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MELANOMA DETECTION USING DEEP LEARNING

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Abstract: Melanoma is considered as one of the fatal cancer in the world, this form of skin cancer may spread to other parts of the body in case that it has not been diagnosed in an early stage. Thus, the medical field has known a great evolution with the use of automated diagnosis systems that can help doctors and even normal people to determine a certain kind of disease. In this matter, we introduce a method for melanoma skin cancer detection that can be used to examine any suspicious skin. Our proposed system rely on the prediction of different methods: A convolutional neural network and trained with a set of features describing the borders, texture and the color of a skin lesion. This method is then combined to improve their performances using RESNET15v2. The experiments have shown that using the method together, gives the highest accuracy level.

Melanoma remains the most harmful form of skin cancer. Convolutional neural network (CNN) based classifiers have become the best choice for melanoma detection in the recent era. The research has indicated that classifiers based on CNN classify skin cancer images equivalent to dermatologists, which has allowed a quick and life-saving diagnosis. Moreover, proposed taxonomy for melanoma detection has been presented that summarizes the broad variety of existing melanoma detection solutions. Lastly, proposed model, challenges and opportunities have been presented which helps the researchers in the domain of melanoma detection.

Keywords: Melanoma Image, Deep Learning, Convolutional Neural Network, Feature Extraction

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1. INTRODUCTION

The report of the world health organization (who) shows that cancer is one of the world's leading causes of death. It predicts that in the next two decades, the number of people diagnosed with cancer will be double. Death rates caused by cancer can be reduced if the cancer is detected and treated in the early stages. Investing research effort in the development of early cancer detection strategies is the primary concern of researchers. The most harmful form of skin cancer is melanoma. It has been ranked at the ninth position among the most common cancer. More than 132,000 cases have been diagnosed every year. A report published in 2019 by the American cancer organization estimates that 192,310 people were diagnosed with melanoma in u.s. Over the past 30 years, melanoma cases have been gradually increasing like other cancer cases. A minor surgery can increase the chances of recovery if the melanoma is diagnosed in the early stages. Melanoma cases have been gradually increasing like other cancer cases. A minor surgery can increase the chances of recovery if the melanoma is diagnosed in the early stages. Dermoscopy is one of the dermatologists' most popular imaging techniques. The study mainly focused on the classical deep learning workflow which consists of preprocessing, segmentation, extraction of features, and classification. Moreover, a decent level of expertise necessarily required for the extraction of features from cancerous images. A poor segmentation can lead to bad feature selection which decreases the accuracy of classification.

In 2016 a transition occurs in the field of skin lesion classification techniques. 2016 indicate this transition. The research contributors didn't apply conventional machine learning algorithms rather they all used a technique of deep learning: convolution neural networks (cnn). Few techniques for skin cancer detection using images. This study was not limited to melanoma detection, it provides an over about different types of cancers that use images for their diagnosis.

2. DESIGN

Melanoma detection using deep learning project of detecting skin cancer . Deeping is methods have been demonstrated successfully on detection problems given their ability to automatically learn higher-order features also it handles large data sets. The recent advancement of deep learning makes it possible to perform automatic high-level feature extraction thus achieves promising performance in many areas. In proposed system, we need to preprocess the data and save the data set and the data set is which is feeding the preprocessed data is to send in convolution neural network and we get train model. We need to saved the model now prediction of melanoma has started.Using Deep Learning, to design an intelligent imaging-based skin lesion diagnosis system Achieve (or improve upon) results for skin lesion classification and Evaluate the impact of skin lesion segmentation on the accuracy of the classifier.

In the future, there will be a lot of use with this application. It is used to detect the melanoma diseases. It is very helpful for the hospital and people to save their life.

We should drawn to Deep learning based on Convolutional Neural Networks, wherewith segmentation, classification and detection for melanoma diseases have been implemented. Initial we have images in a dataset using the Convolutional Neural Network technique, and based on a ResNet152 structure, which classifies lesions as either melanoma or not

3. Figure

3. ANALYSIS

The melanoma detection using deep learning has been solved in this application. The algorithm in this application generates the result whether the skin is detected as melanoma or not. If it is not melanoma which type of disease it was.

