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Extracting ROI-Based Contourlet Subband Energy Feature From the sMRI Image for Alzheimer's Disease Classification

METHOD:

1.Structural magnetic resonance imaging (sMRI)-based Alzheimer's disease (AD) classification.
2.Regions Of Interest-based contourlet subband energy (ROICSE) feature.
3.SVM Classifier.

DATASET USED:

Alzheimer's Disease Neuroimaging Initiative (ADNI) database (adni.loni.usc.edu).

MAJOR FINDINGS:

Instead of extracting features from the brain ROIs in the spatial domain, the contourlet transform is performed on these ROIs to obtain their subbands, and then subband energy feature vectors of different brain ROIs are concatenated to form the ROICSE feature for representing the sMRI image. Finally, results of SVM-based AD classification on six data sets show that the ROICSE approach outperforms six other state-of-the-art methods.

FUTURE WORK:

However, experiments to find brain ROIs related to AD indicate that not all brain ROIs are important for classifying subjects with AD, MCI, and HC.
In our future work, we will model associations between different brain regions in frequency domain so that those brain ROIs mostly related to AD can be selected for AD classification.