

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.













SkinScan Fall 2022

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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.

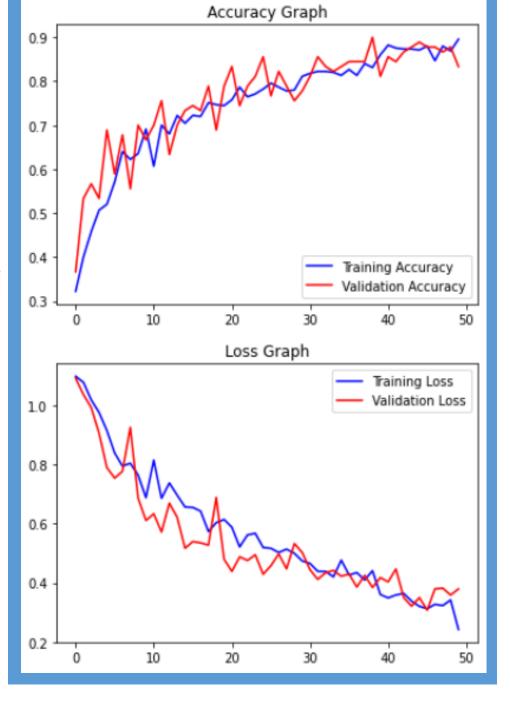
Building The Model

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 **Model Stats Network** recall f1-score chickenpox 0.80 0.95 0.97 20 20 1.00 0.91 shingles 0.92 accuracy 60 60 0.92 0.92 macro avg 0.92 0.92 0.92 ighted avg **Confusion Matrix of Test Set** - 17.5 chickenpox 12.5 19 10.0 measels 5.0 shingles shingles measels 📶 Conv2D 📶 MaxPooling2D 📶 Flatten 📶 Dense

Model Performance over Time



Application

I decided to deploy it to an

application using React Native

be able to easily take a picture

or choose an image from their

based off of my model, which is

photo library and get results

loaded locally into the

application.

and JavaScript. I wanted users to

Home

SkinScan Welcome! SkinScan lets you take images of you're skin, and get accurate results on what it may be. The following is what SkinScan can detect... (Chickenpox, Measles, Shingles) Currently working on getting the following to also be detected...

(Monkeypox, Acne, Mosquito Bites)

an existing image

2) Get results, it's that easy!

Benefits to using SkinScan:
We do not collect the data of our users, and respect their privacy as we know these skin conditions can be in revealing areas. The model used to predict your skin is installed locally onto this app, not in a database. We wanted to develop an app that also gives you fast results when time is of the essence.

) Choose to take a photo yourself, or choose

Backstory:
I decided on this idea to make an app durin
the recent panic over MonkeyPox, a viral
disease that causes skin lesions on the skir
Having an app that can help identify these

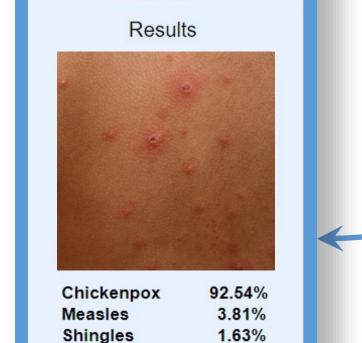
Take Image Choose Image

SkinScan

Image



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



Results

Above is the models confidence in your image being on of the following diseases. These results are not always true, speak to a doctor if you have concerns about your skin. Taking multiple images in good lighting conditions may give you better results

Mockup