

Quantum

Peer review for the arXiv



PAPER

Strawberry Fields: A Software Platform for Photonic Quantum Computing

Nathan Killoran, Josh Izaac, Nicolás Quesada, Ville Bergholm, Matthew Amy, and Christian Weedbrook.

Quantum 3, 129 (2019).

We introduce Strawberry Fields, an open-source quantum programming architecture for light-based quantum computers, and detail its key features. Built in Python, Strawberry Fields is a full-s...



PAPER

A Game of Surface Codes: Large-Scale Quantum Computing with Lattice Surgery

Daniel Litinski,

Quantum 3, 128 (2019).

Given a quantum gate circuit, how does one execute it in a fault-tolerant architecture with as little overhead as possible? In this paper, we discuss strategies for surface-code quantum comp...

A Game of Surface Codes: Large-Scale Quantum Computing with Lattice Surgery

Daniel Litinski @ Dahlem Center for Complex Quantum Systems, Freie Universität Berlin, Arnimallee 14, 14195 Berlin, Germany

Given a quantum gate circuit, how does one execute it in a fault-tolerant architecture with as little overhead as possible? In this paper, we discuss strategies for surface-code quantum computing on small, intermediate and large scales. They are strategies for space-time trade-offs, going from slow computations using few qubits to fast computations using many qubits. Our schemes are based on surface-code patches, which not only feature a low space cost compared to other surface-code schemes, but are also conceptually simple – simple enough that they can be described as a tile-based game with a small set of rules. Therefore, no knowledge of quantum error correction is necessary to understand the schemes in this paper, but only the concepts of qubits and measurements.

The field of quantum computing is fuelled by the promise of fast solutions to classically intractable problems, such as simulating large quantum systems or factoring large numbers. Already ~ 100 qubits can be used to solve useful problems that are out of reach for clas-

form in a surface-code architecture.

There exist several encoding schemes for surface codes, among others, defect-based [7], twist-based [8] and patch-based [9] encodings. In this work, we focus on the latter. Surface-code patches have a low space overhead compared to other schemes, and offer low-overhead Clifford gates [10, 11]. In addition, they are conceptually less difficult to understand, as they do not directly involve braiding of topological defects. Designing computational schemes with surface-code patches only requires the concepts of qubits and measurements. To this end, we describe the operations of surface-code patches as a tile-based game. This is helpful to design protocols and determine their space-time cost. The exact correspondence between this game and surface-code patches is specified in Appendix A, but it is not crucial for understanding this paper. Readers who are interested in the detailed surface-code operations may read Appendix A in parallel to the following section.

Surface codes as a game. The game is played on a board partitioned into a number of tiles. An example of a 5×2 grid of tiles is shown in Fig. 1. The tiles

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- High quality, community organised, peer review
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- Provide platform for publishing experiments beyond traditional journals
- Open source platform to inspire and enable overlays for other fields

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
Román Orús, Donostia International Physics Center (DIPC), Spain

Community feedback

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 Posted by u/sinesha **Lidia del Rio [Quantum]** 2 years ago   





 **Welcome to the Quantum journal discussion platform!**




We want [Quantum](#) to be a journal that takes the community and opinions of fellow researchers seriously. We want to be inclusive and democratic rather than authoritarian, and we strongly believe that community feedback will make Quantum a better journal.


At the same time we anticipated that there would be many and often conflicting opinions about how a journal like Quantum should work.


With this in mind, we first recruited a Steering Board with representatives from diverse sub-fields of quantum science and from all around the globe to worked out first versions of the guidelines for [authors](#) and [referees](#) as well as of the [editorial policies](#) of Quantum.


After we made these public and opened the [call for editors](#) we started receiving more feedback from the community. To give this ongoing discussion more structure we have created this subreddit for Quantum. We encourage all our fellow quantum scientists to





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 Posted by u/aramharrow 1 year ago 

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The list of papers at <https://quantum-journal.org/papers/> is beautiful but doesn't give a good global view of all of them. I have a few feature suggestions

