

Interactive comment on “Short communication: The Topographic Analysis Kit (TAK) for TopoToolbox” by Adam M. Forte and Kelin X. Whipple

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Review of the Short Communication “The Topographic Analysis Kit (TAK) for TopoToolbox” by Forte and Whipple

In this short submission, the authors present a new front-end interface for the existing TopoToolbox landscape analysis software. The novelty of this software is built largely on enhancing ease of use of the underlying code, on permitting access to the TopoToolbox without a Matlab license, and on enhancing and expanding several of the analyses in TopoToolbox. Given ESurf’s recent more explicit focus on landscape evolution software, I would view this submission as appropriate for the journal – especially given its

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status as a Short Communication. However, I would happily defer to the AE’s view on this. The actual algorithms underlying the analyses are not laid out in the manuscript, though there is an explicit statement of this, and a direction of the reader to the user manual. The material presented feels very much like an incremental advance in terms of science and techniques, but I would say the submission is still warranted in laying out how this front end works, and what advantages it offers the user (a little more on this below).

I believe this submission has no major issues preventing its publication. However, there are in my view a number of moderate niggles where more specific information could be provided to the reader to really sharpen the utility of the text as a description of software functionality. Most of these are listed as technical line items at the end of this text but I wanted to pull out the most significant three beforehand:

1. A large part of the novelty of this submission derives from its use of the Matlab Runtime Environment to avoid the user needing a Matlab licence. However, almost no direct information is provided on this in the body text. This needs rectifying. I would recommend a (short!) new section doing this job either before the current section 3 or after the current section 4. This section should introduce what the MRE is (I’ve never used it; I imagine that’s common); whether this is truly open source (it’s not, but that’s OK); and what the interface is (graphical? How is it different to “normal” Matlab? Is it web based? Etc etc). You should also state explicitly that the user can deploy TAK in Matlab proper as well. This section should also briefly outline *how* this makes the TAK interface novel – i.e., what are other analysis software packages using as their interfaces, and how is the TAK method better? This kind of detail will let the reader much more easily assess if this is the software package for them. (I appreciate a lot of this is in the Manual, but defending the novelty up front in the actual manuscript seems necessary.) This section should also include a clear and definitive statement on input/output data types – i.e., you say TAK ingests DEMs and shapefiles, but specifically are these ARC formatted only? If not, what else is permitted (NetCDF?

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If just naked ASCII, how are projections defined?) For the output, you talk unspecifically in the text about tables and arrays, but you should be specific that these come out as Matlab-proprietary Tables and Arrays, which can be exported to more familiar formats in the MRE (if they can?). Again, I get that this is in the Manual, but it's pertinent up front as it relates to the accessibility of TAK to the user through the Matlab interfaces.

2. The manuscript is explicit that it isn't going to review the underlying algorithms for the analyses. I'm not sure if I'd have made that call, but I think it's OK in the actual manuscript, especially given the Short length. However, I'm not sure that the detail in the Manual is sufficient to cover what's needed either. At the very least, each of the major topographic algorithm sections needs to be anchored to information about the actual methods directly – and ideally, ought to give explicit credit to the designers as well via actual referencing. If these are truly novel techniques either from these authors or novel in TopoToolbox underneath, then say that. Otherwise, you want statements along the lines of “This function implements a modification/implementation of the [whatever reference] algorithm for [doing whatever], as described fully in the TopoToolbox manual [direct link to algorithm in the TT manual/webpages]/the TopoToolbox publication”. The user shouldn't have to go through the whole chain of (this paper) -> (this manual) -> (TopoToolbox website) -> (TopoToolbox manual index) -> (TopoToolbox section about algorithm) -> (original paper by someone else describing the method) to be able to access this information.

3. Please slightly expand on why the community uses these kinds of tools in the intro, even if just a bit. Probably only a couple of sentences needed, but will anchor the manuscript more strongly – see RC1's comments.

Minor recommendations:

P1Ln 9 – Several sentences in the manuscript get very long and tough to read. Here's one: probably break at “analyses”, and restart “These include...”

P2Ln1 – “perhaps the most flexible”. This seems like an unnecessary (unjustified?)

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judgement call. Either make direct comparisons between TAK and the other options available, or just remove this and stick with being purely descriptive of TAK.

P2Ln12 – again, very long sentence. Break at “. . .stream profiles. These...?”

P2Ln 21/22 – “with important controls”. On what? As written this doesn't make sense to me. Is it just a grammar problem?. Rephrase, and also be more specific.

P2Ln29 – “discusses how they work”. I don't think it does; I read this and believed I would find implementation details in the manual, and they aren't there. Probably just delete the clause (or add those algorithms! I'd love this, but I'm guessing you really don't want to...)

Fig. 1 – define “shp”, “array” in the caption (see also below)

P4Ln26/27 – This sentence is very vague, both on what the “range of other input types” is, and what the “fully automated procedures” are. Also seems there's a major nonsequitur here – a procedure is not an input type!? Rewrite for clarity and be more specific about what you mean by both “other input types” and “procedures”.

P4Ln28 – “individual files”. Again, be specific about which kinds of files (see also 1, above).

P5Ln1 – Ditto. “tables” -> “Matlab Tables”.

P5Ln3-5 – You're starting to actually talk methods in the main text here, so in this one specific place I don't think you can get away without an explicit reference to the algorithm(s). i.e., what do you mean by “a variety of schemes”, and whose schemes are they?

P6, Code Availability section – A touch more specificity here again, please. I assume those executables you refer to need the Matlab Runtime Environment to work, so say so. Also give information on the fact that a user will need either a licenced Matlab copy, or to download(/use online? I don't know, which is why you should say) the MRE

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to make use of the software. Where can they find/download the MRE? Given that the software updates periodically, to comply with code publication best practice please highlight exactly which snapshot of the code this paper specifically describes at time of publication (i.e., as of right now, I would recommend “. . .expanded periodically; this text refers specifically to the code as of commit 8fad562 on 9th July 2018.”) Although you say it in the paper, also add for maximum clarity “The TAK manual is also available through Github, or can be downloaded as a supplement of this publication” (or equivalent statement).

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