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# HEALTHCARE: SKIN CANCER CLASSIFICATION USING DEEP LEARNING MODEL

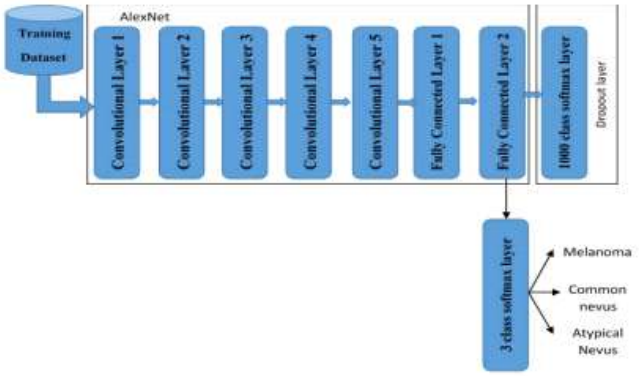
**DEEPTHI KOTTE,** MCA, DCA, DVR & Dr.HS MIC College of Technology, A.P., India.
**Mrs. ANURADHA ANUMOLU,** Associate Professor, Dept.of AI & IT, DVR & Dr.HS MIC college of Technology, A.P., India.

***Abstract***— skin cancer is one of the most important problems faced by the world, due especially to the rapid development of skin cells and excessive exposure to UV rays. Therefore, early detection at an early stage employing advanced automated systems based on AI algorithms plays a major job in order to effectively identifying and detecting the disease, reducing patient health and financial burdens, and stopping its spread in the skin. Damage to tissues is a hallmark of the cancer spectrum of disorders. Studies that can aid professionals during the diagnosis phase are necessary due to the difficulties in identifying skin cancer, a prevalent type of cancer, without technical support. The HAM10000 dataset was used to create a deep learning model with 7 convolution layers and 3 neural layers to categorisedermoscopic images into 7 categories. The proposed model was tested on a set of data, and its accuracy was determined to be 99.01%. This finding demonstrates that the suggested methodology can aid dermatologists in making accurate skin cancer diagnoses.

## • INTRODUCTION

Skin lesions are a common disease that cause suffering, some of which can have serious consequences, for millions of people globally .Because of its complexity, diversity, and similarity, skin disease can only be diagnosed by dermatologists with long-term clinical experience and is rarely reproducible. It is likely to be misdiagnosed by an inexperienced dermatologist, which can exacerbate the condition and impede appropriate treatment. Deaths from skin cancer rank among the highest of any disease worldwide  Melanoma and non-melanoma skin cancers are the two main categories of this disease. If these tumours are caught early enough, the cure rate could reach 90% . Visual examination is challenging and may lead to erroneous investigation  due to the great similarities between different types of skin diseases. hence, skin lesion classification must be automated .The use of AI and image processing techniques allowed for this categorization system to succeed. Advances in deep learning have influenced numerous scientific and industrial fields and have realized significant achievements with inspiration from the human nervous system. With the

rapid development of deep learning in biomedical data processing, numerous specialists have adopted this technique to acquire more precise and accurate data. With the rapid increase in the amount of available biomedical data including images, medical records, and omics, deep learning has achieved considerable success in a number of medical image processing problems. In this regard, deep learning is expected to influence the roles of image experts in biomedical diagnosis owing to its ability to perform quick and accurate assessments. This paper presents the characteristics of skin lesions, overviews image techniques, generalizes the developments in deep learning for skin disease classification, and discusses the limitations and direction of automatic diagnosis.




## LITERATURE REVIEW

**[1] N. C. F. Codella et al.,** "Deep learning ensembles for melanoma recognition in dermoscopy images" IBM Journal of Research and Development, Vol.61, pp.5:1- 5:15, 2017. Melanoma is the deadliest form of skin cancer. While curable with early detection, only highly trained specialists are capable of accurately recognizing the disease. As expertise is in limited supply, automated systems capable of identifying disease could save lives, reduce unnecessary biopsies, and reduce costs. Toward this goal, we propose a system that combines recent developments in deep learning with established machine learning approaches, creating ensembles of methods that are capable of segmenting skin lesions.

