

Cancer Detection: Brain Tumor and Breast cancer classification

IE7615: Neural Networks and Deep Learning- Project Proposal

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Objective:

My objective is to develop a classification model to assess whether the patient's health data exhibits a brain/breast cancer or not, and if so, whether it is malignant.

Current State of art:

Cancer cell continue to be the most lethal form of cancer, and the human body's capacity to resist and treat them is quite restricted, according to pertinent studies from many articles and study papers.

As a result, it is exceedingly challenging for someone to detect it at an early stage (Non-malignant).

In the USA, glioblastoma (deadliest form of brain cancer) has been diagnosed in more than two thirds of adults.

Starting treatment when the cancer is still in its early stages is the key to curing this condition.

The ACS Journal poll indicates that 83,570 persons will receive a brain tumor diagnosis in 2021.

Therefore, developing such a model to detect tumors will be quite beneficial.

Approach:

- Train a ML model, with UCI dataset and perform Logistic Regression Using tensorflow, OpenCV, Sklearn, keras.
- Building a CNN application for brain tumor image segmentation.
- Demonstrate the model's loss, testing, and accuracy which should be greater than 80%.
- Implementing whole project using Agile methodology.

Dataset to be used:

Using Open-source Images of MRI scans, for model training and testing.

Link to the dataset:

<https://archive.ics.uci.edu/ml/datasets/primary+tumor>

<https://archive.ics.uci.edu/ml/datasets/Breast+Cancer+Wisconsin+%28Diagnostic%29>

Progress timeline:

I've been working on developing uncomplicated image classification models for emotion analysis, and the results have been amazing. The accuracy is 88%. Researching the malignancy of a brain tumor and performing image segmentation while creating a CNN.

Deliverables:

- Image classification project:

https://github.com/veersingh9540/Image_classification_deep_learning/blob/master/main.ipynb

This model that I have trained used 100 in total images and showcased very promising results.

Used tensorflow, matplotlib and OpenCV

- Research sources:

Cancer Research:

1. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6650350/>
2. <https://acsjournals.onlinelibrary.wiley.com/doi/10.3322/caac.21693#:~:text=In%202021%2C%20an%20estimated%2083%2C570,will%20die%20from%20the%20disease>

For Neural Network:

1. <https://insightsimaging.springeropen.com/articles/10.1186/s13244-020-00869-4>
2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9239800/>