Demystifying the Power of Machine Learning in Detecting Alzheimer's Disease through Speech Analysis: A Systematic Review

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Abstract : The use of machine learning in the field of healthcare has gained tremendous momentum in recent years, with the potential to revolutionize the way diseases are diagnosed and treated. In particular, the field of machine learning in the detection of degenerative diseases through language performance analysis has shown great promise and has been the subject of a growing body of research. As Alzheimer's Disease (AD) is among the most prevalent neurodegenerative diseases, this review is designed to investigate the effectiveness of machine learning through speech analysis techniques to analyze linguistic data from patients with AD, with the goal of detecting early signs of the disease. A corpus comprising seven comparative studies with a total number of patients (n=1054) was analyzed. The finding reveals a high degree of accuracy, ranging between 83.32% and 97.18%. This systematic review sheds light on the potential of speech analysis and machine learning in the detection of AD, highlighting the need for further development and integration into clinical practice for improved patient outcomes.

Keywords : machine learning, detection, neurodegenerative diseases, Alzheimer's disease, speech analysis

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