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Earth Surface Dynamics Discussions

Interactive comment on "Short Communication: TopoToolbox 2 – an efficient and user-friendly tool for Earth surface sciences" *by* W. Schwanghart and D. Scherler

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I agree with the reviewer #1 who thinks that this paper probably does not thematically belong to the domain of ESurf journal and that *"an application of TopoToolbox 2 to a natural setting that raises a scientific issue"* would be the way to go forward. The paper in the current form would probably be more suited for journals such as Environmental modelling and software and/or Computers and Geosciences, but I leave it to the editor to decide about how well is the domain of the journal covered.

I support the authors to continue developing TopoToolbox (as far as I know, this is the one of the most advanced toolboxes in MatLab for analysis of DEMs). I actually

also prefer command line over GUI for projects and I do deal increasingly with massive data, so TopoToolbox 2 is to me an important contribution to geomorphometry and GIS science. Nevertheless, I suggest major rewriting of the paper and inclusion of additional analysis — most importantly more comparisons and more examples of operation-outputs would help increase the significance of this work.

I think that the authors could significantly improve the paper if they would consider running a more comprehensive analysis of performance of TopoToolbox 2 in the context of other similar software such as e.g. SAGA GIS, GRASS GIS, RiverTools and or TauDEM (at least 2–3 from this list). A matrix comparison (speed benchmark) based on Table 1 in the current version of the paper would be more convincing if TopoToolbox 2 is compared also to some other classical DEM hydrology software.

I am aware of the work of Jasiewicz and Metz et al. that deal with similar issue (computing optimization for hydrological analysis of DEMs) and that could be maybe of interest to the authors:

References:

- Jasiewicz, J. (2011). A new GRASS GIS fuzzy inference system for massive data analysis. Computers Geosciences, 37(9), 1525-1531.
- Metz, M., Mitasova, H., Harmon, R. S. (2011). Efficient extraction of drainage networks from massive, radar-based elevation models with least cost path search. Hydrology and Earth System Sciences, 15(2), 667-678.

Other minor comments:

1. P261: Title and also parts of abstract seem to be somewhat too subjective. Whether a software allows for *"easy coding"* or whether it is *"user-friendly"* is up to the MatLab community to judge. Rephrasing any similar subjective judge-

ments and replacing them with actual analysis results (or results from literature) would help increase the objectivity of the paper.

2. P262L9-12: Abstract should include the results of speed benchmarking (hopefully also vs alternative software) otherwise *"has become more memory efficient"* is not very specific.

3. P264L2: Reference missing.

4. P264L25: Reference missing. BTW, I think that flow direction is the most commonly run hydrological operation on DEMs, but I am not sure if it is the most important topographic variable ever.

5. P265L26-29: These results should come up in the abstract and should be more emphasized through the paper.

6. P266L10-14: I would prefer a more detailed code chunk that explains step-by-step processing of DEMs to a non-MatLab user too.

7. P267L16: What is C-MEX?

8. P268L20: Specify how?

9. Fig 1. Is not very relevant for this work I think. I would prefer a snapshot of the TopoToolbox GUI, more code snippets, examples of drainage networks derived for some standard datasets (http://geomorphometry.org/content/data-sets) TopoToolbox vs GRASS GIS, plots of computing performance curves etc.

Interactive comment on Earth Surf. Dynam. Discuss., 1, 261, 2013.