



ICG2022-384, updated on 28 May 2023

<https://doi.org/10.5194/icg2022-384>

10th International Conference on Geomorphology

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Introducing a new and simplified geostatistical-based roughness algorithm

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The first aim of this work is to introduce a new geostatistical-based algorithm that permits to detect specific aspects of short-range surface roughness (or of image texture) which does not require user defined choices, except for the radius of the search window, and provides a high interpretability of the results. In particular, differently from usual geostatistical approaches, this algorithm does not require the derivation of a residual digital elevation model. The new proposed algorithm, despite its simplicity, permits to detect relevant aspects of surface texture, including anisotropy. Moreover, adopting approaches based of digital elevation model smoothing it can also be applied in the context of multiscale analysis. A second aim, functional to the introduction of the new algorithm, is to furnish a general overview of the key aspects of the geostatistical methodologies, highlighting analogies and differences with other approaches. In presenting the algorithm, a comparison with the roughness computed by means of dispersion of vectors normal to surface is performed.

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