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SKIN CANCER DETECTION USING CNN

Aliasgar Pardawala, Sakshi Jagtap, Tayyaba Pinjari, Ruttik Trymbake

Project Guide: Mrs. Deepika Falak

Dept. of Computer Engineering, Sinhgad Academy of Engineering, Kondhwa (Bk), Pune

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Abstract - Early detection is important for successful treatment of melanoma skin cancer. Melanoma is also commonly considered to be the most dangerous form of skin cancer, since it is far more likely to spread to other areas of the body if not diagnosed and treated early. Medical machine vision alternatively referred to as non-invasive medical image processing, is gaining traction in the clinical diagnosis of a wide variety of diseases. Among these methods is an automated image processing method that enables the lesion to be assessed accurately and quickly. The steps in this s are as follows: collection of a database of dermoscopy images, preprocessing, segmentation via thresholding, statistical feature extraction via Gray Level Co-occurrence Matrix (GLCM), Asymmetry, Border, Color, and Diameter (ABCD), feature selection via Principal component analysis (PCA), calculation of the total Dermoscopy Score, and finally classification via Convocation neural network (CNN). According to the findings, the classification accuracy achieved is 92.1 percent.

***Key Words*: -EGO's, donation type, donors**.

1. INTRODUCTION

Skin cancer is also a chronic illness that affects people worldwide. The two types of skin cancer are melanoma (malignant) and non-melanoma (benign) (benign). This condition results in skin scarring and disfigurement, and also severe pain and bleeding. Since the ozone layer is depleting as a result of increased pollution in the atmosphere, ultraviolet (UV) radiation directly penetrates the earth's surface. Skin cancer is caused by this direct exposure to UV radiation. Skin cancer warning signs include changes in skin color, size, shape, skin lesion or mole color, the appearance of net growth on the skin, swelling, and bleeding. If you notice any of these signs, it is recommended that you see a dermatologist. According to some figures, the number of skin cancer cases and deaths is rising. Each year, the World Health Organization (WHO) reports that 3 million cases of non-melanoma skin cancer and 132,000 cases of melanoma occur worldwide. Nearly ten thousand people are diagnosed in the United States with skin cancer and one in every five people will develop skin cancer at some point. Each year, skin cancer cases surpass the estimated number of cases. Other types of cancer are prevalent in the world. By offering proper treatment and care, early detection of skin cancer increases the patient's chances of survival and saves his life.

1.1. Problem Statement

The current system is a time-consuming process that is difficult to identify in its early stages because signs do not occur until the later stages. Implementation of a method to simplify the classification process in order to detect skin cancer early.

1.2. Motivation

Melanoma incidence rates have risen dramatically in recent decades, and although the majority of people diagnosed with skin cancer have a better chance of being cured, melanoma survival rates are lower than non-melanoma skin cancer survival rates. Melanoma skin cancer (MSC) can develop on any skin surface and been on the increasing in many parts of the globe for the past two decades. Men's heads, necks, and between the hips and shoulders are the most common spots, while women's lower legs or between the shoulders and hips are most popular spots. When it does occur in dark skinned people, it is usually found under the toe nails, toenails, palms, or toes.

2. LITERATURE SURVEY

Md Shahin Ali, Md Sipon Miah , Jahurul Haque, Md Mahbubur Rahman, Md Khairul Islam. "An enhanced technique of skin cancer classification using deep convolutional neural network with transfer learning model" [1], : Skin cancer is one of the top three types of cancer caused by damaged DNA that can cause death. There is some research for the computerized analysis of malignancy in skin lesion images. In this paper, the authors propose a deep convolutional neural network (DCNN) model based on deep learning approach to distinguish between benign and malignant skin lesions. The authors were able to get training accuracy of 93.16% and testing accuracy of 91.93%.

Mahamudul Hasan, Surajit Das Barman, Samia Islam, Ahmed Wasif Reza."Skin Cancer Detection Using Convolutional Neural Network"[2], : This paper focuses on early diagnosis of skin cancer. Scientists have proposed an artificial skin cancer detection system using image processing and machine learning methods. The authors used a deep learning based method convolutional neural network classifier for the stratification of the extracted features and achieved an accuracy of 89.5% and training accuracy of 93.7%.

