SkinScan

Fall 2022

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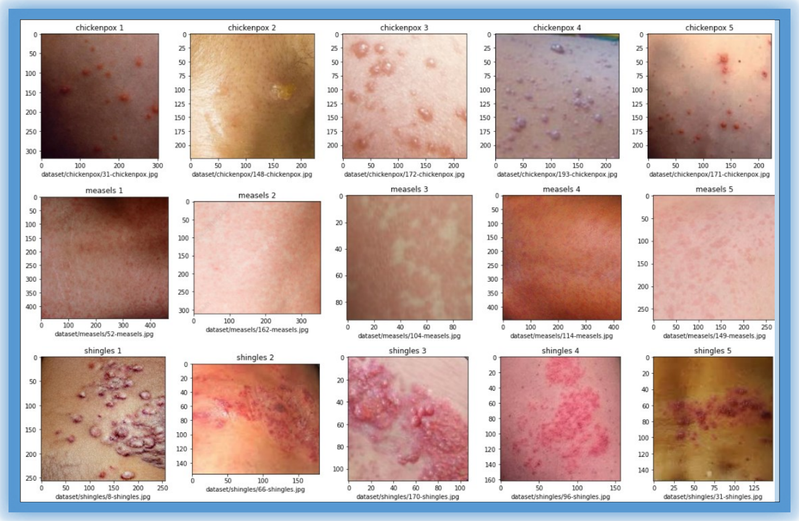
Overview

SkinScan is a tool that uses a self trained model to identify skin diseases. The idea came during the emergence of Monkeypox, a new viral disease. With skin diseases, I believe that machine learning can be a vital medical tool in helping people identify what disease they may have. My model can currently predict chickenpox, measels, and shingles. I also decided to challenge myself and deploy an app using this model where users can submit images and get results based on the models prediction. All the tools and languages for this project were new topics for me, it was a great learning experience.

TensorFlow · Keras · Python · Pandas · React Native · JavaScript

Machine Learning Model



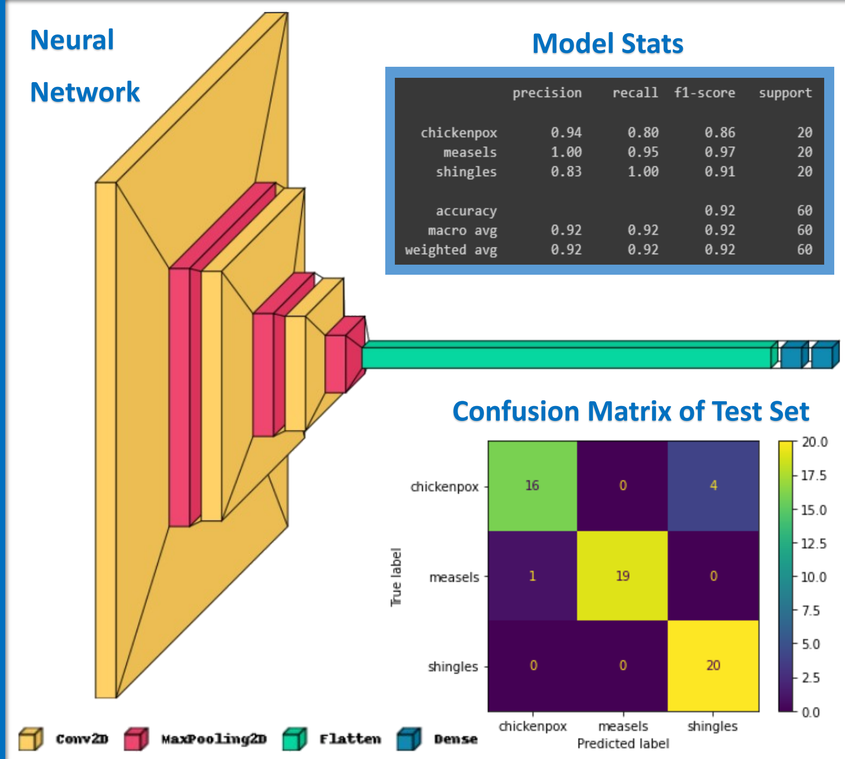
Gathering Data The images to train and test the model were scrapped from multiple search engines. A good emphasis was placed on making sure each class for the dataset had a wide distribution of different lighting conditions and skin pigmentations for equal representation.

Building The Model

After loading the images into the dataset, I then split the dataset into training, validation, and testing sets. I developed a model using TensorFlow and Keras, tweaking it to get the best results. This process of refining the model took a lot of trial and error, but by understanding the flaws in my dataset and neural network I was able to slowly improve my model. I eventually achieved a model that can accurately predict images correctly ~90% of the time. Being satisfied with this, I then exported my model for use in deploying the application.

```
model.save("PythonModel/pox.h5")
```

Neural Network

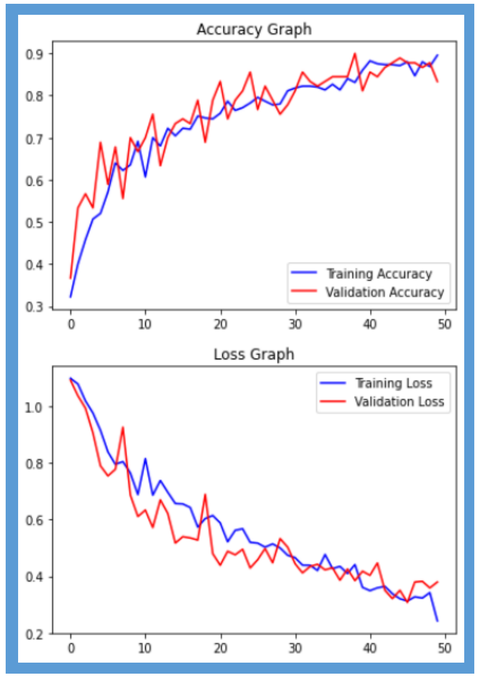


Model Stats

	precision	recall	f1-score	support
chickenpox	0.94	0.80	0.86	20
measels	1.00	0.95	0.97	20
shingles	0.83	1.00	0.91	20
accuracy			0.92	60
macro avg	0.92	0.92	0.92	60
weighted avg	0.92	0.92	0.92	60

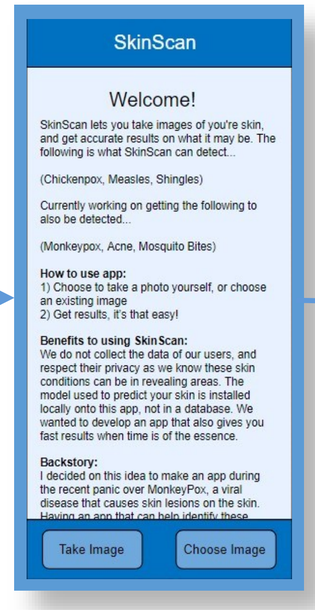
Confusion Matrix of Test Set

Model Performance over Time



Application

Home



I decided to deploy it to an application using React Native and JavaScript. I wanted users to be able to easily take a picture or choose an image from their photo library and get results based off of my model, which is loaded locally into the application.

Image

Results

Mockup

My goal for the app was to display the confidence of the users image for each of the three different diseases. This goal of mine fell slightly short due to time constraints, but I plan to continue working on this project and improving both the model and the application in the future