Abstract

In this paper, a Computer Aided Diagnosis (CAD) system is proposed to provide a comprehensive analytic method for extracting the most significant features of Alzheimer’s disease (AD). It consists of three stages: feature selection, feature extraction, and classification. This proposal selects the features that have different intensity level at all images and discarding the features that have the same intensity level to reach the fewer subset of features that have the most impact distinctive of AD. Then reduces the features by proposing a new feature extraction algorithm that minimizes intra separately distance of AD features. Finally, a Linear Support Vector Machine (SVM) classifier was used to perform binary classifications among AD patients. The data set that used for testing the proposed model consists of 120 cross-sectional Structural MRI images from the Open Access Series of Imaging Studies (OASIS) database. Experiments have been conducted on Open Access Series of Imaging Studies (OASIS) database. The results show that the highest classification performance is obtained using the proposed model, and this is very promising compared to Principle Component Analysis (PCA) and Linear Discriminate Analysis (LDA).


VBM8: http://dbm. neuro. uni-jena. de/vbm/

SPM8: http://www. fil. ion. ucl. ac. uk/spm/

OASIS Data set: http://www. oasis-brains. org/


**Index Terms**

Computer Science Applied Mathematics

**Keywords**

Feature Extraction Feature Selection Support Vector Machine Principle Component Analysis

and Linear Discriminate Analysis.