Project Development Phase
Model Performance Test

Date	27 June 2025
Team ID	LTVIP2025TMID43995
Project Name	Transfer Learning-based Classification of Poultry Diseases for Enhanced Health Management
Maximum Marks	

Model Performance Testing:

Model Summary

When using a pre-trained model like ResNet50 or EfficientNet in transfer learning, the model.summary() displays:

- The layer-wise architecture of the model
- Number of trainable and non-trainable parameters
- The input and output shapes at each layer

Training Accuracy

- This reflects how well the model fits the training data.
- Ideally, it should increase over epochs.
- Too high (>98%) training accuracy might indicate overfitting, especially if validation accuracy is much lower.

Validation Accuracy

- Indicates the model's generalization on unseen data.
- It should ideally track close to training accuracy.
- A large gap implies overfitting.

S.No.	Parameter	Values	Screenshot
1.	Model Summary	-	

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model.summary()
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Model: "functional_2"

Layer (type)	Output Shape	Param #
input_layer_3 (InputLayer)	(None, 224, 224, 3)	0
block1_conv1 (Conv2D)	(None, 224, 224, 64)	1,792
block1_conv2 (Conv2D)	(None, 224, 224, 64)	36,928
block1_pool (MaxPooling2D)	(None, 112, 112, 64)	0
block2_conv1 (Conv2D)	(None, 112, 112, 128)	73,856
block2_conv2 (Conv2D)	(None, 112, 112, 128)	147,584
block2_pool (MaxPooling2D)	(None, 56, 56, 128)	0
block3_conv1 (Conv2D)	(None, 56, 56, 256)	295,168
block3_conv2 (Conv2D)	(None, 56, 56, 256)	590,080
block3_conv3 (Conv2D)	(None, 56, 56, 256)	590,080
block3_pool (MaxPooling2D)	(None, 28, 28, 256)	0
block4_conv1 (Conv2D)	(None, 28, 28, 512)	1,180,160
block4_conv2 (Conv2D)	(None, 28, 28, 512)	2,359,808
block4_conv3 (Conv2D)	(None, 28, 28, 512)	2,359,808
block4_pool (MaxPooling2D)	(None, 14, 14, 512)	0
block5_conv1 (Conv2D)	(None, 14, 14, 512)	2,359,808
block5_conv2 (Conv2D)	(None, 14, 14, 512)	2,359,808
block5_conv3 (Conv2D)	(None, 14, 14, 512)	2,359,808
block5_pool (MaxPooling2D)	(None, 7, 7, 512)	0
global_average_pooling2d_1 (GlobalAveragePooling2D)	(None, 512)	0
dense_9 (Dense)	(None, 1024)	525,312
dense_10 (Dense)	(None, 1024)	1,049,600
dense_11 (Dense)	(None, 512)	524,800
batch_normalization_2 (BatchNormalization)	(None, 512)	2,048
dropout_2 (Dropout)	(None, 512)	0
dense_12 (Dense)	(None, 512)	262,656
dense_13 (Dense)	(None, 512)	262,656
dense_14 (Dense)	(None, 512)	262,656
batch_normalization_3 (BatchNormalization)	(None, 512)	2,048
dropout_3 (Dropout)	(None, 512)	0
dense_15 (Dense)	(None, 4)	2,052

Total params: 23,392,078 (89.23 MB)
Trainable params: 2,891,780 (11.03 MB)
Non-trainable params: 14,716,736 (56.14 MB)
Optimizer params: 5,783,562 (22.06 MB)

2.	Accuracy	Training Accuracy - Validation Accuracy -	Final Training Accuracy: 0.8070 Final Validation Accuracy: 0.6435
3.	Fine-Tuning Result(if Done)	Validation Accuracy -	Trial 30 Complete [00h 01m 57s] val_accuracy: 0.3700000047683716 Best val_accuracy So Far: 0.3869999945163727 Total elapsed time: 00h 34m 56s The Optimal number of units in the dense layer is 512 and the optimal learning rate for the optimizer is 0.0003018648711268866. Epoch 1/10 63/63 ━━━━━━━━━━━━━━━━━━━━ 33s 317ms/step - accuracy: 0.2910 - loss: 1.4506 - val_accuracy: 0.3350 - val_loss: 1.3631 Epoch 2/10 63/63 ━━━━━━━━━━━━━━━━━━━━ 11s 180ms/step - accuracy: 0.3388 - loss: 1.3547 - val_accuracy: 0.4110 - val_loss: 1.3187 Epoch 3/10 63/63 ━━━━━━━━━━━━━━━━━━━━ 11s 182ms/step - accuracy: 0.3267 - loss: 1.3457 - val_accuracy: 0.3785 - val_loss: 1.3396 Epoch 4/10 63/63 ━━━━━━━━━━━━━━━━━━━━ 11s 178ms/step - accuracy: 0.3726 - loss: 1.3197 - val_accuracy: 0.3685 - val_loss: 1.3549 Epoch 5/10 63/63 ━━━━━━━━━━━━━━━━━━━━ 11s 175ms/step - accuracy: 0.3695 - loss: 1.3031 - val_accuracy: 0.2845 - val_loss: 1.3556 Epoch 6/10 63/63 ━━━━━━━━━━━━━━━━━━━━ 11s 173ms/step - accuracy: 0.3789 - loss: 1.3019 - val_accuracy: 0.4165 - val_loss: 1.2906 Epoch 7/10 63/63 ━━━━━━━━━━━━━━━━━━━━ 11s 174ms/step - accuracy: 0.4392 - loss: 1.2676 - val_accuracy: 0.3985 - val_loss: 1.2885 Epoch 8/10 63/63 ━━━━━━━━━━━━━━━━━━━━ 11s 176ms/step - accuracy: 0.4307 - loss: 1.2800 - val_accuracy: 0.4410 - val_loss: 1.2723 Epoch 9/10 63/63 ━━━━━━━━━━━━━━━━━━━━ 11s 176ms/step - accuracy: 0.4129 - loss: 1.2889 - val_accuracy: 0.4200 - val_loss: 1.3039 Epoch 10/10 63/63 ━━━━━━━━━━━━━━━━━━━━ 11s 178ms/step - accuracy: 0.4328 - loss: 1.2622 - val_accuracy: 0.4235 - val_loss: 1.2841

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Training Accuracy per epoch: [0.8040000200271606, 0.7994999885559082, 0.8050000071525574, 0.8234999775886536, 0.7985000014305115, 0.8069999814033508]
Validation Accuracy per epoch: [0.6399999856948853, 0.6420000195503235, 0.6424999833106995, 0.6430000066757202, 0.6434999704360962, 0.6434999704360962]

Final Training Accuracy: 0.8070
Final Validation Accuracy: 0.6435
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