

## COMPUTER BASED DIAGNOSIS OF BREAST TUMOURS ON MICROSCOPY TISSUE IMAGES

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**Abstract.** *Purpose of this study is to develop an image analysis methodology for breast cancer diagnosis based on three types of features on microscopy tissue slides. Material and Methods: Tissues from thirty breast cancer biopsies were stained by Haematoxylin and Eosin. Cases were assessed for their histological tumour grade (I, II or III) by an experienced histopathologist. Initially, tissue slides were digitized and images were segmented in order to distinguish nuclei from background tissue. The segmentation was based on second-order edge detection algorithm followed by a morphological filtering. Three types of features were calculated a/morphological from nuclei, b/textural from nuclei and c/structural from tumour's regions. Following, a pattern recognition system was designed, trained and evaluated to specify the feature combination that discriminated best the three grade classes. Results: The proposed image analysis methodology achieved 73%, 86%, and 81% overall accuracies for each of the three types of features respectively, in predicting histological tumour grade. Combining morphological, textural and structural features the systems' accuracy improved to 93%. Conclusion: The integration of structural, morphological and textural features from malignancy regions may provide meaningful information related to histological tumour grade in the diagnosis of breast cancer.*

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