VIDAR Visual Information Discovery And Recovery

Weekly Report

2018-2019 2018/09/10/-2018/09/16/ Jie Huang

I. Have Done

- 80%: Did conduct experiments by using hdrnet.
- 20%: Improved the net-v2 by affine on the feature layer.

II. Future Plan

- 70%: Continue to survey for the improvement,read some related paper.
- 30%: Continue to improve my net.

III. Problem

IV. Report

. The conduct experiment by using hdrnet

In this week,I have done the conduct experiments by using hdrnet. Although I have done this work in the last term,I didn't use the trained model to test its efficient. Besides, I think there is a problem in hdrnet: It convert the input images to low resolution of 256*256 to extract the features regardless of the original resolution. However,in our dataset,the input patch is 100*100 and it is not reasonable to convert its resolution to 256*256 as the hdrnet assume that its input images are full-size images. Here I change the fisrt feature map to the half-size of the input images,so if the size of an input image is 100*100, it conver its size to 50*50. Then I trained hdrnet again and test the model.

In order to compare the structure of my net with hdrnet,I tried to remove the effect of loss by using only L2 loss to train the net-v2 as hdrnet only use L2 loss.

As hdrnet use the openGL to enforce the interpolation,it is hard to convert its model to the format of .pb,so I directly use the generate model to test its speed by testing on 1000 patches although it is not **precise**. I also test the net-v2 by using this method,too. The comparison of PSNR,SSIM and speed can be shown as follows:

Table 1: The comparision between net-v2 and hdrnet

	PSNR	SSIM	Speed(s/1000 patches)
hdrnet	22.32	0.9281	16.01
net-v2	22.77	0.9316	6.45

The subjective effect of my net-v2 is much better than hdrnet. As the hdrnet is trained on small patches,when apply it on full-size patches, the fc layer is compatible with its size as the weight in this layer can only process the feature of trained image size. So I resize the front layer of the fc layer to the same size of its trained size when I test the harnet on the full-size image. However, this action will result in serious artifact as the effect of the fc layers is to remove the unbalance distribution of color on the output images. The comparison of the subjective effect of net-v1,net-v2 and hdrnet can be shown as follows:

Figure 1: The output images of net-v1,net-v2 and hdrnet(from the left to the right,up to the bottom)

The shortcomings of hdrnet is obvious:First,it can only process the fixed size images which resolution is same with the trained images,the generalization ability is very poor. Second, the fc layer in hdrnet consume a lot of time. These subjective effect of hdrnet is poor,too. The conclusion of this conduct experiments can be used in the future.

. Improve my Net-v2

As original plan,I decide to add the advantages of net-v1 to net-v2, so I apply the affine operation on the features in the net instead of conducting this operation on the input image.By this way, the affine operation can learn more effienct transformation theoretically. As I just began to train the new net which I called net-v3,the result will be displayed in the coming group meeting.

V. Mile-Stone

- September:
  - Continue to improve the net based on the tried methods.
  - Search for more idea from recent papers.