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Machine Learning Algorithm for Detection of Deadliest Forms of Skin Cancer

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Abstract: *Skin cancer is one of the most growing types and dangerous cancer in the world. The early diagnosis of melanoma and other ski cancer is a critical issue for dermatologists. In this paper, we using Machine Learning Algorithm for Detection of Deadliest Forms of Skin Cancer. This project aims to develop a skin cancer detection ML Model which can classify the skin cancer types and help in early detection. The ML Model is developed in Dot Net (. Net). The model is developed and tested with different network architectures by varying the type of layers used to train the machine. Basically our model use DNN (Deep Neural Network) and ResNet50 for detection of skin cancer. The model will be tested and trained on the dataset collected from the International Skin Imaging Collaboration (ISIC).*

Keywords: Skin cancer, Melanoma, Machine learning, DNN (Deep Neural Network), ResNet50

I. INTRODUCTION

Dermatology is the branch of medicine that concerned with the diseases' diagnosis of skin, hair and nails, the skin is the most important part in the human body which protects the internal parts from the outside world. The skin cancer is the most important of these diseases; it can be growing at any part in the body and occurring from non-pigmented cells [1].Skin cancer is one of the most growing types and the most dangerous in the world of cancer; the important of these tumors is malignant melanoma, the rates of melanoma have been rising for at least 30 years.

The main risk of melanoma is could be spread entire the body by lymphatic vessels and blood vessels [2], thus the main strategy is the early diagnosis of melanoma and removal of thin melanoma; it is the most common cancer if diagnosed at an early stage can be cured without complications. Therefore, the early diagnosis of skin cancer and melanoma is a critical issue and the main challenges for dermatologists to reduce mortality and morbidity [3]. It is very difficult the diagnosis of skin cancer by naked eye using the features that recognize a benign from skin cancer when using the clinical practice.

Nowadays the computer technology in medical decision support is used widespread and pervasive across a wide range of medical area, such as cancer research, dermatology[4], thus the computerized methods analysis of dermoscopy images allows overcome various issues which help the dermatologist to take less time and high efficiency in diagnosis of skin cancer. It is important to develop of various computerized method for clinical diagnosis using machine learning system, which these system gives to dermatologist different analysis texture, pigmentation, colour by using classification methods.

