

Object Separation Based on the Multispectral Monitoring Data

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Abstract - In this paper the approach to usage multispectral monitoring data for object separation and classification are given.

Keywords –Multispectral data, monitoring, data fusion, object classification, clusterization

I. INTRODUCTION

The monitoring systems which based on single informative channel don't satisfy modern requirements to such systems and tasks which they can solve. That's why approach based on combination of data given by different sensors, which work in different spectral bands and even based on different physical phenomena, are important to build modern monitoring systems [1, 2].

II. MAIN PART

The multispectral data given by monitoring systems like Earth observation satellite or microwave based system are forming informative hyper cub with many dimensions. Such data is more informative when independent parcial channels are used for producing of scene's image. The physical properties of objects on scene make different distribution of radiation in different spectral bands and different polarizations. This fact is helpful for object separation based on their spectral properties and as much different channels are used as better separation performance is possible to achieve.

As an example radiation distribution of several different objects in two spectral bands are shown on the fig. 1a. There is possible to detect and separate 3 different objects' classes. If we are considering the same scene in three different and independent spectral bands (fig. 1b) becomes obvious that there are more than tree objects' classes. It is because of shadowing some of them so as much information we can obtain as better possibility we have for objects separation and classification.

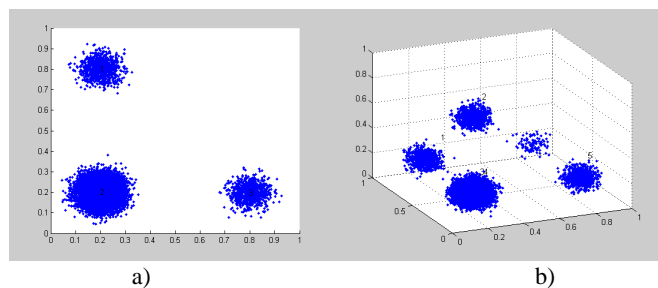


Fig.1 Clusters forming
(a) for two spectral bands; (b)for three spectral bands

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The real image processing results based on three different spectral bands represented on fig. 2. There were applied clusterization algorithm and then separation of object classes [3].

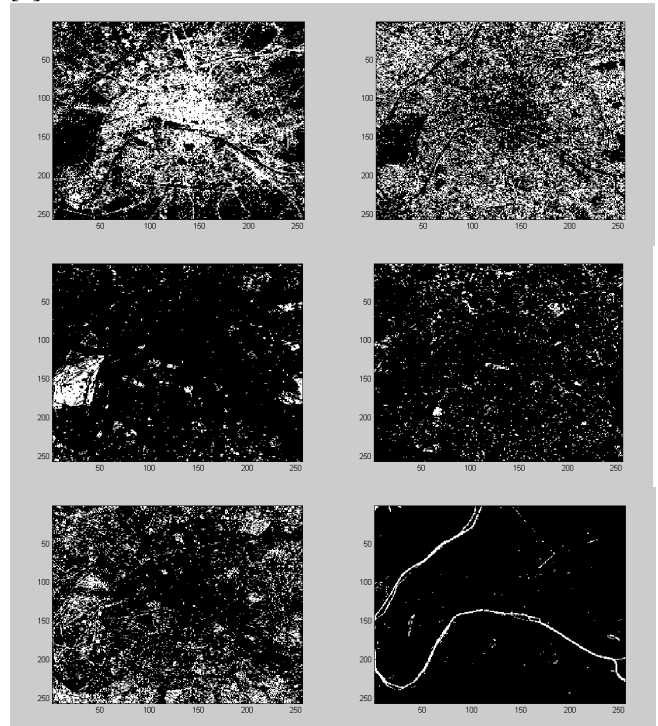


Fig.1 Objects separation example with clusterization

III. CONCLUSION

Increasing of amount of data by data from several independent spectral imaging channels give possibility to improve probability of proper identification, classification or separation of objects which have different properties in comparison with background. The best results are possible to achieve using as independent spectral bunds as possible.

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