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An Overview of Explainable AI Methods for Diagnosing Brain Diseases

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Abstract : In recent years, there has been a significant increase in the use of AI models in healthcare. These models have been demonstrated to produce high accuracy in disease diagnosis and classification; however, they do not reveal the reasoning behind their predictions. Their black-box nature makes them untrustworthy for medical diagnosis. However, eXplainable Artificial Intelligence (XAI) techniques help determine the basis on which AI models make predictions. This review paper provides an overview of research conducted in the field of XAI for diagnosing, detecting, and classifying brain diseases such as brain tumours, Alzheimer's disease, dementia, Parkinson's disease, stroke, epilepsy, and autism spectrum disorder (ASD). It also highlights the importance of XAI techniques and the significance of the research being conducted in this field. Finally, we discuss the limitations of current XAI techniques and future research directions. This study can help doctors, researchers, and policymakers interested in the interpretability and explainability of AI models in diagnosing brain diseases.

Keywords : autism spectrum disorder, brain tumour, computer-aided diagnosis, dementia, epilepsy, explainability, explainable AI, interpretability, Parkinson's disease, stroke, transparency
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