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Detection of Skin Cancer Based on Image Processing using Machine Learning

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Abstract: *Early recognition of malignant melanoma is critical for effective therapy. Melanoma, of the many basal cell carcinomas, is now widely known as the most harmful because it will spread to the parts of the body if it is not identified and given treatment in early stage. Medical computer vision or medical image processing, which is non-invasive, is becoming increasingly important in the clinical diagnosis of many disorders. Melanoma diagnosis is done using both clinical and automated methods. Early detection of malignant melanoma has a lot of potential using image-based computer-aided diagnosis methods. Automatically identifying the type of skin cancer from photos can help with quick diagnosis and increased accuracy, saving time. Using machine learning and image processing techniques, this project will detect and classify types of skin cancer. Dermoscopic images are used as feed in the pre-processing step.*

Keywords: Image processing, Machine Learning, CNN (Convolution Neural Network) model.

I. INTRODUCTION

In past decades, the technology revolution has increased the use of computers in all fields. The era of keeping massive records for data storage is over evolved. Computers have become the most widely used instrument in the world. Nearly every field it has improved people's lives easier. Machines have indeed made research much easier biomedical has a variety of sophisticated medical devices to choose from a variety of diagnostic and preventative reasons, such as diagnostic test kits, vaccinations, antibodies, and radiolabeled biological therapies are all employed in imaging and diagnostics is the goal of the investigation. Human skin has three main layers: the epidermal, derma, and hypodermal. Malignant and benign skin cancer lesions are separated into two groups. Out of all the different types of skin disorders, skin cancer is the type most often found in humans and is the most deadly. Fair-skinned people are particularly prone to this. The two main kinds of skin cancer are malignant melanoma and non-melanoma. Malignant melanoma, which accounts for 75% of deaths from skin cancer despite only affecting 4% of the population, is one of the deadliest and most deadly types of cancer. If melanoma is found in its early stages and treated right away, it can be cured; however, if melanoma is found in its later stages, it can penetrate the skin more deeply and affect other bodily areas, making therapy very challenging. Melanocytes, which can be found all over the body, are the cells that produce melanoma. One of the primary causes of melanoma is skin exposure to Ultraviolet radiation. Melanin deposits are normally found in the epidermal layer of benign lesions (common nevi). Melanin is produced at an abnormally high rate in malignant lesions. Malignant lesions do not pose a life-threatening threat until the melanocytes and their associated cells are destroyed. The associated melanin continues in the epidermis layer, but when it enters into the dermis and deposits, the skin colour changes.

II. LITERATURE SYRVEY

Mahamudul Hasan et al [3], proposed the prevalence of skin cancer among humans is concerning. The rapid development rate of melanoma skin cancer, its high cost of treatment, and its mortality rate have all heightened the need for early diagnosis of skin cancer. The majority of the time, treating cancer cells requires time and manual detection. Using image processing and machine learning techniques, this paper suggested a synthetic skin cancer diagnosis system. After using the publicly available data, an accuracy of 89.5% and the training accuracy of 93.7% have been recent information source. T Y Satheesha, et al [5], proposes a novel automated dermoscopy system. In melanoma skin lesions, the importance of depth is highlighted. A unique 3D reconstruction algorithm is developed to retrieve the depth. The adaptive snake method

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is used to segment the data. As a result, the addition of the depth element has resulted in a significant boost in categorization rate. Because multiple aspects of the image are used to detect melanoma, it can be used to speed up melanoma medical intervention. For melanoma detection, greater characteristics are taken into account. As a result, it performs better in terms of both accuracy and categorization rate.

Sanjana M et al [4], said that with the development of machine learning and artificial intelligence, hospital is no longer just confined to scanning and testing but also provides assistance to clinicians in the diagnosis of the current medical condition. Skin cancer diagnosis, commonly known as basal cell carcinoma, is one of these healthcare specialties. This is frequently brought on by a melanin shortage, which can occur as a result of harsh climatic conditions. In this paper, we focus on a machine learning system for skin cancer detection. It is discovered that the accuracy is 90%.

