A
Project Report
On
Brain Tumor Detection
(MACHINE LEARNING)

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CERTIFICATE

This is to certify that the report entitled "**Brain Tumor Detection**" is a bonafied work carried out by **DhairyaParikh(d19dcs1550,Vatsal Shingala(d19dcs157),Hardik Shiyani(d19dcs159)** under the guidance and supervision of **Assistant Prof. Shraddha Vyas** for the **CS349 Software Group Project-IV** (CE/CSE/IT) of 6th Semester of Bachelor of Technology in **DEPSTAR** at Faculty of Technology & Engineering – CHARUSAT, Gujarat.

To the best of my knowledge and belief, this work embodies the work of candidate himself, has duly been completed, and fulfills the requirement of the ordinance relating to the B.Tech. Degree of the University and is up to the standard in respect of content, presentation and language for being referred to the examiner.

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Acknowledgement

With pleasure, we would like to present this project report on brain tumor detection(Machine Learning). It has been an amazing experience for us to develop this project, which would not have possible without the support of the people around.

We sincerely thanks to our **Principal Dr.Amit Ganatra**, **Prof.Shraddha Vyas** for providing understanding on the ways of preparing a project report and for the guidance and support for software group project. And most importantly we thank all the lab technician for providing perfect environment for developing application.

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Abstract

We propose a color-based segmentation method that uses the K-means clustering technique to track tumor objects in magnetic resonance (MR) brain images. The key concept in this color-based segmentation algorithm with K-means is to convert a given gray-level MR image into a color space image and then separate the position of tumor objects from other items of an MR image by using K-means clustering and histogram-clustering. Experiments demonstrate that the method can successfully achieve segmentation for MR brain images to help pathologists distinguish exactly lesion size and region.

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CH-1 PROJECT DEFINATION

1.1 Project Overview

- The project key concept in this is color-based segmentation algorithm with K-means to convert a given gray-level MRI image into a color space image and then separate the position of tumor objects from other items of an MR image by using Kmeans cluster. K-means clustering is suitable for biomedical image segmentation as the number of clusters is usually known for images of particular regions of the human anatomy.The experimental results will confirm that the proposed method helps pathologists distinguish tumor sizes and regions.

- Project is developed in three stages.

1. Initial stage –gathered information about our project and reviewed.
2. Initialization stage –implement the development.
3. Closer stage-Review our project and diagnosis the error in our project .

1.2 Objectives

- In Brain Tumour Detection we gone use color-based segmentation method that uses the K-means clustering technique to track tumor objects in magnetic resonance (MRI) brain images.
- The method can successfully achieve segmentation for MR brain images to help pathologists distinguish exactly lesion size and region.
- It will make medical facility cheaper and easier for people who are suffering from such tumor as it is automated and faster to provide result.

CH-2: - DESCRIPTION

2.1 Project Summary

Project Name	Brain Tumor Detection(ML)
Project Description	Main purpose of this project is to detect the brain tumor using MRI image of the brain and give resultsbased on it.
Start Date	5-1-2-2021
End date	23-4-2021
Project Duration	4-5 Months
Project Coordinator	**Prof.Shraddha Vyas**
Software Used	Jupyter Notebook
Programming Language	Python

2.2 Technology and literature review

Software Used

- **Python-** Python is an interpreted high-level general-purpose programming language used for different coding purpose.

- **Jupyter Notebook-** is an open-source web application that allows you to create and share documents that contain live code, equations, visualizations and narrative text. Uses include: data cleaning and transformation, numerical simulation, statistical modeling, data visualization, machine learning, and much more.

Libraries Used

- **Matplotlib-** is a comprehensive library for creating static, animated, and interactive visualizations in Python.
- **Sklearn library** contains a lot of efficient tools for machine learning and statistical modeling including classification, regression, clustering and dimensionality reduction.
- **OpenCV-Python** is a library of Python bindings designed to solve computer vision problems.

