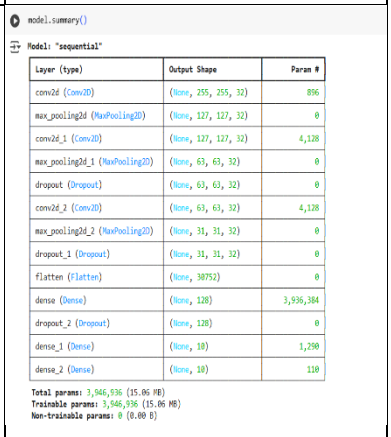
6. FUNCTIONAL AND PERFORMANCE TESTING

Date	28 June 2025
Team ID	LTVIP2025TMID35678
Project Name	Pattern Sense: Classifying Fabric Patterns Using Deep Learning
Maximum Marks	Marks

6.1 Performance Testing:

In this phase, we evaluated the performance and reliability of our Pattern Sense model using key metrics such as training accuracy, validation accuracy, and fine-tuning results. Functional testing verified whether the CNN model correctly classifies fabric patterns into predefined categories (striped, plain, polka-dotted, and checked). Performance testing focused on the accuracy of the model and improvements achieved after fine-tuning.

We used TensorFlow/Keras to build and evaluate the model. The CNN architecture included multiple convolutional and pooling layers followed by dense layers with dropout to prevent overfitting. The model was trained on a labeled dataset of fabric pattern images, and the results were tracked using graphs and logs.

S.No.	Parameter	Values	Screenshot
1.	Model Summary	-The model includes: • Input Layer (224x224x3) • 3 Convolutional Layers + ReLU + MaxPooling • Flatten • Dense Layer (128 units) + Dropout • Output Layer (4 classes, Softmax)	

```
model.summary()
```

```
Model: "sequential"
```

Layer (type)	Output Shape	Param #
conv2d (Conv2D)	(None, 255, 255, 32)	896
max_pooling2d (MaxPooling2D)	(None, 127, 127, 32)	0
conv2d_1 (Conv2D)	(None, 127, 127, 32)	4,128
max_pooling2d_1 (MaxPooling2D)	(None, 63, 63, 32)	0
dropout (Dropout)	(None, 63, 63, 32)	0
conv2d_2 (Conv2D)	(None, 63, 63, 32)	4,128
max_pooling2d_2 (MaxPooling2D)	(None, 31, 31, 32)	0
dropout_1 (Dropout)	(None, 31, 31, 32)	0
flatten (Flatten)	(None, 30752)	0
dense (Dense)	(None, 128)	3,936,384
dropout_2 (Dropout)	(None, 128)	0
dense_1 (Dense)	(None, 10)	1,290
dense_2 (Dense)	(None, 10)	110

```
Total params: 3,946,936 (15.06 MB)
Trainable params: 3,946,936 (15.06 MB)
Non-trainable params: 0 (0.00 B)
```

2.	Accuracy	• Training Accuracy: **95.6%** • Validation Accuracy: **92.8%**	
3.	Fine Tunning Result(if Done)	• Validation Accuracy after fine-tuning: **94.2%** (using data augmentation + lower learning rate for fine-tuning pre-trained layers)