

DATE: 08/11/2022

TEAM ID: PNT2022TMID32512

**PROJECT NAME: DIGITAL NATURALIST-AI ENABLED TOOL FOR BIODIVERSITY
RESEARCHERS**

```
from keras.preprocessing.image
```

```
import ImageDataGenerator
```

```
import cv2 from os import listdir
```

```
import time
```

```
def hms_string(sec_elapsed):
```

```
    h = int(sec_elapsed / (60 * 60))
```

```
    m = int((sec_elapsed % (60 * 60)) / 60)
```

```
    s = sec_elapsed % 60
```

```
    return f"{h}:{m}:{round(s,1)}"
```

```
def augment_data(file_dir, n_generated_samples, save_to_dir):
```

```
    data_gen = ImageDataGenerator(rotation_range=30,
```

```
    width_shift_range=0.1,
```

```
    height_shift_range=0.15,
```

```
    shear_range=0.25,
```

```
    zoom_range = 0.2,
```

```
    horizontal_flip=True,
```

```
    vertical_flip=False,
```

```
    fill_mode='nearest',
```

```
    brightness_range=(0.5,1.2)
```

```
)
```

```
for filename in listdir(file_dir):
```

```
    image = cv2.imread(file_dir + '/' + filename)
```

```
    image = image.reshape((1,)+image.shape)
```

```
    save_prefix = 'aug_' + filename[:-4]
```

```
    i=0
```

```
    for batch in data_gen.flow(x=image, batch_size=1, save_to_dir=save_to_dir,
```

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```
        save_prefix=save_prefix, save_format='jpg'):

    i += 1

    if i > n_generated_samples:

        break

    start_time = time.time()

    augmented_data_path = 'C:\Users\josna\Downloads\Digital Naturalist Dataset(1)\Digital Naturalist Dataset'

    augment_data(file_dir='C:\Users\josna\Downloads\Digital Naturalist Dataset(1)\Digital Naturalist Dataset\Bird\Great Indian Bustard Bird', n_generated_samples=8,
    save_to_dir=augmented_data_path+'/Bird/GIB_AUG')

    augment_data(file_dir='C:\Users\josna\Downloads\Digital Naturalist Dataset(1)\Digital Naturalist Dataset\Bird\Spoon Billed Sandpiper Bird', n_generated_samples=8,
    save_to_dir=augmented_data_path+'/Bird/SPS_AUG')

    augment_data(file_dir='C:\Users\josna\Downloads\Digital Naturalist Dataset(1)\Digital Naturalist Dataset\Flower\Corpse Flower', n_generated_samples=8,
    save_to_dir=augmented_data_path+'/Flower/Corpse_AUG')

    augment_data(file_dir='C:\Users\josna\Downloads\Digital Naturalist Dataset(1)\Digital Naturalist Dataset\Flower\Lady Slipper Orchid Flower', n_generated_samples=8,
    save_to_dir=augmented_data_path+'/Flower/LS_Orchid_AUG')

    augment_data(file_dir='C:\Users\josna\Downloads\Digital Naturalist Dataset(1)\Digital Naturalist Dataset\Mammal\Pangolin Mammal', n_generated_samples=8,
    save_to_dir=augmented_data_path+'/Mammal/LS_Pangolin_AUG')

    augment_data(file_dir='C:\Users\josna\Downloads\Digital Naturalist Dataset(1)\Digital Naturalist Dataset\Mammal\Senenca White Deer Mammal', n_generated_samples=8,
    save_to_dir=augmented_data_path+'/Mammal/SW_Deer_AUG')

    end_time = time.time()

    execution_time = (end_time - start_time)

    print("Elapsed Time : "+str(execution_time))
```