



## **Geostatistics for high resolution geomorphometry: from spatial continuity to surface texture**

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This presentation introduces the use of geostatistics in the context of high-resolution geomorphometry. The application of geostatistics to geomorphometry permits a shift in perspective, moving our attention more toward spatial continuity description than toward the inference of a spatial continuity model. This change in perspective opens interesting directions in the application of geostatistical methods in geomorphometry. Geostatistical methodologies have been extensively applied and adapted in the context of remote sensing, leading to many interesting applications aimed at the analysis of the complex patterns characterizing imagery. Among these applications the analysis of image texture has to be mentioned. In fact, the analysis of image texture reverts to the analysis of surface texture when the analyzed image is a raster representation of a digital terrain model. The main idea is to use spatial-continuity indices as multiscale and directional descriptors of surface texture, including the important aspect related to surface roughness. In this context we introduce some examples regarding the application of geostatistics for image analysis and surface texture characterization. We also show as in presence of complex morphological settings there is the need to use alternative indices of spatial continuity, less sensitive to hotspots and to non-stationarity that often characterize surface morphology. This introduction is mainly dedicated to univariate geostatistics; however the same concepts could be exploited by means of multivariate as well as multipoint geostatistics.