Alzheimer's Prediction

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Git repository for the project : https://github.com/theultimate1/cs584-project

Problem Description

It is estimated that there are approximately 44 million people worldwide living with Alzheimer's disease or a related form of dementia. In the U.S., an estimated 5.5 million people of all ages have Alzheimer's disease. Of these, around 5.3 million are 65 and older and 200,000 are younger and have early-onset Alzheimer's disease[2]. If predicted or caught early, Health care providers can maintain function and abate symptoms such as dementia[1].

Project Description

This is an exploratory study because so far the work done has been to implement different models. This project would be to implement the various top of the line models and compare the properties of the models and look at stats of each model to determine the best model so far to do this. I will also be running it on the same dataset and see how data availability affects the accuracy of the model through the control of the amount of training data available.This has real world applications because Alzheimer's patient data is hard to come by which makes building prediction models harder. I also believe that there could be a model being built for another application that would help shed light on this application.

Project Milestones

Preliminary plan:

- Choose datasets -> there is one that fits so far but I can find more which are with different features in terms of the machine used for CT scan or other edge cases.
- Build out a numerical model of the images
- Run baseline models such as decision trees,SVM,logistic regression
- Run specific CNNs and different architectures such as VGG16,Inceptionv4 and more from the referenced papers section
- Tune the amount of training data available for each of those models and see how it affects the confusion matrix and the different metrics.

Dataset1 : https://www.kaggle.com/tourist55/alzheimers-dataset-4-class-of-images
Reference papers :
https://openaccess.thecvf.com/content_cvpr_2018_workshops/papers/w36/Islam_Early_Diagnosis_of_CVPR_2018_paper.pdf
https://www.nature.com/articles/s41598-020-74399-w
https://arxiv.org/abs/1602.07261