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## **Comment on nhess-2022-141**

Luigi Lombardo (Referee)

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Referee comment on "Landsifier v1.0: a Python library to estimate likely triggers of mapped landslides" by Kamal Rana et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2022-141-RC2>, 2022

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Dear authors,

I would like to express my appreciation on your work. I have read it with great interest and found the overall manuscript of particular scientific relevance for the geomorphology community.

Below I will summarize the manuscript content and later provide my feedback and suggestions, which I would like to stress here from the very beginning are very minor.

The manuscript deals with a very important topic, as it proposes a protocol to estimate the likely trigger of landslides from their shape and size characteristics. This is done by using a CNN architecture, which adds a numerical and methodological flavor to an article that addresses an important research question. In fact, as also stated by the authors, any attempt to predict landslides relies on previous information, this being usually expressed in polygonal inventories. However, often these inventories only provide the location of landslide occurrence and extent lacking to report the date. These inventories are usually geomorphological inventories (*sensu* Guzzetti et al. 2012) and they still represent the vast majority of the available inventories. This means that not knowing the date we cannot know the trigger responsible for the landslide occurrence, which is a fundamental requirement to then better understand the slope response over the whole affected landscapes.

Therefore, the protocol proposed by Rana and co-authors brings a very relevant tool for geomorphologists and for any other practitioner, especially because of the way the authors opted to share their work through a python script. This is particularly important for repeatability and reproducibility.

Aside from this general overview of why I think this manuscript deserve to be published, specific elements support the same conclusion. In fact, the text is extremely elegant and it flows nicely while reading it. I actually read it all in one go, which is something that not always occurs. In addition to the style and readability of it, I would like to stress the originality of the manuscript because to my knowledge at least, no other work has addressed the same issue, specifically with an open source solution to the problem. Also, the quality of scientific illustrations is very high. I am usually quite picky and yet I have no real comment to add, other than complimenting the authors.

In terms of feedback I can provide to improve the text, I have comments almost exclusively related to the literature review and what could be potentially added. One is that the authors refer to Taylor et al. (2018) in their text and rightfully so. But, at least for me a very similar if not better article has been recently published along the same lines that Taylor and co-authors introduced for the first time. The work I am mentioning is authored by Amato et al. (2021), where they also use a neural network architecture to explore landslide shape characteristics and infer on the landslide type at hand. This is even closer to your work because of the method they chose to use and I feel should be mentioned in your text. Another potential missing reference could be Lombardo et al. (2019), a paper where the trigger pattern has been derived from the inventory itself, although using a latent effect featured in a statistical model. Of course what you propose here is different but the question is basically the same: "How do I retrieve the trigger from the landslide themselves?". It is worth mentioning that I am the first author of that paper, therefore if you feel like I am imposing a reference, feel free to avoid my comment. I swear it is a genuine one, without a second interest to it.

Other than these minuscule details, your work is impeccable to me and I would definitely be happy once I see it published in NHESS.

Again, congratulations. Kind regards,

Luigi Lombardo

## References

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