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1. Guidelines 

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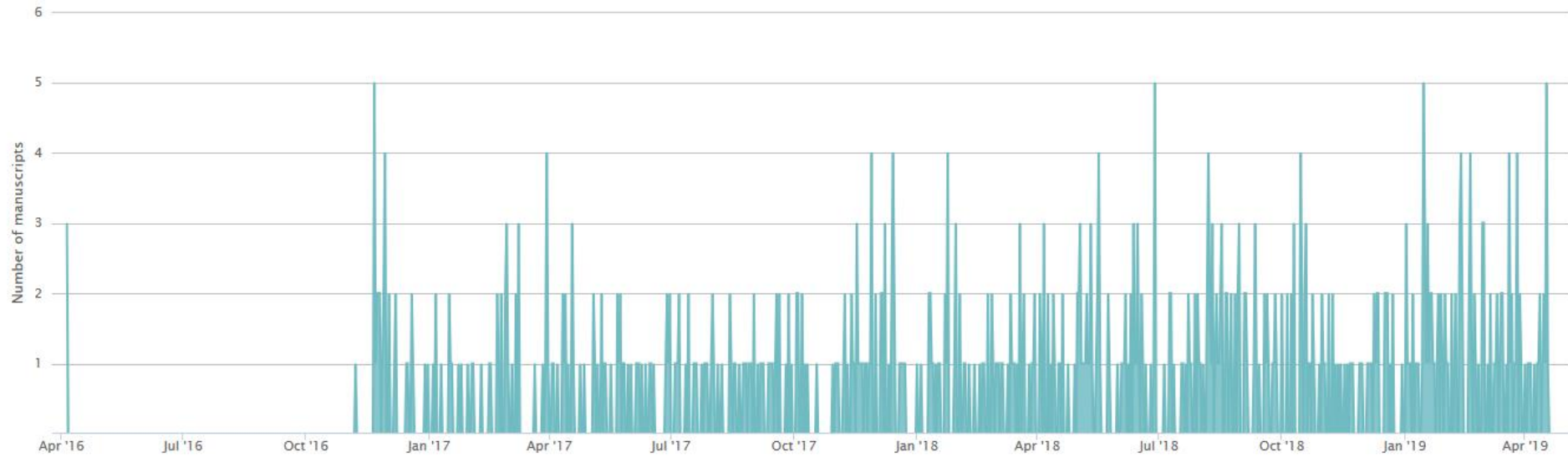
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Regular analysis and feedback



PERSPECTIVE

Peer-review at Quantum – analyzing the data

Christian Gogolin,

Quantum Views 2, 5 (2018).

Many of you asked: "How long does it take to get published in Quantum?" We at Quantum are equally curious, as we want to provide the community with the most efficient peer-review process tha...

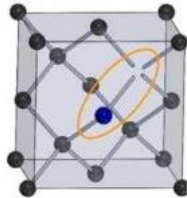
DECISION	NUMBER	MEDIAN DAYS WITH	AUTHORS	EDITORS	AND	REFEREES
accept	49		40	14		86
reject	41		0	13		43
reject (resubmitted)	14		25	22		56
overall	92		22	14		61

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Rechnungslegung des Vereins zur Förderung des Open Access Publizierens in den Quantenwissenschaften							
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		-19.673,88 €	30.082,38 €	-6.196,34 €	13.067,65 €	-\$3.200,00	\$5.200,00
Date	Description	Expenditures	Income	Expenditures	Income	Due (debited)	Credits paid
2019-04-11	Publication fee		200,00 €				
2019-04-09	STANHILL foundation		5.000,00 €				
2019-04-03	Publication fee				193,85 €		
2019-04-01	Publication fee				191,85 €		
2019-03-29	Account management	-19,50 €					
2019-03-29	Bookig fees	-5,95 €					
2019-03-29	Bank statement	-1,20 €					
2019-03-29	Turnover fee	-0,62 €					
2019-03-29	Salary March employee	-325,00 €					
2019-03-29	Salary March employee	-440,00 €					
2019-03-29	Social security employees March	-146,34 €					
2019-03-14	Relevanssi Wordpress plug-in	-324,16 €					
2019-03-13	Publication fee		200,00 €				
2019-03-13	Publication fee		200,00 €				
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2019-03-11	Payment to Publisher's Int'l Linking	-348,62 €					
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2019-03-05	Salary February employee	-440,00 €					
2019-03-05	Social security employees February	-146,34 €					

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LEAP

Sensing magnetic fields with diamonds and green laser light

Louise F. Frellsen and Sepehr Ahmadi,
Quantum Views 2, 10 (2018).

Nitrogen-Vacancy (NV) centres in diamonds have quantum properties that allow them to sense weak magnetic fields. This is relevant both for research and health care as diamond magnetom...

Quantum is launching a pilot outreach project, Quantum Leaps, where scientists write a rigorous and accessible popular science version of a research paper, which are then reviewed by school students, under the supervision of a researcher.

Feedback to executiveboard@quantum-journal.org

<https://quantum-journal.org/>



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- Scalability
- Financing and implicit bias
 - Sustainability

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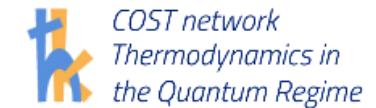
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