Hackathon: Atheneum

Team Name: Supervised Learners

Track Selected: AI for Healthcare

Team Members:

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Project Name -: Assessment of Human Skin Burn using Deep Learning and Transfer Learning Techniques

Problem Statement -:

Skin Burn is a vital skin problem which is often ignored and not taken care of in its early stages, this is due to the unawareness regarding the detection of different degrees of skin burn.

Our project aims to propose a solution for the same. With the help of image classification our Deep learning model will train images of different degrees of skin burn (Degree0, Degree1,Degree2) and will help the user identify the degree of skin burn they are suffering with.

Project Overview:

Burn injuries are also one of the main cause of dying among unintentional deaths, which might be themselves the third leading purpose of demise globally. Early and proper treatment is needed to forestall the degeneration of the organs and allow a complete recovery. Affected person recovery and recovery of burn wounds are of paramount significance that depends on effective and well timed evaluation.

A timely evaluation gives an avenue for a selection to be made as early as possible, whether surgical treatment (skin grafting) is needed or now not. This may ensure shorter medical institution live, decreased costs and lesser chance of health

center acquired headaches. Burns are assessed clinically by using statement because of its availability and lesser diagnostic value.

However, experts frequently misguide those early treatments due to the strain and exigency of emergency situations.

This has triggered the improvement of artificial clinical assistants, which might be used to song the physicians' methods. Successful and proper remedy is primarily based on an correct analysis of damage depth and the motive of the burn. Burn location, intensity, and vicinity are the figuring out factors for the injury intensity.

Abstract:

Correct assessment of skin burns is a difficult activity because of diagnostic challenges faced with traditional visible assessment strategies. At the same time visual assessment, it is the most significant method of evaluating burns globally but specialised dermatologists(skin doctors) are not readily available in most backward locations and assessment are fairly subjective.

The use of other technical gadgets consisting of Laser Doppler Imaging is incredibly expensive at the same time as charge of occurrences is high in low- and center-earnings countries. These necessitate the need for robust and fee-effective assessment techniques thereby acting as an low cost opportunity to human knowledge.

Purpose:

Accurate assessment of burns is increasingly sought due to diagnostic challenges faced with traditional visual assessment methods. While visual assessment is the most established means of evaluating burns globally, specialized dermatologists are not readily available in most locations and assessment is highly subjective. The use of other technical devices such as Laser Doppler Imaging is highly expensive while rate of occurrences is high in low- and middle-income countries. These necessitate the need for robust and cost-effective assessment techniques thereby acting as an affordable alternative to human expertise.

Methodology:

There are several existing pre-trained models that we will be using for transfer learning for example, VGG16, VGG19, ResNet50, InceptionV3 etc. for image classification purpose

For the problem domain, we will be utilised a basic CNN model and various transfer learning techniques i.e- pre-trained model for classification purpose. Our methodology will also use a fine-tuning approach in which initial layers of these models will be frozen to extract useful features, and subsequently, top-most substituted layers will be trained using those features from the initial layers.

In the end we will build a simple web application using Flask, HTML, CSS and JS in which the user would choose a burn image and the model would give accurate prediction regarding the same.

Tec-Stack:

Model Building: Tensorflow, Pytorch, Keras, Matplotlib, Flask, Gradio, Numpy

Deployment: HTML, CSS, Java Script.

Note: You can click on the link below and check for the Final project made by the team which shows the accuracies and prediction of the project :

https://github.com/madhur2218/Hackathon_Atheneum