

AI-BASED LOCALIZATION AND CLASSIFICATION OF SKIN DISEASE WITH ERYTHEMA

LITERATURE SURVEY

| S.NO | NAME | ABSTRACT | ADVANTAGES | DISADVANTAGES |
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| 1. | <p>Skin Disease Detection Using Image Processing And CNN 2020</p> <p>By R.K.M.S.K Karunanyake, W.G Malaka Dananjaya, M.S.Y Peiris, B.R.I.S. Gunatileka, Shashika Lokuliyana, Anuththara Kuruppa</p> | <p>It is a smartphone-based expert system namely "Cureto" is implemented using a hybrid approach using CNN and NLP.It is designed, implemented and tested to classify Acne density, skin sensitivity. This not only classifies Acne Vulgaris but also recommends treatments based on their classification, severity and other demographic factors such as age, gender, etc.</p> | <p>It enables the user to capture or select an existing image of facial Acne or input the symptoms or both and get an output of Acne density, Skin sensitivity, Acne Sub-type and recommendation on the most appropriate Acne homeopathic remedies.</p> | <p>Restricted to only facial Acne Vulgaris detection with only 75-85% accuracy.</p> |
| 2. | <p>Skin Disease Detection Using Machine Learning 2020</p> <p>By Kritika Sujay Rao, Pooja Suresh Yelkar, Omkar Narayan Pise, Dr. Swapna Borde</p> | <p>A multiclass deep learning model to differentiate between Healthy Skin Vs Skin suffering from a Disease and classification of Skin Diseases into its main classes like MelanocyticNevi, Melanoma,Dermatofibro ma etc. The algorithm used is Convolutional Neural Network (CNN) as it is one of the most preferred algorithms for image classification.</p> | <p>Presented a robust and automated method for the diagnosis of dermatological diseases. Testing and Validation accuracy is 93.35%.</p> | <p>Only focuses on detecting skin diseases and does not provide any medications and treatments for the detected skin disease.</p> |
| 3. | <p>AI Recognition in skin pathologies detection 2019</p> | <p>A software based on deep convolutional neural networks technology.This</p> | <p>It can determine the most common (basal and squamous</p> | <p>Recommendation to visit a specialist as output of the program if</p> |

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| | By Dmitriy Gavrilov, Lyubov Lazarenko, Emil Zakirov | complex allows to classify normal and malignant pathology on the uploaded photos. The Machine Learning approach involves the computer evaluating similar factors when processing multiple images of different skin formations. It presents an algorithm for classification of skin lesions into pathology and norm using CNN architecture Xception with prior images segmentations. As a result, the classification of benign and malignant skin tumors provided at least 89% accuracy. | carcinoma) and the most dangerous (melanoma) skin cancers and precancerous conditions (actinic Keratosis, atypical; moles). | any of these pathologies was determined in this application. |
| 4. | Analysis and Classification of Human Skin Diseases- 2016 By P. B. Manoorkar, Prof. D. K. Kamat, Dr. P. M. Patil | The electrical impedance of a tissue depends on its structural characteristics as well as its chemical composition. Studies have shown a wide degree of variation in the bioelectric properties between tissue and cells of the body. The studies have shown differences in the electrical impedance of the skin as a result of irritation, allergic reaction, location, sex, age and hydration. A clinical study has also shown significant differences between affected skin and normal skin. Such clinical study is known as impedance measurement and based on a comparison of four indexes: magnitude, phase, real part and imaginary part index. | By using this measurement we easily diagnose and compare affected skin with normal skin of any disease. The main compensation of the bio-impedance method is it requires very low power, low cost and portable. | Efficiency of the system to diagnose normal and affected skin of different skin diseases is nearly 75% which is very less compared to other researches. |

