ABSTRACT

Brain cancer is one of the most dangerous diseases and requires early detection to ensure proper medical treatment. This study aims to compare brain cancer detection systems using CT-scan images through feature extraction methods including Gray Level Co-Occurrence Matrix (GLCM), Gray Level Run Length Matrix (GLRLM), and Gray Level Size Zone Matrix (GLSZM), as well as classification algorithms such as K-Nearest Neighbors (KNN), Support Vector Machine (SVM), and Naïve Bayes (NB). The dataset used was obtained from Kaggle, consisting of a total of 4.506 images, divided into 3.154 training images and 1.352 testing images. The research process involved pre-processing, feature extraction, and classification. The results show that the combination of feature extraction methods and classification algorithms yielded varying performance levels. The KNN algorithm demonstrated excellent performance on the training data but experienced overfitting, as its accuracy significantly decreased on the testing data. In contrast, the SVM algorithm maintained stable performance on the training data and was able to generalize well on the testing data. Meanwhile, the Naïve Bayes algorithm failed to accurately recognize data patterns, resulting in consistently low performance across all stages. The combination of the GLSZM feature and the SVM algorithm proved to be the most balanced approach for detecting brain cancer from CT-scan images.

***Keywords** : Brain Cancer, CT-Scan, GLCM, GLRLM, GLSZM, KNN, SVM, Naïve Bayes*