

Gradient based adaptive thresholding

Abstract

For images with poor and non-uniform illumination, adaptive thresholding is required to separate the objects of interest from the background. In this paper a new approach to create an adaptive threshold surface is proposed to segment an image. The technique is inspired by the Yanowitz's method and is improved upon by the introduction of a simpler and more accurate threshold surface. The method is tested on several images of different patterns with varying illumination and the results are compared to the ones produced by a number of adaptive thresholding algorithms. In order to demonstrate the effectiveness, the proposed method had been implemented in medical and document images. The proposed method compares favorably against those using watershed and morphology in medical image and favorably against variable threshold and adaptive Otsu's N-thresholding for document image.

Keywords — Image segmentation, adaptive thresholding, gradient based thresholding, diabetic retinopathy, handwritten document images, medical image analysis, exudate detection, binarization