liu</u>, Daoyi Dong, Ian R. Petersen, Qing Gao, Steven X. Ding, Shota Yokoyama, and Hidehiro Yonezawa, "Fault-tolerant coherent H^∞ control for linear quantum systems," IEEE Transactions on Automatic Control. 67(10), pp. 5087-5101, 2022.

5. <u>Yanan Liu</u>, Daoyi Dong, Ian R. Petersen, and Hidehiro Yonezawa, "Fault-tolerant H^∞ control for optical parametric oscillators with pumping fluctuations," Automatica. 140, p.110236. 2022

6. Gan Li, <u>Yanan Liu</u>, Sen Kuang, and Chengdi Xiang, "Approximate bang-bang control assisted rapid switching feedback stabilization for stochastic qubit systems,"Journal of the Franklin Institute. 359(5), pp.2073-2091. <u>Co-first author</u>, 2022.

7. Sen Kuang, Gan Li,<u>Yanan Liu</u>, Xiaqing Sun, Shuang Cong, "Rapid Feedback Stabilization of Quantum Systems With Application to Preparation of Multiqubit Entangled States," IEEE Transactions on Cybernetics. 52(10), 11213-11225, 2022.

8. <u>Yanan Liu</u>, Daoyi Dong, Sen Kuang, Ian R. Petersen, and Hidehiro Yonezawa, "Two-step feedback preparation of entanglement for qubit systems with time delay," Automatica, 125, p.109174. 2020.

9. <u>Yanan Liu</u>, Daoyi Dong, Ian R. Petersen, and Hidehiro Yonezawa, "Filter-based feedback control for a class of Markovian open quantum systems," IEEE Control Systems Letters, 3(3), 565-570, 2019.

10. <u>Yanan Liu</u>, Sen Kuang, and Shuang Cong, "Lyapunov-based feedback preparation of GHZ entanglement of N-qubit systems," IEEE Transactions on Cybernetics, 47(11), 3827-3839, 2017.

11. Xiaqing Sun, Sen Kuang, <u>Yanan Liu</u>, and Shuang Cong, "Feedback stabilization of N-dimensional stochastic quantum systems based on bang-bang control," Control Theory and Technology, 15(3), 206-218, 2017.

Conference papers

12. Chunxiang Song, <u>Yanan Liu</u>, David McManus, and Daoyi Dong,"Learning Control with Evolution Strategy for Inhomogeneous Open Quantum Ensembles" 2022 IEEE International Conference on Systems, Man, and Cybernetics (SMC), 2123-2128, Prague, Czech Republic.

13. <u>Yanan Liu</u>, Daoyi Dong, Ian R. Petersen, Qing Gao, Steven X. Ding, and Hidehiro Yonezawa, "Coherent H^∞ control for Markovian jump linear quantum systems," 2020 International Federation of Automatic Control (IFAC) World Congress, 53(2), 269-274, virtual.

14. <u>Yanan Liu</u>, Daoyi Dong, Sen Kuang, Ian R. Petersen, and Hidehiro Yonezawa, "Feedback preparation of Bell states for two-qubit systems with time delay," 2019 American Control Conference (ACC), 5008-5013, Philadelphia, USA.

15. Ahmadreza Argha, Steven W. Su, <u>Yanan Liu</u>, and Branko G. Celler, "Control allocation based sliding mode fault tolerant control," 2019 American Control Conference (ACC), 3752-3757, Philadelphia, USA.

REFEREES

Daoyi Dong (*d.dong@unsw.edu.au*)
Associate Professor, University of New South Wales Canberra, Australia

Ian Petersen(*ian.petersen@anu.edu.au*)
Professor, School of Engineering, Australian National University, Australia

Howard Wiseman (*h.wiseman@griffith.edu.au*)
Professor, Director of Centre for Quantum Dynamics, Griffith University, Australia