D.K.T.E. Society's Textile and Engineering Institute, Ichalkaranji.

(An Autonomous Institute, Affiliated to Shivaji University, Kolhapur)

Department of Computer Science & Engineering

2021-2022

Project Synopsis On

STROKE DISEASE CLASSIFICATION

Under The Guidance Of

S.J.Murchite

Submitted By:

1. 19UCS301 Srushti Birajdar

2. 19UCS307 Pratiksha Mane

3. 19UCS311 Dhanashri Patil

4.19UCS312 Poonam Patil

4. 19UCS313 Pratibha Sawant

S.J Murchite
Project Guide

Prof. (Dr.) D.V.Kodavade
Head of Department

INTRODUCTION

What is Stroke :

Stroke is the number one leading cause of mortality and obesity in many countries. A stroke occurs when the blood supply to part of your brain is interrupted or reduced, preventing brain tissue from getting oxygen and nutrients. Brain cells begin to die in minutes. A stroke is a medical emergency, and prompt treatment is crucial. Early action can reduce brain damage and other complications. It is important to receive a correct diagnosis before stroke treatment starts, because treatment for stroke depends on the type of stroke suffered.

Effects of stroke

1. Paralysis or loss of muscle movement.
2. Difficulty talking or swallowing.
3. Memory loss or thinking difficulties.
4. Emotional problems.
5. Changes in behavior and self-care ability.

Types of brain stroke

1. Ischemic stroke

This is the most common type of stroke. It happens when the brain's blood vessels become narrowed or blocked, causing severely reduced blood flow (ischemia). Blocked or narrowed blood vessels are caused by fatty deposits that build up in blood vessels or by blood clots or other debris that travel through your bloodstream and lodge in the blood vessels in your brain. Some initial research shows that COVID-19 infection may be a possible cause of ischemic stroke, but more study is needed.

2.Haemorrhagic stroke

A. Haemorrhagic stroke occurs when a blood vessel in your brain leaks or ruptures. Brain haemorrhages can result from many conditions that affect your blood vessels. Factors related to haemorrhagic stroke include:

- Uncontrolled high blood pressure
- Overtreatment with blood thinners (anticoagulants)
- Bulges at weak spots in your blood vessel walls (aneurysms)
- Trauma (such as a car accident)
- Protein deposits in blood vessel walls that lead to weakness in the vessel wall (cerebral amyloid angiopathy)
- Ischemic stroke leading to haemorrhage

A less common cause of bleeding in the brain is the rupture of an abnormal tangle of thin-walled blood vessels (arteriovenous malformation).

RELATED WORK

- Computer Methods and Programs in Biomedicine - Jae–woo Lee, Hyunsun Lim, Dong-wook Kim, Soon-ae Shin, Jinkwon Kim, Bora Yoo, Kyunghee Cho – The Purpose of this paper was Calculation of 10-year stroke prediction probability and classifying the user's individual probability of stroke into five categories.

- Probability of Stroke: A Risk Profile from the Framingham Study - Philip A. Wolf, MD; Ralph B. D'Agostino, PhD, Albert J. Belanger, MA; and William B. Kannel, MD - In this paper, A health risk appraisal function has been developed for the prediction of stroke using the Framingham Study cohort

- Stroke prediction using artificial intelligence- M. Sheetal Singh, Prakash Choudhary - In this paper, Here, decision tree algorithm is used for feature selection process, principle component analysis algorithm is used for reducing the dimension and adopted back propagation neural network classification algorithm, to construct a classification model

- stroke disease prediction using Ct scan image-Tessy badriyah, nur sakinah, Iwan syarif , daisy rehmania syarif have published a Ieee conference paper on machine learning algorithm on stroke disease classification. In this, they have implemented a stroke disease prediction using Ct scan image dataset of patients with the help of various algorithms like KNN, naive bayes, logistic regression, etc.
  Hence, Existing system is implemented upto prediction of the stroke disease. So we have scope to take a step forward to classify which type of stroke is occurred using various algorithms.

PROBLEM STATEMENT

Machine Learning Algorithm for Stroke Disease Classification based on CT scan image data.

PROBLEM DESCRIPTION

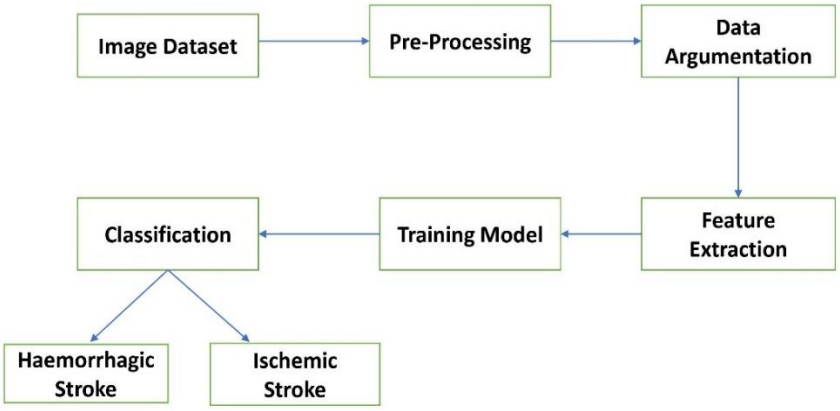
Stroke is the number one leading cause of mortality and obesity in many countries. In older days some technique are used to detect those disease which will take more time to detect disease but, by using our system we can easily detect disease. This study preprocessing data to improve the image quality of CT scans of stroke patient by optimizing the quality of image to improve image results and to reduce noise, and also applying machine learning algorithms to classify the patients image.

Objective

- To Make an efficient use of image processing technique.
- Provide solution with least hardware requirement.
- Minimize the use of instruments which is needed for stroke disease and make it affordable.

METHODOLOGY

1. **ARCHITECTURAL DIAGRAM:**



Module Description

1. Data preprocessing:
For our project we are going to use images of brains. Before we use that we have to first preprocessed it. For this we need to do following operations on images.

- Cropping
- Scaling
- convert images into grayscale

2. Data Augmentation:
Data augmentation is the process of reproducing an image without losing its essence. That means we increasing our dataset by duplicating these images for better performance of model.At this stage, there are seven ways of augmentation namely random brightness, Horizontal Flip, Vertical Flip, Random Rotation, horizontal shift, vertical shift and zoom image.

3.Feature Extraction:

In this phase we are going to extract the features from images by using Gray-Level Co-Occurrence Matrix (GLCM) algorithm. This algorithm will give 6 features used in GLCM feature extraction, namely Contrast, Dissimilarity, Homogenity, Energy, Correlation, and ASM. After this process we will get a dataset of having these features and one more attribute called class (There will be two values for this attribute 0 and 1. 0 for hemorrhage and 1 for Ischemic).

4. Training:
In this phase train model using different classification algorithm of machine learning and we are going to choose the algorithm for our model which has highest accuracy.

FACILITIES REQUIRE

HARDWARE AND SOFTWARE REQUIREMENT

Hardware & Software Characteristics

Memory →8.0 GB

Processor →Intel® Core Tm i5.9300H CPU @ 2.40GHz

Graphics→ NVIDIA GeForce RTX 2060 6GB GDDR6

Operating System→ Windows 10 Home 64 Page 11 sdfsd SYTEM DESIGN

Platform→kagal

Dataset→dataset of brain image