Project Development Phase

Model Performance Test

Date	14 September 2022
Team ID	EXT2023TMID592333
Project Name	Microbe Mapper: Visual Recognition Of Micro-Organisms
Maximum Marks	10 Marks

Model Performance Testing:

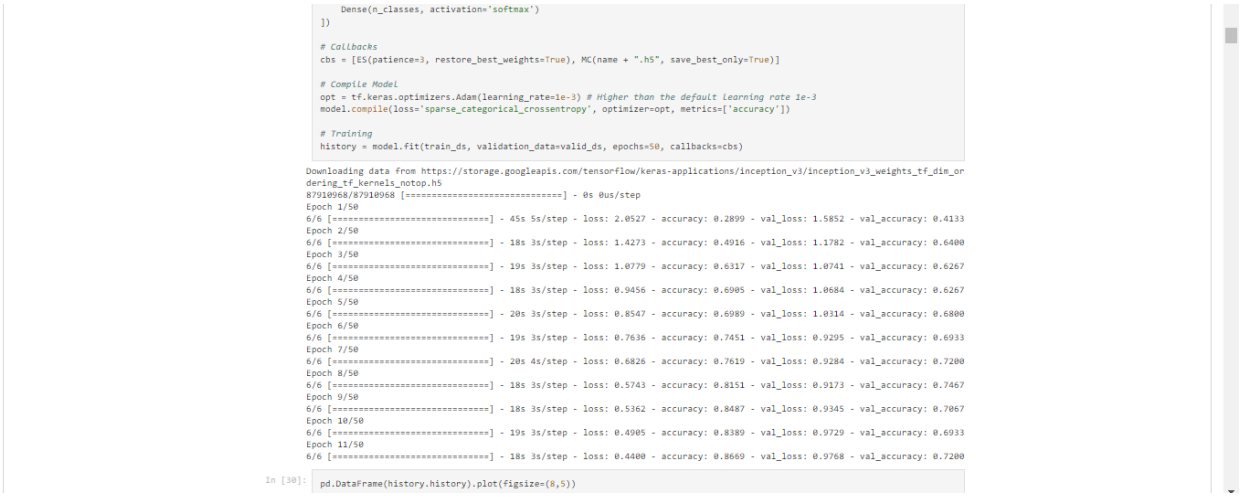
Project team shall fill the following information in model performance testing template.

S.No	Parameter	Values	Screenshot
1.	Model Summary	**Total params: 19,06,928** **Trainable params: 19,06,928** **Non-trainable params: 0**	**Summary of the Model** `model.summary()` Model: "inception_v3" Layer (type) — Output Shape — Param # — Connected to input_2 (InputLayer) — [(None, 299, 299, 3)] — 0 — [] conv2d_94 (Conv2D) — (None, 149, 149, 32) — 864 — ['input_2[0][0]'] batch_normalization_94 (BatchNormalization) — (None, 149, 149, 32) — 96 — ['conv2d_94[0][0]'] activation_94 (Activation) — (None, 149, 149, 32) — 0 — ['batch_normalization_94[0][0]'] conv2d_95 (Conv2D) — (None, 147, 147, 32) — 9216 — ['activation_94[0][0]'] batch_normalization_95 (BatchNormalization) — (None, 147, 147, 32) — 96 — ['conv2d_95[0][0]'] activation_95 (Activation) — (None, 147, 147, 32) — 0 — ['batch_normalization_95[0][0]'] conv2d_96 (Conv2D) — (None, 147, 147, 64) — 18432 — ['activation_95[0][0]'] batch_normalization_96 (BatchNormalization) — (None, 147, 147, 64) — 192 — ['conv2d_96[0][0]'] activation_96 (Activation) — (None, 147, 147, 64) — 0 — ['batch_normalization_96[0][0]'] batch_normalization_187 (BatchNormalization) — (None, 8, 8, 192) — 576 — ['conv2d_187[0][0]'] activation_179 (Activation) — (None, 8, 8, 320) — 0 — ['batch_normalization_179[0][0]'] mixed9_1 (Concatenate) — (None, 8, 8, 768) — 0 — ['activation_181[0][0]', 'activation_182[0][0]'] concatenate_3 (Concatenate) — (None, 8, 8, 768) — 0 — ['activation_185[0][0]', 'activation_186[0][0]'] activation_187 (Activation) — (None, 8, 8, 192) — 0 — ['batch_normalization_187[0][0]'] mixed10 (Concatenate) — (None, 8, 8, 2048) — 0 — ['activation_179[0][0]', 'mixed9_1[0][0]', 'concatenate_3[0][0]', 'activation_187[0][0]'] avg_pool (GlobalAveragePooling2D) — (None, 2048) — 0 — ['mixed10[0][0]'] predictions (Dense) — (None, 1000) — 2049000 — ['avg_pool[0][0]'] Total params: 23851784 (90.99 MB) Trainable params: 23817352 (90.86 MB) Non-trainable params: 34432 (134.50 KB)

