

Project report on

BRAIN TUMOR DETECTION SYSTEM



Under the supervision of **Dr. Manoj Diwakar**

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Semester : **4th**

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Topic : **Brain Tumor Detection System**

DECLARATION

I, **Kirti Sharma**, student of B. tech 4th semester, Department of Computer Science and Engineering, Graphic Era University, Dehradun, declared that the technical project work entitled “**Brain Tumor Detection System**” has been carried out by me under the supervision of **Dr. Manoj Diwakar** and submitted in the partial fulfillment of the course requirements for the award of degree in B. tech of Graphic Era University during the academic year 2021-2022.

I further declare that to the best of my knowledge and belief that the project report does not contain any work which has been submitted for the award of any other degree/diploma in this University or any other University.

CERTIFICATE

This is to certify that the project report entitled “**Brain Tumor Detection System**” is a bonafide project work carried out by **Kirti Sharma**, roll no-2017336, in partial fulfillment of award of degree of B. tech of Graphic Era University, Dehradun during the academic year 2021-2022.

It is certified that all corrections/suggestions indicated for internal assessment have been incorporated. The project has been approved as it satisfies the academic requirements associated with the degree mentioned.

ACKNOWLEDGEMENT

I would like to convey my sincere thanks to **Dr. Devesh Pratap Singh**, Head of Department of Computer Science, for providing a congenial environment to work in and carry out our project. He is a source of inspiration and helped me understand and remember important details about the project. He gave me an amazing project to do this wonderful project on **Brain Tumor Detection System**.

I consider it my cardinal duty to express the deepest sense of gratitude to **Dr. Manoj Diwakar**, Department of Computer Science and Application for the invaluable guidance extended at every stage and in every possible way.

Finally, I am very much thankful to all the faculty members of the Department of Computer Science and Engineering, friends and my parents for their constant encouragement, support and help throughout the project conduction.

BRAIN TUMOR DETECTION SYSTEM

PROBLEM STATEMENT

Brain tumor detection system using Deep Learning

PRE-REQUISITE KNOWLEDGE

- Knowledge of python language
- Basics of machine learning

INTRODUCTION

Human brain is the major controller of our body. The abnormal growth and division of cells in the brain lead to a brain tumor, and the further growth of brain tumors leads to brain cancer. In the area of human health, Computer Vision plays a significant role, which reduces the human judgment that gives accurate results. CT scans, X-Ray, and MRI scans are the common imaging methods among magnetic resonance imaging (MRI) that are the most reliable and secure. MRI detects every minute objects. Based on our machine, we will

predict whether the subject has a brain tumor or not. The resultant outcomes will be examined through various performance examined metrics.

CONVOLUTIONAL NEURAL NETWORK

Deep Learning – which has emerged as an effective tool for analyzing big data – uses complex algorithms and artificial neural networks to train machines/computers so that they can learn from experience, classify and recognize data/images just like a human brain does. Within Deep Learning, a Convolutional Neural Network or CNN is a type of artificial neural network, which is widely used for image/object recognition and classification. Deep Learning thus recognizes objects in an image by using a CNN. CNNs are playing a major role in diverse tasks/functions like image processing problems, computer vision tasks like localization and segmentation, video analysis, to recognize obstacles.

IDE USED

An IDE (Integrated Development Environment) is a software where you can write your program and also test them. Using an IDE, the programmer can write, compile, debug and execute the program at the same place.

The IDE used in this project was VSCode. You can write your code in python language using VSCode and import multiple packages and can later compile and execute it.

METHODOLOGY

- Import the required modules.
- Load the dataset into your program.
- Dividing the dataset into two parts i.e. images having tumor and images having no tumor.
- We then append the dataset and label them as zero if the image shows no tumor and label as one if the image shows tumor.
- Split your data into training set and test set. Train is the method used to create the model while test is the method which checks the accuracy of the model.

- The model type that we used was Sequential. Sequential is the easiest way to build a model in Keras. It allows you to build a model layer by layer.
- We used the add() function to add layers to our model. Our first 2 layers are Conv2D layers. These are convolution layers that will deal with our input images, which are seen as 2-dimensional matrices.
- We then train the model by analyzing the dataset provided by us and using that trained set for brain tumor detection.

CHALLENGES FACED

- Obtaining the dataset was a big obstacle while working on this project.
- Setting up python on my system and importing the required modules.
- Since I had no prior knowledge of machine learning, I had to gather some basic knowledge of it.
- Finding the appropriate model and training that model to detect brain tumor.
- Faced some errors while working on the project so rectified it by learning about it on the internet.

- Checking the accuracy of the model.

MOTIVATION FOR THE PROJECT

A brain tumor is defined as abnormal growth of cells within the brain or central spinal canal. Some tumors can be cancerous thus they need to be detected and cured in time. The exact cause of brain tumors is not clear, and neither is exact set of symptoms defined, thus, people may be suffering from it without realizing the danger. There are two types of brain tumor which is primary brain tumor and metastatic brain tumor. Primary brain tumor is the condition when the tumor is formed in the brain and tended to stay there while the metastatic brain tumor is the tumor that is formed elsewhere in the body and spread through the brain.

APPLICATION

- The main reason behind this project is to provide proper treatment as soon as possible and protect the human life which is in danger.
- This model is helpful for doctors as well as patients.

- The manual identification is not fast, accurate and efficient. To overcome those problems this model was designed.
- It is a user-friendly model.

CONCLUSION

In this project, a model was designed to detect brain tumor using deep learning. In this the model was designed through image processing. The system is very useful to detect a tumor when the tumor is in secondary stage because in this situation manual system is not work properly. The application is useful to doctors as well as patients. Application is useful to protect tumor patients' life and provide proper treatment before any harmful stage.

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