Titus Josef Brinker et al [7], proposed that the first comprehensive analysis of the most recent work on using CNNs to categorise skin lesions. Researchers just look at classifiers for skin lesions. Particularly, techniques that use a CNN only for segmentation or for categorising dermoscopic patterns are not taken into consideration here. This report will also discuss the reasons why it is so difficult to compare the techniques that are shown, as well as the issues that will need to be resolved mostly in ahead.

Ashlesha Aher et al [2], stated that Various phases of image processing were used on skin nodules in this research. The fuzzy filter will give efficient de noising from these many image processing techniques. The image is segmented using a marker-based watershed technique, which results in different regions of the image. GLCM is used to extract the many aspects of a picture in a faster and more efficient manner. The information is then fed into CNN Classifier, which determines whether the nodules are benign or cancerous. The CNN classifier has a 92.5% accuracy rate.

Vijayalakshmi M M [8], proposed Due to their challenging and subjective human interpretation and extremely complex and expensive diagnosis, dermatological diseases rank among the most serious medical problems of the twenty-first century. When deadly conditions like melanoma are present early diagnosis is essential for determining the likelihood of acquiring cured. We think that using automated processes will aid in early diagnostic, particularly with the collection of photographs and different diagnoses. Hence In this paper, we offer a fully automated technique for diagnosing skin conditions a machine intervention in contrast to recognition by lesion images detection carried out by customary medical personnel. Our simulation is built to three stages, including data gathering, augmentation, and designing model, followed by prediction.

III. PROPOSED METHODOLOGY

Our paper's primary goal is the identification and feature extraction of the lesion component of skin cancer.

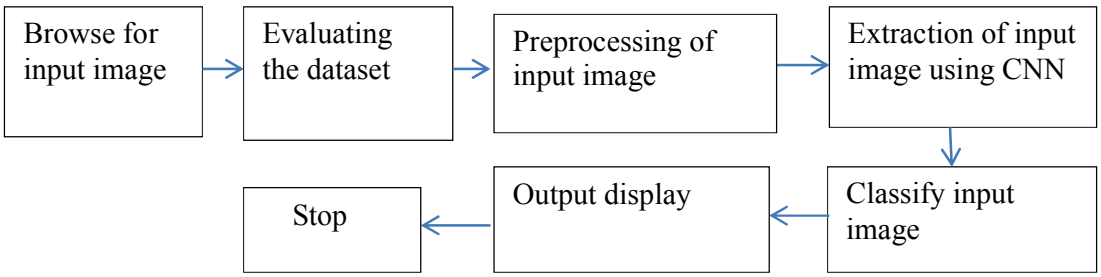

Figure 1: High-level System Design

In this proposed methodology the dataset is uploaded to the machine and it is trained for the machine using machine learning. And then the input image is browsed from the trained model for the processing of the image. This methodology has used CNN model for the extraction of the image features. Based on that the image is classified and output is displayed whether the browsed image is melanoma or not.

3.1 Browse for Input Image

The ISIC dataset, which offers a collection of photos for melanoma skin cancer, was used to collect the photographs. The ISIC melanoma project was started to improve the effectiveness of melanoma early detection and decrease the rising

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number of deaths associated with the disease. About 23,000 photos make up the ISIC dataset, of which we have gathered 1000–1500 and used for training and testing. The images were collected from the ISIC dataset;

3.2 Pre-processing

The pre-processing of photos is a critical problem or activity that lets Vector Machine identify the pictures into cancer and benign and to forecast the precise reliability. It also saves a lot of time for training.

3.3 Convolution Neural Network

There are three various types of layers in a typical neural network:

1. **Input Layer**: The tier in which we offer input to our model is termed as the input layer. The overall range of factors in our data is equal to the number of neurons in this layer (number of pixels in the case of an image).
2. **Hidden Layer**: The hidden layer receives the input from the input layer. Depending on our model and the volume of the data, there may be numerous hidden levels. The number of neurons in each hidden layer might vary, but they are typically more than the number of features. The output from each layer is calculated by multiplying the output of the layer before it by a matrix using the learnable weights from that layer, and then by adding the network becomes nonlinear as a result of learnable biases followed by activation function.
3. **Output Layer:** After being passed into a logistic function like sigmoid or softmax, the output from the hidden layer is transformed into the probability score for each class. The model is then given the data and each layer's output is then obtained.
4. **Output:** Classifies the input as melanoma or not.