2.	Accuracy	Training Accuracy - 91.34 Validation Accuracy - 93.06	Downloading data from https://storage.googleapis.com/tensorflow/keras-applications/inception_v3/inception_v3_weights_tf_dim_ordering_tf_kernels_notop.h5 87910968/87910968 [==============================] - 0s 0us/step Epoch 1/50 6/6 [==============================] - 45s 5s/step - loss: 2.0527 - accuracy: 0.2899 - val_loss: 1.5852 - val_accuracy: 0.4133 Epoch 2/50 6/6 [==============================] - 18s 3s/step - loss: 1.4273 - accuracy: 0.4916 - val_loss: 1.1782 - val_accuracy: 0.6400 Epoch 3/50 6/6 [==============================] - 19s 3s/step - loss: 1.0779 - accuracy: 0.6317 - val_loss: 1.0741 - val_accuracy: 0.6267 Epoch 4/50 6/6 [==============================] - 18s 3s/step - loss: 0.9456 - accuracy: 0.6905 - val_loss: 1.0684 - val_accuracy: 0.6267 Epoch 5/50 6/6 [==============================] - 20s 3s/step - loss: 0.8547 - accuracy: 0.6989 - val_loss: 1.0314 - val_accuracy: 0.6800 Epoch 6/50 6/6 [==============================] - 19s 3s/step - loss: 0.7636 - accuracy: 0.7451 - val_loss: 0.9295 - val_accuracy: 0.6933 Epoch 7/50 6/6 [==============================] - 20s 4s/step - loss: 0.6826 - accuracy: 0.7619 - val_loss: 0.9284 - val_accuracy: 0.7200 Epoch 8/50 6/6 [==============================] - 18s 3s/step - loss: 0.5743 - accuracy: 0.8151 - val_loss: 0.9173 - val_accuracy: 0.7467 Epoch 9/50 6/6 [==============================] - 18s 3s/step - loss: 0.5362 - accuracy: 0.8487 - val_loss: 0.9345 - val_accuracy: 0.7067 Epoch 10/50 6/6 [==============================] - 19s 3s/step - loss: 0.4905 - accuracy: 0.8389 - val_loss: 0.9729 - val_accuracy: 0.6933 Epoch 11/50 6/6 [==============================] - 18s 3s/step - loss: 0.4400 - accuracy: 0.8669 - val_loss: 0.9768 - val_accuracy: 0.7200
3.	Confidence Score (Only Yolo Projects)	Class Detected - NA Confidence Score - NA	Not Applicable

Screenshot:

Model Summary



```
    Dense(n_classes, activation='softmax')
])

# Callbacks
cbs = [ES(patience=3, restore_best_weights=True), MC(name + ".h5", save_best_only=True)]

# Compile Model
opt = tf.keras.optimizers.Adam(learning_rate=1e-3) # Higher than the default learning rate 1e-3
model.compile(loss='sparse_categorical_crossentropy', optimizer=opt, metrics=['accuracy'])

# Training
history = model.fit(train_ds, validation_data=valid_ds, epochs=50, callbacks=cbs)
```

```
Downloading data from https://storage.googleapis.com/tensorflow/keras-applications/inception_v3/inception_v3_weights_tf_dim_ordering_tf_kernels_notop.h5
87910968/87910968 [==============================] - 0s 0us/step
Epoch 1/50
6/6 [==============================] - 45s 5s/step - loss: 2.0527 - accuracy: 0.2899 - val_loss: 1.5852 - val_accuracy: 0.4133
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In [30]:

```
pd.DataFrame(history.history).plot(figsize=(8,5))
```

Accuracy

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