Pytorch Data Augmentation

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[1]:
```
pip install torch torchvision torchaudio
```

```
Collecting torch
  Using cached torch-2.3.1-cp311-cp311-win_amd64.whl.metadata (26 kB)
Collecting torchvision
  Using cached torchvision-0.18.1-cp311-cp311-win_amd64.whl.metadata (6.6 kB)
Collecting torchaudio
  Using cached torchaudio-2.3.1-cp311-cp311-win_amd64.whl.metadata (6.4 kB)
Requirement already satisfied: filelock in c:\users\mvass\anaconda3\lib\site-
packages (from torch) (3.13.1)
Requirement already satisfied: typing-extensions>=4.8.0 in
c:\users\mvass\anaconda3\lib\site-packages (from torch) (4.9.0)
Requirement already satisfied: sympy in c:\users\mvass\anaconda3\lib\site-
packages (from torch) (1.12)
Requirement already satisfied: networkx in c:\users\mvass\anaconda3\lib\site-
packages (from torch) (3.1)
Requirement already satisfied: jinja2 in c:\users\mvass\anaconda3\lib\site-
packages (from torch) (3.1.3)
Requirement already satisfied: fsspec in c:\users\mvass\anaconda3\lib\site-
packages (from torch) (2023.10.0)
Collecting mkl<=2021.4.0,>=2021.1.1 (from torch)
  Using cached mkl-2021.4.0-py2.py3-none-win_amd64.whl.metadata (1.4 kB)
Requirement already satisfied: numpy in c:\users\mvass\anaconda3\lib\site-
packages (from torchvision) (1.26.4)
Requirement already satisfied: pillow!=8.3.*,>=5.3.0 in
c:\users\mvass\anaconda3\lib\site-packages (from torchvision) (10.2.0)
Collecting intel-openmp==2021.* (from mkl<=2021.4.0,>=2021.1.1->torch)
  Using cached intel_openmp-2021.4.0-py2.py3-none-win_amd64.whl.metadata (1.2
kB)
Requirement already satisfied: tbb==2021.* in c:\users\mvass\anaconda3\lib\site-
packages (from mkl<=2021.4.0,>=2021.1.1->torch) (2021.12.0)
Requirement already satisfied: MarkupSafe>=2.0 in
c:\users\mvass\anaconda3\lib\site-packages (from jinja2->torch) (2.1.3)
Requirement already satisfied: mpmath>=0.19 in
c:\users\mvass\anaconda3\lib\site-packages (from sympy->torch) (1.3.0)
Using cached torch-2.3.1-cp311-cp311-win_amd64.whl (159.8 MB)
Using cached torchvision-0.18.1-cp311-cp311-win_amd64.whl (1.2 MB)
Using cached torchaudio-2.3.1-cp311-cp311-win_amd64.whl (2.4 MB)
```

```
Using cached mkl-2021.4.0-py2.py3-none-win_amd64.whl (228.5 MB)
Using cached intel_openmp-2021.4.0-py2.py3-none-win_amd64.whl (3.5 MB)
Installing collected packages: intel-openmp, mkl, torch, torchvision, torchaudio
Successfully installed intel-openmp-2021.4.0 mkl-2021.4.0 torch-2.3.1
torchaudio-2.3.1 torchvision-0.18.1
Note: you may need to restart the kernel to use updated packages.
```

[2]:
```python
import git
import os
import random
from PIL import Image
import torchvision.transforms as transforms
```

[3]:
```python
# Packages Install
!pip install gitpython

# Cloning repository
repo_url = 'https://github.com/dylanseychell/COTSDataset.git'
repo_dir = 'COTSDataset'  # Directory to clone the repository into

# Checking if the repository directory already exists
if not os.path.exists(repo_dir):
    # Cloning repository
    git.Repo.clone_from(repo_url, repo_dir)
    print("Repository cloned successfully.")
else:
    print("Repository already cloned.")

# Defining paths
part1_single_objects = os.path.join(repo_dir, "Part 1 - Single Objects")
part2_multiple_objects = os.path.join(repo_dir, "Part 2 - Multiple Objects")
part3_complex_background = os.path.join(repo_dir, "Part 3 - Complex Background")

print("Repository cloned successfully.")
```

```
Requirement already satisfied: gitpython in c:\users\mvass\anaconda3\lib\site-
packages (3.1.37)
Requirement already satisfied: gitdb<5,>=4.0.1 in
c:\users\mvass\anaconda3\lib\site-packages (from gitpython) (4.0.7)
Requirement already satisfied: smmap<5,>=3.0.1 in
c:\users\mvass\anaconda3\lib\site-packages (from gitdb<5,>=4.0.1->gitpython)
(4.0.0)
Repository already cloned.
Repository cloned successfully.
```

[4]:
```python
image_path = 'COTSDATASET'
pytorch_augmented_path = 'CVPICS_PYTORCH'
os.makedirs(pytorch_augmented_path, exist_ok=True)
```

```
image_files = [f for f in os.listdir(image_path) if f.lower().endswith(('png',␣
 ↪'jpg', 'jpeg'))]
random_images = random.sample(image_files, 5)
print(f"Selected images: {random_images}")

pytorch_transform = transforms.Compose([
    transforms.RandomRotation(40),
    transforms.RandomHorizontalFlip(),
    transforms.RandomResizedCrop(256, scale=(0.8, 1.0)),
    transforms.ColorJitter(brightness=0.2, contrast=0.2, saturation=0.2, hue=0.
 ↪2)
])

for image_file in random_images:
    img = Image.open(os.path.join(image_path, image_file))
    for i in range(3):
        augmented_img = pytorch_transform(img)
        save_path = os.path.join(pytorch_augmented_path, f'pytorch_aug_{os.path.
 ↪splitext(image_file)[0]}_{i}.jpeg')
        augmented_img.save(save_path)

print("saved to", pytorch_augmented_path)
```

```
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
Cell In[4], line 6
      3 os.makedirs(pytorch_augmented_path, exist_ok=True)
      5 image_files = [f for f in os.listdir(image_path) if f.lower().
 ↪endswith(('png', 'jpg', 'jpeg'))]
----> 6 random_images = random.sample(image_files, 5)
      7 print(f"Selected images: {random_images}")
      9 pytorch_transform = transforms.Compose([
     10     transforms.RandomRotation(40),
     11     transforms.RandomHorizontalFlip(),
     12     transforms.RandomResizedCrop(256, scale=(0.8, 1.0)),
     13     transforms.ColorJitter(brightness=0.2, contrast=0.2, saturation=0.2␣
 ↪hue=0.2)
     14 ])

File ~\anaconda3\Lib\random.py:456, in Random.sample(self, population, k, counts)
    454 randbelow = self._randbelow
    455 if not 0 <= k <= n:
--> 456     raise ValueError("Sample larger than population or is negative")
    457 result = [None] * k
    458 setsize = 21        # size of a small set minus size of an empty list
```

```
ValueError: Sample larger than population or is negative
```

Output:

Selected images: [‘elephant_depth8.png’, ‘tajin_depth8_nofill.png’, ‘painting_depth8.png’, ‘cmt_mug_depth8_nofill.png’, ‘shampoo_colour.jpeg’] saved to C:/Users/jacob/Desktop/CVPICS_PYTORCH