

Abstract 75 – Paper ID: 033**A Robust Machine Learning Framework for Preclinical Alzheimer’s Detection Using Cognitive Features and Ensemble Voting**

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Abstract

Alzheimer’s disease (AD) is a brain disorder that deteriorates with time and interferes with memory, thinking, and behaviour. Early diagnosis is significant as it can be treated and manage the symptoms at the right time. The proposed voting-based ensemble machine learning model is used to detect the presence of Alzheimer disease when selected cognitive features are used in the study. Neighborhood Component Analysis (NCA) and correlation-based filtration were used to extract important features and enhance accuracy and eliminate unnecessary data. Several classifiers were fused via a soft-voting system to enhance the stability and general performance. The individual machine learning models are not as accurate and as consistent as the proposed model. The findings indicate that the ensemble approach can contribute to early diagnosis and assist medical practitioners to make more sound decisions.

Keywords: Alzheimer disease, Cognitive features, Machine learning, Ensemble learning, Voting classifier, Early detection, Feature selection, NCA, Soft voting