



## Improving the performance of image segmentation methods through background subtraction

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### Abstract

Many image segmentation algorithms have been proposed to partition an image into foreground regions of interest and background regions to be ignored. These algorithms use pixel intensities to partition the image, so it should be good practice to choose an appropriate background color as different as possible from foreground one. In the case of a unique digitizing operation the user can make the choice of background color by himself in order to obtain a good result in segmentation process, but in the case of several digitizing operations it would be useful to automate the whole process by removing any decision of the user about the choice of background color. Furthermore modern instruments allow capturing images with a high resolution characterized by a massive number of pixels, and pose speed problems to image segmentation algorithms based on a local thresholding approach. In this work an approach that adapt a widely used method for detecting moving objects from a video, called background subtraction, is introduced to the image segmentation framework characterized by the specific situation in which background of the image is changeable. Respect to the standard methods, it adds new information into segmentation process. A comparison between standard methods and the approach proposed has been presented, applying both a Global and a Local thresholding method. The background subtraction approach proposed allows to improve quality of segmentation output, to automatize the process when foreground color of images is not homogeneous, and to speed it up.

**Keywords:** binary segmentation; computational efficiency; Otsu thresholding; Sauvola thresholding.