IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 12, Issue 2, April 2024

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.379

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 | Monthly Peer Reviewed & Refereed Journal |

|| Volume 12, Issue 2, April 2024 ||

International Conference on Recent Development in Engineering and Technology – ICRDET 24

Organized by

Dhaanish Ahmed Institute of Technology, KG Chavadi, Coimbatore, Tamilnadu, India

Detection and Classification of Skin Cancer by Using Convolution Neural Networks

G. Vijayakumari, K. Nathiya, G. Pavithra, T. Vanmathi

Assistant Professor, Department of ECE, Builders Engineering College, Tirupur, India

UG Students, Department of ECE, Builders Engineering College, Tirupur, India

ABSTRACT: Skin cancer is a major health concern, and early detection is vital for successful treatment. The project addresses this challenge by creating a cutting-edge deep learning model, specifically using Convolutional Neural Networks (CNNs). This model analyzes dermatoscopic images, which are magnified close-up views of skin lesions, to identify images are cancer or non cancer. The key to the model's effectiveness is the HAM10000 dataset. This rich collection contains over 10,000 high- resolution dermatoscopic images sourced from a diverse population. By training on this dataset, the model learns to recognize the subtle visual characteristics that distinguish cancerous from lesions. The results are promising. The model achieved an impressive 95% accuracy in correctly classifying different skin cancer types. This high accuracy suggests that the model has the potential to be a valuable tool in a dermatologist's arsenal. By aiding in early diagnosis, the model can significantly improve patient outcomes. The project's significance extends beyond its immediate application. It contributes valuable insights into the field of dermatological research by demonstrating the effectiveness of deep learning for skin cancer detection. Additionally, the HAM10000 datasetserves as a treasure trove of information for researchers, paving the way for further advancements in medical image analysis and classification techniques. This project holds the promise of revolutionizing the early detection of skin cancer, ultimately saving lives.

I. INTRODUCTION

Skin cancer is measured as a major contribution to the causes of deaths around the world. There are various types of cancer that are discovered and battled with. However, skin cancer is amongst fast- growing cancer nowadays. According to modern research, patients with a skin cancer diagnosis significantly increasing more than any other Skin cancer is a major contributorto global mortality rates. While various cancers are constantly being researched and treated, skin cancer appears to be the fastest-growing cancer type in recent years. Modern research suggests a significant year-on-year increase in diagnosed skin cancer cases compared to other cancers[1]. People with lighter skin tones have less melanin, a pigment that provides natural protection against ultraviolet (UV) radiation. This increased risk applies to all age groups.The incidence of skin cancer has reportedly doubled in the past two decades. Fair- skinned individuals, who are prone to sunburn and rarely tan, are most susceptible to this disease. [4]Early detection of skin cancer is crucial for reducing patient risk factors. The primary cause of skin cancer is exposure to ultraviolet (UV) radiation, primarily from the sun but also from artificial sourceslike tanning beds. In order to reduce the death rate due to skin cancer, it is necessary to diagnosis it at an early stage. Skin cancer has been the most widespread disease globally .The occurrence of either non- melanoma or melanoma skin cancers has grown in subsequent decades[2]. As per the World Health Organization (WHO),Skin cancer can be detected in every three cases of cancer, and one out of five Americans according to Skin Cancer Foundation Statistics, will face skin cancer throughout their lifetime.In regions including the united states, Canada and Australia, the million individuals are infected with skin cancer has grown at a relatively steady pace in past few centuries. skin diseases appear to have significant adverse effects in health of population worldwide.

Disease burden estimated in disability-adjusted life years[3]. Around 7 percent of new cancer cases world wide are caused by skin cancer, with a 2011 expense of more than 8 billion to the US medicare project. There is clinical evidence of such result differences with respect to race in cases of skin cancer: while people with different skin tones are around 20 to 30 percent less likely to contract melanoma than those with lighter skin, they have also been discovered to have a lower or higher mortality risk for certain melanoma types[4]. Figure.1.1. Skin cancer rates in various country according to world cancer research foundation In recent time, Convolutional Neural Networks have widely been used for various classification as well as to classify skin cancer lesions.In the classification of skin cancers,

many CNN models have dramatically outpaced highly skilled health care professionals. The performance of these models has been further increased by many approaches, such as transfer learning using massive datasets.The convolutional networks VGG-16 and VGG-19 has 16 and 19 convolutional layers, respectively.The retrained network could identify photos such as keyboard , mouse, pen, and creatures into 1000 object levels.The networks have now accumulated rich feature representations for a large collection of images.

