Developing a Non-Invasive Eye Tracking Screening Tool for Early Detection of Alzheimer's Disease

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Alzheimer's disease (AD) is a common neurodegenerative condition that impairs daily functioning, memory, and cognition. The ability to treat and manage the disease effectively depends on early detection, but current diagnostic techniques frequently fall short of this goal. This study assesses the potential of eye-tracking parameters, remarkably smooth pursuit amplitude, and fixation stability, as biomarkers for AD screening in the early-mid stages to address this issue. A visual tracking task is used in the study to measure participants' fixation stability and smooth pursuit amplitude. The sample includes individuals diagnosed with AD and healthy older adults, to compare eye-tracking parameters between the two groups. The study's findings show that smooth pursuit amplitude and fixation stability are significantly different between AD and healthy controls. Specifically, the AD group AUC was 0.966 and the Control Group AUC was 0.869, with a sensitivity of 93% and specificity of 100%, and overall accuracy of 96.5%. This study highlights the importance of investigating novel and non-invasive methods for early AD detection and establishes the foundation for further investigation in this field. The findings of this study will help create a low-cost screening tool that is easily accessible for AD in its early stages.

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