Reid, Andrew C.E. (Fed) Liu, Yi-Kai (Fed) Miller, Carl A. (Fed) Re: Informal but technical quantum computing talk? Thursday, February 7, 2019 5:40:44 PM

Thanks for this -- I'll have a look

In the meantime, I had look at part 2 of the Roetteler talk, and it's much better than I was expecting — it doesn't introduce the notation or the gate scheme especially well, but it does a good job on the Deutsch algorithm.

We may be getting close to some kind of convergence

I'm also not opposed to inviting outsiders, we've done that before also. On Thu, Feb 07, 2019 at 11:42:45AM -0500, Liu, Yi-Kai (Fed) wrote: > Thanks for following up on this, and I'm sorry for not replying earlier! I did a bit more searching on youtube, here are a couple more video lectures that might work: > |
- https://na01.safelinks.protection.outlook.com/?url=https:%3.A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3DMye5uaGq5no&data=02%7C01%7Cyi-kai.liu%40nist.gov%7Cdde161375dee4829da6a08d68d4d4a0%7C2ab5d8Zd8fa4797a93e05465566 Idee%7C19%7C0%7C636851760428030224&data=%2B7j7Yz7IIFZxUmLsC%2FPyHECrtbAaBRf4OJrrP0gxfTo%3D&reservec
John Watrous on quantum algorithms, it looks like he goes through the quantum circuit model, and Shor's and Grover's algorithms. While it is advertised as an undergrad lecture, it looks like he is being pretty thorough... he is not a hand-wavy person. > https://na01.safelinks.protection.outlook.com?url=https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3DQrP9HACtac&&data=02%7C01%7Cyi-kai.liu%40nist.gov%7Cdde161375dec4829da6a98d68d444a50%7C2ab5d82fd8fa4797a936054655c61dec%7C1%7C0%7C636831760428030224&sdata=04%2FWQYCNt6%2BbxLiPfKBv24XzftCaN8V9JQSF70ZX2Qg%3D&reserved=0-Andrew Childs on quantum algorithms. he doesn'et cover the quantum circuit model, but he works through several worst for quantum period-finding and Shor's algorithm, and covers Grover's algorithm briefly at the end. Actually, Andrew is at UMD now, so you could invite him, though 1 think he is busier than 1 am. He also has very nice lecture notes on quantum algorithms: https://na01.safelinks.protection.outlook.com? u=https:%2P\$2Fwww.su.md.edx%2Fawchid&2Fay6x2Fawqudsta=04%2FC10%7Cyi-C10%7Cyi-kai.liu%40nist.gov%7Cdde161375dec4829da6a08d68d4d4a50%7C2ab5d82fd8fa4797a93e054655c61dec%7C1%7C0%7C636851760428030224&sdata=xyyD0nD3YExTiglygOhVxJ3wOTGZLmol0s%2BxmtmOlK4%3D&reserved=0 > --Yi-Kai > --Yi-Kai > From: Reid, Andrew C.E. (Fed) <andrew.reid@nist.gov>
> Sent: Wednesday, January 30, 2019 3:48 PM > To: Liu, Yi-Kai (Fed) > Cc: Miller, Carl A. (Fed) > Subject: Re: Informal but technical quantum computing talk? Hi again Yi-Kai --I like the video idea, we've done that once before in this I've had a chance to look at a few of the CSSQI videos, but the space > is kind of big, I could possibly use a few more clu-> I think what I am looking for is biased more towards how quantum computers are used to solve example problems, and less
about the ins and outs of quantum information theory, except insofar
as that's required. Just based on keywords, the candidates for this seem to be the "quantum algorithm" ones -- there are two, Martin Roetteler > has a two-parter, and Peter Hoyer also has a two-parter, both
> from CSSQI 2012. I'll try to get a look at these soon, but if you have better > candidates along these lines, that would certainly help. I found another one, where I like the content but the pace is > I round another one, where I nike the content but the pace is > kind of slow, and some of the audience's questions could have > been skipped, in my opinion -- there is the option of just > stealing this talk's slides, or ones like it, and presenting it > separately, maybe. The video in question was this one > https://na01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3DF_Riqidh2oM&data=02%7C01%7Cyi-kai.liu%40nist_gov%7Cdde161375dee4829da6a08d68d4d4a50%7C2ab5d82fd8fa4797a93e054655c61dee%7C1%7C0%7C636851760428030224&sdata=idTvlGZH0JGZCmXsad0cSBlfiCowRlhPbQt01uCtNxY%3D&reserved=0 The outline is very good for what I want, it goes from > "what is a qubit", to "what is the state space of a qubit", then > to linear algebra representations of gates, and on through the > "Deutsch oracle" algorithm. Something like that that maybe did > *two* algorithms would really be nice. As I say, I plan to at least check out part 1 of the Roetteler > and the Hoyer talks, but if you have any hints about other> good sort of algorithm-level QC resources, I'd be happy to hear it. Thanks again for engaging with this. Obviously the shutdown
has complicated the scheduling, but I'm still keen to make this
happen one way or another. On Fri, Dec 14, 2018 at 02:57:04PM -0500, Liu, Yi-Kai (Fed) wrote: >> I'd be happy to talk about this... however, I wonder if I could suggest something a bit different? There are lots of online lectures from the Canadian Summer School on Quantum Information, which has been going on for years, see here: >> https://na01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.youtube.com%2Fresults%3Fsearch_query%3DCSSQl&data=02%7C01%7Cyi-kai.liu%40nist_gov%7Cdde161375dee4829da6a08d68d4d4a50%7C2ab5d82fd8fa4797a93e054655c61dee%7C1%7C0%7C636851760428030224&sdata=Dx8pufp9BnokWjPay4EuSWVBZW%2Bs51EfL748t1PDDKI%3D&reserved=0 >> Those lectures are aimed at beginning graduate students, so they are probably at level you want. I'd be happy to watch some of those lectures with you all, and answer questions or lead a discussion. What do you think?