**[2].Michael W. Vannier:**

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- The screening and early identification of malignant melanoma could benefit greatly from the use of image-based computer aided diagnosis tools. We take a look at the present methods, challenges, and future developments in dermoscopy image capture, preprocessing, segmentation, feature extraction and selection, and classification, and review the state of the art in these systems. Statistics and results from the most significant deployments recorded to date are presented in this document. Several classifiers were created for the purpose of identifying skin lesions, and we compared their results and explained our findings. When possible, information about the effects of various variables on the technique's performance is included in the report. We provide a method for comparing the efficacy of several skin cancer diagnostic models and summarise the resulting data. We point out the problems with some of the current studies and offer some ideas for how to improve them.

## IMPLEMENTATION

Upload image: Upload the test image to predict the disease

Analysis : in analysis module first we resize the test image then we convert the test image into grey scale image finally we convert the grey scale image into numerical values like arrays.

The conversion of image into grey scale is nothing but data pre-processing. We can do that with the help of opencv library.

We can convert the image into numerical values by using numpy library.

Detect disease: we already train the cnn with dataset.The training process have the following steps.

Data collection: we have to collect the dataset from Kaggle website.

Data preprcessing: we have to remove noise from images in this step.

Train & test Split: we have to split the data into training and testing data.

Model build: we have to train the CNN algorithm with train data and test with test data to get the accuracy.

Predict: finally we apply the test image and compare the test image with CNN train image the we can predict the disease of test image.

- **PROPOSED WORK**

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Increase the efficiency of data entry by designing intuitive user interfaces. Input design's goal is to minimize the possibility of human error when entering data. Because of the design of the data entry panel, any data manipulation is feasible. Additionally, it's capable of presenting previously saved data.

The system will check to see if the data entered is correct. Data can be entered on a screen. Users don't get lost in the shuffle since messages are provided at the appropriate time. Because of this, input design's major objective is to create a user-friendly layout.

## SAMPLE SCREENSHOTS

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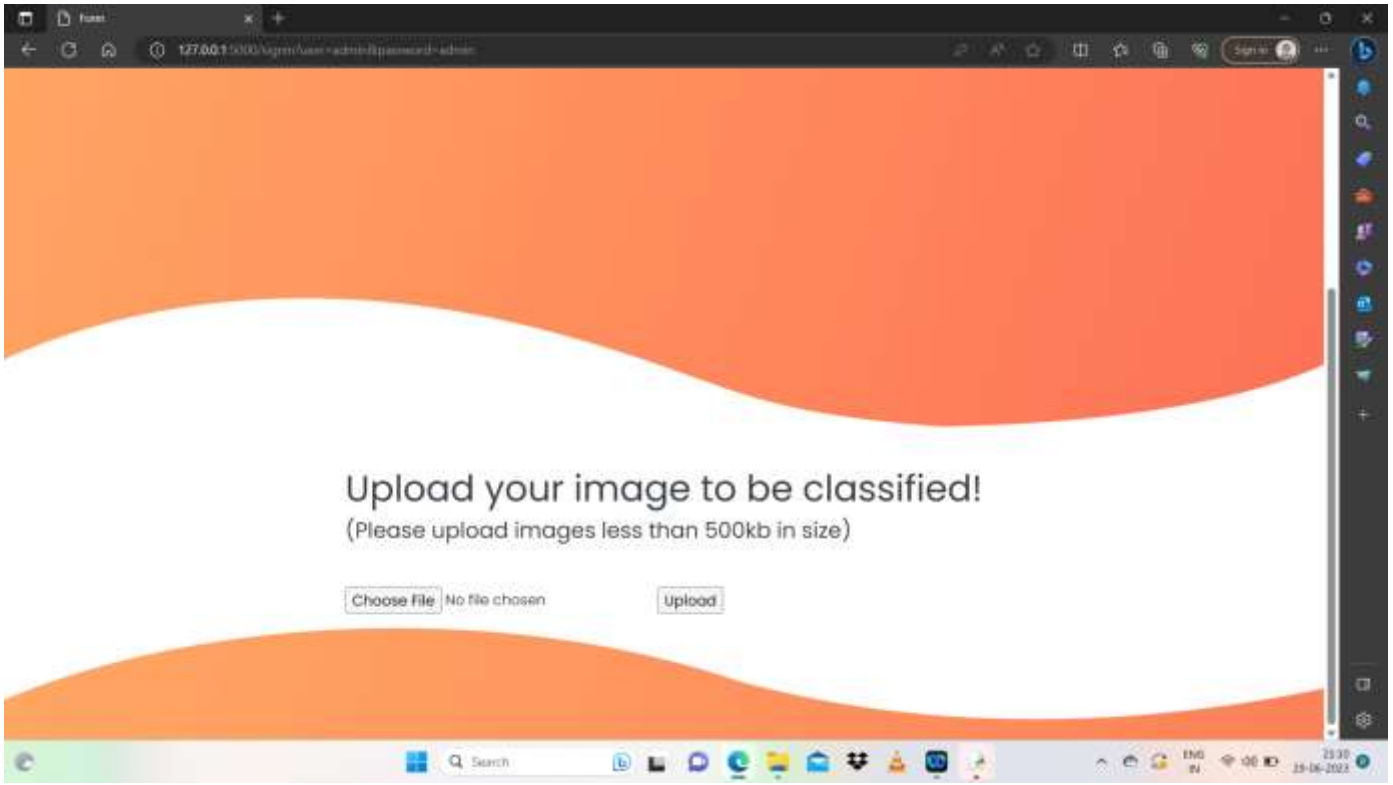