Mehwish Dildar, Shumaila Akram, Muhammad Irfan, Hikmat Ullah Khan, Muhammad Ramzan , Abdur Rehman Mahmood, Soliman Ayed Alsaiari , Abdul Hakeem M Saeed, Mohammed Olaythah Alraddadi and Mater Hussen Mahnashi "Skin Cancer Detection: A Review Using Deep Learning Techniques"[3], : Skin cancer is caused by genetic defects or mutations in unrepaired deoxyribonucleic acid (DNA) skin cells. Lesion parameters such as color, symmetry, shape, size etc. are used to detect and distinguish between benign skin cancer from melanoma. In this paper a systematic review of deep learning techniques for the early detection of skin cancer has been conducted.

Yunendah Nur Fu'adah, NK Caecar Pratiwi, Muhammad Adnan Pramudito and Nur Ibrahim "Convolutional Neural Network (CNN) for Automatic Skin Cancer Classification System"[4], : Early diagnosis and proper treatment can minimize and control the harmful effects of skin cancer. The authors used the Convolutional Neural Network (CNN) model consisting of 3 hidden layers and also used several optimizers and achieved an accuracy of 99% when tested on a publicly available dataset.

Jinen Daghrir, Lotfi Tlig, Moez Bouchouicha, Mounir Sayadi. "Melanoma skin cancer detection using deep learning and classical machine learning techniques: A hybrid approach"[5], : The model proposed in this paper combines the results from a convolutional neural network and two classical machine learning classifiers trained with a set of parameters describing the borders, texture and the color of a skin lesion and uses a majority voting strategy to predict the presence/absence of skin cancer.

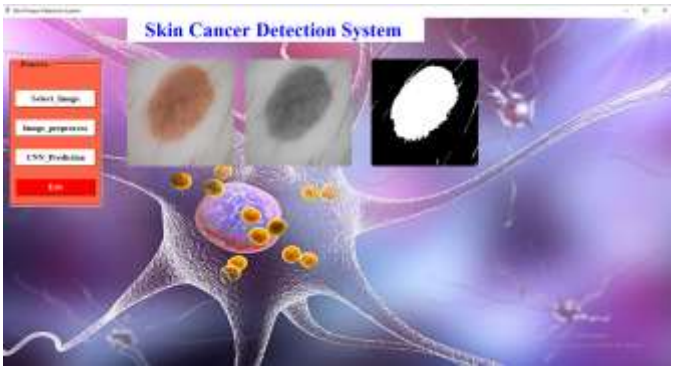
3. MODULE

• **Preprocessing:**
Pre-processing is used to enhance image data by removing undesirable distortions and improving certain image features needed for subsequent processing. Pre-processing is a concept that refers to operations on photos at a most fundamental level of abstraction, for both input and output being intensity images.

• **Feature Extraction**:
Feature extraction is a step in the dimensionality reduction process, which divides and reduces a large collection of raw data into smaller classes. As a result, processing would be simpler. The fact that these massive data sets have a large number of variables is the most important feature. To process these variables, a large amount of computational power is needed. As a result, feature extraction aids in the extraction of the best feature from large data sets by selecting and combining variables into features, effectively reducing the amount of data. These features are simple to use while still accurately and uniquely describing the actual data collection.

• **Classification:**
Classification of images involves extracting features from them in order to define patterns within a dataset. Using an ANN for image classification will be highly computationally costly due to the increase in trainable parameters. Accepting an input image and then describing its class is the primary objective of image classification.

4. RESULT



5. CONCLUSIONS

In this experiment, various stages of image processing were applied to skin nodules. The fuzzy filter can effectively cancel out the noise generated by these various image processing techniques. The image is segmented using a watershed algorithm based on markers, resulting in distinct regions of the image. GLCM is used to rapidly and efficiently extract various features from an image. This knowledge is loaded into the CNN Classifier, which decides the benign or malignant nature of the nodules. The CNN classifier has an accuracy rate of 92.5 percent.

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