



Feature identification and extraction of urban built-up surfaces and materials in AVIRIS-NG hyperspectral imagery

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ABSTRACT

Regular monitoring and precise mapping of urban environment is required by various applications. In this paper, a new method is proposed, in which different combinations of feature bands have been utilized for extraction of built-up surfaces, sub-surfaces and materials in different levels (Level-1, 2 and 3) using AVIRIS-NG hyperspectral imagery of Jodhpur, Rajasthan region of India. Features identified in this study are based on spectral indices, major principal components and fractional abundances, in which first combination is developed using spectral indices and fractional abundances while second is made using spectral indices and major principal components and finally third using combination of all the aforesaid features. It is observed that the combined form of all the aforementioned features produces better extraction results than the other two while combination of spectral indices and fractional abundances may be more useful than the combined form of spectral indices and major principal components.

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spectral index; PCA;
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1. Introduction

Urban land cover analysis is essential for the study of geographic environment, as changes in urban land cover affect the ecological environment. Real time information on urban land covers and multi temporal mapping is of paramount importance for monitoring the changes in the urban ecosystem, and is also important for managing urban sprawl, and local and regional level planning. It is highly desirable to develop reliable methods for mapping of urban land covers. The urban diversified activities and spatial and temporal variations imply a challenge to classify and map land covers in these areas. Over the past few decades, remote sensing data have proved efficient for mapping urban land covers and monitoring multi-temporal changes. Various land cover classification/target detection approaches have been used to map different land covers. However, it is difficult to select the best classifiers because each of the methods has its own strengths and limitations (Manolakis and Shaw 2002; Mohapatra and Wu 2010).

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