Automatic Classification of MR Brain Tumor Images using Decision Tree

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Abstract

A tumor classification system has been designed and developed. It is used to classify five different types of tumors such as glioblastoma multiforme, astrocytoma, metastatic, glioma and pituitary macro. The magnetic resonance feature images used for the tumor classification consist of T1-weighted images with contrast for each axial slice through the head. The magnetic resonance imaging has become a widely used method of high quality medical
imaging, especially in brain imaging where the soft-tissue contrast and non-invasiveness is a clear advantage. The proposed method has three stages. They are pre-processing, feature extraction and classification. In the first stage, the noise is removed using a Wiener filter. In the second stage, six texture features are extracted using gray level co-occurrence matrix. The features extracted are angular second moment, contrast, inverse difference moment, entropy, correlation and variance. Finally, a decision tree classifier is used to classify the type of tumor image. The extracted features are compared with the stored features in the knowledge base to classify the type of tumors. Thus, the proposed system has been evaluated on a dataset of 21 patients. Then the system was found efficient in classification with a success of 98%.

References

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**Index Terms**

Computer Science  
Image Processing

**Keywords**

Tumor  
Magnetic Resonance Imaging  
Gray Level Co-occurrence Matrix  
Decision Tree