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Alzheimer's Disease Detection using Machine Learning Techniques

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Abstract : Alzheimer's disease (AD) is a progressive, irreversible brain illness that affects a person's thinking and causes the brain to shrink, eventually leading to death. It's required for the treatment of early stages of Alzheimer's disease in order to prevent further damage .Machine learning algorithms using various optimization and probabilistic methodologies can be used to make this diagnosis. Because no single non-amyloid protein has been proved to consistently diagnose Alzheimer's disease, using machine learning (ML) techniques to determine optimal combinations of non-amyloid proteins is a potential approach. As a result, our strategy is mostly dependent on machine learning in order to separate persons with normal brain ageing from those who are likely to develop Alzheimer's disease.

I .PROBLEM STATEMENT

Alzheimer's disease (AD), a kind of dementia, is marked by the onset of increasing cognitive and behavioural difficulties in middle or late life.Symptoms normally develop gradually and increase to the point of interfering with everyday activities. Its goal is to make disease diagnosis easier, to detect Alzheimer's disease in its early stages, and to make efficient use of the machine algorithm.

II . INTRODUCTION

Alzheimer's disease (AD) is one of today's most common causes of dementia. According to the World Alzheimer Report 2018 [126], the illness impacted roughly 50 million individuals in 2018, with the number anticipated to quadruple by 2050. After 60 years of age, Alzheimer's symptoms are usually obvious [43]. Some kinds of Alzheimer's disease, on the other hand, manifest themselves at a young age (30–50 years).people with mutations in their genes [10]. Alzheimer's causes anatomical and functional changes in the brain. the brain's modifications The transition from a healthy state to Alzheimer's disease can take up to ten years in AD patients.[180] a long time Patients first have mild cognitive impairment (MCI), which then progresses to severe cognitive impairment (SCI).

Alzheimer's disease is a degenerative disease. Patients with MCI do not all develop Alzheimer's disease [37].In recent years, academics have conducted study on the use of machine learning in the treatment of Alzheimer's disease. Litjens et al., different statistical techniques might be applied. [151] Shen et al. A survey on deep learning for Alzheimer's was conducted. It also backed up the fact that there was a lot of ambiguity. deep learning models in prediction Jose et al. published a review on.

Opencv

OpenCV, an open-source computer vision and Machine Learning library, is used to distinguish and perceive faces, objects, group account developments, follow moderate modules, follow eye movements, track camera activities, remove red eyes from pictures taken with the streak, track down nearly identical pictures from a picture information database, see the scene and set up markers to overlay it with upgraded reality, and so on.

Pillow

Digital photographs may become a vital source of receiving data as technology advances. In our daily lives, we come across a lot of digital photographs. These images, on the other hand, can be related to anything. We can process digital photos utilising numerous libraries or tools in the programming world. In this tutorial, we'll look into Pillow, one of Python's most popular tools. OpenCV, Python Image Library (PIL), and Scikit-image are just a few of the many excellent libraries available in Python. The Python Pillow module is the sole focus of this article (PIL).

The Python Pillow module is based on PIL (Python Image Library). It is one of the most important Python modules for image processing. However, Python 3 does not support it. However, we may use this module as a PIL with Python 3.x. It can handle a variety of image formats, including jpeg, png, bmp, gif, ppm, and tiff.

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III . RELATED WORK

We offer an application for early diagnosis of the disease. There are two steps in our application: The three parts of the brain were extracted using the Region of Intert ROI: Hippocampus, Corpus Callosum, and Cortex. Following that, there is a classification step based on SVM (Support Vector Machine). The frontal, sagittal, and axial portions are shown. His other roles include:

- Frontal (or coronal) section: A front view of the brain is seen in this cut. It's measured in a plane parallel to the axial and sagittal incisions. The hippocampus variation descriptors were utilised in this section.
- This cup is an axial (or transverse) view of the brain from the top. A plane perpendicular to the static magnetic field corresponds to it. We are interested in a variety of topics in our work.

