

Intelligent Rheumatoid Arthritis Identification System Based Image Processing and Neural Classifier

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Abstract : Rheumatoid joint inflammation is characterized as a perpetual incendiary issue which influences the joints by hurting body tissues. Therefore, there is an urgent need for an effective intelligent identification system of knee Rheumatoid arthritis especially in its early stages. This paper is to develop a new intelligent system for the identification of Rheumatoid arthritis of the knee utilizing image processing techniques and neural classifier. The system involves two principle stages. The first one is the image processing stage in which the images are processed using some techniques such as RGB to grayscale conversion, rescaling, median filtering, background extracting, images subtracting, segmentation using Canny edge detection, and features extraction using pattern averaging. The extracted features are used then as inputs for the neural network which classifies the X-ray knee images as normal or abnormal (arthritic) based on a backpropagation learning algorithm which involves training of the network on 400 X-ray normal and abnormal knee images. The system was tested on 400 x-ray images and the network shows good performance during that phase, resulting in a good identification rate 97%.

Keywords : rheumatoid arthritis, intelligent identification, neural classifier, segmentation, backpropagation

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