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VHR satellite multitemporal data to extract cultural landscape changes in the roman site of Grumentum

nicola masini and Rosa Lasaponara
CNR, CNR-IMAA, Tito Scalo, Italy (lasaponara@imaa.cnr.it, 0039 0971 427271)

The papers deals with the use of VHR satellite multitemporal data set to extract cultural landscape changes in the roman site of Grumentum
Grumentum is an ancient town, 50 km south of Potenza, located near the roman road of Via Herculea which connected the Venusia, in the north est of Basilicata, with Heraclea in the Ionian coast. The first settlement date back to the 6th century BC. It was resettled by the Romans in the 3rd century BC. Its urban fabric which evidences a long history from the Republican age to late Antiquity (III BC-V AD) is composed of the typical urban pattern of cardi and decumani. Its excavated ruins include a large amphitheatre, a theatre, the thermae, the Forum and some temples.
There are many techniques nowadays available to capture and record differences in two or more images. In this paper we focus and apply the two main approaches which can be distinguished into : (i) unsupervised and (ii) supervised change detection methods.

Unsupervised change detection methods are generally based on the transformation of the two multispectral images in to a single band or multiband image which are further analyzed to identify changes
Unsupervised change detection techniques are generally based on three basic steps (i) the preprocessing step, (ii) a pixel-by-pixel comparison is performed, (iii). Identification of changes according to the magnitude an direction (positive /negative).
Unsupervised change detection are generally based on the transformation of the two multispectral images into a single band or multiband image which are further analyzed to identify changes. Than the separation between changed and unchanged classes is obtained from the magnitude of the resulting spectral change vectors by means of empirical or theoretical well founded approaches

Supervised change detection methods are generally based on supervised classification methods, which require the availability of a suitable training set for the learning process of the classifiers.
Unsupervised change detection techniques are generally based on three basic steps (i) the preprocessing step, (ii) supervised classification is performed on the single dates or on the map obtained as the difference of two dates, (iii). Identification of changes according to the magnitude an direction (positive /negative).
Supervised change detection are generally based on supervised classification methods, which require the availability of a suitable training set for the learning process of the classifiers, therefore these algorithms require a preliminary knowledge necessary: (i) to generate representative parameters for each class of interest; and (ii) to carry out the training stage
Advantages and disadvantages of the supervised and unsupervised approaches are discuss. Finally results from the the satellite multitemporal dataset was also integrated with aerial photos from historical archive in order to expand the time window of the investigation and capture landscape changes occurred from the Agrarian Reform, in the 50s, up today.