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Feature preserving processing of terrain data

Terrains are often represented as a collection of height measurements (digital elevation model). The data is available in many different forms that vary in accuracy, and horizontal and vertical resolution. There are many potential sources of errors that effect accuracy and uncertainty of terrain feature analysis using DEM data. The data can also be noisy and contain holes. Terrain data contains information that is pertinent to a variety of applications that often require that data be accurate. Unfortunately, standard image processing techniques are not optimal when applied to terrain data. Therefore, a push towards more automated analysis should be the development of processing techniques specific to terrain data. We present several methods for terrain data processing for smoothing terrain data (removing noise) and filling holes while preserving terrain features. We demonstrate these methods for several applications, including ridge/gully detection and smoothing of noisy digital elevation models.