Improving Change Detection in Forest Areas Based on Stereo Panchromatic Imagery Using Kernel MNF - DTU Orbit (05/04/2019)

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The goal of this paper is to develop an efficient method for forest change detection using multitemporal stereo panchromatic imagery. Due to the lack of spectral information, it is difficult to extract reliable features for forest change monitoring. Moreover, the forest changes often occur together with other unrelated phenomena, e.g., seasonal changes of land covers such as grass and crops. Therefore, we propose an approach that exploits kernel Minimum Noise Fraction (kMNF) to transform simple change features into high-dimensional feature space. Digital surface models (DSMs) generated from stereo imagery are used to provide information on height difference, which is additionally used to separate forest changes from other land-cover changes. With very few training samples, a change mask is generated with iterated canonical discriminant analysis (ICDA). Two examples are presented to illustrate the approach and demonstrate its efficiency. It is shown that with the same amount of training samples, the proposed method can obtain more accurate change masks compared with algorithms based on k-means, one-class support vector machine, and random forests.

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