Critics of the paper of Bowe *et al.* “Succinct de Bruijn Graph” (2012)

The paper of Bowe *et al.* “Succinct de Bruijn Graph” describes an approach to the compressed representation of the de Bruijn graph. The paper introduces an extension of the XBW-transform, which implements a BWT-based approach for indexing labeled trees.

The paper discusses the general ideas of the new algorithmic approach. It introduces the formula of memory bound required to store the compressed graph. It also introduces the computations of time complexity for the following graph operations: graph construction, calculation of the numbers of outgoing and incoming edges, the node of a given k-mer. However they do not provide a strict proof of those assuming probably that the formulas can be derived from the context.

It would be also valuable to provide a comparison of the introduced results to the corresponding bounds in case of the standard de Bruijn graph representation. The comparison to other de Bruijn graph construction approaches is really very superficial. The authors do not provide any benchmarking either. In case one should treat the paper as a theoretical research, it lacks proofs and formulations. It also lacks demonstration of an improvement in performance in comparison to other existing approaches. So this work can be also hardly considered from the practical perspective.

The authors introduce labeling of the edges in de Bruijn graph in a manner that slightly differs from the common. From my point of view it would be valuable to mention this difference.

Some computations performed in the paper need some clarification. For example, it is rather difficult to fully understand what connects the order-0 entropy and the discussed formula of memory complexity required to store a graph. Although there is a reference to another paper where the discussed results are proved, it is not obvious how this formula is applied in the paper later.

There are also some didactical mistakes in the text construction. The meaning of the parameter n is not clear at the point of the definition of the term *last* (p.229). The definition of string *last* occurred in on the page 229 is introduced before the meaning of the letter *n* which appears only in the end of the paragraph.

The authors provide a reference to the source code. I managed to build it without a problem on the Unix platform, which is obviously advantageous among the numbers of open software which demand some effort to be compiled. However I didn't find any toy example of data, which could be used to check if the tool works.

It seems one more issue is worth mentioning. The tool takes a .bwt file as an input. It would be very valuable if there was a pipeline which accepts a dataset consisting of reads, and would automatically run all the necessary tools.