

عنوان مقاله:

Improving the performance of neural network using wavelet transformation on dynamic MR imaging

محل انتشار:

یازدهمین کنفرانس مهندسی پزشکی ایران (سال: 1382)

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خلاصه مقاله:

In an attempt to differentiate malignant from benign in a group of patients with histopathologically proved breast lesions based on the data derived independently from time-intensity curve using the wavelet transform an neural network established. The performance of ANN was evaluated using a database with 105 patients' records each of which consisted of 8 quantitative parameters mostly derived from time-intensity curve using wavelet transform. These findings were encoded as features for a three-layered neural network to predict the outcome of biopsy. The network was trained and tested using the jackknife method and its performance was then compared to that of the radiologists in terms of sensitivity, specificity and accuracy using receiver operating characteristic curve (ROC) analysis. The network was able to classify correctly of 84 original cases and yielded a comparable diagnostic accuracy (80%), compared to that of the radiologist (85%) by performing a constructive association between extracted quantitative data and corresponding pathological results ($r=0.63$, $p<0.001$). An ANN supported by wavelet transform can be trained to differentiate malignant from benign with a reasonable degree of accuracy.

کلمات کلیدی:

wavelet transform, neural network, and ROC curve

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