

GPU Framework for Change Detection of Multitemporal Hyperspectral Images

Experimental results related to the paper [GPU Framework for Change Detection of Multitemporal Hyperspectral Images](#) published in the International Journal of Parallel Programming.

Abstract

Nowadays, it is increasingly common to detect land cover changes using remote sensing multispectral images captured at different time-frames over the same area. A large part of the available change detection methods focus on pixel-based operations. The use of spectral-spatial techniques helps to improve the accuracy results but also implies a significant increase in processing time. In this paper, a GPU (Graphical Processor Unit) framework to perform object-based change detection in multitemporal remote sensing hyperspectral data is presented. It is based on Change Vector Analysis (CVA) with the Spectral Angle Mapper (SAM) distance and Otsu's thresholding. Spatial information is taken into account by considering watershed segmentation. The GPU implementation achieves real-time execution and speedups of up to 46.5× with respect to an OpenMP implementation.

Downloads

Input dataset

All the images are available in Matlab (.mat) format, among others. For further information see the readme in the files.

* [Santa Barbara](#)

* [Bay Area](#)

Results

Experimental conditions

For information see the readme in the files.

* [outputscva.zip](#)

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