

Detecting HCC Tumor in Three Phasic CT Liver Images with Optimization of Neural Network

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Abstract : The aim of the present work is to build a model based on tissue characterization that is able to discriminate pathological and non-pathological regions from three-phasic CT images. Based on feature selection in different phases, in this research, we design a neural network system that has optimal neuron number in a hidden layer. Our approach consists of three steps: feature selection, feature reduction, and classification. For each ROI, 6 distinct set of texture features are extracted such as first order histogram parameters, absolute gradient, run-length matrix, co-occurrence matrix, autoregressive model, and wavelet, for a total of 270 texture features. We show that with the injection of liquid and the analysis of more phases the high relevant features in each region changed. Our results show that for detecting HCC tumor phase3 is the best one in most of the features that we apply to the classification algorithm. The percentage of detection between these two classes according to our method, relates to first order histogram parameters with the accuracy of 85% in phase 1, 95% phase 2, and 95% in phase 3.

Keywords : multi-phasic liver images, texture analysis, neural network, hidden layer

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