Detection of Melanoma Skin Cancer

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Abstract – Dermatology diseases are one of the biggest medical issues in 21st century due to its highly expensive and complex diagnosis. There are two types of skin cancer – Melanoma and Non -melanoma. Early detection of this fatal Melanoma skin disease increases the curing rate to 90%. In recent times Computer vision can play important role in Medical Image Diagnosis and it has been proved by many existing systems.

I. INTRODUCTION

SKIN- Jack of all trades meaning it performs various tasks like protects the body by covering all the muscles and other tissues, maintaining the body optimal temperature in extreme climatic conditions, helps as an excretory organ removing wastes through sweating. The presence of melanocytes in a body part causes Melanoma. Our task is mainly centered around detection of this lethal type of malignant growth. Melanoma can be detected by straightforward visual assessment known as ABCDE examination where A stands for ASSYMETRIC cancerous mole tend to be irregular in shape. B stands for BORDER it appears to be ragged and notched while C stands for COLOR includes uneven shades of colors. D stands for DIAMETER if a mole becomes larger than one-quarter of an inch it is cancerous and E stands for EVOLVING change in mole's appearance over weeks or months can also be a sign. But high similarity between different types of skin lesions makes a visual assessment difficult and leads to wrong investigation. Therefore, an automated system is required to ease out the skin lesions classification.

II. METHODOLOGY

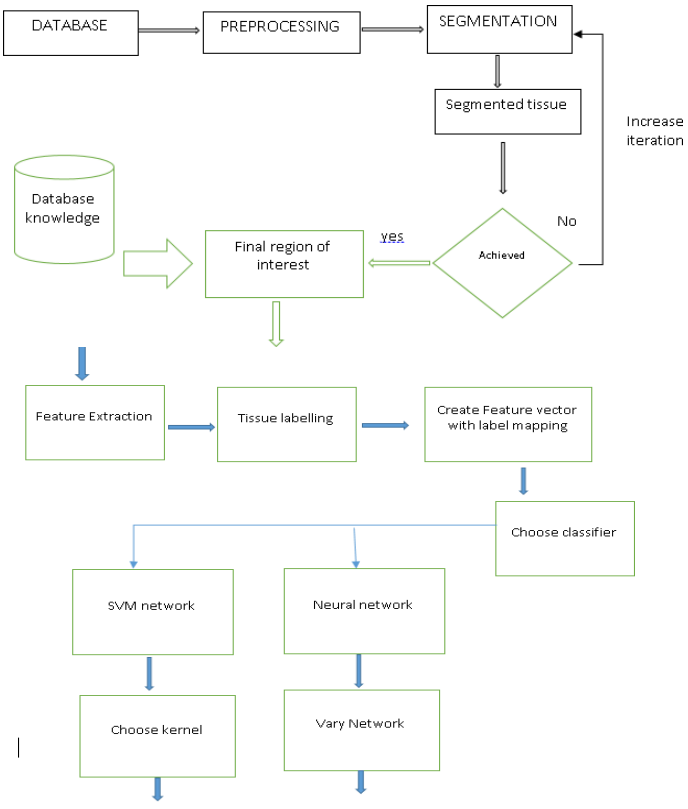
The system consists of four stages:

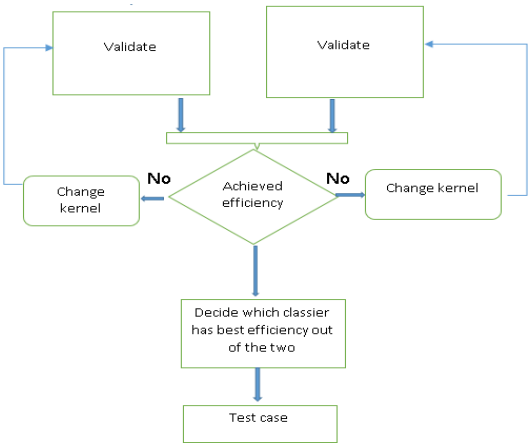
1. Image Pre-processing: Pre-processing techniques includes Removal of noise and undesired structures from the images and Rescaling the pixels to standard form.
2. Image Segmentation: In this step,
   To segment and localize the lesion and Improves the affected area and isolates from normal skin.
3. Feature Extraction**:** It is the most important step. Here features such as asymmetric, border, colour, diameter etc of the lesion are extracted for classifying the image.
4. Image Classification**:** Finally, the dimensionality of the selected feature is supplied to an Artificial Neural Network and Support Vector Machine classifiers for classification.

III. TECHNIQUE

Our system will undergo training and testing phases. This is done using the Convolutional Neural Network and Support Vector Machine techniques.

Train case:





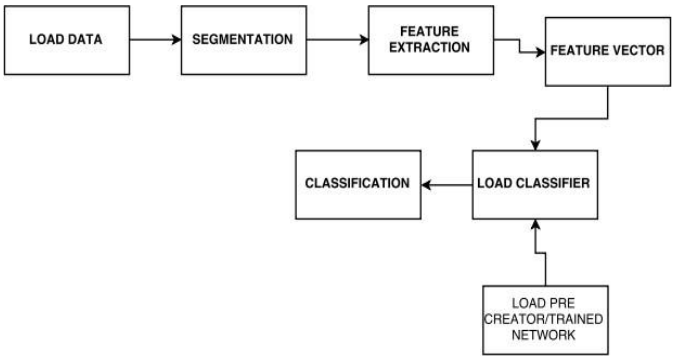
Support Vector Machine:
SVM (Support Vector Machine) is a supervised machine
A learning algorithm that is used primarily to classify information into various classes. SVM, unlike most algorithms, uses A hyperplane that acts like a boundary of decision between the different classes. It is possible to use the SVM to generate multiple separating hyperplanes in such
a way that the information is split into the segments and each segment only contain one type of information.

SVM's features are as follows
1. SVM is an algorithm for supervised learning. It ensures that on a collection of labeled files, the SVM trains. SVM investigates the labelled training knowledge and then categorizes any new data focused on what the training process learned.
2. A key benefit of SVM is that it can be used for both problems of classification and regression. Although SVM is the SVR (Support Vector), known primarily for classification, Regressor) is used for issues of regression.
3. By using SVM, SVM can be used to classify non-linear data

We use SVM in this project to recognize the malignant and benign pictures of skin cancer, achieved by transferring the segmented images and extracted features into SVM where the SVM writes the hyperplane and groups all close by characteristics in various groups.

Convolutional Neural Network (CNN):
Neural networks with a particular architecture are CNNs that in areas such as photos, it has been shown to be very strong Acknowledgement and classification. CNNs have been shown to better recognize faces, objects, and traffic signs than humans and can therefore be used in robots and cars that drive by themselves. The secret strata of CNN have a particular architecture. Each layer is in standard neural networks. A collection of neurons and a single neuron of a layer are created linked to each neuron in the preceding layer. This is the architecture of secret layers on CNN is slightly different. The neurons in the layer are not connected to all the neurons in the previous layer; rather they are linked to a single layer by a small number of neurons.

Test case:



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