Project Poster Presentation on

Stroke Disease Prediction

Students Details

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Abstract

A stroke is a medical condition in which the blood arteries in the brain rupture, leading brain damage. Symptoms may appear if the brain's flow of blood and other nutrients is disrupted. Stroke is the leading cause of death and disability worldwide, according to the World Health Organization (WHO). Early awareness of the numerous stroke warning symptoms can assist to lessen the severity of the stroke. To forecast the chance of a stroke happening in the brain, many machine learning (ML) models have been created. Random forest, support vector machines, decision trees and classifiers, and neural networks were the most often utilised approaches.

Introduction

1 Overview:

When blood flow to different parts of the brain is interrupted or reduced, the cells in those areas of the brain don't get the nutrients and oxygen they need, and they die. A stroke is a life-threatening medical condition that need immediate medical intervention. To avoid additional damage to the afflicted area of the brain, as well as effects in other parts of the body, early identification and effective therapy are necessary. According to the World Health Organization (WHO), fifteen million people worldwide suffer from strokes each year, with one person dying every four to five minutes. According to the Centers for Disease Control and Prevention(CDC), stroke is the sixth greatest cause of death in the United States . Approximately 795,000 persons in the United States suffer from the devastating effects of strokes on a regular basis. It is the fourth largest major cause of death in India. Ischemic and hemorrhagic strokes are the two types of strokes. Clots hinder drainage in a chemical stroke, whereas a weak blood artery breaks and bleeds into the brain in a hemorrhagic stroke. Stroke can be avoided by living a healthy.

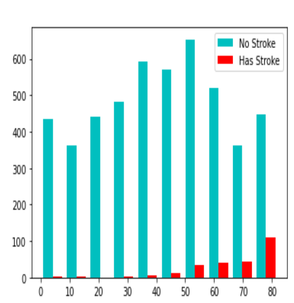
2 Purpose:

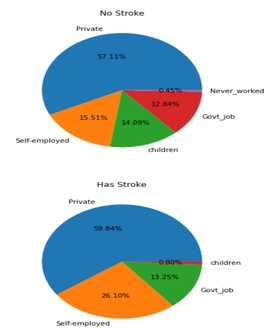
A stroke is a medical condition in which the blood arteries in the brain rupture, leading brain damage. Symptoms may appear if the brain's flow of blood and other nutrients is disrupted. Stroke is the leading cause of death and disability worldwide, according to the World Health Organization (WHO). Early awareness of the numerous stroke warning symptoms can assist to lessen the severity of the stroke. To forecast the chance of a stroke happening in the brain, many machine learning (ML) models have been created.

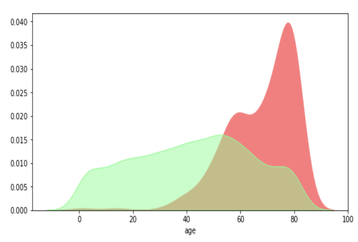
Technologies to be used

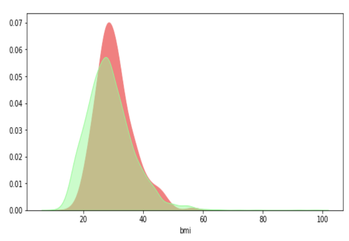
- Machine Learning Algorithms
- NearMiss Technique
- SMOTE Technique
- Neural Network
- Front-End: HTML5, CSS3
- Back-End: Django
- Database: Postgresql
- Version Control: Git

