

Yi-Cong Zheng

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| CONTACT INFORMATION | National University of Singapore #607 Block S15, 3 Science Drive Singapore 117543 | +65-91346542 zheng.yicong@quantumlah.org |
| WORKING EXPERIENCE | Centre for Quantum Technologies , Yale-NUS College, National University of Singapore, Singapore Post-Doc Research Fellow, from July 2015 | |
| EDUCATION | University of Southern California , Los Angeles, CA Ph.D. Electrical Engineering, June 2015, <ul style="list-style-type: none">• Thesis Title: <i>Towards Efficient Fault-Tolerant Quantum Computation</i>• Thesis Advisor: Todd A. Brun M.S., Computer Science, Dec 2013 Specialized in: High Performance Computation and Simulation M.S., Electrical Engineering, May 2009 Shanghai Jiao Tong University , Shanghai, China B.S., Electrical Engineering, June 2007 B.S., Applied Physics, June 2007 | |
| RESEARCH INTERESTS | <ul style="list-style-type: none">• Quantum Computation Architecture: holonomic quantum computation; self-correcting quantum computation; adiabatic quantum computation; topological quantum computation.• Quantum Error Correction: Quantum error-correcting code and quantum control.• Quantum Algorithm• Physical System in Quantum Information Science: Especially QC in solid states system like quantum dots and superconducting qubits | |
| RESEARCH PROJECT INVOLVED | <ul style="list-style-type: none">• Quantum Computation Science Project, physical machine description part, supported by Intelligence Advanced Research Projects Activity (IARPA), 2012• Quantum Computation in Large Block Codes, supported by Hughes Research Laboratories (HRL), 2014• Fault-tolerant Holonomic Quantum Computation in topological codes.• Quantum Error Correction with non-Markovian bath. | |

PUBLICATIONS

1. **Yi-Cong Zheng**, Ching-Yi Lai, and Todd A. Brun,
“Efficient Preparation of Large Block Code Ancilla States for Fault-tolerant Quantum Computation”, arXiv:1710.00389
2. **Yi-Cong Zheng** and Hui-Khoon Ng
“A Digital Quantum Simulator in the Presence of a Bath”, accepted by *Physical Review A*, arXiv:1707.04407
3. Ching-Yi Lai, **Yi-Cong Zheng**, and Todd A. Brun,
“Quantum Calderbank-Shor-Steane Stabilizer State Preparation by Classical Error-Correcting Codes”, *Physical Review A*, 95, 032339 (2017) (District 2, IF 2.750) arXiv:1605.05647
4. David Hocker, **Yi-Cong Zheng**, Robert Kosut, Todd Brun and Herschel Rabitz
“Survey of control performance in quantum information processing”, *Quant. Inf. Proc.* DOI 10.1007/s11128-016-1406-9 (2016) (District 3, IF 1.840)
5. Todd A. Brun, **Yi-Cong Zheng**, Kung-Chuan Hsu, Joshua Job and Ching-Yi Lai,
“Teleportation-based Fault-tolerant Quantum Computation with Multi-qubit Large Block Codes.”, arXiv:1504.03913.
6. **Yi-Cong Zheng** and Todd A. Brun,
“Fault-tolerant Holonomic Quantum Computation in Surface Codes.” *Physical Review A*, 91, 022302 (2015) (District 2, IF 2.750) arXiv:1411.4248 .
7. **Yi-Cong Zheng** and Todd A. Brun,
“Fault-tolerant Scheme of Holonomic Quantum Computation on Stabilizer Codes with Robustness to Low-weight Thermal Noise.”, *Physical Review A*, 89, 032317 (2014) (District 2, IF 2.750) arXiv:1309.1534.
8. **Yi-Cong Zheng** and Todd A. Brun,
“Geometric Manipulation of Ensembles of Atoms on Atom Chip for Quantum Computation.” *Physical Review A*, 86, 032323, (2012) (District 2, IF 2.750) arxiv:1109.5009
9. **Yi-Cong Zheng**, Jing Xiong and Guihua Zeng,
“Quantum light memory using quantum dot spins in a microdisk cavity via Raman process.” *Physics Letter A*, 372(3):197–203, (2008) (District 3, IF 1.677).

OTHER
EXPERIENCE

| | |
|--|------------------------|
| Yale-NUS Undergraduate Research Program Mentor | Fall 2016 |
| Teaching Assistant | Fall 2013– |
| EE 514: Introduction to Quantum Error Correction Instructor: Prof. Daniel Lidar, | |
| Research Assistant | Aug 2013 to Dec 2013 |
| Department of Electrical Engineering, University of Southern California Supervisor: Prof. Ben Reichardt, | |
| Research Assistant | Aug 2009 to June 2015 |
| Department of Electrical Engineering, University of Southern California Supervisor: Prof. Todd. A Brun, | |
| Research Assistant | June 2005 to June 2007 |
| State Key Laboratory Advanced Of Communication Systems and Networks, Shanghai Jiao Tong University Supervisors: Jing Xiong, Ka-Di Zhu and Gui-Hua Zeng | |

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| AWARDS | Phi Kappa Phi Honor Award for Distinguished Ph.D thesis | 2015 |
| | Travel Awards | |
| | • 11th Canadian Summer School on Quantum Information | June 2011 |
| | Student Awards — University of Southern California, Department of Electrical Engineering | |
| | • Ming Hsieh Research Festival Best Poster Award | April 2011 |
| | Student Awards — Shanghai Jiao Tong University, | |
| | • Mathematical Contest in Modeling, MCM third award | 2007 |
| | • Outstanding Academic Awards | 2006-2007 |
| | • Outstanding Academic Awards | 2005-2006 |
| | • Outstanding Academic Awards | 2004-2005 |
| TALKS AND POSTER | • <i>Towards Quantum Computation</i> , China Eastern Normal University | June 2017 |
| | • <i>Fault-tolerant Quantum Computation using Large Block Error Correcting Code</i> , University of Science and Technology of China | June 2017 |
| | • <i>Efficient Ancilla States Distillation using Classical Codes for Fault-tolerant Quantum Computation</i> (talk). Academia Sinica, Taiwan | May 2017 |
| | • <i>Quantum Digital Simulator interacting with Bath</i> Academia Sinica, Taiwan | May 2017 |
| | • <i>Quantum Digital Simulator interacting with Bath</i> (talk). IPS, Singapore | Feb 2017 |
| | • <i>Efficient Ancilla States Distillation using Classical Codes for Fault-tolerant Quantum Computation</i> (talk). Fault-Tolerant Quantum Technologies, Benasque, Spain | Aug 2016 |
| | • <i>Fault-tolerant Holonomic Quantum computation in Surface Codes</i> (talk) QCMC 2016, Singapore | July 2016 |
| | • <i>Efficient Fault-tolerant Quantum Computation</i> CQT (talk), Singapore, | April 2015 |
| | • <i>Fault-tolerant Holonomic Quantum Computation in Surface Codes</i> (talk) APS March Meeting, San Antonio | March 2015 |
| | • <i>Fault-tolerant Holonomic Quantum Computation in Stabilizer Codes against Thermal Noises</i> (talk) APS March Meeting, Denver, Colorado, oral presentation | March 2014 |
| | • APS March Meeting, Baltimore, Maryland (poster) | March 2013 |
| | • 11th Canadian Summer School on Quantum Information, Sherbrooke, Quebec | June 2011 |
| | • APS March Meeting, Dallas (poster), Texas | March 2011 |
| | • 13th Southwest Quantum Information and Technology (poster) | Feb 2011 |