

AI-BASED LOCALIZATION AND CLASSIFICATION OF SKIN
DISEASE WITH ERYTHEMA

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ABSTRACT

Although computer-aided diagnosis (CAD) is used to improve the quality of diagnosis in various medical fields such as mammography and colonography, it is not used in dermatology, where non-invasive screening tests are performed only with the naked eye, and avoidable inaccuracies may exist. This study shows that CAD may also be a viable option in dermatology by presenting a novel method to sequentially combine accurate segmentation and classification models. Given an image of the skin, we decompose the image to normalize and extract high-level features. Using a neural network-based segmentation model to create a segmented map of the image, we then cluster sections of abnormal skin and pass this information to a classification model. We classify each cluster into different common skin diseases using another neural network model. Our segmentation model achieves better performance compared to previous studies, and also achieves a near-perfect sensitivity score in unfavourable conditions. Our classification model is more accurate than a baseline model trained without segmentation, while also being able to classify multiple diseases within a single image. This improved performance may be sufficient to use CAD in the field of dermatology.

Book/journal	Author's name	Inference
Localization and Classification of Skin Disease with Erythema	Ha Min Son, Woocho jeon, jinhyun kim Chan Yeong Heo Hye Jin Yoon Ji-ung Park & Tai-Myoung Chung	Our analysis model for localization and classification, We decomposed the original image into its hemoglobin and melanin constituents using preprocessing, to help our model extract valuable information from data that would have been otherwise unavailable. We provide these images as input to our segmentation model, the U-Net, which generated a segmented image. This segmented image was then analyzed for clusters, which were subsequently cropped and input to our classification model, the Efficient Net, which then produced a classified label, thus completing our analysis model.

Classification of Skin Disease Using Deep Learning Neural Networks with Mobile Net V2 and LSTM	Paravathaneni naga srinivasu, Jalluri gnana siva sai ,Muhanned fazal liaz, Akash kumar bhoi Wonjoon kim James jin kang	Mobile Net V2 is used in classifying the type of skin disease, and LSTM is used to enhance the performance of the model by maintaining the state information of the features that it comes across in the previous generation of the image classification.
Erythema detection in digital skin images	Juan Lu Jonathan H. Manton Edmund Kazmierczak Rodney Daniel Sinclair	In this work, we present a 3-layer segmentation scheme for automatic erythema detection. First, a skin region is detected with a histogram-based Bayesian classifier. Next, the extracted skin image is represented in terms of melanin and hemoglobin components based on Independent Component Analysis (ICA). At last, a trained Support Vector Machine (SVM) is applied to identify erythema areas using feature attributes from hemoglobin and melanin component images. Experiment results on our database demonstrate the effectiveness of the proposed method. This work is motivated by the need of objective assessment of

		<p>psoriasis treatment for study of psoriasis therapy. Distribution of abnormal redness on skin is an important sign in evaluation of psoriasis severity, but in practice it is determined subjectively by dermatologists. Our method can be used in a therapy evaluation system to assess treatment objectively and quantitatively</p>
<p>Skin Disease Classification using Machine Learning Algorithms</p>	<p>K.Veeraswamy B.divya</p>	<p>Skin diseases are the large number of spread diseases in the world. Their diagnoses are very difficult because of its difficulties in skin texture, presence of hair on skin and color. It is required to develop methods like machine learning in order to increase the accuracy of diagnosis for various types of skin diseases. Machine learning techniques are widely used in medical fields for diagnosis. These algorithms use feature values from images as input to make a decision. The process consists of three stages-The feature extraction stage, the training stage and the testing stage. The process makes use of machine learning technology to train itself with the various skin images. The</p>

	<p>objective of this process is to increase accuracy of skin disease detection. Three important features in image classification are texture, color, shape, and combination of these. In this work, color and texture features are used to classify the skin disease. Normal skin color is different from the skin with disease. Smoothness, coarseness, and regularity is effectively identified using texture features in the images. Hence, these two features are explored to identify skin disease effectively. In this work, entropy, variance and maximum histogram value of Hue-Saturation-Value(HSV) features are used. These features are used to build machine learning algorithm by using Decision Tree(DT) and Support Vector Machine(SVM). At first level, entropy measure is used to split the tree. At second level, variance is used to get leafs for textures. In color features, maximum histogram value of HSV measure is used to split the tree. Accuracy is used to</p>
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		test the performance of the proposed algorithm.
Variants of Erythema Multiforme	Luis Paulino, David J. Hamblin, Ngozi Osondu, Richard Amini	<p>Erythema multiforme is an acute skin condition characterized by targetoid lesions and occurs most frequently in young adults, particularly males.</p> <p>There are two variants of this condition, one with mucosal involvement, termed erythema multiforme major, and one without mucosal involvement, known as erythema multiforme minor. Due to the similarities in clinical and histological findings, it was previously believed that erythema multiforme major was indistinguishable from Steven-Johnson syndrome (SJS). However, evidence suggests these are two distinct diseases with a different etiology. It is important for clinicians to readily identify the difference between erythema multiforme from SJS, as the prognosis and mortality rate vary significantly between the two disorders.</p>