An important outcome of preliminary investigation is the determination that the system request is feasible. This is possible only if it is feasible within limited resource and time. The different feasibilities that have to be analyzed are

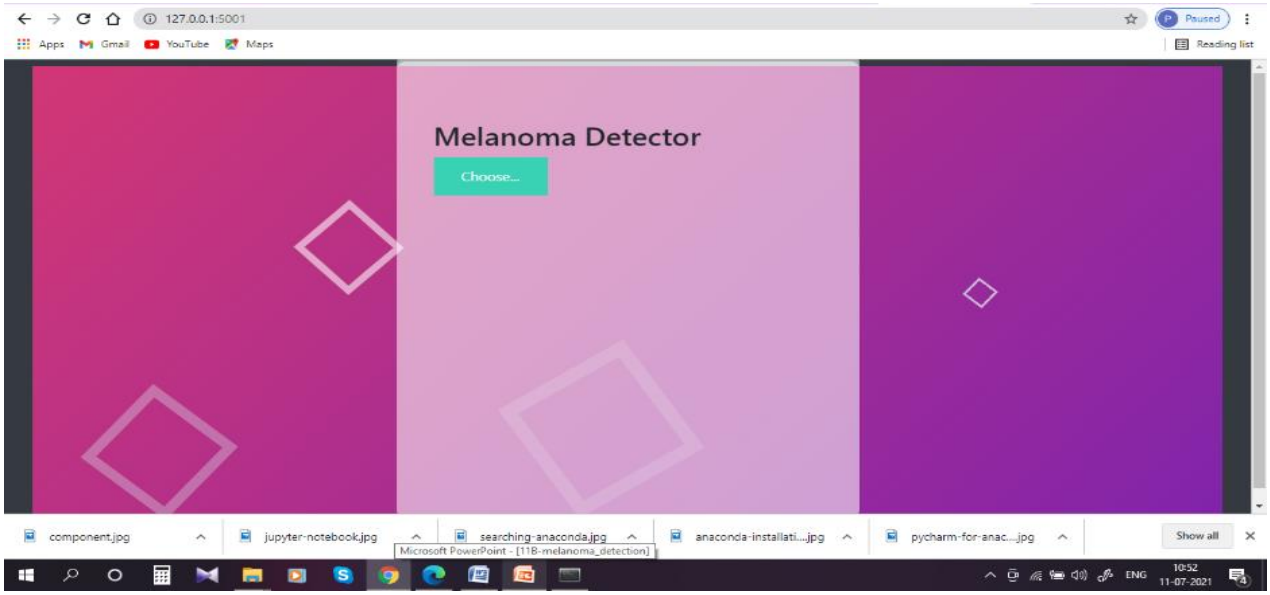
OPERATIONAL FEASIBILITY: Operational Feasibility deals with the study of prospects of the system to be developed. This system operationally eliminates the manpower and effectively tracking the project progress. This kind of automation will surely reduce the time and energy, which previously consumed in manual work. Based on the study, the system is proved to be operationally feasible.

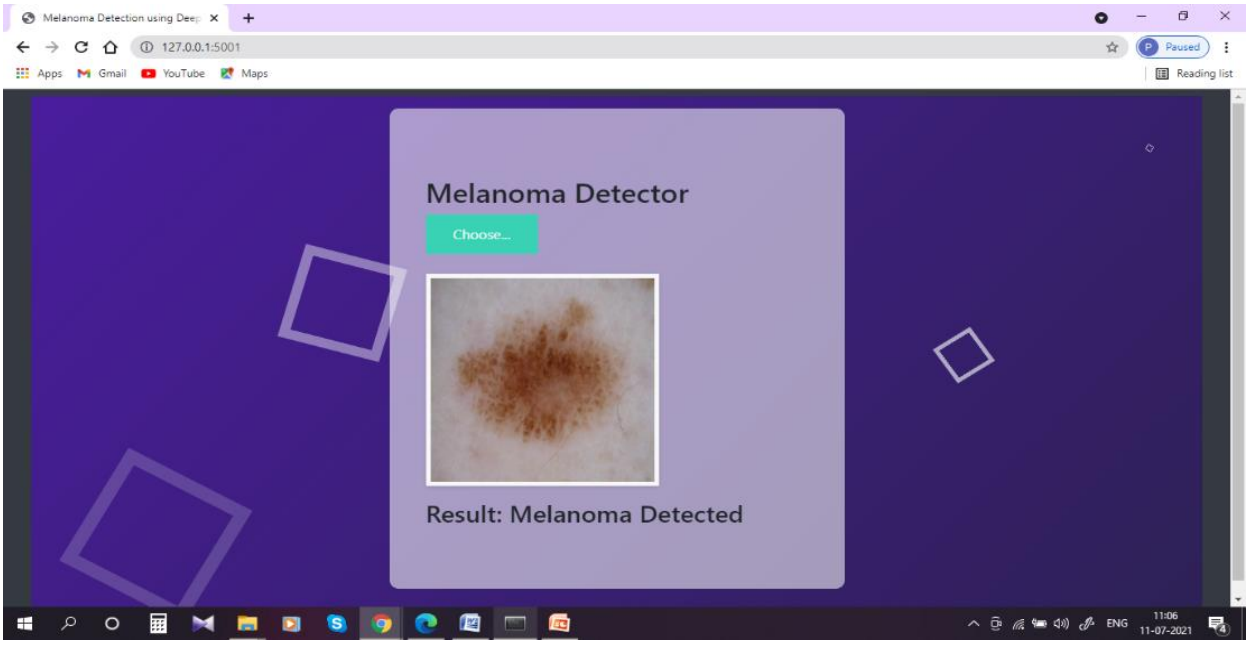
ECONOMIC FEASIBILITY: Economic Feasibility or Cost-benefit is an assessment of the economic justification for a computer based project. As hardware was installed from the beginning & for lots of purposes thus the cost on project of hardware is low. Since the system is an ML based.so the project is economically feasible.

