Application of region-based segmentation and neural network edge detection to skin lesions.

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24 February 2004

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Abstract:

This work investigates the application of two approaches to the skin lesion segmentation problem; iterative segmentation (IS) and neural network edge detection (NNED). The aim is to quantitatively analyze the error in locating the border due to the application of an automated segmentation method. The automatic skin segmentation (ASS) method presented by Xu et al. [12] is also used here to verify the other two proposed methods. These approaches are compared for synthetic lesions at different image signal to noise ratios (SNRs).

Advantages:

The use of synthetic lesions is advantageous in initial analysis and verification, as by knowing the true position of the lesion border the different methods can be quantitatively and more accurately compared.

Disadvantages:

In practice, this case may not always exist especially when considering a wide range of lesion scenes with widely different properties e.g. effect of noise and image details such as skin texture and hair. Moreover, the subsequent initial thresholding only finds an approximate lesion boundary, which does not always represent true region boundaries even if this region is refined using edge information in the image.