II. METHODOLOGY

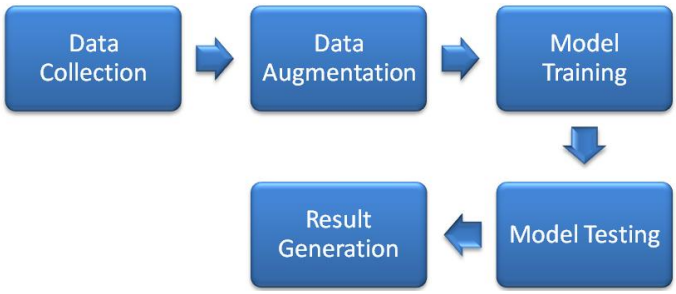

Figure 1: Methodology

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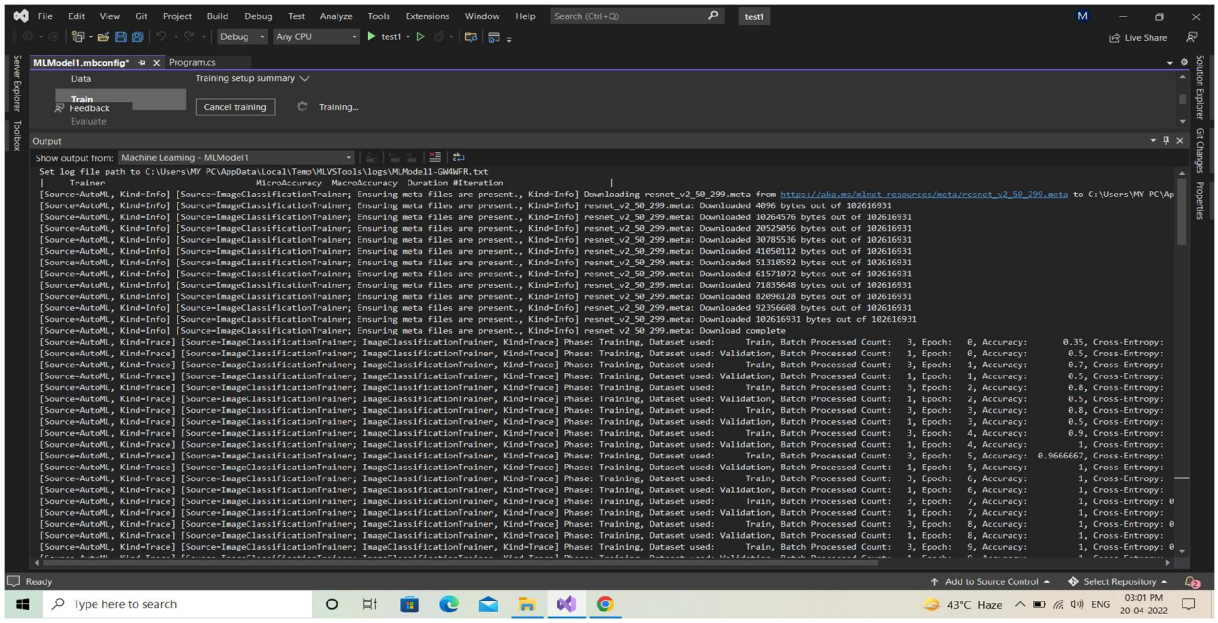
III. PROPOSED SYSTEM

The proposed system should be able to:

- **Data Collection:** For facilitating the computer-aided diagnosis related work on melanoma many datasets can be found online. The International Skin Imaging Collaboration (ISIC) is an academia and industry partnership designed to facilitate the application of digital skin imaging to help reduce melanoma mortality.
- **Data Augmentation:** Data augmentation is a strategy that enables practitioners to significantly increase the diversity of data available for training models, without actually collecting new data. Data augmentation techniques used to train large neural networks. As the modern neural networks contain millions of parameters, it takes a proportional amount of data to result considerable performance [5]. So, it is understandable that deep learning models require a large dataset of images to provide desired performance. But it is a wild goose chase to look for novel images in a huge quantity. Instead, minor alterations to the existing data will pull the trick. A poorly trained neural network considers these slightly modified images as distinct ones.
- **Mode Training:** As the modern deep neural networks require millions of images to train the entire model, it is inconvenient to collect that amount of data for a particular task. Therefore, a method called transfer learning has been getting attention for training a deep neural network with a limited amount of data. Transfer learning is the method of taking a pretrained model and fine-tune the model with a smaller dataset. ResNet-50 is a deep neural network that is 50 layers deep. You can load a pretrained version of the network trained on more than a million images from the ImageNet database [6]. The pretrained network can classify images into 1000 object categories



