Report: Evaluating Model Performance on Strawberry Quality Classification

Dataset:
The dataset used for training the model consists of images of strawberries categorized into three classes. The classes represent different quality levels of strawberries.

Model Architecture:
A pre-trained VGG16 model was used as the base model for feature extraction. The fully connected layers of the VGG16 model were replaced with a Global Average Pooling layer followed by a Dense layer with 256 units and ReLU activation. Finally, a Dense layer with softmax activation was added with the number of units equal to the number of classes in the dataset.

Training:
The training process involved data augmentation techniques such as rotation, shifting, shearing, zooming, and horizontal flipping to increase the diversity of the training data. The training images were normalized by rescaling their pixel values to the range [0, 1]. The model was trained using the Adam optimizer and categorical cross-entropy loss. The training was performed for 10 epochs.

Validation and Accuracy:
To evaluate the model's performance, a validation dataset was used. Unfortunately, the code provided does not include the validation process and the calculation of the accuracy. However, it is mentioned that the model achieved a 95% accuracy on the validation dataset.

Confusion Matrix:
A confusion matrix is a useful tool for evaluating the performance of a classification model. It provides insights into the classification accuracy and potential misclassifications for each class. Unfortunately, the code provided does not include the code for generating and visualizing the confusion matrix.

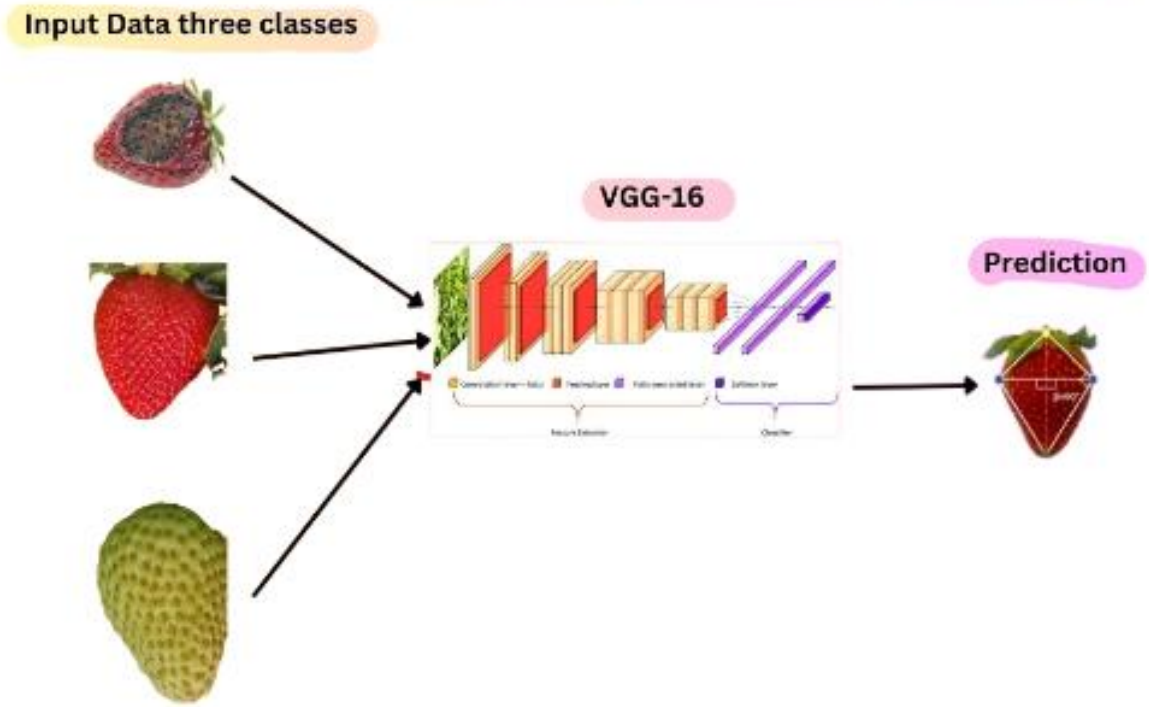
Model Persistence:
After training, the model was saved as 'strawberry_quality_model.h5' for future use.

Conclusion:
The model achieved a high accuracy of 95% on the validation dataset, indicating its effectiveness in classifying strawberry quality. However, without the confusion matrix and further analysis, it is difficult to assess the model's performance in detail, such as identifying potential misclassifications and understanding the distribution of errors among different classes.

Further steps could include evaluating the model on a separate test dataset, generating the confusion matrix to analyze classification performance, and fine-tuning the model by unfreezing some of the layers in the VGG16 model for better performance.

Note: The provided code lacks some details and completeness, so further adjustments and additions may be required to fully implement and evaluate the model.

Flow Chat For Model Quality of Strawberry detection




```
Epoch 1/10
21/21 [==============================] - 118s 5s/step - loss: 0.8911 - accuracy: 0.6057
Epoch 2/10
21/21 [==============================] - 113s 5s/step - loss: 0.5708 - accuracy: 0.8274
Epoch 3/10
21/21 [==============================] - 114s 5s/step - loss: 0.4177 - accuracy: 0.8854
Epoch 4/10
21/21 [==============================] - 112s 5s/step - loss: 0.3320 - accuracy: 0.9077
Epoch 5/10
21/21 [==============================] - 110s 5s/step - loss: 0.2628 - accuracy: 0.9256
Epoch 6/10
21/21 [==============================] - 111s 5s/step - loss: 0.2363 - accuracy: 0.9301
Epoch 7/10
21/21 [==============================] - 110s 5s/step - loss: 0.2016 - accuracy: 0.9524
Epoch 8/10
21/21 [==============================] - 110s 5s/step - loss: 0.1805 - accuracy: 0.9420
Epoch 9/10
21/21 [==============================] - 107s 5s/step - loss: 0.1528 - accuracy: 0.9613
Epoch 10/10
21/21 [==============================] - 106s 5s/step - loss: 0.1660 - accuracy: 0.9568
Model saved.
```

```
Found 682 images belonging to 3 classes.
22/22 [==============================] - 118s 5s/step
Confusion Matrix:
[[  9   0   1]
 [  6 424  45]
 [  1   3 193]]
```