II. OBJECTIVE

The Primary objective of this project is to develop a system capable of identifying whether a skin image contains cancerous or non-cancerous lesions.Utilizing advanced image analysis techniques, the system aims to aid in early detection and enhance medical dignosis of skin condition.

III. PROBLEM STATEMENT

Skin cancer is one of the most prevalent forms of cancer worldwide,with millions of cases diagnosed annually. Early detection plays a crucial role in improving patient outcomes, yet accurate and efficient diagnosis remains achallenge. The existing cancer detection system provides a binary classification of skin lesions into cancerous and non-cancerous categories, serving as a valuable tool in medical diagnostics. However, the system's performance and scope can be further enhanced to address key challenges in cancer diagnosis. Therefore, the problem at hand is to improve the accuracy, sensitivity, and efficiency of the cancer detection system while also expanding its capabilities to detect and classify multiple types of cancer. This entails optimizing the model architecture, refining data preprocessing techniques, and leveraging advanced machine learning algorithms to achieve robust and reliable cancer detection. By addressing these challenges, we aim to contribute to advancements in healthcareand provide clinicians with a powerful tool for early cancer detection anddiagnosis.

IV. PROPOSED SYSTEM

The proposed system employs advanced deep learning techniques, such as CNNs, data augmentation, and class imbalance handling, to enhance skin cancer prediction. It's optimized for real-time inference in clinical settings, maintaining ethical standards and addressing algorithmic biases. By diversifying the training data and minimizing inference time, it aims to improve accuracy and efficiency. The system ensures patient data privacy and secure storage while striving to prevent disparities in predictions. Rigorous evaluation against established datasets and real- world clinical data will validate its effectiveness for widespread adoption. The following steps are involving to diagnosis of skin cancer,

Data Collection
Image Pre-processing
Image Segmentation
Feature Extraction
Image Classification

V. EXISTING SYSTEM

The existing system for skin cancer prediction employed the ResNet (Residual Neural Network) architecture, which is a deep learning model known for its exceptional performance in image recognition tasks. The primary aim of this system was to accurately classify dermatoscopic images into three distinct categories: The RESNET based skin cancer prediction system demonstrated a commendable 82.87% accuracy in classifying dermatoscopic images into distinct categories: Melanoma, Basal cell Carcinoma, and Squamous cell skin cancer. This success highlights the potential of deep learning in aiding early detection efforts. However, it's essential to recognize that while AI can provide valuable support, human expertise remains paramount in the diagnostic process. Continuedresearch endeavors focus on refining existing models and integrating cutting-edgetechniques to further improve accuracy and ultimately enhance patient care outcomes in combating skin cancer globally.

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 | Monthly Peer Reviewed & Refereed Journal |

