

Capstone Project Weekly Progress Report

Semester	Fall 2022
Course Code	AML 2404
Section	Section 2
Project Title	Skin Diseases Classification using Deep Learning
Group Name	G
Student names/Student IDs	Tomson George (C0857730) Praveen Mahaulpatha (C0860583) Thulana Abeywardana (C0861333) Jaskaran Singh Moti (C0860026)
Reporting Week	Week 11 (20 November 2022 to 26 November 2022)
Faculty Supervisor	William Pourmajidi

1. Tasks Outlined in Previous Weekly Progress Report

Task 01: Improving Model performance of Model 02

Responsible: (Thulana)

Added more images to address the imbalances of the dataset. The model was trained using different hyperparameters

Task 02: Integrate “model 02” with the application and show the skin disease name instead of showing the array index

Responsible: (Tomson)

The model ‘model02’ was integrated with the flask application, and the code was modified to display the corresponding disease name instead of showing array indexes.

Task 03: Work on representations for the latest model using Plotly

Responsible: (Jaskaran)

For the previous week, we did check for 20 epochs. This week for the updated version of our model, we plotted the graph for 50 epochs showing accuracy and loss using plotly. Trained it for all 141 epochs but was getting errors at the time of loading the saved model. Again saved the model for 50 epochs.

2. Progress Made in Reporting Week

Task 1 : Improving Model performance – Model 02

The model was trained by removing the dropout layers under the following parameters:

Layer	Kernels	Filter Size	Activation Function	Shape / Other parameters
Input Layer				(224,224,3)
Random flip				horizontal_and_vertical
Random rotation				0.2
RandomZoom				height_factor= 0.5, width_factor = 0.2
Convo2D	32	3*3	“relu”	
MaxPool2D				
Convo2D	64	3*3	“relu”	
MaxPool2D				
Convo2D	128	3*3	“relu”	
MaxPool2D				
Convo2D	64	3*3	“relu”	
MaxPool2D				
Flatten				
Dense				128
Dense				256
Dense				64
Dense				32
Output Layer				4

Table: 2.1

Parameter	Value
Learning Rate	0.01
Epochs	30
Loss Function	SparseCategoricalCrossentropy (logits = False)

Table: 2.2

Following results were observed:

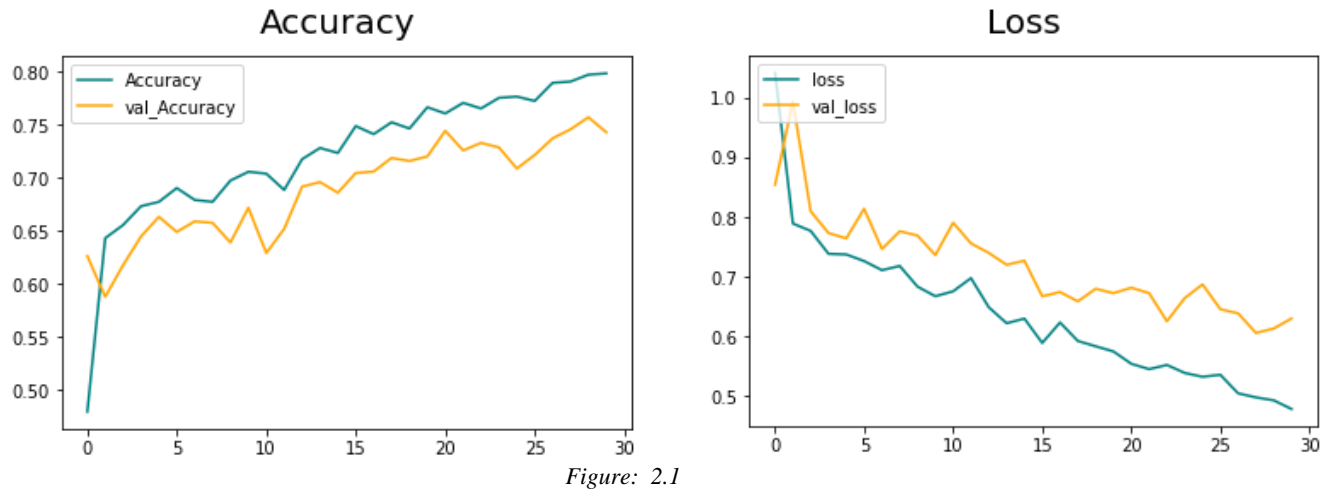


Figure: 2.1

	precision	recall	f1-score	support
Melanoma	0.39	0.29	0.33	220
Nail_Fungus	0.43	0.44	0.43	291
Viral_Infections	0.27	0.33	0.30	193

Figure: 2.2: - Classification Report

Step 2:

Hyper parameres were kept as Table 2.1 and the model was trained for 200 epoches:

