IEEE Quantum Week 2025
Accepted QSYS Technical Papers

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1	327	Damian Rovara, Lukas Burgholzer and Robert Wille	Automatically Refining Assertions for Efficient Debugging of Quantum Programs
2	311	Jatin Arora, Mingkuan Xu, Sam Westrick, Pengyu Liu, Dantong Li, Yongshan Ding and Umut A. Acar	Local Optimization of Quantum Circuits
3	523	Sahil Khan, Suhas Vittal, Kenneth Brown and Jonathan Baker	Moveless: Minimizing QEC Overhead on QCCDs via Versatile Execution and Low Excess Shuttling
4	96	Filip Mazurek, Marissa D'Onofrio, Andrew Van Horn, Jiyong Yu, Kavyashree Ranawat, Jungsang Kim and	Tailored Quantum Device Calibration with Statistical Model Checking
5	183	Tobias Forster, Nils Quetschlich, Mathias Soeken and Robert Wille	Improving Hardware Requirements for Fault-Tolerant Quantum Computing by Optimizing Error Budget
6	210	Pengyu Liu, Mingkuan Xu, Hengyun Zhou, Hanrui Wang, Umut A. Acar and Yunong Shi	ConiQ: Enabling Concatenated Quantum Error Correction on Neutral Atom Arrays
7	219	Mingfei Yu, Mathias Soeken and Giovanni De Micheli	A New Perspective of Constructing Resource-Efficient Data-Lookup Quantum Oracles
8	273	Giacomo Lancellotti, Giovanni Agosta, Alessandro Barenghi and Gerardo Pelosi	Improving Quantum Compilation via Circuit Partitioning and Floorplanning
9	332	Jaime Alvarado-Valiente, Javier Romero-Álvarez, Jorge Casco-Seco, Enrique Moguel and Jose Garcia-Alonso	Quantum Island Mapping: Optimizing Multi-Circuit Execution in Quantum Processors
10	345	Tobias Forster, Nils Quetschlich and Robert Wille	Quantum Circuit Optimization for the Fault-Tolerance Era: Do We Have to Start from Scratch?
11	420	Ulrik de Muelenaere, Sinan Pehlivanoglu, Amr Sabry and Peter Kogge	A Formalization of Measurement-Commuting Unitaries
12	522	Mitchell Chiew, Cameron Ibrahim, Sergii Strelchuk and Ilya Safro	Optimal Fermion-Qubit Mappings via Quadratic Assignment
13	792	Namitha Liyanage, Yue Wu, Emmet Houghton and Lin Zhong	Network-Integrated Decoding System for Real-Time Quantum Error Correction with Lattice Surgery
14	149	Junjie Luo, Haoyu Zhang and Jianjun Zhao	QIRopt: An Optimization Method for Quantum Intermediate Representation
15	155	Cheng Chu, Lei Jiang and Fan Chen	BVQC: A Backdoor-style Watermarking Scheme for Variational Quantum Circuits
16	206	Joshua Viszlai, Willers Yang, Sophia Fuhui Lin, Junyu Liu, Natalia Nottingham, Jonathan Baker and Fred Chong	Matching Generalized-Bicycle Codes to Neutral Atoms for Low-Overhead Fault-Tolerance
17	403	Wen-Chen Yu, Tian-Fu Chen, Yu-Hsiang Chan, Jie-Hong Roland Jiang, Dah-Wei Chiou and Yao-Wen Chang	Optimal Qubit Reuse for Quantum Computation with Gate Reordering and Eager Measurement
18	405	Ronny Mueller, Maximilian Zanner, Mika Schielein, Martin Rüfenacht, Elise Jennings and Cica Gustiani	Towards a Digital Twin of Noisy Quantum Computers: Calibration-Driven Emulation of Transmon Qubits
19	544	Santiago Núñez-Corrales, Olivia Di Matteo, John Dumbell, Marcus Edwards, Edoardo Giusto, Scott Pakin and	Productive Quantum Programming Needs Better Abstract Machines
20	762	Songqinghao Yang and Prakash Murali	Is Circuit Cutting Scalable for Practical Quantum Applications?
21	7	Austin J. Adams, Sharjeel Khan, Arjun S. Bhamra, Ryan R. Abusaada, Travis S. Humble, Jeffrey S. Young and	Qwerty: A Basis-Oriented Quantum Programming Language
22	227	Gabriel Pontolillo, Asmar Muqeet, Shaukat Ali and Mohammad Reza Mousavi	From Ideal to Noisy: Adapting Property-Based Testing for Real-World Noisy Quantum Computers
23	370	Jonas Winklmann and Martin Schulz	HiPARS: Highly-Parallel Atom Rearrangement Sequence
24	419	Simon Thelen and Wolfgang Mauerer	Predict and Conquer: Navigating Algorithm Trade-offs with Quantum Design Automation
25	423	Gopika Kizhuvettil, Georgios Ioannou, Siyuan Niu and Samah Saeed	Physically-Aware Qubit Reuse for Optimized Quantum Circuit Compilation Using Machine Learning
26	430	Siyuan Niu, Efekan Kökcü, Sonika Johri, Anurag Ramesh, Avimita Chatterjee, David Bernal Neira, Daan Camps	A Practical Framework for Assessing the Performance of Observable Estimation in Quantum Simulation
27	489	Zeyuan Zhou, Andrew Ji and Yongshan Ding	Surface Code Error Correction with Crosstalk Noise
28	645	Enrico Russo, Elio Vinciguerra, Maurizio Palesi, Davide Patti, Giuseppe Ascia and Vincenzo Catania	TeleSABRE: Heuristic Layout Synthesis in Multi-Core Quantum Systems with Teleport Interconnect
29	182	Zikang Jia, Shravan Veerapaneni and Gokul Subramanian Ravi	A Lightweight Local Quantum Error Correction Decoder for Length-2 Errors in the Surface Code
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33	245	Ratun Rahman, Atit Pokharel, Md Raihan Uddin and Dinh Nguyen	SimQFL: A Quantum Federated Learning Simulator with Real-Time Visualization
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35	279	George Typaldos, Theodoros Trochatos and Jakub Szefer	Quantum Circuit Cutting: A Security Methodology
36	315	Norihiro Kakuko, Shun Gokita, Naoyuki Masumoto, Keita Matsumoto, Kosuke Miyaji, Takafumi Miyanaga, Toshio	A Practical Open-Source Software Stack for a Cloud-Based Quantum Computing System
37	320	Laura S. Herzog, Lucas Berent, Aleksander Kubica and Robert Wille	Lattice Surgery Compilation Beyond the Surface Code
38	651	Folkert de Ronde, Stephan Wong and Sebastian Feld	Compiler design for hardware specific decomposition optimizations, tailored to diamond NV centers
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41	322	Antonio Brogi, Schahram Dustdar, Michael Felderer, Hausi Muller, Juan Manuel Murillo, Ricardo Pérez-Castillo,	Self-Adaptive Quantum and Classical Software Systems
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45	476	Hrushikesh Pramod Patil, Dror Baron and Huiyang Zhou	Q-Cluster: Quantum Error Mitigation Through Noise-Aware Unsupervised Learning
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47	608	Lucy Xing, Sanjay Kumar Lalta Prasad Vishwakarma, David Kremer, Francisco Martín-Fernández, Ismael Faro	Quantum Processing Unit (QPU) processing time Prediction with Machine Learning
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