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Configuration-Transition-Based Connected-Component Labeling

Abstract:

This paper proposes a new approach to label-equivalence-based two-scan connected-component labeling. We use two strategies to reduce repeated checking-pixel work for labeling. The first is that instead of scanning image lines one by one and processing pixels one by one as in most conventional two-scan labeling algorithms, we scan image lines alternate lines, and process pixels two by two. The second is that by considering the transition of the configuration of pixels in the mask, we utilize the information detected in processing the last two pixels as much as possible for processing the current two pixels. With our method, any pixel checked in the mask when processing the current two pixels will not be checked again when the next two pixels are processed; thus, the efficiency of labeling can be improved. Experimental results demonstrated that our method was more efficient than all conventional labeling algorithms.