Performance Analysis of Machine Learning Approaches in Stroke Prediction

[Minhaz Uddin Emon](https://ieeexplore.ieee.org/author/37088599756), [Maria Sultana Keya](https://ieeexplore.ieee.org/author/37088600634), [Tamara Islam Meghla](https://ieeexplore.ieee.org/author/37088602981), [Md. Mahfujur Rahman](https://ieeexplore.ieee.org/author/37088521497), [M Shamim Al Mamun](https://ieeexplore.ieee.org/author/37088598607), [M Shamim Kaiser](https://ieeexplore.ieee.org/author/37530503600)

**Abstract:**

Most of strokes will occur due to an unexpected obstruction of courses by prompting both the brain and heart. Early awareness for different warning signs of stroke can minimize the stroke. This research work proposes an early prediction of stroke diseases by using different machine learning approaches with the occurrence of hypertension, body mass index level, heart disease, average glucose level, smoking status, previous stroke and age. Using these high features attributes, ten different classifiers have been trained, they are Logistics Regression, Stochastic Gradient Descent, Decision Tree Classifier, AdaBoost Classifier, Gaussian Classifier, Quadratic Discriminant Analysis, Multi layer Perceptron Classifier, KNeighbors Classifier, Gradient Boosting Classifier, and XGBoost Classifier for predicting the stroke. Afterwards, results of the base classifiers are aggregated by using the weighted voting approach to reach highest accuracy. Moreover, the proposed study has achieved an accuracy of 97%, where the weighted voting classifier performs better than the base classifiers. This model gives the best accuracy for the stroke prediction. The area under curve value of weighted voting classifier is also high. False positive rate and false negative rate of weighted classifier is lowest compared with others. As a result, weighted voting is almost the perfect classifier for predicting the stroke that can be used by physicians and patients to prescribe and early detect a potential stroke.

**DOI:**[10.1109/ICECA49313.2020.9297525](https://doi.org/10.1109/ICECA49313.2020.9297525)

**Conference / Journal Link:**

[https://ieeexplore.ieee.org/document/9297525](https://ieeexplore.ieee.org/document/9297525" \t "_blank)