IMAGE PREPROCESSING

PROJECT TITLE : AI-powered Nutrition Analyzer for Fitness Enthusiasts

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Import The ImageDataGenerator Library

Image data augmentation is a technique that can be used to artificially expand the size of a training dataset by creating modified versions of images in the dataset.

The Keras deep learning neural network library provides the capability to fit models using image data augmentation via the ImageDataGenerator class.

Let us import the ImageDataGenerator class from Keras

```
[ ]  #image preprocessing(or) image augmentation
     from keras.preprocessing.image import ImageDataGenerator
```

Configure ImageDataGenerator Class :

- ImageDataGenerator class is instantiated and the configuration for the types of data augmentation
- There are five main types of data augmentation techniques for image data; specifically:
- Image shifts via the width_shift_range and height_shift_range arguments.
- The image flips via the horizontal_flip and vertical_flip arguments.
- Image rotations via the rotation_range argument
- Image brightness via the brightness_range argument.
- Image zoom via the zoom_range argument.
-

```
train_datagen = ImageDataGenerator(rescale=1./255,shear_range=0.2,zoom_range=0.2,horizontal_flip=True,vertical_flip=True)
#rescale => rescaling pixel value from 0 to 255 to 0 to 1
#shear_range=> counter clock wise rotation(anti clock)

[ ] test_datagen = ImageDataGenerator(rescale=1./255)
```

An instance of the ImageDataGenerator class can be constructed for train and test.

Apply Image DataGenerator Functionality To Trainset And Testset

- Let us apply ImageDataGenerator functionality to Trainset and Testset by using the following code
- For Training set using flow_from_directory function.

- This function will return batches of images from the subdirectories'apples', 'banana', 'orange', 'pineapple', 'watermelon' together with labels 0 to 4{'apples': 0, 'banana': 1, 'orange': 2, 'pineapple': 3, 'watermelon': 4}
- Arguments:

- directory: Directory where the data is located. If labels are "inferred", it should contain subdirectories, each containing images for a class. Otherwise, the directory structure is ignored.

- batch_size: Size of the batches of data. Default: 32.

- target_size: Size to resize images after they are read from disk.

- class_mode:

    - ‘int': means that the labels are encoded as integers (e.g. for sparse_categorical_crossentropy loss).

    - 'categorical' means that the labels are encoded as a categorical vector (e.g. for categorical_crossentropy loss).

    - 'binary' means that the labels (there can be only 2) are encoded as float32 scalars with values 0 or 1 (e.g. for binary_crossentropy).

    - None (no labels).