Predictive Modeling of Brain Stroke Using Machine Learning and Deep Learning Methods

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Abstract

This project proposes a deep learning based system for automatic brain stroke prediction using CT scan images. Leveraging the Xception model for feature extraction, the system classifies scans as stroke or non stroke with high accuracy. Comparative evaluation with ResNet50V2 and DenseNet121 models demonstrates Xception's superior performance, achieving 98.63% accuracy. The system incorporates preprocessing, data augmentation, and transfer learning to enhance robustness and generalization. Designed for real-time diagnosis, it offers a scalable, cost-effective solution suitable for deployment in emergency and low-resource medical settings, supporting faster and more accurate clinical decision-making.

Keywords

Brain Stroke Prediction, Deep Learning, Convolutional Neural Networks, CT Scan Classification, Xception, ResNet50V2, DenseNet121, Medical Image Analysis, Stroke Detection, Healthcare AI.