

Yolo v3 - train (0)

먼저, VOC 데이터로 train 잘 되는지 테스트함

```
./darknet detector train cfg/voc.data cfg/yolov3-voc.cfg darknet53.conv.74
```

- 학습 시, 과적합을 막는 세팅을 따로 해야함. 모든 값이 nan이 나와도 계속 학습되고 있음.
- Yolo 학습 자체는 잘 진행되고 있음을 확인.

```
./darknet detector train cfg/voc.data cfg/yolov3-voc.cfg darknet53.conv.74
Resizing
608
Loaded: 0.021483 seconds
Region 82 Avg IOU: 0.000000, Class: 0.000000, Obj: 0.000000, No Obj: 0.000000, .5R: 0.000000, .75R: 0.000000, count: 1
Region 94 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.001644, .5R: -nan, .75R: -nan, count: 0
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000037, .5R: -nan, .75R: -nan, count: 0
961: 628946752.000000, 17382625280.000000 avg, 0.000853 rate, 75.710204 seconds, 961 images
Loaded: 0.000067 seconds
Region 82 Avg IOU: 0.000000, Class: 1.000000, Obj: 0.000000, No Obj: 0.333333, .5R: 0.000000, .75R: 0.000000, count: 2
Region 94 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000842, .5R: -nan, .75R: -nan, count: 0
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000025, .5R: -nan, .75R: -nan, count: 0
962: 115137339392.000000, 27158095872.000000 avg, 0.000856 rate, 75.212312 seconds, 962 images
Loaded: 0.000068 seconds
Region 82 Avg IOU: 0.000000, Class: 0.000000, Obj: 1.000000, No Obj: 0.333333, .5R: 0.000000, .75R: 0.000000, count: 1
Region 94 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.001059, .5R: -nan, .75R: -nan, count: 0
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: 0.000018, .5R: -nan, .75R: -nan, count: 0
963: 378535231172936136524824576.000000, 37853523578462215495221248.000000 avg, 0.000860 rate, 75.195539 seconds, 963 images
Loaded: 0.000079 seconds
Region 82 Avg IOU: -nan, Class: nan, Obj: nan, No Obj: nan, .5R: 0.000000, .75R: 0.000000, count: 1
Region 94 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: nan, .5R: -nan, .75R: -nan, count: 0
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: nan, .5R: -nan, .75R: -nan, count: 0
964: -nan, -nan avg, 0.000864 rate, 75.158733 seconds, 964 images
Loaded: 0.000098 seconds
Region 82 Avg IOU: -nan, Class: nan, Obj: nan, No Obj: nan, .5R: 0.000000, .75R: 0.000000, count: 1
Region 94 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: nan, .5R: -nan, .75R: -nan, count: 0
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: nan, .5R: -nan, .75R: -nan, count: 0
965: -nan, -nan avg, 0.000867 rate, 75.384323 seconds, 965 images
```

964번째부터 모든 값이 nan이 나오기 시작

```
./darknet detector train cfg/voc.data cfg/yolov3-voc.cfg darknet53.conv.74
Region 94 Avg IOU: -nan, Class: nan, Obj: nan, No Obj: nan, .5R: 0.000000, .75R: 0.000000, count: 1
Region 106 Avg IOU: -nan, Class: nan, Obj: nan, No Obj: nan, .5R: 0.000000, .75R: 0.000000, count: 1
1547: -nan, -nan avg, 0.001000 rate, 65.928801 seconds, 1547 images
Loaded: 0.000073 seconds
Region 82 Avg IOU: -nan, Class: nan, Obj: nan, No Obj: nan, .5R: 0.000000, .75R: 0.000000, count: 1
Region 94 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: nan, .5R: -nan, .75R: -nan, count: 0
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: nan, .5R: -nan, .75R: -nan, count: 0
1548: -nan, -nan avg, 0.001000 rate, 65.925677 seconds, 1548 images
Loaded: 0.000075 seconds
Region 82 Avg IOU: -nan, Class: nan, Obj: nan, No Obj: nan, .5R: 0.000000, .75R: 0.000000, count: 2
Region 94 Avg IOU: -nan, Class: nan, Obj: nan, No Obj: nan, .5R: 0.000000, .75R: 0.000000, count: 1
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: nan, .5R: -nan, .75R: -nan, count: 0
1549: -nan, -nan avg, 0.001000 rate, 65.931852 seconds, 1549 images
Loaded: 0.000069 seconds
Region 82 Avg IOU: -nan, Class: nan, Obj: nan, No Obj: nan, .5R: 0.000000, .75R: 0.000000, count: 1
Region 94 Avg IOU: -nan, Class: nan, Obj: nan, No Obj: nan, .5R: 0.000000, .75R: 0.000000, count: 1
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: nan, .5R: -nan, .75R: -nan, count: 0
1550: -nan, -nan avg, 0.001000 rate, 69.222363 seconds, 1550 images
Resizing
544
Loaded: 0.019853 seconds
Region 82 Avg IOU: -nan, Class: nan, Obj: nan, No Obj: nan, .5R: 0.000000, .75R: 0.000000, count: 2
Region 94 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: nan, .5R: -nan, .75R: -nan, count: 0
Region 106 Avg IOU: -nan, Class: -nan, Obj: -nan, No Obj: nan, .5R: -nan, .75R: -nan, count: 0
1551: -nan, -nan avg, 0.001000 rate, 59.620458 seconds, 1551 images
Loaded: 0.000064 seconds
```

