Tumor Detection of Cerebral MRI by Multifractal Analysis

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Abstract : This paper shows the application of multifractal analysis for additional help in cancer diagnosis. The medical image processing is a very important discipline in which many existing methods are in search of solutions to real problems of medicine. In this work, we present results of multifractal analysis of brain MRI images. The purpose of this analysis was to separate between healthy and cancerous tissue of the brain. A nonlinear method based on multifractal detrending moving average (MFDMA) which is a generalization of the detrending fluctuations analysis (DFA) is used for the detection of abnormalities in these images. The proposed method could make separation of the two types of brain tissue with success. It is very important to note that the choice of this non-linear method is due to the complexity and irregularity of tumor tissue that linear and classical nonlinear methods seem difficult to characterize completely. In order to show the performance of this method, we compared its results with those of the conventional method box-counting.