Geoscientific Instrumentation Methods and Data Systems Discussions

Geosci. Instrum. Method. Data Syst. Discuss., author comment AC1
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Reply on RC1

Wenbo Guo and Jun Zhao

Author comment on "Study on a Compatible Model Combining Point Cloud Model and Digital Elevation Model" by Wenbo Guo and Jun Zhao, Geosci. Instrum. Method. Data Syst. Discuss., https://doi.org/10.5194/gi-2021-10-AC1, 2021

Thank you for your rigorous comment.Those comments are valuable and very helpful. We have read the comments carefully and reply as follows:

1.Comment: How the present work compares to previous solutions to the problem of 3D data representation.

1.Reply: The current 3D representation methods can be classified into three categories: surface-based modeling method, body-based modeling method and the modeling method that based on the mixture of surface and body. Some of those models have high accuracy, but in practical application, it is often difficult to promote. In the vast majority of large-scale terrain rendering projects, data representation methods other than TIN and DEM format are rarely used, and the results stored are basically in DEM format. In this work, the multi-level model based on regular grid is used for 3D representation. Compared with the current 3D representation solution, it has strong advantages in processing efficiency and scalability.

2.Comment: Also, the quality of the resulting 3D representation is discussed in qualitative terms, without providing some numerical measure of the fidelity of the DEM to the original point cloud, for example.

2.Reply: The original point cloud conversion to DEM can be divided into two steps:‘Point Cloud to Surface’and‘Surface to DEM’. There are extensive relevant studies on both processes. At the same time, because this problem is seriously affected by the scale and other factors, so this article does not explore this part deeply, and we may try to explore this problem in the subsequent work.

3.Comment: Lastly, limitations of the proposed methods are not discussed: how would a concave shape be represented, for example?

3.Reply: In part 2.3 of the article, we explained how to model the underground cavity through the model shown in Figure 3. The same interpretation applies to concave shapes.Of course, the model does have some limitations, which we have discussed in part 3.

4**.Comment:** A final remark concerns the list of references: very often, standards and methodologies are quoted indirectly by citing papers that presumably contain references

to the original works that present their description. I think that an effort should be made to quote the original sources.

4.Reply: Thank you very much for the question and we will improve this issue in subsequent amendments.

Thank you once again for your attention to our paper.