Result of the Implementation of Front End Design

The following snap shots are highlighted as browsing and skin disease detection examples as in figure 2 and figure 3 below:

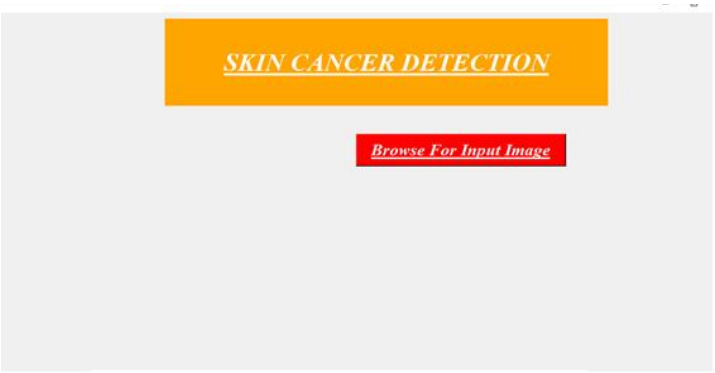

Figure 2: Browse for input

Figure 3: Result of skin cancer detection

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IV. CONCLUSION

In this paper, we suggested architecture based on convolutional neural networks (CNN) for skin lesion segmentation for dermoscopy pictures as well as a method for skin lesion segmentation based on the proposed CNN architecture. Even with a minimal amount of training data, our suggested strategy is still effective. Despite not requiring any pre-processing chores, such as hair removal, ROI extraction, picture modifications, etc., it produces a very nice and remarkable result. The segmentation of skin lesions using our suggested method can be compared favourably to other cutting-edge techniques. The proposed methodology gives the accuracy rate 93%.

REFERENCES

[1]. Arneesh Aima, Akhilesh Kumar Sharma, Predictive approach for Melanoma Skin Cancer Detection using CNN, International Conference on Sustainable Computing in Science, Technology & Management (SUSCOM-2019), 6, 2019.

[2]. Ashlesha Aher1 , Shruti Maitri2 , Kalyani Patil3 , Harsha Jadhav4, SKIN CANCER DETECTION USING IMAGE PROCESSING, International Journal of Advanced Research in Computer and Communication Engineering, ISSN (O) 2278-1021, ISSN (P) 2319-5940, 3, 2022.

[3]. Mahamudul Hasan, Surajit Das Barman, Samia Islam, Ahmed Wasif Reza, Skin Cancer Detection Using Convolutional Neural Network, 4, 2019.

[4]. Sanjana M , Dr. V. Hanuman Kumar, Skin Cancer Detection Using Machine Learning Algorithm, International Journal of Research in Advent Technology, E-ISSN: 2321-9637, 6, 2018.

[5]. T Y Satheesha1 Dr. D Satyanarayana2 Dr. M N Giriprasad3 K N Nagesh4, Detection of Melanoma Using Distinct Features, International Conference on Big Data and Smart City, 6, 2016.

[6]. Snehal Vijay Kamble, Dr. P.R. Gumble, A SURVEY ON DIAGNOSIS OF SKIN CANCER BASED ON IMAGE PROCESSING USING MACHINE LEARNING, IJCRT, ISSN: 2320-2882, 9, 2021.

[7]. Titus Josef Brinker1,2 , MD; Achim Hekler1 ; Jochen Sven Utikal3,4 , MD; Niels Grabe5 , PhD; Dirk Schadendorf6 , MD; Joachim Klode6 , MD; Carola Berking7 , MD; Theresa Steeb7 , MPH; Alexander H Enk2, MD; Christof von Kalle1 , MD, PhD, Skin Cancer Classification Using Convolutional Neural Networks: Systematic Review, 8, 2018.

[8]. Vijayalakshmi M M, Melanoma Skin Cancer Detection using Image Processing and Machine Learning, International Journal of Trend in Scientific Research and Development (IJTSRD), e-ISSN: 2456 – 6470, 3, 2019.

BIOGRAPHY

Skin Cancer Segmentation Using Neural Network.
Skin Cancer.