

Robust surface roughness indices and morphological interpretation

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Geostatistical-based image/surface texture indices based on variogram (Atkison and Lewis, 2000; Herzfeld and Higginson, 1996; Trevisani et al., 2012) and on its robust variant MAD (median absolute differences, Trevisani and Rocca, 2015) offer powerful tools for the analysis and interpretation of surface morphology (potentially not limited to solid earth). In particular, the proposed robust index (Trevisani and Rocca, 2015) with its implementation based on local kernels permits the derivation of a wide set of robust and customizable geomorphometric indices capable to outline specific aspects of surface texture. The stability of MAD in presence of signal noise and abrupt changes in spatial variability is well suited for the analysis of high-resolution digital terrain models. Moreover, the implementation of MAD by means of a pixel-centered perspective based on local kernels, with some analogies to the local binary pattern approach (Lucieer and Stein, 2005; Ojala et al., 2002), permits to create custom roughness indices capable to outline different aspects of surface roughness (Grohmann et al., 2011; Smith, 2015). In the proposed poster, some potentialities of the new indices in the context of geomorphometry and landscape analysis will be presented. At same time, challenges and future developments related to the proposed indices will be outlined.

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