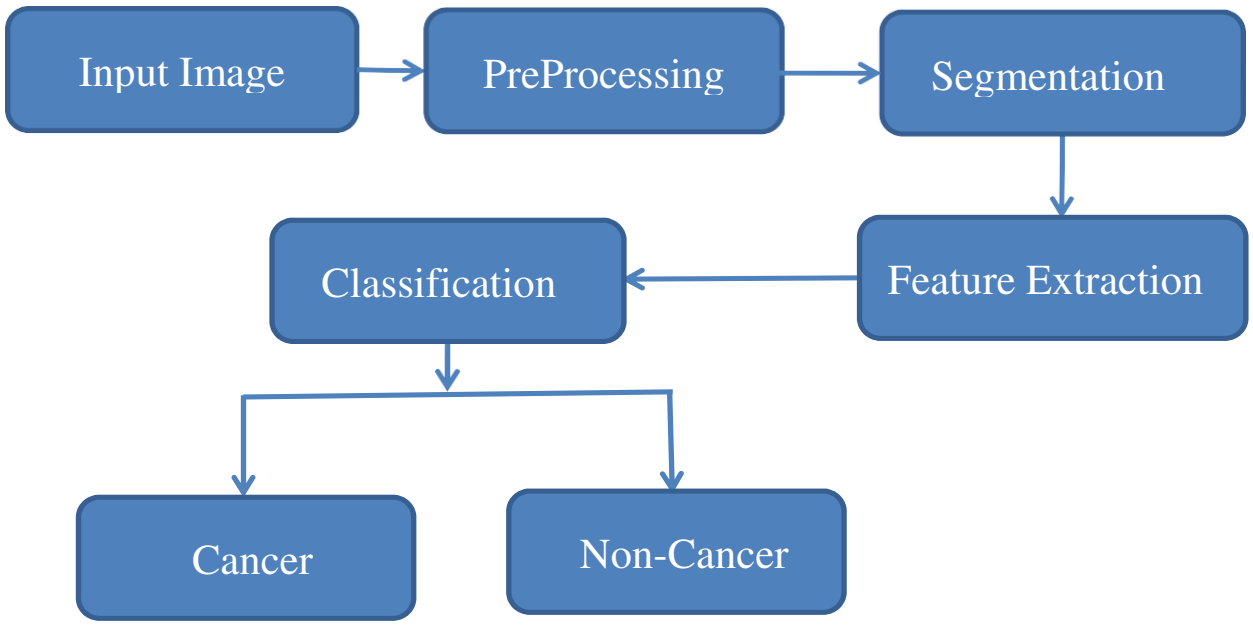
|| Volume 12, Issue 2, April 2024 ||

International Conference on Recent Development in Engineering and Technology – ICRDET 24

Organized by

Dhaanish Ahmed Institute of Technology, KG Chavadi, Coimbatore, Tamilnadu, India

BLOCK DIAGRAM:



VI. CONCLUSION

In the proposed system, Image Pre-Processing, Image Segmentation and Image Classification steps are performed for categorizing skin lesion images into cancer or non-cancer it is done by using automated extracted features by CNN images. Data augmentation technique is used in Convolutional Neural Network for increasing the number of images which leads to better performance of proposed method. Experimental results show an accuracy of CNN algorithm developed with data augmentation is higher than the CNN algorithm created without data augmentation. The proposed method detects cancers faster than the biopsy method. The proposed method can be extended to identify different types of skin related diseases.

VII. FUTURE ENHANCEMENT

Expanding the system to detect multiple types of cancers, future enhancements will also focus on evaluating its performance in terms of accuracy, sensitivity, and specificity across each cancer type.

VIII. SKIN CANCER PREDICTED RESULT

Our experimental results showcase the efficacy of the enhanced cancer detection system in accurately distinguishing between cancerous and non-cancerousskin lesions. Through rigorous training and validation, we observe improvements in key performance metrics, including accuracy, precision, recall, and F1 score. Visualizations such as training/validation accuracy and loss curves provide insights into the model's learning dynamics and convergence behavior. Furthermore, comparative analysis against baseline models or existing benchmarks highlights the significancour enhancements in advancing cancer diagnostics.

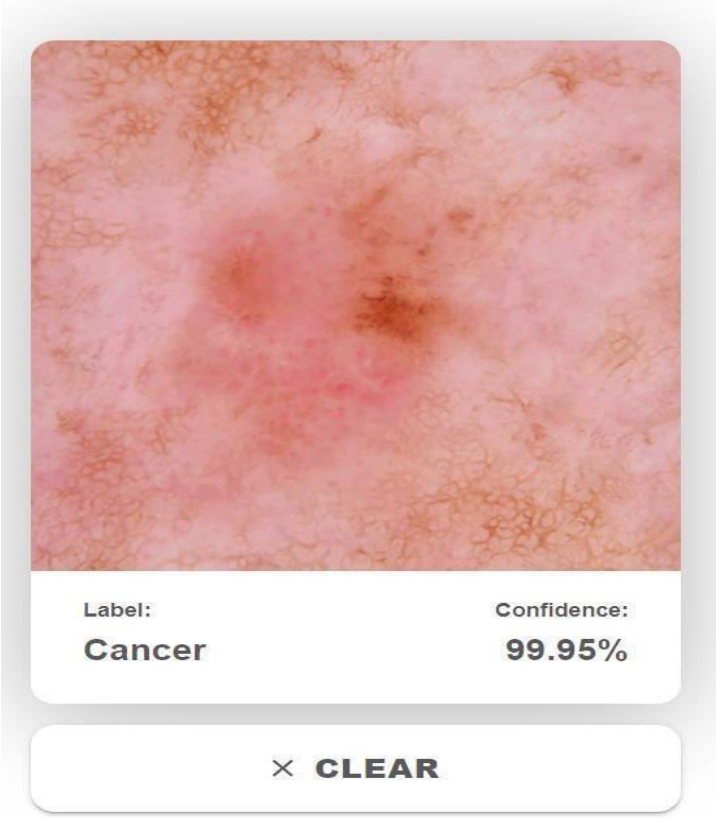
| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 | Monthly Peer Reviewed & Refereed Journal |

