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Automatic Object Segmentation of Image Data

Background

Automatic object segmentation of image data relates to the task of automatically recognizing objects on an image and segmenting the image into regions that correspond to spatial extent of objects on the image. This task is a fundamental step in various applications associated with image data, such as remote sensing image processing, medical image analysis, web image searching, and video surveillance. Traditional techniques have mostly failed to deliver satisfactory results in practice due to lack of effective methods to incorporate object specific knowledge into image segmentation.

Description of the Invention

In the view of the above, University of Waterloo researchers have developed a novel technique for object segmentation, which can integrate object specific knowledge with image segmentation in an effective manner. In this technique, image segmentation and object recognition are performed in an alternate manner through multiple levels. At each level, image segmentation is generated under constraint of object recognition from the previous level. Object recognition is conducted by integrating information from multiple image segmentations generated from pervious levels. In addition, a series of algorithms have also been developed for efficient implementation of this object segmentation technique.

In the light of increasing availability of satellites with on-board high spatial resolution (HSR) sensors and their potential commercial value, this technique has been first applied to HSR satellite image interpretation and achieved its success. Experiments showed this technique delivered tangible performance improvements in terms of both accuracy and efficiency compared to existing techniques. In addition, a graphic interface has been developed that allows users to work with this technique in a friendly environment.

Advantages

- Automatic object segmentation with high quality and fast processing speed
- Robust to various applications

Potential Applications

- Remote Sensing Image Processing
- Medical Image Analysis
- Web Image Searching
- Video Surveillance

Reference

8810-7348

Patent Status

U.S. Provisional patent application filed

Stage of Development

Proof-of-principle studies in progress
Seeking industrial partner for remote sensing image processing
Studies for additional markets are on-going

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