Parameter	Value
Learning Rate	0.01
Epochs	200
Loss Function	SparseCategoricalCrossentropy (logits = False)

Table: 2.3

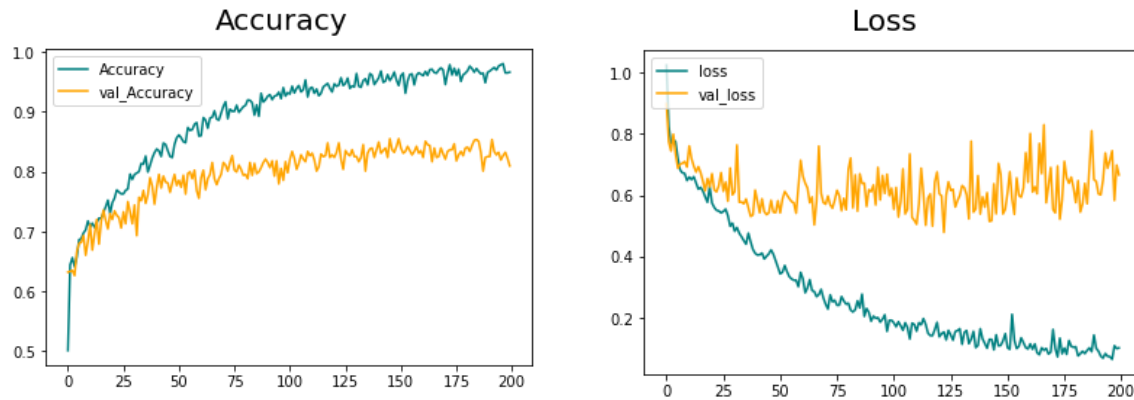


Figure 2.3

	precision	recall	f1-score	support
Melanoma	0.35	0.35	0.35	226
Nail_Fungus	0.44	0.48	0.46	296
Viral_Infections	0.21	0.18	0.19	182

Figure: 2.4 - Classification Report

Note: Over-fitting was observed

Step 3:

The model was saved and made predictions with unseen data. A better result was observed during the testing:

```

1 test_nw = tf.keras.utils.image_dataset_from_directory('test_nw', image_size=(224, 224))
Found 1 files belonging to 1 classes.

1 pred=model.predict(test_nw)
1/1 [=====] - 1s 631ms/step

1 import numpy as np

1 pred[0]
2 print(np.argmax(pred[0]))
2

```

Figure: 2.5

Task 2: Integrate “model 02” with the application and show the skin disease name instead of showing the array index

The flask application for predicting skin disease was successfully hosted in the AWS platform. When an image was uploaded and given to the model, the output displayed to the user was the

index number of the most probable skin disease. The application is now integrated with a model with better accuracy. Instead of showing the array index numbers, the corresponding skin disease name and the value of match probability in percentage are displayed.