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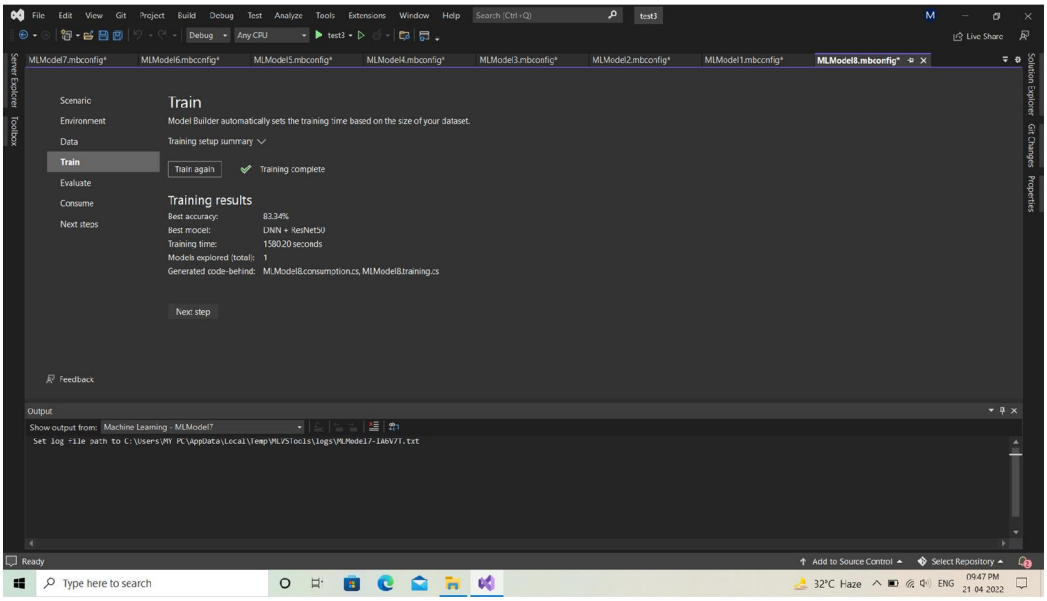
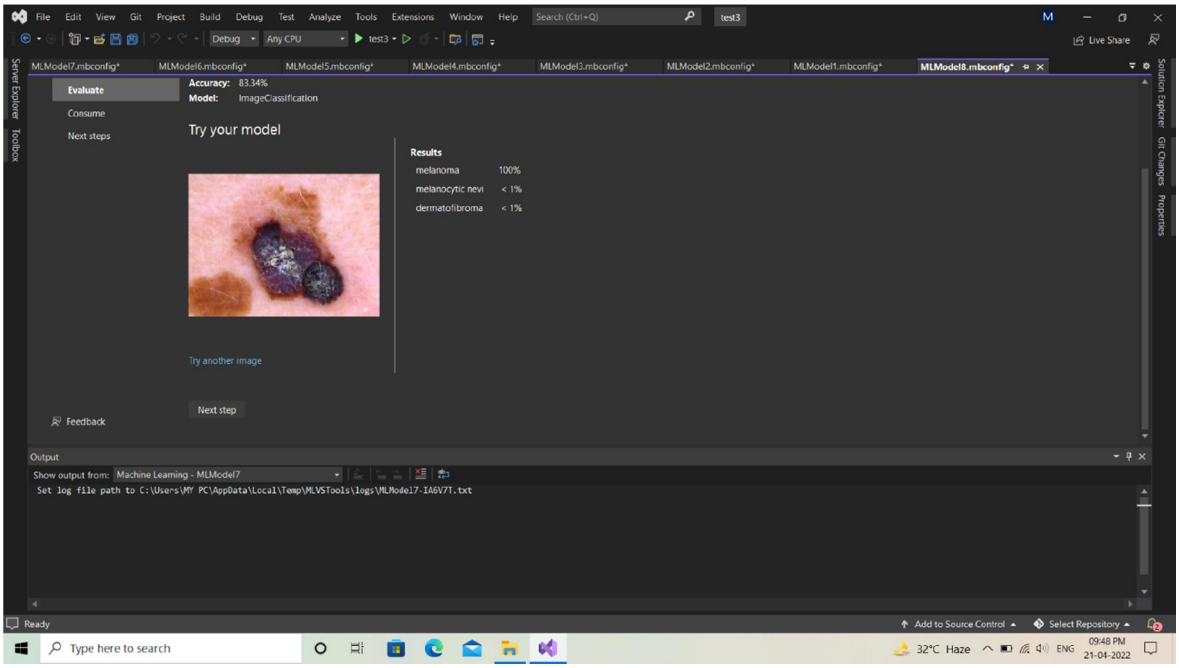


Figure 2: Model Training

- **Model Testing:** This step utilizes the weights achieved from training step to predict the classes for the images in the test-set. As the training has been done using a five-fold cross validation approach, ML Model needs to execute the testing in the similar manner. ML Model also provides an option for the researcher to visualize the detection on test data. In this work, this monitoring approach has been proved to be useful for finding the difficulties the model is facing while going through this test-phase. For example augmentation had been found to generate some artifacts in the augmented data which was hurting the performance of the model.

IV. Result Generation

In this MLModel shows the result by analysing and evaluating the image. For every sets of observation, the observation with the highest sensitivity value while keeping the specificity and accuracy above 80.00%, has been chosen as the best one.



