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A Wrapped Multi-label Classifier for the Automatic Diagnosis and Prognosis of Alzheimer's Disease

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Highlights

- We implemented a ML classifier for the early AD diagnosis/prognosis through MRI brain images
- MMSE and hippocampus measures must be used in the classification
- Classification performance is greatly affected by the choice of the voting scheme

Abstract

Background AD is the most frequent neurodegenerative disease, severely impacting our society. Early diagnosis and prognosis are challenging tasks in the management of AD patients. **New Method** We implemented a machine-learning classifier for the automatic early diagnosis and prognosis of AD by means of features extracted, selected and optimized from structural MRI brain images. The classifier was designed to perform multi-label automatic classification into the following four classes: HC, ncMCI, cMCI, and AD.
Results From our analyses, it emerged that MMSE and hippocampus-related measures must be included as primary measures in automatic-classification systems for both the early diagnosis and the prognosis of AD. The voting scheme mainly based on the binary-classification performances on