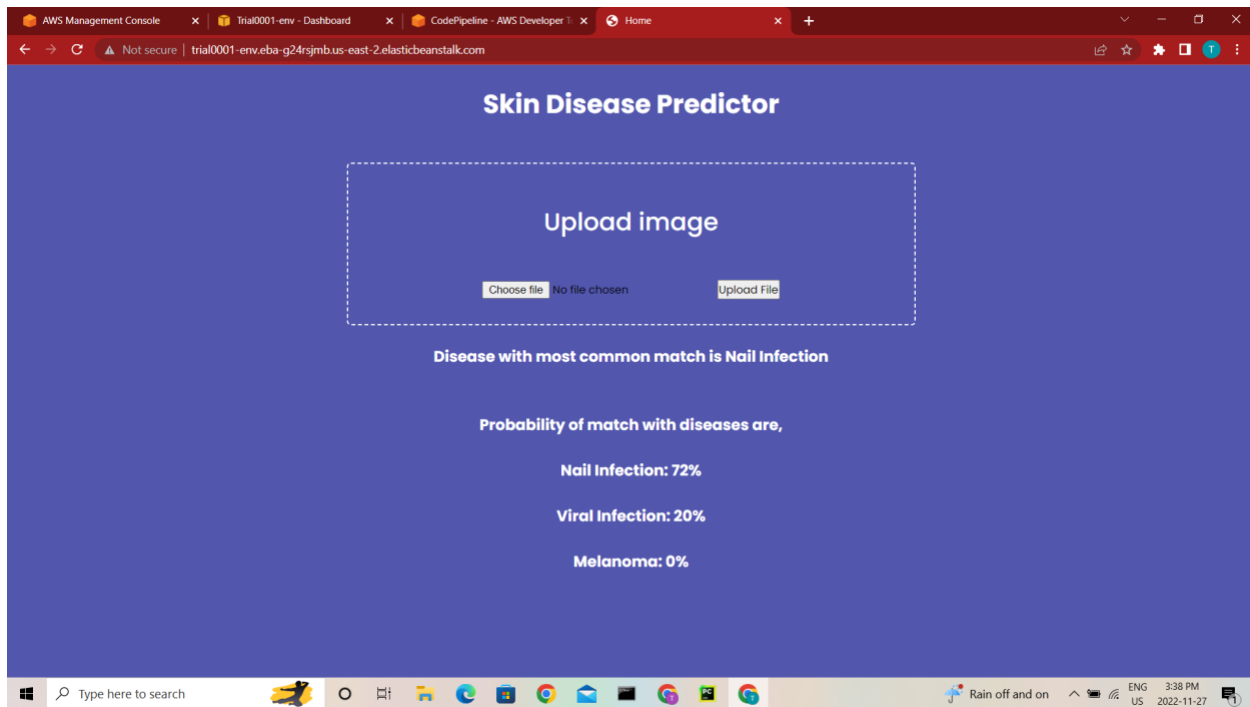


Figure 2.6

Task 03: Work on representations for the latest model using Plotly

For the previous week we did check for 20 epochs. This week for the updated version of our model we plotted the graph for 50 epochs showing accuracy and loss using plotly. Trained it for all 141 epochs but was getting error at the time of loading the saved model. Again saved the model for 50 epochs.

The model provided an output, which then shown like this.

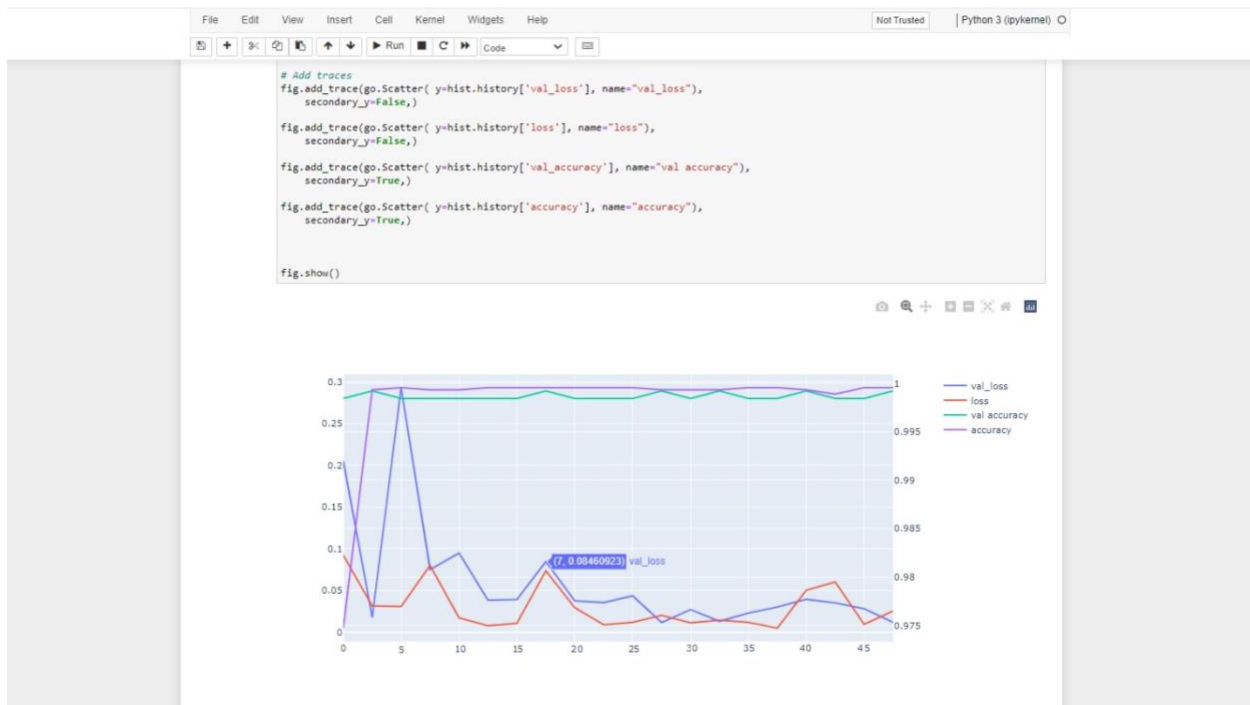


Figure 2.8

3. Difficulties Encountered in Reporting Week

None

4. Tasks to Be Completed in Next Week

Tasks	Responsible
Prepare the report for the entire work done in hosting the application in AWS	Tomson
Prepare final deliverables	Praveen
Improve the performance of the model (Get better values for F1 score)	Thulana
Save the model with all 141 epochs and load it after that perform visualization related to that.	Jaskaran