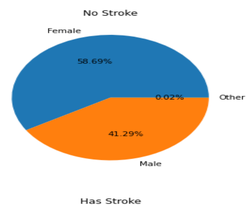
Project work and images

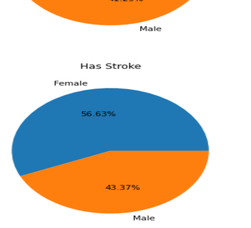


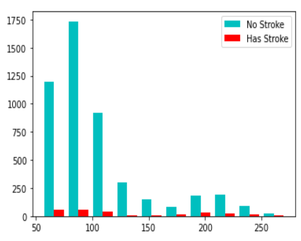


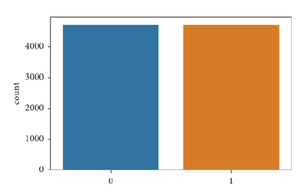


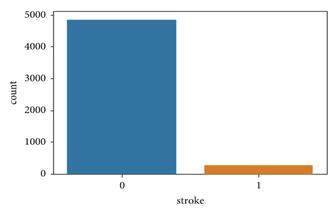






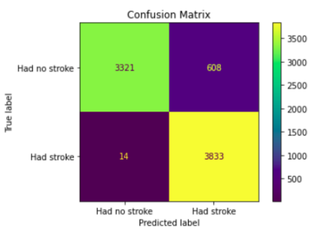


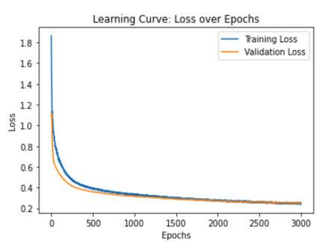


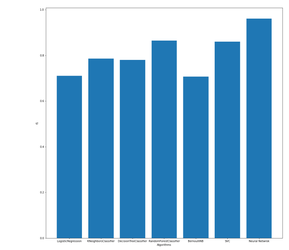


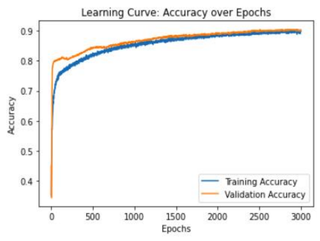
	precision	recall	f1-score	support
0	0.95	0.97	0.96	931
1	0.97	0.96	0.97	1013
accuracy			0.97	1944
macro avg	0.96	0.97	0.96	1944
weighted avg	0.97	0.97	0.97	1944

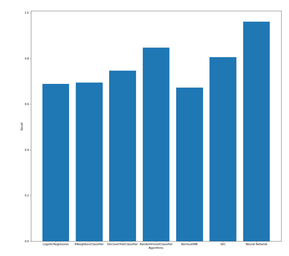
	Model	Precision	Recall	F1	balanced_accuracy
0	LogisticRegression	0.758555	0.812842	0.784723	0.779670
1	KNeighborsClassifier	0.841099	0.963609	0.898139	0.892595
2	DecisionTreeClassifier	0.898514	0.903815	0.901880	0.902018
3	RandomForestClassifier	0.922971	0.943074	0.932647	0.931979
4	BernoulliNB	0.660416	0.927474	0.771435	0.730086
5	SVC	0.776550	0.884065	0.826799	0.817447

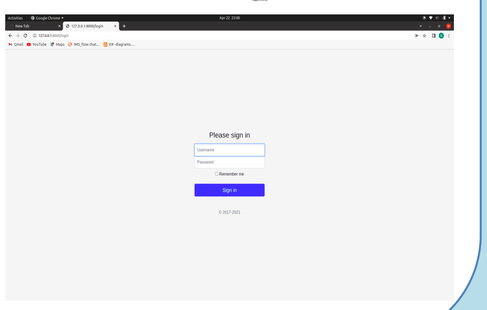












Proposed System

In new system will use NearMiss Undersampling Technique to balance the imbalance data. NearMiss Technique remove the values form majority class.

Steps of NearMiss Technique :

(1) The algorithm first calculates the distance between all the points in the larger class with the points in the smaller class. This can make the process of undersampling easier.

(2) Select instaces of the larger class that have the shortest distance with the smaller class. These n classes need to be stored for elimination.

(3) If there are m instances of the smaller class then the algorithm will return m*n instances of the larger class.

Conclusion

With NearMiss imbalanced data managing technique The 'Neural Network' algorithm performs the best out of all the algorithms tested, with a 96 percent accuracy rate. The following graph shows a comparison of accuracies achieved from various methods. 'Neural Network' outperformed the others in terms of accuracy, recall, and F1 scores.

Delivering additional data as an input-set to neural networks and giving Brain CT Scan Image as input can increase neural network accuracy.

Future Enhancement

- Used NearMiss data balancing technique
- Implemented Neural Network For better accuracy
- Will design user interface using Django

Industry details

Name of Company: Inexture Solutions LLP

Industry trainer name:- Devanshi Desai, Pritesh Thaker

Guided By : Prof. Manish Singh