Lab 6 - Dataloaders

Computer Vision (10224)

Goals

- Learn how to write a dataloader for various datasets and tasks (classification, segmentation, detection, etc.)
- Learn to add augmentation capability to the dataloader.
- Practice the useage of a common augmentation library.

Preparatory report

1. Read and summarize (3 - 10 lines) the documentation of pytorch dataset.

   make sure to take a closer look at section 1.2: "Create a dataset class".

2. Read and summarize (3 - 10 lines) the documentation of albumentations' image augmentation for classification.

3. Use Albumentation to perform the following augmentations with probabilities based on the last digits of your id number:

- The augmentations:
  - Flip
  - Rotate
  - Blur
- The probability of each augmentation would be from the last digit to the 7th digit of your id number divided by 10. If your last digits are zeros, take the rightmost triplet ending with non zero:
  - example 1: if your ID is 123456789: The probability of Flip is 0.9, the probability of Rotate is 0.8 and the probability of Blur is 0.7.
  - example 2: if your ID is 123456700: The probability of Flip is 0.7, the probability of Rotate is 0.6 and the probability of Blur is 0.5.

Lab Session

1. write a data_loader for mnist classification using the following template:

```python
class MNISTDataset(Dataset):
  def __init__(self, train_set, transforms=None):
    super(MNISTDataset, self).__init__()
    self.x_train = train_set.data
    self.y_train = train_set.targets
    self.tranform = transforms

  def __getitem__(self, idx):
   # Your Code

  def __len__(self):
    return len(self.x_train)
```

2. add the augmentation you wrote in the preparatory to your data_loader.
3. Display typical results (up to 30 images), with accompanying relevant titles.

Final Report

1. Complete the unfinished lab session tasks.
2. write a dataloader for segmentation task using the Airbus Ship Detection dataset from Kaggle.
    - You may use code from the competition code section to convert the RLE encoded masks to binary mask see example.
    - Hint: Albumentations - Mask augmentation for segmentation
3. Write a short TL;DR (too long didn't read) summary and describe your work and what you understood from the lab.