عنوان مقاله:

Implementation of Combinational Deep Learning Algorithm for Non-alcoholic Fatty Liver Classification in Ultrasound Images

محل انتشار:

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خلاصه مقاله:

Background: Nowadays, fatty liver is one of the commonly occurred diseases for the liver which can be observed generally in obese patients. Final results from a variety of exams and imaging methods can help to identify and evaluate people affected by this condition. Objective: The aim of this study is to present a combined algorithm based on neural networks for the classification of ultrasound images from fatty liver affected patients.Material and Methods: In experimental research can be categorized as a diagnostic study which focuses on classification of the acquired ultrasonography images for ۵۵ patients with fatty liver. We implemented pre-trained convolutional neural networks of Inception-ResNetv۲, GoogleNet, AlexNet, and ResNet۱۰۱ to extract features from the images and after combining these resulted features, we provided support vector machine (SVM) algorithm to classify the liver images. Then the results are compared with the ones in implementing the algorithms independently. Results: The area under the receiver operating characteristic curve (AUC) for the introduced combined network resulted in ۰.۹۹۹۹, which is a better result compared to any of the other introduced algorithms. The resulted accuracy for the proposed network also caused ۰.۹۸۶۴, which seems acceptable accuracy for clinical application. Conclusion: The proposed network can be used with high accuracy to classify ultrasound images of the liver to normal or fatty. The presented approach besides the high AUC in comparison with other methods have the independence of the method from the user or expert interference.

کلمات کلیدی:

Fatty liver, Ultrasonography, Deep Learning, Transfer Learning, Support Vector Machine, Receiver Operating Characteristic Curve