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A Fast Algorithm for Road Recognition in Remote Sensing Image

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Abstract. In general, the road extraction methods in remote sensing images mainly are edge detection, feature integration, and so on. A fast road recognition arithmetic is presented in this paper. First using adaptive binarization arithmetic, the path on remote sensing images is extracted. Then morphological method is used to process image. Finally, the extracted image superimposed with the original and get clear road. Simulation results shows that this algorithm is efficiency, the anti-noise ability is enhance, and more precision.

Introduction

Road extraction is a hot research area in image processing field, both in the military or civilian, will be recognized as an important application goal. While the human eye, the road is relatively easy to identify, but for computer vision and image processing research, is still a difficult and key issues. How simple and accurate identification of the complete road model has been a hot current study. In the mountains of remote sensing images, trees and rocks blocking the irregular distribution of the accuracy of extraction will be on the road great interference. [1]

As the mountain there is the interference factor, the traditional mathematical morphology algorithms, in the process of extracting the road, there will be broken, noise, or extraction there is now jagged and so on. Adaptive binarization image processing can be more effective pre-split foreground and background, reducing the value of ordinary two can not handle the noise, as well as the contours and details can not take into account issues. After extracting the road image with the original image overlay, image fusion Original on the road in the important data information, integrated, iterative calculations, can effectively overcome the above problems, the accuracy of the extracted road information significantly improved noise reduction. This method is a specific process shown in Fig. 1.

Separation of the Prospects for Adaptive Threshold

In the gray image binarization, select a certain threshold, could be targets will need to separate from the original image, in order to prepare for subsequent image processing. However, in most cases, since the goal is not a single gray value, leading to setting a fixed threshold value, the target can not be completely extracted, or extraction process, the other unnecessary information content would be displayed. Usually the use of foreground and background gray scale range of differences in gray-scale histogram, set the threshold can be foreground and background separation. However, experiments show that the area of separation methods and objectives of the relevant, when the area of accounting for a larger proportion of the whole image, the separation results are obvious, with an area reduced to a certain value, its performance decreased rapidly.

Thus, in the image target recognition, be the first targets of the image threshold segmentation extraction, obtained binary image usually contains multiple connected region, using region growing methods connected domains mark. Pixel P has coordinates (x, y), its vertical and horizontal of the four neighboring pixels $(x+1, y)$, $(x-1, y)$, $(x, y+1)$, $(x, y-1)$, called 4 - neighborhood of pixels P, denoted by $N_4(p)$. Vertical, horizontal and diagonal eight neighboring pixels of pixel X, denoted by $N_8(p)$. In this paper, the approach is the way the growth of four neighborhoods, that is, $N_4(p)$. First, the image line