Predicting Dementia Diagnosis with Neuroimaging Data

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Introduction

Alzheimer's is a dementia degenerative disease starting with mild memory impairment in the early stages and progressing to a complete loss of the mental and physical faculties. Definitive Alzheimer's Disease (AD) diagnosis relies on a magnetic resonance image (MRI) study. Brain MRI scans are detailed three-dimensional anatomical images, and changes in the hippocampus, frontal and parietal regions are evidential markers in the progress of AD. The ability to diagnose and classify AD at an early stage allows clinicians to make more knowledgeable decisions regarding clinical interventions.

Data and Preprocessing

OASIS (Open Access Series of Imaging Studies) is a well-known initiative that is publicly available for study and analysis. The present MRI dataset, OASIS-I (presented in 2007), is a cross-sectional collection of data for 416 participants aged 18-96yrs, 316 non-demented and 100 at various stages of AD. Subjects were characterized by the Clinical Dementia Rating (CDR) scale from cognitive normal (CDR 0), 0.5 (very-mild dementia) to mild dementia (CDR 1). The data set also contains the following demographics information: male/female, age, education (Educ), and socioeconomic status (SES). Data set of MRI contains 176 slices/images of 176 x 208 pixel size.
Since AD is more prevalent among older adults,

Methods and Results

Conclusion and Discussion

Deliverable and Code Repository

Shiny App: GitHub: Google Colab?

Contributions

References