CH-3 : -SOFTWARE AND HARDWARE REQUIREMENT

3.1 Software Requirement

- **Python**

- **Jupyter Notebook**

3.2 Hardware Requirement for developing application

- Min requirements: -
  - 4Gb RAM
  - 500GB hard disk
  - Windows 7,8,10
  - I3 Processor or any high end

3.3 Hardware Requirement for using application

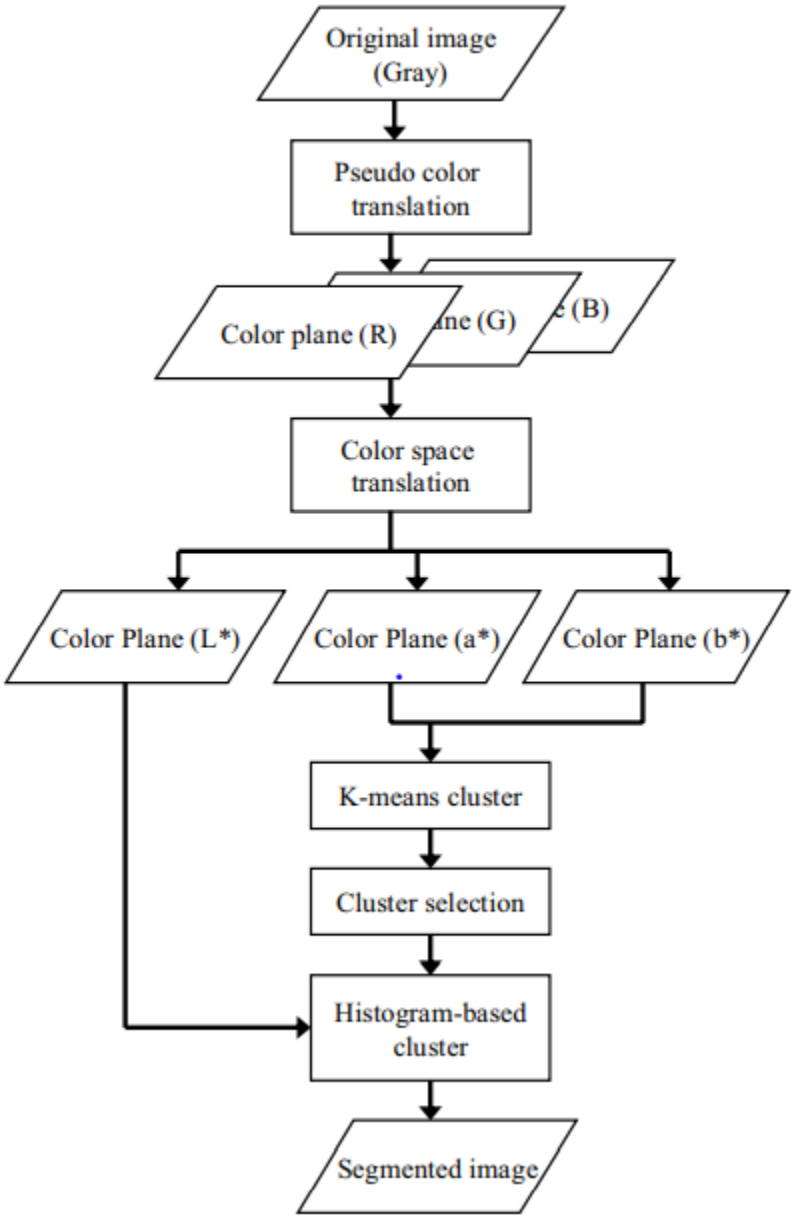
- Minimum requirements :-
  - Windows 7,8,10
  - 2gb graphic card
  - 500GB hard disk
  - Processor i3 or any high end

