MASTER'S THESIS

Enhanced snakes algorithm for contour detection

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Enhanced Snakes Algorithm for Contour Detection

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Abstract

This thesis presents a new algorithm, named as Enhanced Snakes Algorithm (*ESA*), for contour detection. The aim of this algorithm is to extend the flexibility and reliability of the active contour model (snake model) in detecting objects with variety shape.

In *ESA*, a split and merge procedure (*SMP*) is applied to the contour (detected from the original snake model) for splitting it into small pieces (segments) and pushing the segments near the concave parts on the objects. More precisely, this procedure involves the location of control points for splitting, the determination of the blowing direction, and the application of the normal force to the segments. Accordingly, a novel terminating criterion, called Contour Length Criterion (*CL-Criterion*), is employed to provide a reliable termination on the recursive iteration of the snake model. The measurement on the new criterion is based on the relative change of the curve length.

By applying our proposed algorithm, we can enjoy more success on object contour detection with arbitrary shape. In particular, the results are more accurate for the objects with concave parts that cannot be located by employing the original snake model only. Furthermore, our *ESA* is more reliable in dealing with noisy images.

Finally, a set of images is selected to evaluate the algorithm and the results are encouraging.

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