

In this file, there are responses to the Editor.

Responses to the Editor

We thank the Editor for his investigation about the root of the misunderstanding and the constructive feedback. We agree that our use of „terrains” and „lineaments” was misleading.

To better observe communicating our response, we divided our responses into three categories:

Agree/Clarification/Disagree.

1.

Suggestion, Question, or Comment from the Editor	Author's Response	Change in the Manuscript
I therefore conducted my own review of your revised manuscript in order to understand the cause for this discrepancy between your statements and those of the referees. I believe that the key to the misunderstandings may be language. In particular: * A "lineament" is a geographical feature, i.e., one occurring at Earth's surface * "Terrain" is a set of topography, also occurring at Earth's surface	<p style="text-align: center;">Agree</p> <p>We agree that the combination of words was misleading.</p> <p>We think that the term „subsurface slopes” better aligns with the focus on subsurface topographic data with preferred orientation.</p> <p>And it seems that the term „subsurface slope” is adopted well for the subsurface characterization studies (see the below reference).</p>	We deleted the occurrences of „lineament” and „terrains” from the manuscript.

References:

Du, J., Zhang, W. G., & Li, Y. (2021). Variability of deep water in Jordan Basin of the Gulf of Maine: Influence of Gulf Stream warm core rings and the Nova Scotia Current. *Journal of Geophysical Research: Oceans*, 126(5), e2020JC017136.

2.

Suggestion, Question, or Comment from the Editor	Author's Response	Change in the Manuscript
For further consideration in GMD, please revise the paper to make it very clear what the input data are, how they are being classified, and where this is taking place. For example: Are we looking at data of elevations of buried stratigraphic contacts? Whatever it is, please be precise.	<p style="text-align: center;">Clarification</p> <p>Yes, we confirm that we are looking at data of elevations of buried stratigraphic contacts.</p> <p>To avoid ambiguity: while the data are buried stratigraphic contacts, we don't use geographic data (such as elevation) in the classification.</p>	We added information to the abstract and Introduction that borehole data are buried stratigraphic contacts.

3.

Suggestion, Question, or Comment from the Editor	Author's Response	Change in the Manuscript
I am afraid that your model name does not make sense to the broader community because it seems that it is not about terrain (surface topography) but rather about geological units observed in the subsurface. Perhaps you can find something clever!	<p>Agree</p> <p>As a new model name, we propose: „SubsurfaceBreaks”</p>	<p>The model name has been changed in the title.</p> <p>The README file in the GitHub repository and Zenodo description have been revised.</p> <p>Variable names in the C++ computer code have been changed: we replaced „terrains” with „subsurface_slopes”.</p>

4.

Suggestion, Question, or Comment from the Editor	Author's Response	Change in the Manuscript
Section 3 requires a full rewrite. You should cleanly present your method to detect faults (your 3.3).	<p>Clarification/ Agree</p> <p>Our previous Method section was presented in a chronological order (from synthetic data, through data preparation to classification using Support Vector Machines and evaluation).</p> <p>The requested rearrangement results in the engine of the task (Support Vector Machines) being more exposed.</p>	<p>The Methods section begins now with a short summary about the method used for classification and short presentation of variables.</p> <p>Then, our previous section 3.3 (Support Vector Machines) is presented, as required.</p>

5.

Suggestion, Question, or Comment from the Editor	Author's Response	Change in the Manuscript
Your section 3.4 might be relevant here as well for visualization.	<p>Clarification/Disagree</p> <p>We could do this. However, our initial section 3.3 is mathematical description of the Support Vector Machines. We believe that the section about visualization does not match this content very well.</p>	<p>None, as of now. The section about visualization is the last section.</p>

6.

Suggestion, Question, or Comment from the Editor	Author's Response	Change in the Manuscript
Section 3.1 should appear after, and could even be given within the Synthetic Tests section.	Agree	Our previous section 3.1 appears after our previous section 3.3.

7.

Suggestion, Question, or Comment from the Editor	Author's Response	Change in the Manuscript
Section 3.2 appears to start at the middle of a stream of thought about how to add attributes to and select features. It is critical to place your new method at the forefront and to highlight what you have done and why: Which attributes do you use, and how do you do so?	<p>Agree/Clarification</p> <p>Our previous Method section was presented in a chronological order (from synthetic data, through data preparation to classification using Support Vector Machines and evaluation).</p> <p>In the requested rearrangement, the Methods section starts with a very short summary about the classification tool, attributes and evaluation which, as we believe, satisfy the requirement to place our new method at the forefront.</p> <p>Then, we present the Support Vector Machines algorithm as the engine of the classification which requires several paragraphs.</p> <p>The description of the algorithm is followed by the description of the attributes and the preprocessing steps which is reflected by the rearrangement of the columns in a data frame.</p>	<p>We did the rearrangement of the Methods section.</p> <p>We added a sentence clarifying that attributes are represented by columns in a data frame and sorting some of the features (distances) introduces their rearrangement in the data frame.</p>

8.

Suggestion, Question, or Comment from the Editor	Author's Response	Change in the Manuscript
1. In modern English, we take the Polish spelling of Kraków. No need to change the name of your home city when you change the language!	Agree	Done.

9.

Suggestion, Question, or Comment from the Editor	Author's Response	Change in the Manuscript
2. Please note that the "short summary" stands outside of the main manuscript.	Agree	We deleted the „Short summary” from the main manuscript.

10.

Suggestion, Question, or Comment from the Editor	Author's Response	Change in the Manuscript
3. Section 2.1 might not be necessary. A condensed version that need not go so into detail on the cited studies and focuses on relevance to the method presented here could be folded into other sections.	<p>Clarification</p> <p>If possible, we would like to have this section because there are many classification approaches for detecting faults. And it may be useful for a reader to decide if our method is relevant.</p> <p>However, we understand that we should not go into detail in this section. Therefore, we propose to shorten this section.</p>	We deleted from the section 2.1 some information about limitations of unsupervised approaches.

11.

Suggestion, Question, or Comment from the Editor	Author's Response	Change in the Manuscript
4. You can move your case study to after the presentation of the method.	Agree	Done.