

ABSTRACT

Object segmentation is a fundamental task in digital image processing for separating objects from the background to obtain regions of interest. Although deep learning-based approaches have demonstrated high performance, they require large training datasets and high computational resources, making them less suitable for resource-constrained environments. This study proposes a lightweight object segmentation method based on classical image processing by combining Canny Edge Detection and Adaptive Thresholding. The proposed method integrates preprocessing, distance transform, morphological operations, and the Convex Hull algorithm to address common issues such as broken edge and background noise. Convex Hull is utilized to improve contour continuity and produce a more complete object mask. Experimental evaluation is conducted using the Intersection over Union metric by comparing segmentation results with manually annotated ground truth. The results show that the proposed method achieves a mean IoU of 0.6981, indicating stable and accurate segmentation performance across various test images.

Keywords: *Adaptive Thresholding, Canny Edge Detection, Image Processing, Object Segmentation.*