

Optimizing Image Classification Model: Signature Shield Pro 2.0 A Step-by-Step Approach

Step 1: Model Architecture Selection

Our initial approach involved the selection of the MobileNetV2 architecture as the foundation for our model. This choice was underpinned by its proven capabilities in image classification tasks.

Step 2: Finetuning Implementation

The second phase comprised the implementation of the Finetuning technique. Leveraging MobileNetV2 as the base model, we introduced additional dense layers to enhance the model's performance. The achieved overall accuracy was commendable, yet the validation accuracy raised concerns at 73

Step 3: Hypothesis Testing Through Additional Layers

In response to the sub-optimal validation accuracy, we tested the hypothesis that further training through additional layers could address the issue. However, the validation accuracy remained stagnant at 73%, prompting a deeper investigation.

Step 4: Depth Enhancement and Unanticipated Results

In an attempt to enhance the model's learning capacity, we explored increasing its depth. Contrary to expectations, the validation accuracy remained unchanged at 73%, signaling a potential issue within the dataset.

Step 5: Dataset Analysis and Anomaly Identification

Conducting a meticulous analysis of classes with low validation accuracy, we identified images in poor conditions and lacking visual consistency within classes. This observation pointed towards dataset anomalies as the root cause of our challenges.

Step 6: Dataset Cleansing and Refinement

In response to the identified anomalies, we initiated the creation of a refined dataset. This involved the exclusion of classes exhibiting corrupted or inconsistent images, ensuring a more robust and reliable dataset for subsequent model training.

Step 7: Model Retraining on Refined Dataset

Taking our refined dataset into account, we conducted another round of model training. Remarkably, this iteration achieved an accuracy surpassing 98%, with validation accuracy reaching an impressive 100%. Minor underfitting, attributed to the sparse validation dataset, was deemed acceptable.

Step 8: Model Validation and Confidence Boost

To validate the model's efficacy, a random selection of images from a specific class was employed. The model demonstrated flawless accuracy, correctly predicting all images within the chosen class. This outcome instilled confidence in the model's reliability and suitability for diverse datasets.

Step 9: Creation of Preserved Refined Dataset

To safeguard the integrity of our refined dataset for future applications, we formally archived the cleansed dataset. This strategic move ensures a consistent and dependable foundation for subsequent model development and experimentation.

Step 10: Conclusion

The sequential progression through these steps reflects a methodical and iterative approach, where each stage addressed specific challenges encountered in the pursuit of an optimized and accurate image classification model.