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Analyzing the Performance of Machine Learning Models to Predict Onset of Alzheimer's Disease and Addressing Missing Value Problem

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Alzheimer's disease (AD) is a neurodegenerative disorder primarily characterized by deteriorating cognitive functions. AD has gained relevant attention in the last decade. An estimated 24 million people worldwide suffered from this disease by 2011. In 2016 an estimated 40 million were diagnosed and by 2050 it is expected to reach 131 million people affected by AD. Therefore, detecting and confirming AD at its different stages is a priority for medical practices to provide adequate and accurate treatments. Recently, Machine Learning (ML) models have been used to study AD's stages handling missing values in multiclass, focusing on the delineation of Early Mild Cognitive Impairment (EMCI), Late Mild Cognitive Impairment (LMCI), and normal cognitive (CN). But, to our best knowledge, robust performance information of these models and the missing data analysis has not been presented in the literature. We propose studying the performance of five different ML models for AD's stages multiclass prediction in terms of accuracy, precision, and F1-score. Also, the analysis of three imputation methods to handle the missing value problem is presented. A framework that integrates ML model for AD's stages multiclass prediction is proposed, performing an average accuracy of 84%.

Biography

Richard A. Aló is from IFlorida A&M University. He has attended many international conferences and published his research in many Journals.

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