REPORT PEER REVIEW

Author: Group 25

Reviewer: Jakub Nawrocki, Group 24

Q1: The report provides an overview of Delaunay triangulation and tetrahedralization techniques. First the theoretical background is introduced both for the 2D and 3D case. Then selected, existing implementations are presented and discussed in-depth.

Q2: The overall structure of the report is very well thought out and easy to follow. The quality of explanations, especially near the beginning of the report, is sometimes lacking. This is partly because the theoretical background is demanding and hard to explain intuitively, however some parts of the script lack clarity or can be simplified (please see the Q7 section below). Overall, the clarity and organization of the report is very good.

Q3: To my knowledge there are no major errors in the report. The content of the report is very well justified by its structure and aims. There are no redundancies or missing information.

Q4: The report is a great introduction/overview of Delaunay triangulation/tetrahedralization with a good mixture of well explained theory and literature review. For the scope of our seminars, I believe its contribution is relevant and valuable.

Q5:

S1: Structure of the report – as mentioned above the report is structured very well and is easy to follow. The information is presented in a logical order, building on previous sections.

S2: Use of figures – since the topic is very geometrical, figures are a great choice to help the reader understand the complex topic that are being presented. The figures in this report are precise and provided exactly where needed.

S3: Literature overview – in the final sections of the report, a lot of references to literature are made which provide the reader with many further sources of information about the topic. The references are not only to competing/state-of-the-art papers but also to previous works, fundamental to understanding the presented topic.

Q6:

W1: Clarity of explanations – while the overall structure of the report is great, some of the explanations are not clear or too limited. This is especially evident in the initial sections, where background knowledge is being introduced. Once again please see the Q7 section below, for the things I noticed while reading.

W2: Layout of figures – the formatting put the figures in very awkward places around the pdf. I don't know to what extent you can control that with Latex, but it would be a very nice improvement if they were located closer to their references in text.

W3: TODOs :) – the report is not yet finished, with the last section being incomplete and some todo comments.

Q7:

M1: Section 1 – “DT has also been extremely helpful for problems that require solving partial differential equations (PDEs).” - citation needed, or better explanation?

M2: Section 1 – “A brief overview of modern geometry processing techniques.” - where is this in the report? Or is this just the 2nd phase of the (Hu et al., 2018) method?

M3: Section 1 – “Concerning the academic tone and language. We rebel against the notion that a scientific work must be written with a certain authority. We embrace our ineptitude in some of the topics that we discuss. To best our knowledge and ability, we will try to summarize the current state of the art.” - I'm a big fan of ELI5 and simple explanations! I think you don't need to include this statement. Let the contents speak for themselves :)

M4: Section 2 – “provide informal explanations alongside visualizations” - once again, no need to mention that the explanation is informal. A good explanation is a good explanation.

M5: Section 2.1 – “Given two points” -> “given any two points” (clearer when you read it)

M6: Section 2.1 – “A half-plane” - make this italicized too (makes it clear that you are providing a new definition)

M7: Section 2.1 – “The convex hull is the intersection of all convex sets containing vertices” - not clear which vertices you're talking about. Say explicitly that a convex hull of a set M is the intersection of all convex sets containing the vertices/elements of the set M.

M8: Section 2.1 – “Given a set of points satisfy $||x-s|| \leq ||x-t||$, then it is a closed half-plane” - not clear what is a half-plane and what is a closed half-plane. The set of points is not a half-plane, right? or are you introducing a new definition here of a "closed half-plane"?

M9: Section 2.1 – “The edge-flip algorithm can be found in many literature” - grammar "many literature"

M10: Section 2.2 – “For the sake of clarity, we refer to the 3D case as Delaunay Tetrahedralizations (DTET).” - Why is DTET clearer than DT?

M11: Section 3 – “underlie” -> underline typo.

M12: Section 3.1 – “Unlike existing algorithms, which seek to construct a high-quality mesh directly” - source?

M13: Section 3.1 – “Only after performing the optimization and ensuring that the validity is preserved the interior of the volume can be …” - missing comma after preserved.

M14: Section 3.1 – “Moreover, it penalizes flat and fat elements, slivers (Sec. 4), and inversions.” - What are fat elements?

Q8: My overall opinion about the report is positive. As for the downsides, its obviously unfinished and lacks clarity and precision in some definitions. However, the idea, structure and content of the report are sound. Mistakes and explanations can be corrected but a report with a bad initial idea is much worse. The high quality of figures in this report also adds a lot to its strengths. All this leads me to believe that the final version will be great.