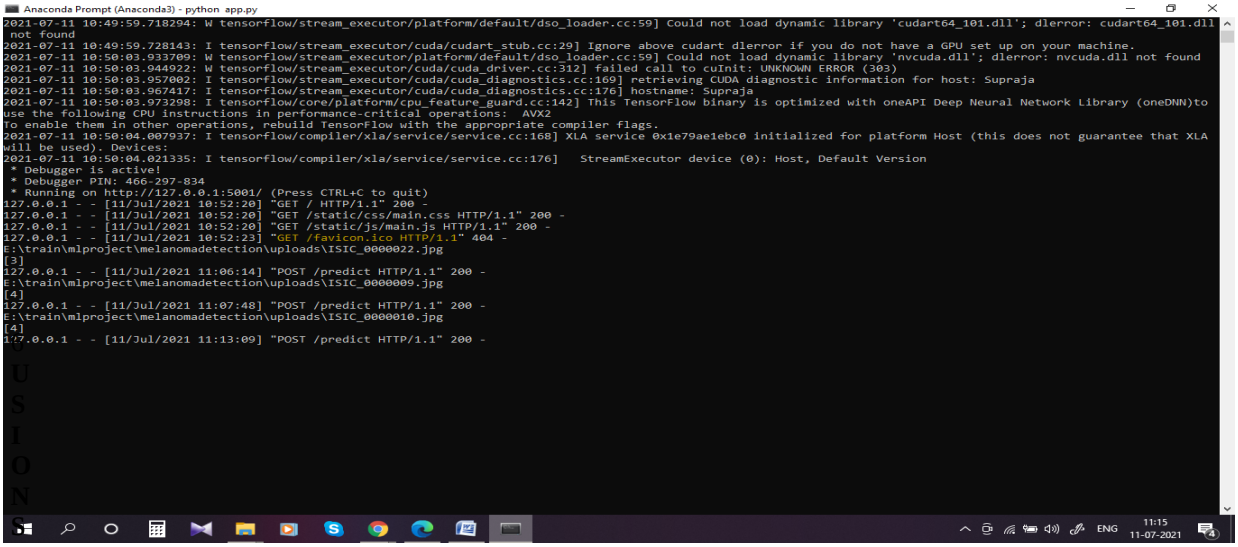
TECHNICAL FEASIBILITY: Technical Feasibility is the assessment of the technical resources of the organization. The organization needs MIT App inventor online tool which consist languages of blocks code. The technical feasibility has been carried out. The system is technically feasible for development and can be developed with the existing facility.

4. RESULTS

Training and testing of the proposed model was carried out using the dataset. On the test data set, the proposed model achieves an increase in accuracy 84% respectively, with respect to the best accuracy and the best sensitivity/specificity ratio reported to date for melanoma detection in this challenge. Additionally, unlike previous models, the specificity and sensitivity achieve a high score. simultaneously, which indicates that the model is good for accurate discrimination between melanoma or not.







6.Conclusion

In conclusion, A practitioner can use the model- driven architecture and quickly build the deep learning models to predict skin cancer. In our project we get better accuracy i.e. 84 %. To reduce skin cancers in the population, people must get the information they need to make informed choices about sun protection, policies must support these efforts, youth must be protected from harms of indoor tanning, and adequate investments need to be made in skin cancer. Achieving these goals will not be a small task. It will require dedication, ingenuity, skill, and the concerted efforts in prevention across many different sectors.

Our project can predict the following skin cancer abnormalities

- vascular lesion
- seborrheic keratosis
- nevus
- dermatofibroma
- actinic keratosis
- squamous cell carcinoma
- pigmented benign keratosis
- basal cell carcino

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