

DETECTING HUMAN-INDUCED SCENE CHANGES USING COHERENT CHANGE DETECTION IN SAR IMAGES

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ABSTRACT:

The technique of coherent change detection in repeat-pass Synthetic Aperture Radar imagery has the potential to detect very subtle scene changes such as changes in man-made targets or potential human activities. Nevertheless, urban areas represent a potential problem due to too many human activities. In this paper, we propose a simple method for detecting temporal changes in a scene that are possibly caused by human activities, such as building up areas of hard soil at a terrain that was previously a part of a desert. This method is based on comparison of coherence change detection results obtained in successive time frames. In order to cover a wide range of applications and situations, the proposed method is intentionally designed in such a way that it does not need any specific knowledge source about the terrain. However, once coherent change detection results are obtained, various knowledge sources can be taken into account in order to further improve the final interpretation. These knowledge sources can be related to the sensors, such as their operational principles, or to the situation at hand, referring to the context – terrain type, land-use, historical background etc. A way to include them in the reasoning process is discussed in this paper too. In addition, in order to further improve the quality of the obtained output, usefulness of applying a spatial regularization technique is tested as well. The method is illustrated and validated using ALOS PALSAR temporal data related to a real situation - works performed in building up additional runways of an airport. The obtained results are in concordance with the ground-truth information, showing that the presented method is promising.

TOPIC: Multi-spectral and hyperspectral remote sensing

ALTERNATIVE TOPIC: Multi-spectral and hyperspectral remote sensing