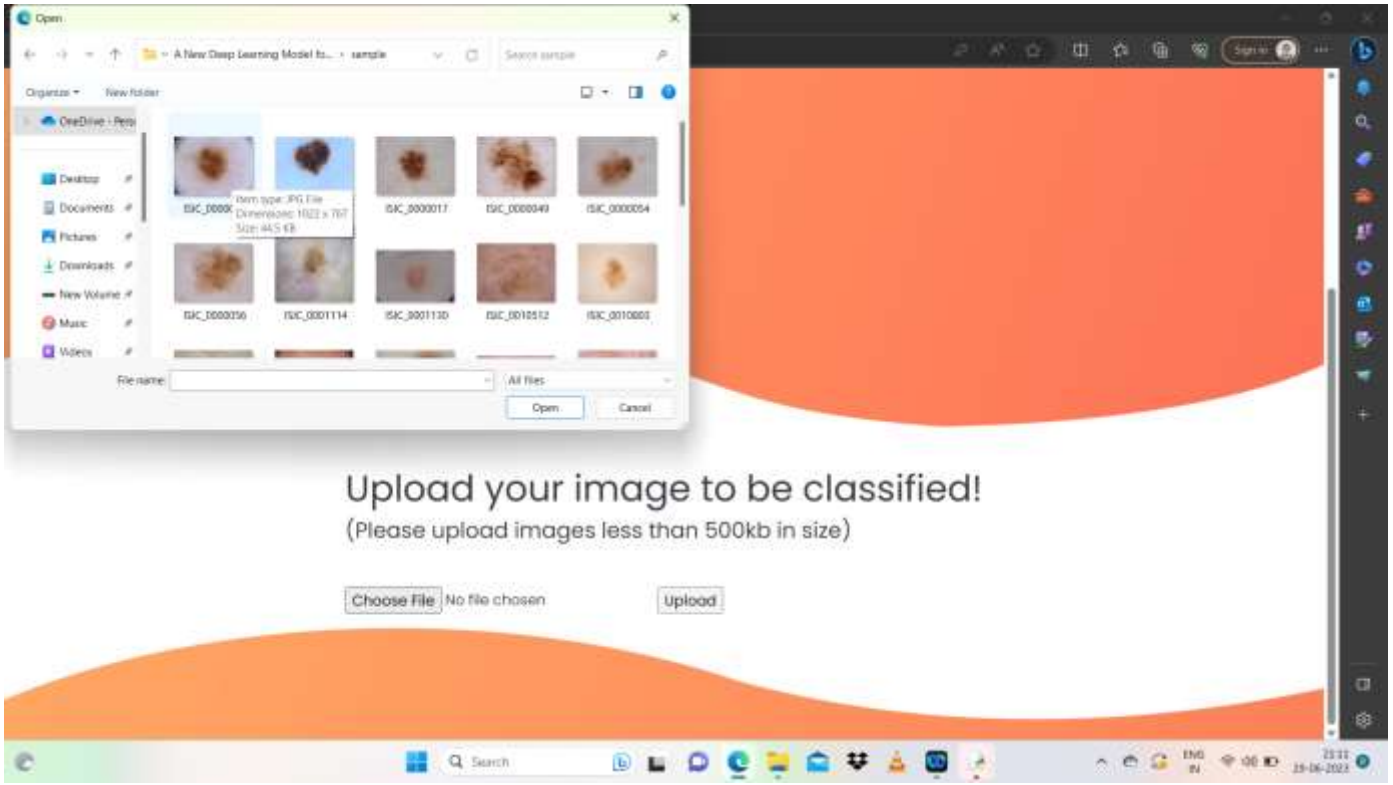

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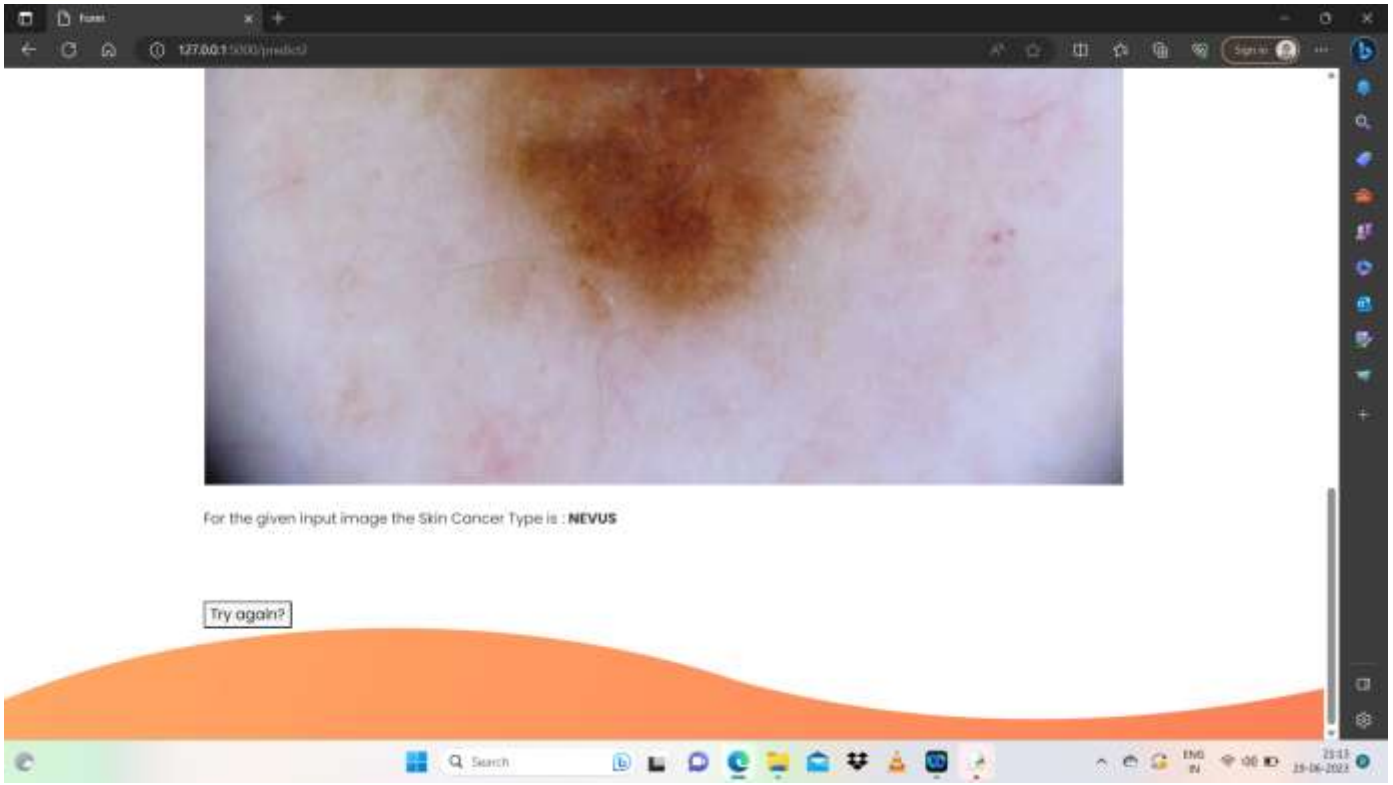


- **CONCLUSION**

In this paper, we propose a Two dynamic searchable encryption techniques with a high level of security wereprovided by the researchers. Both forward and backward collusion between thecloudserverandsearchuserscanbepreventedbythefirstmethod.Anothersolutionto the problem of key sharing in the kNN-based searchable encryption system isprovided by the second. According to performance assessments, the new methodsoutperform the existing ones in terms of storage, search, and update complexity.Testing showsthatschemesareefficientin termsof storageoverhead,indexconstructionandtrapdoorcreationand queries.

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