

Team leader : Kowsik Naraayanan.K

Team member 1 : Christopher.J

Team member 2 : Jeya Sankara.S

Team member 3 :Muthamizh Kumar.S

AI- based localization and classification of skin disease with erythema

Abstract

Now a day's people are suffering from skin diseases, More than 125 million people suffering from Psoriasis also skin cancer rate is rapidly increasing over the last few decades especially Melanoma is most diversifying skin cancer. If skin diseases are not treated at an earlier stage, then it may lead to complications in the body including spreading of the infection from one individual to the other. The skin diseases can be prevented by investigating the infected region at an early stage. The characteristic of the skin images is diversified so that it is a challenging job to devise an efficient and robust algorithm for automatic detection of skin disease and its severity. Skin tone and skin colour play an important role in skin disease detection. Colour and coarseness of skin are visually different. Automatic processing of such images for skin analysis requires quantitative discriminator to differentiate the diseases.

To overcome the above problem we are building a model which is used for the prevention and early detection of skin cancer, psoriasis. Basically, skin disease diagnosis depends on the different characteristics like colour, shape, texture etc. Here the person can capture the images of skin and then the image will be sent the trained model. The model analyses the image and detect whether the person is having skin disease or not.

AI- based classification of skin disease

From the below study we analyzed and included a technology called computer aided diagnosis in our system. 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 noninvasive 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. His segmentation model achieves better performance compared to previous studies, and also achieves a near-perfect sensitivity score in unfavorable conditions. His classification model is more accurate than a baseline model trained without segmentation, while also being able to classify multiple diseases within a single image.

Skin Disease Classification Using Hybrid AI Based Localization Approach

Using the below theory we analyzed and used a technology called image processing in our project. The image processing techniques are involved in the following ways, namely, the given input data sets go through the preprocessing techniques, these techniques are handled by using the median filter in our proposed approach, the preprocessing techniques are helping to remove the noise in the

images, the median filter removes the salt and the pepper noise in the given input images. After the completion of the preprocessing technique, the segmentation process has been handled by reducing the dimensionality space in the entire image thus helping to smoothen and sharpen the edges in the entire image. After the completion of the segmentation process, the feature extraction process has been taking place, the feature extraction in the entire image processing is considered as the dimensional reduction process, thus the entire dataset individual images are broken up into more manageable groups; in our paper, it is implemented that the given collections for skin diseases are extracted by using the Structural Co-Occurrence matrices.

Skin Disease Detection Using Artificial Intelligence

By using the below study we analyzed and included a technology called AI algorithm in our system. Artificial intelligence (AI) algorithms for automated classification of skin diseases are available to the consumer market. Studies of their diagnostic accuracy are rare. We assessed the diagnostic accuracy of an open-access AI application for recognition of skin diseases. The AI algorithm classified the images giving 5 differential diagnoses, which were then compared to the diagnoses made clinically by the dermatologists and/or histological. The level of diagnostic accuracy varied considerably for diagnostic groups. The online application demonstrated low diagnostic accuracy compared to a dermatologist evaluation and needs further development. Input signs have been developed to classify the disorder. With the aid of experts in the area, we received symptoms of 10 skin diseases. The symptom data were trained by various classifiers. We observed that high quality AI-based support for clinical decision making enhances the accurate diagnosis of either AI or doctors alone and that less skilled physicians are better served by AI.

Automated Skin Disease Identification using Deep Learning

Algorithm

We analyzed the below theory and included deep learning technology in our project. Deep learning models are efficient in learning the features that assist in understanding complex patterns precisely. This study proposed a computerized process of classifying skin disease through deep learning. Machine Learning is that branch of computer studies that gives the potentiality to the computer to grasp without being characteristically programmed. Machine learning is employed in a wide range of computing functions where building and designing specific algorithms with better performances is difficult or impractical. Machine Learning is also firmly attached to computational statistics which makes prediction through computers easier and feasible. In commercial terms Predictive Analysis is machine learning used to design multiple algorithms and models that greatly helps the process of prediction. Here the machine learns itself and divide the data provided into the levels of prediction and in a very short period of time gives the accurate results

CONCEPTS USED	DESCRIPTION
Computer Aided Design(CAD)	Computer-aided design (CAD) is the use of computers to aid in the creation, modification, analysis, or optimization of a design. This software is used to increase the productivity of the designer, improve the quality of design, improve communications through documentation, and to create a database for manufacturing. CAD output is often in the form of electronic files for print, machining, or other manufacturing operations.
Deep learning	Deep learning is a type of machine learning and artificial intelligence (AI) that imitates the way humans gain certain types of knowledge. Deep learning is an important element of data science, which includes statistics and predictive modeling. It is extremely beneficial to data scientists who are tasked with collecting, analyzing and interpreting large amounts of data, deep learning makes this process faster and easier.
Artificial Intelligence(AI)	Artificial intelligence is the simulation of human intelligence processes by machines, especially computer systems. Specific applications of AI include expert systems, natural language processing, speech recognition and machine visions.
Machine Learning	Machine learning (ML) is a type of artificial intelligence (AI) that allows software applications to become more accurate at predicting outcomes without being explicitly programmed to do so. Machine learning algorithms use historical data as input to predict new output values