CH-4: - MAJOR FUNCTIONALITY

Major functionality of application: -

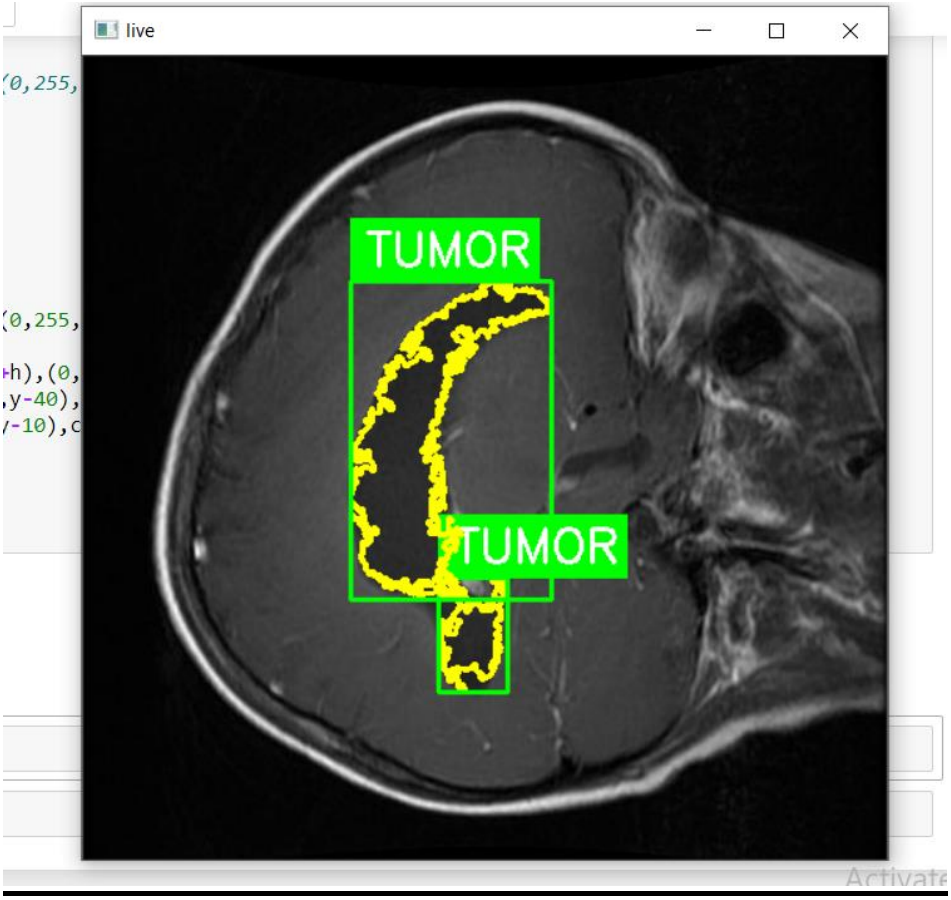
- Brain tumor exact location can be identified.
- Brain tumor size can be estimated from the detection
- In Brain Tumour Detection we gone use color-based segmentation method that uses the K-means clustering technique to track tumor objects in magnetic resonance (MRI) brain images.
- Easier and faster to implement for detection of tumor in brain using machine learning.

CH-5: -SYSTEM FLOW DIAGRAM:



***Flow Diagram of Application**

CH-6: -SCREENSHOT



Tumor detected in brain image

CH-7: - LIMITATION

- GUI is not present.
- Accuracy can be more improved
- It cannot give exact length of tumor.
- Performance can be enhanced.
- Currently can be used for brain MRI only for detecting tumor in it.

CH-8: - OUTCOME

- Here we conclude that we learn machine learning concepts while developing a color-based segmentation method based on K-means clustering for tracking tumor in the MRI brain image is proposed. The proposed method simply combines color translation, K-means clustering and histogram clustering, thus making it efficient and very easy to implement.
- The application will help to find brain tumor exact location can be identified, brain tumor size can be estimated from the detection which will make the process of detection easy and efficient.

CH-9 FUTURE ENHANCEMENT:-

- GUI will be added.
- We can implement user interface using tkinter which can make code more easy.
- Accuracy can be increased.
- Detected tumor size can be exactly measured .
- We can use more accurate algorithms in later versions.
- Deep Learning can be implemented for training new model.

CH-10 REFERENCES :-

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