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| 5. | <p>Deep Learning in Skin Disease Image Recognition 2020</p> <p>By Ling-Fang Li, Xu Wang, Wei-Jian Hu, Neal N.Xiong, Yong-Xing Du, Bao-Shan Li</p> | <p>It analyzes various studies from the aspects like skin disease type, data set, data processing technology, data augmentation technology, model for skin disease image recognition etc. The results show that the skin disease image recognition method based on deep learning is better than those dermatologists and other computer-aided treatment methods in skin disease diagnosis, especially the multi deep learning model fusion method for the best recognition effect.</p> | <p>Among the 29 papers with accuracy indicators, four papers have an accuracy rate of less than 70%, 15 papers have an accuracy rate of 80% to 89%, and the other nine have an accuracy rate of more than 90%. This finding shows the good generalization ability of deep learning, and the recognition accuracy of the model built.</p> | <p>The comparison of this study is strictly limited to the techniques used in each paper.</p> |
| 6. | <p>Digital Dermatology 2017</p> <p>By Archana Ajith, Vrinda Goel, Priyanka Vazirani, Dr. M. Mani Roja</p> | <p>Proposes a skin disease detection method based on image processing techniques. The patient provides an image of the infected area of the skin as an input to the prototype. Image processing techniques are performed on this image and the detected disease is displayed at the output. It is highly beneficial in rural areas where access to Dermatologists is limited.</p> | <p>The proposed system in this paper provides a feasible solution for skin disease detection providing up to 80% efficiency.</p> | <p>The proposed prototype is limited to detecting six diseases which is very much less compared to other studies and systems.</p> |
| 7. | <p>Skin Lesion Classification System using a K-Nearest Neighbor Algorithm 2022</p> <p>By Mustafa Qays Hatem</p> | <p>It proposes a system developed in MATLAB that can identify skin lesions and classify them as normal or benign. The classification process is effectuated by implementing the K-nearest neighbor (KNN) approach to differentiate between normal skin and</p> | <p>Presented in a user-friendly GUI that allows step-by step classification, with visualization of the statistical features that are used for classification. Upon testing, the system achieved 98% accuracy.</p> | <p>The K-NN algorithm does not work well with large datasets and with a high number of dimensions.</p> |

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| | | <p>malignant skin lesions that imply pathology. KNN is used because it is time efficient and promises highly accurate results.</p> | | |
| 8. | <p>Automatic Facial Spots and Acnes Detection System 2013</p> <p>By Chuan-Yu Chang, Heng-Yi Liao</p> | <p>First locates the facial region from the input image. Then, the shapes of faces were recognized using a contour descriptor. The facial features are extracted to define regions of interest and an image segment method is used to extract potential defects. SVM based classifier is then used to classify the potential defects into spots, acnes and normal skin.</p> | <p>Experimental results show that the proposed method can detect facial skin defects and recognize the lesion effectively.</p> | <p>The accuracy is considerably less.</p> |
| 9. | <p>Classification of Dog Skin Diseases using Deep Learning with Images 2022</p> <p>By Sungbo Hwang, Hyun Kil Shin, Jin Moon Park, Bosun Kwon, Myung-Gyun Kang¹</p> | <p>Developed consensus models for each skin disease for dogs by combining each best model developed with the normal and multispectral images, respectively. Since the normal images could be used to determine areas suspected of lesion of skin disease and additionally the multispectral images could help confirming skin redness of the area, the models achieved higher prediction accuracy with balanced performance between sensitivity and specificity.</p> | <p>The consensus models for each skin disease to maximize strength of features from each model. The consensus models performed better with balanced accuracy on image data from disease and non-disease compared to the single models.</p> | <p>Restricted to detect dog skin diseases.</p> |
| 10. | <p>Multi-type Skin diseases classification</p> | <p>Initially, the input dataset is fed into the</p> | <p>The analysis of the method is compared</p> | <p>It does not work well with the large datasets.</p> |

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| | <p>using OP-DNN based feature extraction approach 2022</p> <p>By Arushi Jain, Annavarapu Chandra Sekhara Rao, Praphula Kuamr Jain, Ajith Abraham</p> | <p>pre-processing stage, which helps to remove unwanted contents in the image, then features extracted for all the pre-processed images are subjected to the proposed Optimal Probability-Based Deep Neural Network (OP-DNN) for the training process. Classification algorithm classifies incoming clinical images as different skin diseases with the help of probability values. The multi-type skin disease prediction model is implemented in MatLab software and achieved 95% of accuracy, 0.97 of specificity, and 0.91 of sensitivity.</p> | <p>with existing algorithms to prove the efficiency of the proposed approach. The methodology shows 95% accuracy in skin disease identification. The error rate calculations obtained for the proposed method is 0.087 which is very less.</p> | |
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