Minutes of Meeting : Machine Learning Class-3

Date : 08-03-2025

Topic : Computer Vision

Agenda : How to perform Image Preprocessing and Forward Propagation using PyTorch in Computer Vision.

The topics covered :

1. Tasks that we perform in Computer Vision (Introduction).
2. Image Importation.

```
from PIL import Image # to import image
```

```
dog =Image.open("path")
```

3. Performimg operations on Image such as Flipping, Rotating, Color Contrasting, Shifting.

```
transforms.RandomHorizontalFlip(p=0.5) #flip the image horizontal with 0.5 probability
```

```
transforms.RandomVerticalFlip(p=0.5) #flip the image vertically with 0.5 probability
```

```
transforms.RandomRotation(180) #rotate the image
```

```
transforms.ColorJitter(brightness=2,contrast=2,saturation=2,hue=0.3)
```

```
transforms.RandomAffine(45,translate =[0.3,0.3],scale=[2,3],shear=[0.1,0.8])
```

4. Converting Image into a tensor.

```
from torchvision import transforms
```

```
convert = transforms.ToTensor() # to convert data to a tensor
```

5. Padding of Image.
6. Applying convolutions to the image using PyTorch.
7. Stride, Size of the Filter.
8. Activation Function.

```
import torch.nn.functional as F
F.relu()
```

9. Pooling Layers.

```
nn.MaxPool2d(3,stride= 2)  #for pooling layer
```

10. Transformation of Intermediate tensor to an Image.

```
transforms.ToPILImage() #to see the image at a intermediate step of the propagation
```

11. Flattening out the filter outputs.

```
lin = nn.Linear(tn.view(-1).shape[0],10)
```

+ Code + Markdown

```
lin(tn.view(-1))
```

12. Introducing non-linearity into the model.