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Cloud Detection In Landsat5 Images Based On Template Gradient

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Abstract. Cloud is an important factor affect the quality of optical remote sensing image. How to automatically detect the cloud cover of an image, reduce of useless data transmission, make great significance of higher data rate usefulness. This paper represent a method based on Lansat5 data, which can automatically mark the location of clouds region in each image, and effective calculated for each cloud cover, remove useless remote sensing images.

Introduction

With the increasingly development of remote sensing technology, space technology and computer science, remote sensing technology is widely applied in many different fields, such as defense, land, forestry, agriculture, mapping and so on; remote sensing technology is also generally associated with our everyday life, for instance, Google-map, Google-earth, GPS navigation. As an imperative source of remote sensing data, optical remote sensing image provides high resolution and abundant information, however, its quality is fluctuated considerably with climate. It's obvious that cloud affect the quality of image, and hinder the interpretation of the remote sensing image greatly. Therefore, how to use image processing technology to control the cloud noise is significant in improving the quality of the image[1].

The types of clouds are many , whose texture was not obvious, and can easily changed by geography, season, weather and other conditions of the combined effects, the above problem existing make clouds detection of remote sensing image difficult to solve.

At present, many researchers study higher accuracy cloud detection algorithms. KANG Xiao-guang's [2] study for cloud detection use MODIS data based on artificial neural network. W-H.Lee's [3] approach was developed using NOAA AVHRR images. The visible and near-infrared is used to detecting low clouds. LIU Zhi-gang's[4] method was based on dynamic clustering method, using multi-spectral threshold method for the classification of clouds and background. Gray level threshold method is used by TIAN Yang-jun et al. [5]. Decision tree was used to detecting cloud by SHAN Na [6]. An approach to detection clouded areas is applied by XU Yi-xiang et al.[7].

Data Information

In this paper, eight remote sensing images were choosen with acquisition date from 2006/7/25 to 2009/10/2. And the time span from April to October (the season has rich ground information), more complex terrain, with mountains, plains and other terrain features, also includes a snow surface features of the plateau mountain. Also different type of cloud(thin and thick cloud) are considered in image. The kinds of images are helpful to the researchers who study the affect of the cloud detection under different terrain conditions and different cloud type.

Image information are shown in Table 1 as below: