

Assignment 3

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Part 1: Self-supervised Learning on CIFAR10

1) Rotation training

Report the hyperparameters you used to train your model. Discuss any particular implementation choices which caused significant performance increases.

Batch_size = 128

Loss function = cross entropy

Optimizer = SGD (lr=0.001, momentum=0.9)

Num_epochs = 45

Decay_epochs = 15

Init_lr = 0.01

Accuracy = 74.81 %

Average loss = 0.635

2) Fine-tuning late layers

Report the hyperparameters you used to fine-tune your model. Compare the performance between pre-trained model and randomly initialized model.

Batch_size = 128

Loss function = cross entropy

Optimizer = SGD (lr=0.001, momentum=0.9)

Num_epochs = 20

Decay_epochs = 10

Init_lr = 0.01

	Accuracy	Average loss
Pre-trained model	69.37 %	0.997
Randomly initialized model	45.65 %	1.537

The pre-trained model performed better than the randomly initialized model.

3) Fully supervised learning

Report the hyperparameters you used to fine-tune your model. Compare the performance between pre-trained model and randomly initialized model. Discuss anything you find interesting comparing fine-tuning the late layers only in section (2) and fine-tuning the whole model in section (3).

Batch_size = 128

Loss function = cross entropy

Optimizer = SGD (lr=0.001, momentum=0.9)

Num_epochs = 20

Decay_epochs = 10

Init_lr = 0.01

	Accuracy	Average loss
Pre-trained model	86.17 %	0.422
Randomly initialized model	78.62 %	0.621

The model that fine-tuned all layers performed better than the model that fine-tuned only the late layers.

Part-2: Object Detection by YOLO

1. My best mAP value on Kaggle: 0.50644
2. Did you upload final CSV file on Kaggle: Yes
3. My final loss value: 2.63142
4. What did not work in my code (if anything): N/A
5. Sample Images from my detector from PASCAL VOC:

