

Geog 696
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W6-Feb. 28, 2011
Debrief

Article: De Laet, V.; Paulissen, E.; and Waelkens, M. 2007.

Methods for the extraction of archaeological features from very high-resolution Ikonos-2 remote sensing imagery, Hisar (southwest Turkey). *Journal of Archaeological Science* 34, 5: 830-841.

Structure of the Article

1. Introduction
2. Study Area
3. Methods
 - 3.1 Adequate satellite imagery
 - 3.2 Extraction of archaeological features from Ikonos-2 imagery
 - 3.2.1 GIS- based method: edge enhancement filtering technique
 - 3.2.2 Pixel-based method
 - 3.2.3 Object-based remote sensing
4. Results
 - 4.1 Visual interpretation
 - 4.2 Edge enhancement filtering technique
 - 4.3 Pixel-based classification
 - 4.4 Object-based classification
5. Discussion and Conclusion

Key Points

Introduction

Literature Review (Critical issues, missing points, conflicts)

Study Justification

Viewing archaeological structures from ground level generally does not clearly identify the spatial characteristics of these structures or the relationship to surrounding archaeological sites. In some cases ancient structures are not apparent from ground level but become obvious from a bird's eye view. (Briton)

Purpose

Within this study, three satellite remote sensing images with varying ground resolutions are examined in order to test their potential for automatic extraction of archaeological features. (Janice)

Data

Data used

The authors mentioned ASTER, SPOT, and Ikonos-2 are used, but in the end, they just used Ikonos-2, even in the title.

Methods

Visual interpretation
GIS- based method: Edge enhancement filtering technique using Idrisi
Pixel-based classification using
Object-based Image Analysis using eCognition

Results

Visual interpretation is the best.

How convincing & clear

It is not that convincing. There are quite a lot of issues in the article.

Discussion Topics

1. Advantage of the article

It is a good start for me to process my project which is focused on OBIA with eCognition.

2. Disadvantage of the article

(1) Briton talked about 4x4 m data used in 833p. There is no explanation why they used 4m resolution multispectral images instead of 1 m resolution of panchromatic.

(2) Molan talked about the other weakness of the article. Hisar was chosen by the authors to be study site because it has its large size and many vertical, well visible archaeological structures, and they concluded visual interpretation have the best result. When they set the site, the site has inherent results.

(3) Molan mentioned that they did not conduct a spectral analysis and keep talking about spectral characteristics are similar, so they cannot get a unique spectral class.

(4) Briton mentioned that if they talked about the limitations of trees, they could have used InSar data.

(5) Molan mentioned that even though one step of preprocessing, they used different softwares such as ENVI and PCI, so she thinks they just want to check what software can have what kind of jobs. Dr. Rodrigue agreed with that.

(6) Molan talked about GIS software is not for Raster Image Analysis. Dr. Rodrigue mentioned that Idrisi is for both vector and raster.

(7) Janice asked which method is the best other than visual interpretation. Molan said OBIA. Even in the article, the authors said that it had 80 % of match. Briton said that even 80% is a quite high rate. Molan said that for her project she expects more than that because when they conducted OBIA, they did not mention what algorithm used for segmentation and what algorithm used for classification. So she assumed it is not that thorough test.

(8) Caren asked how people can get the accuracy of how they know and how much the real is when Dr. Rodrigue talked about Mars with ground-penetrating radar. Briton said that when he conducted InSar analysis, he compared his Sar analysis to hyperspectral results. Dr. Rodrigue agreed that.

(9) Molan asked how they can get a ground truth or justification for one's study. Dr. Rodrigue and Briton said that they should compare to other convincing and proven analysis or established method or results.

(10) Janice mentioned that she wondered who people can find oil underground? Dr. Rodrigue said that it's radar.

(11) Before closing in, Molan mentioned that in 835p there is irrelevant explanations for other spectral analysis citing the number one hyperspectral analysts. It is out of scope of study. It is not necessary to mention in the method.

3. Important issue

Dr. Rodrigue mentioned that we need to be careful about defining scope when we do our thesis. We need to mention that we are not going to be responsible for the study out of our analysis.