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Abstract

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Mutual Augmentation of Region and Edge
Detection Techniques in Segmentation and
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13. Abstract (Maximum 200 words).

A crucial first step in the computer aided recognition of features in a digital image is the segmentation of the image into subsets which roughly represent objects or phenomena in the depicted scene. The process of segmentation has traditionally been executed in one of two fundamentally different ways: edge based segmentation and region based segmentation. In edge based segmentation the image is scanned for intensity gradients which represent borders between image features, while in region based segmentation features are detected by intensity uniformity between contiguous pixels. The locally oriented edge and the globally oriented region detection techniques provide information that reflects different but important aspects of the image.

This paper described a knowledge based system for the understanding of oceanographic IR imagery which uses both region and edge detection techniques in a mutually augmentory way. The automated interpretation system uses a cluster shade edge detector capable of distinguishing edges from noise and an iterative split/merge region detector to perform image segmentation. Region and edge information is combined**

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**combined in a spatial correlation technique which applies contextual and temporal constraints for edges and regions as well as predefined edge/region correlation rules to group edges and regions into clusters which match image features. The results of edge/region correlation are used to iteratively redirect the edge detection and region detection processes. It is shown that, for the oceanographic images studies, the mutual augmentation of edge and region detection yields more concise feature identification and higher confidence in edge and region labelling.

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