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Fuzzy spectral clustering for automated delineation of chronic wound region using digital images

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Abstract

Chronic wound is an abnormal disease condition of localized injury to the skin and its underlying tissues having physiological impaired healing response. Assessment and management of such wound is a significant burden on the healthcare system. Currently, precise wound bed estimation depends on the clinical judgment and remains a difficult task. The paper introduces a novel method for ulcer boundary demarcation and estimation, using optical images captured by a hand-held digital camera. The proposed approach involves gray based fuzzy similarity measure using spatial knowledge of an image. The fuzzy measure is used to construct similarity matrix. The best color channel was chosen by calculating the mean contrast for 26 different color channels of 14 color spaces. It was found that D_b color channel has highest mean contrast which provide best segmentation result in comparison with other color channels. The fuzzy spectral clustering (FSC) method was applied on D_b color channel for effective delineation of wound region. The

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