

IDEA PROPOSAL

Problem or Idea Description

The main idea of this project is to build a machine learning model that can categorize skin lesions based on the images. Early and accurate detection of skin diseases is very important, by doing this many lives can be saved thanks to early medical treatment. Successful implementation of such model is not only demonstrative exhibition of what machine learning is capable of, but also, it might be a great contribution to the world of medicine.

Background Information on the Problem or Idea

Skin Lesion is a growth or appearance of the skin that is abnormal concerning the surrounding skin.

Skin Lesion Classification is a great challenge in medical analysis which demands the model to extract unique patterns and features of different skin conditions. Aim of this project is to create a CNN (convolutional neural network) in order to classify skin diseases based on their visual peculiarities.

Available Solutions with Links

There are plenty of models that successfully completed the task of skin lesion image classification, here are the links for the best two:

1) FixCaps: An Improved Capsules Network for Diagnosis of Skin Cancer

[[FixCaps: An Improved Capsules Network for Diagnosis of Skin Cancer | Papers With Code](#)]

2) Attention-based-Skin-Cancer-Classification

[[Soft-Attention Improves Skin Cancer Classification Performance | Papers With Code](#)]

How to Get the Data?

The dataset, which consists of 10000 images of seven various skin lesions which have been diagnosed based on expert consensus, is available on [[HAM10000 Benchmark \(Lesion Classification\) | Papers With Code](#)].

Brief Description of Your Solution

We are planning to do Skin Lesion Classification by using TensorFlow, a popular machine learning framework. On top of that, ML library - Keras and NumPy library for mathematical operations will be used in various ways.

Primary steps in our project: Setting up data, Preparing Data (The dataset is going to be split into training, evaluation and testing sets), Building the model, Compiling, Training, Evaluating and Testing. Additional steps include improving and exporting our newly built CNN model on website.

Tech Stack That Will Be Used

Python 3.12.1 (Programming Language)

Google Colaboratory (Jupyter notebooks with GPU support)

TensorFlow (open-source machine learning framework)

Keras (high-level neural network API)

NumPy (for mathematical operations)

Matplotlib (for data visualization)

(and other additional libraries)

Necessary Information

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