

ABSTRACT

Lung cancer remains one of the most lethal cancers globally, making early detection crucial for improving patient survival. This research compares the effectiveness of different texture feature combinations—Gray Level Co-occurrence Matrix (GLCM), Gray Level Size Zone Matrix (GLSZM), and Gray Level Run Length Matrix (GLRLM)—when paired with classification algorithms such as Random Forest, Decision Tree, and Support Vector Machine (SVM) to identify lung tumors in CT scan images. Texture features were extracted from CT scans using these three methods and subsequently classified with the mentioned machine learning algorithms. The findings reveal that the combination of GLSZM and GLRLM with Random Forest produced the highest accuracy of 98%, followed by GLCM with Decision Tree at 97%. Conversely, SVM consistently yielded the lowest accuracy, between 86.36% and 86.81%. These outcomes suggest that the choice of classification algorithm, particularly Random Forest, exerts a greater impact and the most consistent on accuracy than the type of texture feature utilized.

Keyword: *lung cancer, CT-Scan, texture features, machine learning, GLCM, GLSZM, GLRLM, Decision Tree, Random Forest, Support Vector Machine*