

Prediction of Delayed Trauma Following an Ischemic Stroke Using Comparative Machine Learning Study

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Abstract— Strokes are now the third largest cause of death worldwide. Only a small fraction of patients, however, die as a result of the trauma. Initial Ischemic infarction, recurrent ischemic stroke, recurrent hemorrhagic stroke, pneumonia etc. are some of the main causes of death. The potential to boost the accuracy of various treatment protocols and health outcomes lie with machine learning. The majority of research used machine learning to forecast the risk of the stroke to come about or the chances of surviving based on a patient's characteristics, but very few talk about the likely outcomes of patients who survive the first stroke attack. As a result, the purpose of this initiative is to put concepts of machine learning to effectively predict the possibility of future fatality.

Keywords—Machine Learning Algorithms, Stroke Ischemic, Future Fatality, Post Stroke

I. INTRODUCTION

The limiting blood supply to certain key parts of the brain or a brain blood artery breaks, a stroke occurs. Parts of the brain are injured or die in this case. brain damage, disability, or even death are results of stroke [1].

Ischemic stroke accounts for the majority of strokes. When blood clots or other particles clog a blood vessel, an ischemic stroke ensues. Plaque, which is made up of fatty deposits, can clog blood arteries and cause blockages.

In India, stroke is now the fourth leading cause of death and the fifth leading cause of disability. An alarming rate of stroke fatalities have been occurring. Incidence of stroke ranges between 105 and 152/100,000 people per year [2].

By 2025, artificial intelligence (AI) is expected to warrant patients, alter medical practice, and save the health-care

industry more than \$150 billion. By improving diagnosis, boosting healthcare access, and enabling precision medicine, AI is expected to improve health outcomes by up to 40% and cut treatment billings if adopted appropriately [3].

II. REALATED WORKS

Some of the recent work done in the area of prediction/analysis of stroke disease is presented in this section:

1. Prediction of Stroke Lesion at 90-Day Follow-up by Fusing Raw DSC-MRI with Parametric Maps Using Deep Learning [4]

The authors have proposed a deep learning architecture that incorporates perfusion dynamic susceptibility, MRI data as well as perfusion and diffusion parametric maps. To supplement the information acquired from typical parametric maps, the features were automatically derived from the raw perfusion DSC-MRI. However, there is some information loss during MRI scanning.

2. Automated Ischemic Stroke Subtyping Based On Machine Learning Approach [5]

It was presented how an integrated machine learning technique was utilized to classify the subtype of ischemic stroke. The Shapiro-Wilk technique and Pearson correlations were used to rank features, which were then used in various machine learning models. Despite the employment of many classifiers, only Extra Trees and Random Forest functioned to some extent.

3. Machine Learning Algorithm for Stroke Disease Classification [6]

Patients' photographs were classified into two subtypes of stroke disease using machine learning techniques. The authors investigated data pre-processing techniques. The image quality, which resulted in enhanced image quality of CT scans of stroke patients, which improved picture results and reduced noise. The optimization of default settings, on


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5th International Conference on
Inventive Computation Technologies
ICICT 2022

20-22, July 2022 | Lalitpur, Nepal



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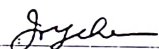
has successfully presented the paper entitled


Prediction of Delayed Trauma Following an Ischemic Stroke Using Comparative Machine Learning Study

at the

5th International Conference on Inventive Computation Technologies (ICICT - 2022)
organized by Tribhuvan University, Pulchowk Campus, Lalitpur, Nepal
held on 20-22, July 2022.


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