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Neuroimage-Based Stroke Identification: A Machine Learning Approach

Ms. Priyanka V Dhurve[1] and Prof. (Dr) N. R. Wankhade[2]
Student, Computer Engineering, Late G. N.Sapkal College of Engineering, Nashik, India[1]
Head of Department, Computer Engineering, Late G. N.Sapkal College of Engineering, Nashik, India[2]

Abstract: *Stroke diagnosis is a time-critical process that requires rapid and accurate identification to ensure timely treatment. This study proposes a machine learning-based diagnostic model for stroke identification using neuro images. Early identification and timely intervention are critical to improving outcomes for stroke patients, but current diagnostic techniques, such as CT and MRI scans, often require time-consuming expert analysis. These delays can limit the effectiveness of treatment, particularly in acute cases where every minute counts. The problem lies in the need for faster, more reliable diagnostic tools that can analyze neuroimaging data with high accuracy and minimal human intervention. Machine learning, specifically deep learning, offers a promising solution to address this gap by automating the process of stroke detection. We employed a comprehensive approach, utilizing Inceptionv3, MobileNet, Convolutional Neural Network (CNN) algorithms to analyze neuroimages and predict stroke occurrence. This research proposes a machine learning-based diagnostic model for stroke identification using neuroimages, leveraging the power of Convolutional Neural Networks (CNN), with Inception V3 and MobileNet architectures. Inception V3, known for its ability to capture intricate image features through deep convolutional layers, and MobileNet, optimized for efficiency and speed, were employed to process large datasets of brain scans. The model was trained on these neuroimaging datasets to distinguish between healthy brain tissues and those affected by stroke. The combination of these two architectures allows for both detailed analysis and fast processing, making the model adaptable to clinical settings. The results showed that the model achieved a high accuracy rate in stroke identification, demonstrating its potential to assist healthcare professionals in diagnosing stroke faster and more accurately. By integrating this machine learning model into existing diagnostic workflows, it could significantly reduce the time to diagnosis, enabling earlier treatment and ultimately improving patient outcomes. Our model has the potential to enhance patient outcomes and reduce the economic burden of stroke. By leveraging the power of these advanced machine learning techniques, the model aims to enhance the efficiency and accuracy of stroke diagnosis compared to traditional methods..*

Keywords: Stroke Identification, Machine Learning, Neuroimages, Diagnostic Model,Inceptionv3, MobileNet, Convolutional Neural Network (CNN)