

Abstract

Bone cancer is a leading cause of global mortality, and detecting it in medical images through semantic segmentation offers a promising approach. This study focuses on the performance of U-Net++ for hotspot segmentation on anterior and posterior bone scan images, utilizing both 4-segment and 3-segment configurations. The dataset includes annotations for both normal and abnormal bone scans, with models trained separately for anterior and posterior views to optimize segmentation. U-Net++ achieves high accuracy, stability, and robustness, with an F1-score of 0.990 and an IoU of 0.341 for hotspots in the 4-segment configuration, while maintaining computational efficiency with 36.6M parameters. Despite challenges in hotspot annotation using thresholding methods, U-Net++ proves to be an effective and reliable solution for bone lesion detection in complex segmentation scenarios.

Keywords: bone, hotspot, semantic segmentation, detection, U-Net++
