**Computer Aided Diagnosis of Atopic Dermatitis**

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**Abstract**

Skin diseases with an allergic background such as atopic dermatitis are commonly noticed in children. This requires an urgent need to develop an objective and non-invasive method to examine the skin condition before and during the therapy. The newest clinical research mention the benefit of using high frequency ultrasound to image inflammation of the skin. A characteristic feature of inflammatory dermatoses is the presence of a superficial hypoechoic band below the echo entry in high frequency ultrasound images. Its measurement can be useful in the assessment of atopic dermatitis. To meet this need, this paper presents a novel fully automatic method for the characteristic hypoechoic band segmentation. A three step methodology includes epidermis echo entry layer detection and segmentation and on this basis the segmentation of the sought skin abnormality. The algorithm is dedicated to MHz US probe, which enables visualisation of a skin area of a mm length and mm depth. The accuracy of the proposed framework was verified on clinical images annotated by two independent experts. The obtained results prove the benefits of using the ultrasound-based skin disease assessment framework.