

The Use of Artificial Intelligence Technologies in the Diagnosis of Neurological Diseases: A Review on Brain Tumors, Alzheimer's, Parkinson's, and Epilepsy

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Neurological disorders such as Parkinson's disease, Alzheimer's disease, brain tumors, and epilepsy pose significant global health challenges due to their diagnostic complexity, increasing prevalence, and profound impact on quality of life. Despite some challenges, classical methods remain crucial in the diagnosis and prognosis process. Furthermore, the recent advancement of artificial intelligence in the automated, accurate, and efficient analysis of complex biomedical data has paved the way for improved diagnostic processes. Therefore, this study examines methodological trends in Artificial Intelligence applications for the diagnosis of major neurological diseases over the past five years (2021-2025). A bibliometric analysis was conducted in the Web of Science and Scopus databases using disease-specific search queries. Open access journal articles were included in the study and the data were analyzed with VOSviewer after word filtering involving artificial intelligence methods to identify dominant algorithms and annual trends. Convolutional Neural Networks are the most widely used method across all neurological disease groups, particularly in the study of brain tumors and Alzheimer's disease. While Support Vector Machines are prominent in Parkinson's disease research, Artificial Neural Networks and Recurrent Neural Networks are gaining more prominence in epilepsy and Alzheimer's disease studies. Long Short-Term Memory Networks play a significant role in the analysis of time-series EEG and motion data in epilepsy and Parkinson's disease.

Keywords: Artificial Intelligence, neurological disorders, diagnosis, parkinson, alzheimer, brain tumor, epilepsy.