Jordan University of Science and Technology

Brain Images Classifier: A Hybrid Approach Using Decision Trees and Genetic Algorithms

Authors: Amer Al-Badarneh, Hassan Najadat, Ali Alraziqi

Abstract: The classification of Magnetic Resonance Imaging (MRI) brain images is important to prune the normal patient and to consider only those who have the possibility of having abnormalities. This paper presents a hybrid approach to classify magnetic resonance imaging (MRI) of a brain images. In this study, decision tree (DT) and genetic algorithms (GA) are used to construct the binary classifier to categorize an MRI as normal or abnormal. This work is performed in three stages: texture features extraction, features reduction using principal component analysis, and MRI classification using the proposed approach. The proposed classifier is evaluated using a benchmark MRI dataset of 710 brain images collected from Harvard Medical School. The experiments results show significant accuracy improvements have occurred: 96.31% is achieved using the decision tree and 98.55% is achieved using our approach DT/GA.