ABSTRACT

This research focuses on the application of canny and sobel algorithms for preprocessing in digital image processing, specifically in the context of detection and classification of skin tumors. Preprocessing images is a fundamental step in digital image processing that affects the quality and effectiveness of subsequent image processing. This technique is essential in enhancing the prediction accuracy of machine learning models. In this study, the canny and sobel algorithms are utilized to improve image quality by reducing noise and clarifying edge detection, which is a crucial aspect in medical image analysis. Skin tumors, as a global health issue that is on the rise, require accurate detection techniques for early recognition. By combining preprocessing algorithms and classification techniques through Random Forest Classifier, augmented with Box Counting method for texture analysis, this research aims to develop a more effective and efficient prediction system.

The experimental results show that the combination of canny and sobel algorithms in image preprocessing, along with the use of Box Counting as an input feature, significantly improves the accuracy of the machine learning model, achieving the highest accuracy rate of 0.85. This indicates that the developed system is capable of classifying skin tumors with considerable accuracy between benign and malignant classes. These findings reinforce the critical role of edge detection algorithms in the preprocessing of skin tumor images and demonstrate the potential of Box Counting as an alternative input feature in digital image processing. This research provides valuable insights into the development of more efficient diagnostic tools for early detection of skin tumors, with the hope of contributing to improved clinical outcomes for patients.

Keywords— Image preprocessing, Image prediction, canny, sobel, box counting.