>> I feel that for covering this kind of material, the CSSQI video lectures are very polished and cover a wide range of important topics, but at the same time it's also still nice to interact with a live person, and so this gives you the best of both

>> If you're interested, we could also look at some more applied topics, like simulating quantum chemistry on quantum computers, see here:

>> https://na01.safelinks.protection.outlook.com/?url=htt

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kai.liu%40nist.gov%7Cdde161375dee4829da6a08d68d4d4a50%7C2ab5d82fd8fa4797a93e054655c61dee%7C1%7C0%7C636851760428030224&amp:sdata=xnJNkxeuh0nVMhx3pc4KbA89HX0xREpOTIv2cBa5dBY%3D&amp:reserved=0
>> Anyway, this is just a suggestion... let me know what you think!
>>
>> Cheers,
>>
>>--Yi-Kai
 >> From: Reid, Andrew C.E. (Fed) <andrew.reid@nist.gov>
>> Sent: Thursday, December 13, 2018 5:01:45 PM
>> To: Miller, Carl A. (Fed)
>> Cc: Liu. Yi-Kai (Fed)
 >> Subject: Re: Informal but technical quantum computing talk?
  >> OK, thanks for the reply, and the tips for ways forward!
                                                    -- A.
>> On Thu, Dec 13, 2018 at 03:52:05PM -0500, Miller, Carl A. (Fed) wrote:
 >> 0 in Int, Dec 13, 2018 at 03:52:03PM -0500, Miller, Carl A. (Fed) wrote:
>>> Hi Andrew -
>>> I won't be a good person to give that talk, unfortunately -- my expertise is mainly in quantum cryptography. We'll see if Yi-Kai is interested?
 >>> The two people in my group (besides me) who specialize in quantum are Gorjan Alagic and Bill Fefferman. I'm not sure if either is a good match for this, although Bill Fefferman's publication list:
 >>> https://na01.safelinks.protection.outlook.com/?url=http%3A%2F%2Fwww.billfefferman.com%2F%3Fpage_id%3D15&amp.data=02%7C01%7Cyi-kai.liu%40nist.gov%7Cdde161375dee4829da6a08d68d4d4a50%7C2ab5d82fd8fa4797a93e054655e61dee%7C1%7C0%7C636851760428040233&sdata=CyrqfjaMkZ2qxqbCT1CGPTbzxjwU9rXMzjUJVd49WEc%3D&reserved=0
 >>> Good luck!
>>>
>>> -Carl
>>>
>>> ______
>>> Carl A. Miller
 >>> Mathematician Computer Security Division
    >>> National Institute of Standards and Technology
>>> Gaithersburg, MD
  >>> On 12/12/18, 4:49 PM, "Reid, Andrew C.E. (Fed)" <andrew.reid@nist.gov> wrote:
  >>>
>>> Hi Carl, Yi-Kai --
                     This request was initially made to Stephen Jordan, with whom
  >>> I was familiar from a previous public lecture, and who recommended one or both of you given that he has left NIST.
 >>> I run a fairly informal speaker series in MML on computational
>>> methods – the itch that I am scratching is that we often hear
>>> a lot about interesting new computational techniques, but have
>>> difficulty getting past the popular-media versions of them, we
>>> know there's substantive technical content that's interesting
  and probably accessible, but nobody is presenting it.

You might get some flavor of it from the Sharepoint site, which is here:
   >>> > https://nistgov.sharepoint.com/sites/ComputationalMethods/
  >>> I'd like to have someone speak on quantum computing -- it
>>> certainly fits the bill, it's definitely not magic, but popular
>>> media presentations are pretty frustrating for someone with
a technical background and good analytical skills, but without
>>> a technical background and good analytical skills, but
>>> a knowledge of how these systems work
>>>

Vould you be willing to make such a presentation?
>>>

I want to emphasize that the audience should be asset
>>> be technically and analytically sharp, so while a brief
and a construction of the state of the sta
                     I want to emphasize that the audience should be assumed to
>>> be technically and analytically sharp, so while a brief refresher
>>> on quantum mechanics might be warranted, I would recommend that
>>> the emphasis be on the space that qubits live in, and the existence
>>> of interesting gates that can combine them in useful ways.
                 Not being an expert, I hesitate to suggest a target, but I am personally curious if it would be possible to get from "here is a qubit" to "here's how factorization works" in a 60 or 90 minute
                  talk. My own efforts have included skimming the relevant
chapters of Nielsen and Chuang, but not all of the audience
will have done that, of course.
 >>> will nave done that, of course.
>>>
Does this sound like something you'd be willing to take on?
>>>
As for timing, the holiday season makes things a bit
 >>> complicated, I have a speaker for a mid-January slot, but
>>> mid or late February might be reasonable.
  mid or late February might be reasonable.

>>>
Please let me know if this sounds like som
do, or if you can recommend someone else.
                       Please let me know if this sounds like something you could
  >>> Thanks!
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