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14. Implement a Pre-trained CNN Model as a Features Extracter

Aim:-

To use a Pre-trained CNN mode (e.g. ResNet 50, VGG16) as a feature extractor for a custom dataset

Objective:-

1. To understand Transfer learning

2. To reuse learned convolutional filters from large datasets

3. To train only the final classification layer with minimal computation

Pseudo code:-

1.) Start

2.) Load Pre-trained CNN model with weights = 'imagenet' and exclude top layers,

3.) Freeze all convolution layers.

4.) Compile model (Adam + Cross Entropy)

5.) Train only the new to layers on custom dataset.

6.) Evaluate model accuracy

7.) END.

Observation:-

1. Training was significantly faster compared to training from scratch

2. Accuracy improved due to effective features reuse

3. Freezing the base layers Prevented overfitting on small dataset.

Result:-

89. Transfer learning using a Pre-trained CNN model successfully extracted features and improved classification Performance efficiently