Validating Wound Severity Assessment via Region-Anchored Convolutional Neural Network Model for Mobile Image-Based Size and Tissue Classification

Abstract

Evaluating and tracking the size of a wound is a crucial step in wound assessment. The measurement of various indicators on wounds over time plays a vital role in treating and managing crucial wounds. This article introduces the concept of utilizing mobile device-captured photographs to address this challenge. The research explores the application of digital technologies in the treatment of chronic wounds, offering tools to assist healthcare professionals in enhancing patient care and decision-making. Additionally, it investigates the use of deep learning (DL) algorithms along with the use of computer vision techniques to enhance the validation results of wounds. The proposed method involves tissue classification as well as visual recognition system. The wound's region of interest (RoI) is determined using superpixel techniques, enabling the calculation of its wounded zone. A classification model based on the Region Anchored CNN framework is employed to detect and differentiate wounds and classify their tissues. The outcome demonstrates that the suggested method of DL, with visual methodologies to detect the shape of a wound and measure its size, achieves exceptional results. By utilizing Resnet50, an accuracy of 0.85 percent is obtained, while the Tissue Classification CNN exhibits a Median Deviation Error of 2.91 and a precision range of 0.96%. These outcomes highlight the effectiveness of the methodology in real-world scenarios and its potential to enhance therapeutic treatments for patients with chronic wounds.

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