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Computer-Aided Classification of Liver Lesions Using Contrasting Features Difference

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Abstract : Liver cancer is one of the common diseases that cause the death. Early detection is important to diagnose and reduce the incidence of death. Improvements in medical imaging and image processing techniques have significantly enhanced interpretation of medical images. Computer-Aided Diagnosis (CAD) systems based on these techniques play a vital role in the early detection of liver disease and hence reduce liver cancer death rate. This paper presents an automated CAD system consists of three stages; firstly, automatic liver segmentation and lesion’s detection. Secondly, extracting features. Finally, classifying liver lesions into benign and malignant by using the novel contrasting feature-difference approach. Several types of intensity, texture features are extracted from both; the lesion area and its surrounding normal liver tissue. The difference between the features of both areas is then used as the new lesion descriptors. Machine learning classifiers are then trained on the new descriptors to automatically classify liver lesions into benign or malignant. The experimental results show promising improvements. Moreover, the proposed approach can overcome the problems of varying ranges of intensity and textures between patients, demographics, and imaging devices and settings.

Keywords : CAD system, difference of feature, fuzzy c means, lesion detection, liver segmentation
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