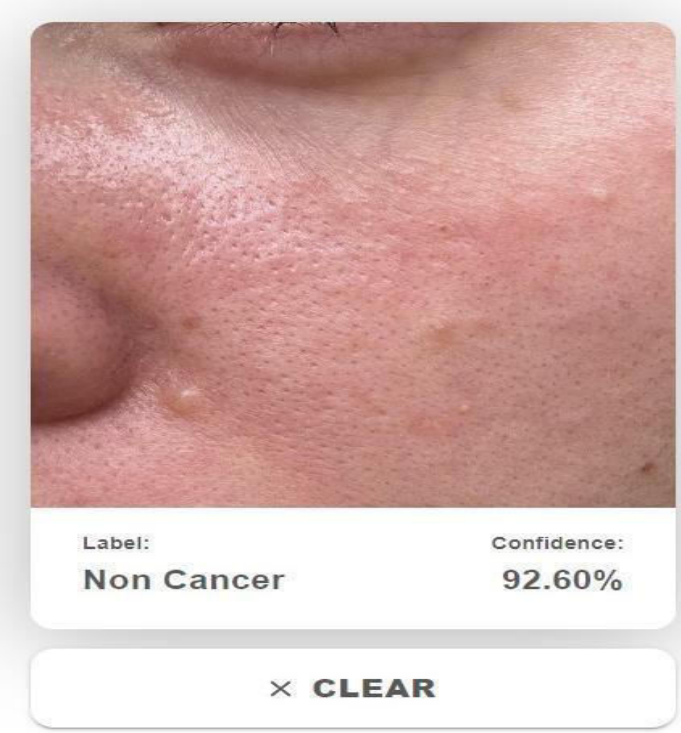
|| Volume 12, Issue 2, April 2024 ||

International Conference on Recent Development in Engineering and Technology – ICRDET 24

Organized by

Dhaanish Ahmed Institute of Technology, KG Chavadi, Coimbatore, Tamilnadu, India





REFERENCES

1.R Raja Sekar, Y Jagan Mohan Reddy, K Nani,C Sai Pratap Reddy,K Chiranjeevi,K Vikram,"SKIN CANCER PREDICTION USING DEEP LEARNING TECHNIQUE",(2023).

2.Tayyab Irfan, Abid Rauf, M Javed Iqbal,"SKIN CANCER PREDICTION USING DEEP LEARNING TECHNIQUES ,"(2023).

3.Nikita mali, Prajwal thawari, Udhay jawheri, Sulaxan Jadhav, "SKIN CANCER CLASSIFICATION",(2023).Manjunath H R,"SKIN CANCER DETECTION USING MACHINE LEARNING",(2023).

4.Mostafiz Ahammed, Md. Al Mamun, Mohammad Shorif Uddin,A "MACHINE LEARNING APPROACH FOR SKIN DISEASE DETECTIONAND CLASSIFICATION USING IMAGE SEGMENTATION",(2023).

5.Bhagyanie chathurika. Tharmika.R, "A MOBILE BASED SKIN DISEASE IDENTIFICATION SYSTEM", (2023).

6.Mr.MostafizAhammed, Mr.Al Mamunb, Mr.Mohammad ShorifUddin,"A MACHINE LEARNING APPROACH FOR SKIN DISEASE DETECTION AND CLASSIFICATION USING IMAGE PROCESSING",(2022).

7.Ms.Radhika, Ms.sruthimol kurianİ, "SKIN DISEASE PREDICTION USING MACHINE LEARNING," (2022).

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

INNO SPACE SJIF Scientific Journal Impact Factor

doi crossref

निस्केयर NISCAIR

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

9940 572 462 6381 907 438 ijircce@gmail.com

www.ijircce.com

Scan to save the contact details