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AUTOMATIC SKIN CANCER DETECTION IN DERMOSCOPY IMAGES BASED ON ENSEMBLE LIGHTWEIGHT DEEP LEARNING NETWORK

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Abstract: Skin cancer affects 30,000 people each year, according to the World Cancer Research Fund. Most frequently, skin exposed to the sun gets skin cancer, an abnormal development of skin cells. But this typical sort of cancer can also develop on parts of your skin that aren't usually exposed to sunlight. Melanoma and Benign are the two main kinds of skin cancer. It is currently very difficult to automatically diagnose different skin lesion disorders using medical dermoscopy images. In this study, a cascading innovative deep learning network-based integrated model for segmenting skin lesion boundaries and classifying skin lesions is proposed. In the first stage, the boundaries of skin lesions are segmented from dermoscopy pictures using a unique full resolution convolutional network (FrCN). Following that, a deep residual network is fed with the segmented lesions to classify them.

Keywords: Skin cancer; Deep learning ; Dermoscopy ; Full resolution convolution network

I. INTRODUCTION

One of the most common malignancies is skin cancer, and it has become more common over the past few decades. The process of manual feature extraction can be avoided with the use of deep learning architectures. If there is a questionable signal, this can both save time and notify the patient. In order to help dermatologists identify skin cancer and quickly take the appropriate action, we have made an effort to develop a reliable and accurate deep learning models. The doctor can identify the type of lesion and determine whether or not it has the potential to metastasis in the future by feeding imaging data of skin lesions to trained deep learning models. If cancer is discovered in its early stages, there are better possibilities of recovery; the cure rate can be above 90%. Visual inspection of the lesion is used to make the diagnosis of skin cancer, and if a suspicion exists, a clinical analysis is carried out. Deep learning-based image classification in particular has lately demonstrated notable accuracy in classifying medical images.

II. REVIEW OF THE LITERATURE

A programme called "Design and implementation of Skin Cancer Predictor system utilizing Machine Learning Algorithms on Live cloud architecture" was created. It is currently very difficult to automatically diagnose different skin lesion disorders using medical dermoscopy images. In this study, a cascading innovative deep learning network-based integrated model for segmenting skin lesion boundaries and classifying skin lesions is proposed. In the first stage, the boundaries of skin lesions are segmented from dermoscopy pictures using a unique full resolution convolutional network (FrCN). Following that, a deep residual network is fed with the segmented lesions to classify them. [1].

To build a computer assisted diagnosis (CAD) system that uses deep learning to recognise and categorise different skin lesions. One of the most prevalent cancers worldwide is skin tumour illness. In fact, the uncontrolled growth of melanocyte cells is the typical precursor to melanoma (a malignant skin tumour). The likelihood of survival increases when skin lesions are discovered and correctly diagnosed in their earliest stages. Dermoscopy is now the gold standard imaging tool for dermatologists in clinical settings because it helps them better screen for skin lesions by enabling them to see significant features that are present beneath the skin's surface.Dermatologists still struggle to perform lesion identification at a higher level despite dermoscopy screening's improved sensitivity and specificity compared to visual inspection and better visualisation of skin lesions. [2]

Our daily lives are heavily influenced by technology. Deep learning segmentation and classification can be considerably improved with technological support at different phases of skin lesion processes.

A large number of training samples are necessary for deep learning networks to learn properly. However , one of the

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difficulties in implementing such deep learning algorithms sis a limit of the size of the medical picture dataset, particularly a limit on trustworthy annotated ground-truths. [3].

To increase the amount of training data, decrease the overfitting issue, and speed up convergence, we have used various augmentation methods to the training datasets. Skin Lesion Boundary Segmentation via FrCN and Skin Lesion Classification via ResNet-50 are two novel approaches for the segmentation and classification of skin lesions, respectively. The full resolution convolutional network (FrCN) is an end-to-end supervised deep network that is trained by mapping the entire input image to its corresponding ground-truth masks with no loss, producing better performance for segmenting skin lesion boundaries. [4].

The deep residual network, often known as ResNet, is the deep learning classification models that has been used to numerous image recognition tasks. When deep network are developed further, ResNetwork can solve the vanishing gradient issue (i.e., increasing network depth by stacking layers). In other words, ResNet enables these layers to fit a residual mapping rather than transmitting the learnt features through the stacked layers directly, making network optimization simpler than with an unreferenced mapping. [5].

CONCLUSION

The Skin Cancer Prediction System employs a variety of machine learning algorithms, and the prediction outcome provides the user's status in order to aid in diagnosis. The usage of numerous algorithms in the suggested system is due to the efficiency and accuracy of the machine learning algorithms, which have greatly evolved as a result of recent technological breakthroughs. Additionally, this system utilizes feedback from individuals to get a trustworthy result that is close by. If more people use the system, their current heart condition will be recognized and gradually fewer people will die from skin cancer, decreasing the rate at which it causes severe death.

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