

ABSTRACT

This study explores the segmentation of Diabetic Foot Ulcer (DFU) wounds using a public dataset containing DFU images with infection and ischemia conditions. The segmentation model is developed using a self-supervised approach to reduce dependence on large amounts of labeled data. A Retinex-based image enhancement module is integrated into the S3Net model to improve image quality through correction of uneven lighting and local contrast enhancement, supporting more accurate pseudo-label generation. The model architecture is also equipped with an Affine Transform module to strengthen feature representation and improve adaptation to geometric variations. Evaluation results show that the model achieves an average Dice Coefficient of 0.55, which, although limited, demonstrates improvement over the baseline model's score of 0.53. These results represent an important initial step in developing DFU segmentation methods without reliance on manual labels, with clinical application potential that can be further improved through continued development and optimization.

Keywords: Diabetic Foot Ulcer (DFU), Self-Supervised Learning, Image Segmentation, Retinex Image Enhancement, S3Net, Pseudo-labeling