

Project Development Phase Model Performance Test

Date	27 June 2025
Team ID	LTVIP2025TMID41438
Project Name	GrainPalette - A Deep Learning Odyssey In Rice Type Classification Through Transfer Learning
Maximum Marks	

Model Performance Testing:

Our project Model Performance Testing:

S.No.	Parameter	Values	Screenshot
1.	Trained a Deep Learning CNN model for Rice Type Classification	<ul style="list-style-type: none"> Data Set: 5 rice types(Arborio,Basmati,Ipsala,Jasmin e,Karacadang) Image Classification using CNN Train-Test Split: 80-20% Evaluation Metrics Used: Accuracy, Precision, Recall, F1-score, Confusion Matrix Final Test Accuracy:98.58% 	<pre> y_pred_probs = model.predict(x_test) y_pred = np.argmax(y_pred_probs, axis=1) # Calculate and print the Confusion Matrix print("\n--- Confusion Matrix ---") cm = confusion_matrix(y_test, y_pred) print(cm) # Define target names for better readability in the classification report target_names = list(df_images.keys()) # ['arborio', 'basmati', 'ipsala', 'jasmine', 'karacadang'] # Calculate and print the Classification Report print("\n--- Classification Report ---") cr = classification_report(y_test, y_pred, target_names=target_names) print(cr) </pre> <p>18/18 [=====] - 9s 461ms/step</p> <pre> --- Confusion Matrix --- [[111 0 0 3 2] [0 122 0 2 0] [0 0 109 0 0] [0 0 0 98 0] [1 0 0 0 114]] --- Classification Report --- precision recall f1-score support arborio 0.99 0.96 0.97 116 basmati 1.00 0.98 0.99 124 ipsala 1.00 1.00 1.00 109 jasmine 0.95 1.00 0.98 98 karacadang 0.98 0.99 0.99 115 accuracy 0.99 0.99 0.99 562 macro avg 0.99 0.99 0.99 562 weighted avg 0.99 0.99 0.99 562 </pre>
2.	Accuracy	Training Accuracy – 99.33%(CNN)	<pre> historymodel.fit(x_train,x_train_epochst0,validation_data=(x_val,y_val)) Epoch 1/10 71/71 [=====] - 36s 287ms/step - loss: 0.5118 - accuracy: 0.8671 - val_loss: 0.1798 - val_accuracy: 0.9787 Epoch 2/10 71/71 [=====] - 36s 535ms/step - loss: 0.1426 - accuracy: 0.9698 - val_loss: 0.1135 - val_accuracy: 0.9848 Epoch 3/10 71/71 [=====] - 31s 431ms/step - loss: 0.1000 - accuracy: 0.9800 - val_loss: 0.8868 - val_accuracy: 0.9848 Epoch 4/10 71/71 [=====] - 36s 430ms/step - loss: 0.8798 - accuracy: 0.9816 - val_loss: 0.8783 - val_accuracy: 0.9848 Epoch 5/10 71/71 [=====] - 32s 446ms/step - loss: 0.8056 - accuracy: 0.9862 - val_loss: 0.8637 - val_accuracy: 0.9848 Epoch 6/10 71/71 [=====] - 31s 432ms/step - loss: 0.8564 - accuracy: 0.9898 - val_loss: 0.8571 - val_accuracy: 0.9848 Epoch 7/10 71/71 [=====] - 36s 546ms/step - loss: 0.8526 - accuracy: 0.9893 - val_loss: 0.8548 - val_accuracy: 0.9854 Epoch 8/10 71/71 [=====] - 37s 526ms/step - loss: 0.8458 - accuracy: 0.9928 - val_loss: 0.8482 - val_accuracy: 0.9848 Epoch 9/10 71/71 [=====] - 36s 529ms/step - loss: 0.8480 - accuracy: 0.9924 - val_loss: 0.8583 - val_accuracy: 0.9848 Epoch 10/10 71/71 [=====] - 36s 537ms/step - loss: 0.8493 - accuracy: 0.9933 - val_loss: 0.8671 - val_accuracy: 0.9848 </pre>
3.	Validation Accuracy	Validation Accuracy -98.40% (CNN)	<pre> historymodel.fit(x_train,x_train_epochst0,validation_data=(x_val,y_val)) Epoch 1/10 71/71 [=====] - 36s 287ms/step - loss: 0.5118 - accuracy: 0.8671 - val_loss: 0.1798 - val_accuracy: 0.9787 Epoch 2/10 71/71 [=====] - 36s 535ms/step - loss: 0.1426 - accuracy: 0.9698 - val_loss: 0.1135 - val_accuracy: 0.9848 Epoch 3/10 71/71 [=====] - 31s 431ms/step - loss: 0.1000 - accuracy: 0.9800 - val_loss: 0.8868 - val_accuracy: 0.9848 Epoch 4/10 71/71 [=====] - 36s 430ms/step - loss: 0.8798 - accuracy: 0.9816 - val_loss: 0.8783 - val_accuracy: 0.9848 Epoch 5/10 71/71 [=====] - 32s 446ms/step - loss: 0.8056 - accuracy: 0.9862 - val_loss: 0.8637 - val_accuracy: 0.9848 Epoch 6/10 71/71 [=====] - 31s 432ms/step - loss: 0.8564 - accuracy: 0.9898 - val_loss: 0.8571 - val_accuracy: 0.9848 Epoch 7/10 71/71 [=====] - 36s 546ms/step - loss: 0.8526 - accuracy: 0.9893 - val_loss: 0.8548 - val_accuracy: 0.9854 Epoch 8/10 71/71 [=====] - 37s 526ms/step - loss: 0.8458 - accuracy: 0.9928 - val_loss: 0.8482 - val_accuracy: 0.9848 Epoch 9/10 71/71 [=====] - 36s 529ms/step - loss: 0.8480 - accuracy: 0.9924 - val_loss: 0.8583 - val_accuracy: 0.9848 Epoch 10/10 71/71 [=====] - 36s 537ms/step - loss: 0.8493 - accuracy: 0.9933 - val_loss: 0.8671 - val_accuracy: 0.9848 </pre>