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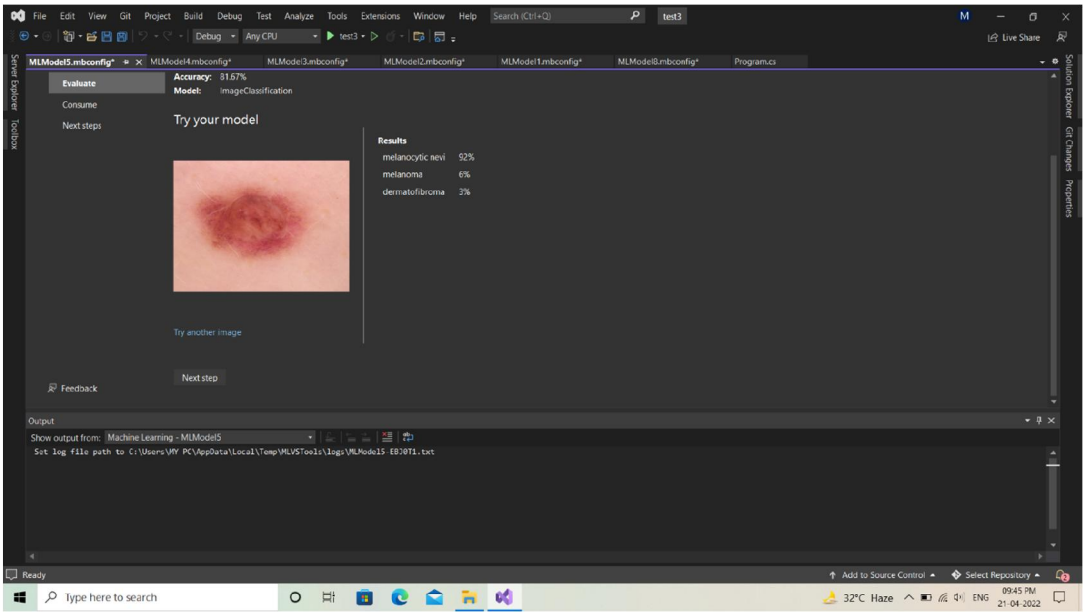

Figure 3: Result Generation

V. CONCLUSION

The proposed work was aimed to develop a model for detecting melanoma, Melanocytic and Dermatofibroma in images by using a deep learning model. By the end of this work, a model, named "ML Model", has been developed. ML Model uses the DNN and ResNet50 network as the architecture for the deep learning model. An available dataset of dermoscopic images, provided by International Skin Imaging Collaboration (ISIC), has been utilized to train and evaluate the performance of MelNet on the dermoscopic data. The digital dataset, provided by ISIC, has been used to train and analyse MelNet's performance on the digital data. Every image from the datasets was annotated according to the clinical classification of the mole. For making the system robust, the data was augmented by operating several augmentation methods.

During the training phase,

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REFERENCES

[1]. K. Korotkovand R. Garcia, "Computerized analysis of pigmented skin lesions: A review", Artificial Intelligence in Medicine, 56 (2),2012,pp. 69–90.

[2]. J. Scharcanski, M. E. Celebi and S. Service, "Online. Computer Vision Techniques for the Diagnosis of Skin Cancer", 2014, pp. 193–219.

[3]. L. Li, Q. Zhang, Y. Ding, H. Jiang, B. H. Thiers and J. Z. Wang, "Automatic diagnosis of melanoma using machine learning methods on a spectroscopic system", BMC Medical Imaging, 14 (1),2014, 36

[4]. E. Barati, M. Saraee, A. Mohammadi, N. AdibiandM.R. Ahamadzadeh, "A Survey on Utilization of Data Mining Approaches for Dermatological (Skin) Diseases Prediction", Journal of Selected Areas in Health Informatics, 2 (3),2011,pp. 1–11.

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[5]. L. Perez and J. Wang, "The Effectiveness of Data Augmentation in Image Classification using Deep Learning," Dec. 2017.

[6]. ImageNet. http://www.image-net.org