



## TITLE: Early prediction of Adult onset dementia by deep learning models using MRI labelled Images

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### ABSTRACT

Adult-onset dementia disorders represent a heterogeneous class of diseases that largely affect an individual's memory loss and cognitive decline. It ranges from different stages of mild to severe and impacts physical changes in the brain. Alzheimer's disease (AD) is the most common dementia type that affects cognitive functioning, and social and behavioural skills. Early diagnosis and intervention to delay the onset of dementia are beneficial and can decrease the burden of the disease and save costs for the healthcare systems. Integrative data analysis using Machine Learning (ML) techniques is becoming increasingly popular. Deep learning is a branch of ML that focuses largely on the automatic classification of image data by learning subtle patterns from high-dimensional datasets. The use of these algorithms could lead to the early detection of AD and the progression of the disease. For image processing, deep learning uses neural networks such as convolutional, recurrent, and artificial types. In this work, based on MRI, a deep learning model for predicting Mild Cognitive Impairment (MCI) subjects' progression to AD with the highest accuracy is proposed. During the discrimination of AD type, deep and convolutional

neural networks (CNN) show significant differences in accuracy, they classified AD subjects with 97.83% of accuracy. By introducing different deep learning models to understand and check which model frameworks are really helpful in the early detection of adult-onset dementia disorders.

### BIOGRAPHY



Dr Gopi Battineni, PhD is a post-doctoral researcher at the clinical research centre, School of Medicinal and Health Products Sciences, University of Camerino in Italy. He finished his PhD in One health at the University of Camerino in December 2021. His research area includes Telemedicine, Dementia predictive analytics, MRI analysis, Artificial Intelligence, Data mining, Big data and Machine learning. Dr Battineni is a member of the European Research Committee and has published more than 65 several research papers in SCI, SCIE and Scopus indexed journals.

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