

**RESEARCH INTERESTS**      Quantum information, near-term quantum algorithms, quantum computing, and machine learning.

**EDUCATION**      *M.Sc Computer Science (with distinction)*      Jul 2020 - Jul 2022  
The University of Melbourne, Melbourne, Australia

- Focus areas: Quantum Computing and Natural Language Processing.
- Grades: First class honour.

*B.S. Computing and Software Systems*      Jul 2017-Jul 2020  
The University of Melbourne, Melbourne, Australia

- Focus areas: Machine Learning, Software Modeling.

**EXPERIENCE**      *Research Intern*  
Institute for Quantum Computing, Baidu Research      Dec 2021 - April 2023  
Mentor: Dr. Xin Wang

- Conduct various research in quantum channel capacity, near-term quantum algorithms and quantum error mitigation, leading to 5+ patents.
- Participate in the development of the Python-based quantum machine learning platform Paddle Quantum. Primarily responsible for developing quantum information tools, improving the user experience in training variational quantum algorithms and web maintenance.  
Platform website: <https://qml.baidu.com/>.
- Engage in the development of the quantum application model library utilising Paddle Quantum. My primary responsibility involves the development of quantum machine learning models.

*Research Assistant*  
Quantum and Photonics Science Lab, Melbourne University      July 2021 - Dec 2021  
Supervisor: Assoc. Prof. Muhammad Usman.

- Investigate the integration of machine learning techniques in quantum error correction and quantum computer architecture.
- Develop a surface code decoder based on reinforcement-learning that can decode errors more efficiently than the minimum weight perfect matching algorithm at a larger scale distance.

**PUBLICATIONS** † indicates equal contribution.

1. Chengkai Zhu<sup>†</sup>, **Chenghong Zhu**<sup>†</sup> and Xin Wang,  
Estimate distillable entanglement and quantum capacity by squeezing useless entanglement,  
arXiv preprint [2303.07228](https://arxiv.org/abs/2303.07228) (2023).
2. Youle Wang<sup>†</sup>, **Chenghong Zhu**<sup>†</sup>, Mingrui Jing<sup>†</sup> and Xin Wang,  
Ground state preparation with shallow variational warm-start.  
arXiv preprint [2303.11204](https://arxiv.org/abs/2303.11204) (2023).

3. Yifei Chen, Zhan Yu, **Chenghong Zhu** and Xin Wang, Efficient information recovery from Pauli noise via classical shadow, arXiv preprint [2305.04148](https://arxiv.org/abs/2305.04148) (2023).
4. Hao-kai Zhang, **Chenghong Zhu**, Mingrui Jing and Xin Wang, Statistical analysis of quantum state learning process using quantum neural networks, *In preparation*.

## TALKS

1. **Beyond IID in Information Theory 11**, Estimate distillable entanglement and quantum capacity by squeezing useless entanglement, University of Tübingen, Germany.

## PATENTS

1. X. Wang, L. Jin, Z. Yu, **C. Zhu**, X. Zhao, Quantum circuit processing method on the quantum chip, device and electronic equipment, CN114970865B, Granted, 2023.
2. X. Wang, **C. Zhu**, X. Zhao, Method for eliminating quantum noise, electronic equipment and medium, Under review, 2022.
3. X. Wang, **C. Zhu**, X. Zhao, Method for eliminating amplitude damping noise, electronic equipment and medium, Under review, 2022.
4. X. Wang, M. Jing, **C. Zhu**, Method for determining system feature information, electronic equipment and medium, Under review, 2022.

## SERVICES

Reviewer for the Quantum journal.  
Subreviewer for AQIS23.

## HONORS

Melbourne Graduate Scholarship 2022.

## SKILLS

Python, Matlab and Mathematica.  
Familiar with deep learning frameworks PaddlePaddle and Pytorch.  
Experience in developing quantum machine learning platform.  
Fluency in English.

## REFERENCE

### **Dr. Xin Wang**

Staff Researcher and Tech Leader,  
Institute for Quantum Computing, Baidu, Beijing,  
wangxinfelix@gmail.com.

### **Assoc. Prof. Muhammad Usman**

Team Leader Quantum Systems, Data61, CSIRO, Australia.  
Associate Professor (H/F), School of Physics, The University of Melbourne, Australia.  
musman@unimelb.edu.au