

DETECTING ALZHEIMER'S DISEASE EARLIER

Physician Assessments



Behavioral evaluation by a clinician has long been the standard method for identifying dementias like Alzheimer's disease (AD.)

Mini-Mental State Examination (MMSE)

Alzheimer's Disease Assessment Scale (ADAS)

But what is the future of identifying AD?

MACHINE LEARNING

IMAGE PROCESSING

Convolutional Neural Networks (CNNs) have the capability of learning patterns in spatial data, like those collected by MRI and PET scans. Researchers have used CNNs to model brain trajectories and classify them as healthy, early onset, or late onset AD (Marti-Juan et al., 2020).

BIOLOGY

Biomarkers tau and beta-amyloid have been strongly linked to early stages of AD by using genetic learning algorithms on large cohorts (Aberathne et al., 2023).

COMPUTER AIDED DIAGNOSIS (CAD)

Machine learning has advanced our understanding of AD and its progression through life stages. CAD models are exceeding physician accuracy for identifying AD and other dementias. Earlier diagnoses may mean a higher chance of successful interventions.



PREDICTIVE MODELING

- Ensemble learning can combine different data types (e.g. longitudinal MRI & behavioral observations)
- Algorithms like Random Forest combine classification and regression models to predict disease outcomes

Only

5%

Of AD cases have a hereditary link

2023 CAD model accuracy for identifying AD

96%

MMSE assessment accuracy on the same cohort (Adelson et al., 2023)

71%

References

