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import os
from PIL import Image
from tensorflow.keras.preprocessing.image import load_img, img_to_array,
ImageDataGenerator
from numpy import expand_dims
from tqdm import tqdm

class ImageAugment:
    # Constructor
    def __init__(self, data_dir, output_path):
        self.data_dir = data_dir
        self.output_path = output_path

    # Open image from directory
    def __open_img(self, file):
        img = load_img(self.data_dir + '/' + file)
        data = img_to_array(img)
        return expand_dims(data, 0)

    # Saving some processing and saving the current image
    def __save_img(self, datagen, samples, count):
        it = datagen.flow(samples, batch_size=1)
        batch = it.next()
        image = batch[0].astype('uint8')
        im = Image.fromarray(image)
        im.save(self.output_path + '/img' + str(count) + '.jpg')
        # have to change names on img save, everytime you do and augmentation

    # Horizontal flip image
    def horizontal_img_flip(self):
        counter = 0
        for file in tqdm(os.listdir(self.data_dir)):
            samples = self.__open_img(file)
            datagen = ImageDataGenerator(horizontal_flip=True)
            self.__save_img(datagen=datagen, samples=samples, count=counter)
            counter = counter + 1

    # Horizontal image shift <->
    def horizontal_img_shift(self, shift_amount): # shift_amount example: [-
250, 250]
        counter = 0
        for file in tqdm(os.listdir(self.data_dir)):
            samples = self.__open_img(file)
            datagen = ImageDataGenerator(width_shift_range=shift_amount)
            self.__save_img(datagen=datagen, samples=samples, count=counter)
            counter = counter + 1

    # Random image brightness
    def random_img_brightness(self, b_range): # b_range example: [0.2, 1.0]
        counter = 0
        for file in tqdm(os.listdir(self.data_dir)):
            samples = self.__open_img(file)
            datagen = ImageDataGenerator(brightness_range=b_range)
            self.__save_img(datagen=datagen, samples=samples, count=counter)
            counter = counter + 1

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# img_dir = ImageAugment(data_dir='chest_xray/train/NORMAL',  
output_path='chest_xray/train/NORMAL')  
# img_dir = ImageAugment(data_dir='chest_xray/train/PNEUMONIA',  
output_path='chest_xray/train/PNEUMONIA')  
# img_dir = ImageAugment(data_dir='chest_xray/val/NORMAL',  
output_path='chest_xray/val/NORMAL')  
img_dir = ImageAugment(data_dir='chest_xray/val/PNEUMONIA',  
output_path='chest_xray/val/PNEUMONIA')  
# img_dir.horizontal_img_flip()  
# img_dir.horizontal_img_shift(shift_amount=[-250, 250])  
img_dir.random_img_brightness(b_range=[0.2, 1.0])
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