

Reviewer Report

Title: iGenomics: Comprehensive DNA Sequence Analysis on your Smartphone

Version: Original Submission **Date: 5/12/2020**

Reviewer name: Yulia Suvorova

Reviewer Comments to Author:

Dear Authors,

I think that iGenomics is an exciting application that will allow many researchers and doctors to quickly analyze genomic sequences outside their labs. I believe that it would be especially useful in the current pandemic situation.

I have several questions and comments about the work described below.

With kind regards,

Yulia Suvorova

1. Why BWA-MEM/Samtools tools (algorithms) were chosen for the work (not minimap2, for example)?
2. Page 2. "Due to the lower amount of processing power in mobile devices compared to high-end desktop computers or servers, iGenomics is limited in the size of the genome that can be processed" I think it would be useful to specify what is the limit (in terms of genome size and coverage) for the application?
3. Page 6 mentions "the BWA-MEM/Samtools runtime for these data sets was computed on an early 2015 MacBook Pro with a 2.9GHz Intel Core i5 running OS X El Capitan while the iGenomics runtime was computed on a 2017 iPhone 8 with a 2.39 GHz A11 Bionic Chip running iOS 12.3.1." Were the same devices used in the other tests of the work? Was iGenomics tested on other iOS devices?
4. Page 8-9 Section "Viral Genome Analysis". Figure 5. It is not completely clear to me what was considered as a "ground truth" in each comparison (what is 'nucmer?'). Additional comments would be helpful here.
5. Section "Simulated read accuracy analysis" Why the simulations were stopped at the error rate 0.2 ("sequence error rates of 0.01, 0.1, and 0.2")? An error rate of nanopore reads is generally higher (in the other sections the value 10.0 was used).
6. Section "Simulated read runtime analysis" The sizes of reference genomes are not shown in the text, only in Figure 1, where they are hard to find.
7. Figure 10, 6-th column ("G") - Is "3" in the correct row?

Methods

Are the methods appropriate to the aims of the study, are they well described, and are necessary controls included? Choose an item.

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