IV. METHODOLOGY

SVM

Machine learning techniques including SVM, DT, and NB are used in the suggested system. The Alzheimer's disease (AD) Dataset must be uploaded to the proposed system, and the model must be trained using a machine learning technique. We're very aware of our shortcomings. We use three data processing systems to conduct data processing operations on the system.

Pre-processing, feature extraction, and classification are three processing modules that are used together.
This uses a different algorithm from the previous one. After that, create a model and evaluate it. This model can be used to predict Alzheimer's (AD).

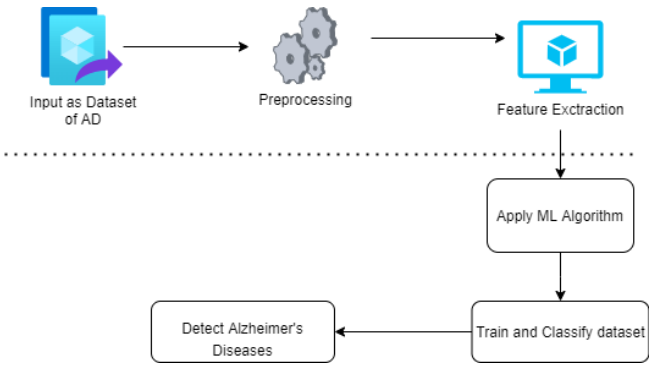

Fig : System Architecture

VI . CONCLUSION

This research is based on a comparison and evaluation of recent work in Alzheimer's disease prognosis and prediction utilising machine learning algorithms. In This Proposed Alzheimer's Disease Early Detection System Using Blood Plasma Support Vector Machines are used to study proteins. Explicitly, recent trends in terms of The types of data used and the algorithms used in machine learning have been revealed. efficacy of machine learning methods in predicting Alzheimer's disease in its early stages. It is self-evident that machine learning improves prediction accuracy, particularly when compared to traditional statistical tools.

VI . FUTURE WORK

In the future, feature selection and optimization approaches will be used to improve the accuracy and efficiency of Alzheimer's disease identification. Understanding the relationships between the proteins in illness subjects may also provide fresh insights into the disease. Such a better knowledge could aid in the development of better interventions in clinical trials.

VI . REFERENCES

1. Chima S. Eke, Emmanuel Jammeh, Xinzhong Li, Camille Carroll, Stephen Pearson, Emmanuel Ifeachor, ”2020 Early Detection of Alzheimer’s Disease with Blood Plasma Proteins using Support Vector Machines 2020.

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2. A. Association, ”2018 Alzheimer’s disease facts and figures,” Alzheimer’s Dementia, vol. 14, no. 3, pp. 367-429, 2018.
3. T. Altaf, S. M. Anwar, N. Gul, M. N. Majeed, and M. Majid, “Multiclass Alzheimer’s disease classification using image and clinical features,” Biomedical Signal Processing and Control, vol. 43, pp. 64– 74, 2018.
4. Z. Chiba, N. Abghour, K. Moussaid, A. El Omri, and M. Rida, “A novel architecture combined with optimal parameters for back propagation neural networks applied to anomaly network intrusion detection,” Computers Security, vol. 75, pp. 36–58, 2018
5. I. Beheshti, N. Maikusa, H. Matsuda, H. Demirel, and G. Anbarjafari, “Histogram Based Feature Extraction from Individual Gray Matter Similarity-Matrix for Alzheimer’s Disease Classification,” Journal of Alzheimer’s Disease, vol. 55, no. 4, pp. 1571–1582, 2017.
6. Tarigan, Nadia, R. Diedan, and Y. Suryana, “Plate Recognition Using Back propagation Neural Network and Genetic Algorithm,” 2nd International Conference on Computer Science and Computational Intelligence 2017, ICCSCI, vol. 116, pp. 365–372, 2017.
7. M. Prince, A. Comas-Herrera, M. Knapp, M. Guerchet, and M. Karagianidou, ”World Alzheimer report 2016: improving healthcare for people living with dementia: coverage, quality and costs now and in the future,” 2016.