Train 24시간 경과 후

Yolo v3 - train (1)

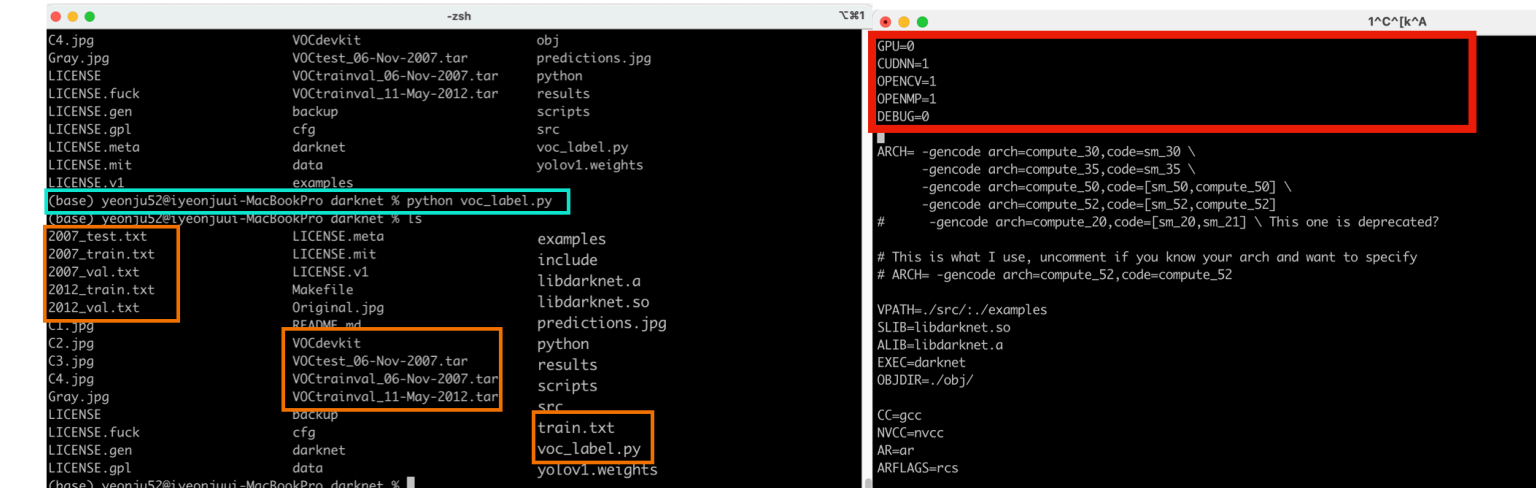
문제 발생 - 해결 시도

- (문제) Yolo v3 train 시도: (800 batch = 8시간)
-> Too Long !
 - (가정) Makefile에서 GPU=1로 설정했음에도 불구하고 GPU가 활성화가 안 된 걸까? Why?
 - (해결1) MakeFile과 Make명령어에 대한 오해가 있었음
 - Make 명령어 후, ./darknet (실행파일) 생성됨
 - MakeFile 바꾼 설정을 적용하기 위해선,
Make 명령어 실행 전에 MakeFile을 수정해야함.
 - (해결2) CUDA arch & gencode를 nvidia 버전에 매칭해야함
<https://arnon.dk/matching-sm-architectures-arch-and-gencode-for-various-nvidia-cards/>
- (현버전: `user ➡ nvidia-smi --query | fgrep 'Product Name'`
Product Name : NVIDIA GeForce RTX 3090)

Setting & Get Pascal VOC Data

yolo v1 설치 후 데이터 처리

- train dataset (15680개): 2007 (train, val), 2012 (train, val)
- test dataset (4952개): 2007 (test)
- Makefile: GPU=1 -> GPU = 0으로 변경 (개인컴이므로 ! 서버컴에서는 GPU=1로 돌려야 함)



(좌) python voc_label.py (우) Makefile

[발표자료 230214 1p] 오개념

```
if(avg_loss == -1) avg_loss = loss;
avg_loss = avg_loss*.9 + loss*.1;
printf("%ld, %.3f: %f, %f avg, %f rate, %lf seconds, %ld images\n", get_current_batch(net), (float)(*net.seen),
free_data(train);
if(get_current_batch(net)%100 == 0){
    char buff[256];
    sprintf(buff, "%s/%s_batch_%ld.weights", backup_directory, base, get_current_batch(net));
    save_weights(net, buff);
}
if(*net.seen/N > epoch){
    epoch = *net.seen/N;
    char buff[256];
    sprintf(buff, "%s/%s_%d.weights", backup_directory, base, epoch);
    save_weights(net, buff);
}
```

batch라고 생각한 이유 (iteration, epoch x)

Yolo v3 - train (2)

Train을 위한 추가 설정

- (추가) yolov3.cfg
 - Test -> Train 모드로 변경 시, 수정 필요

```
[net]
# Testing
# batch=1
# subdivisions=1
# Training
batch=64
subdivisions=16
width=608
height=608
channels=3
momentum=0.9
decay=0.0005
angle=0
saturation = 1.5
exposure = 1.5
hue=.1

learning_rate=0.001
burn_in=1000
max_batches = 500200
policy=steps
steps=400000,450000
scales=.1,.1

"yolov3.cfg" 789L, 8342B
```

LICENSE	LICENSE.gen	LICENSE.meta	LICENSE.v1	README.md	data	include	scripts
LICENSE.fuck	LICENSE.gpl	LICENSE.mit	Makefile	cfg	examples	python	src

Make 명령어 실행 전 모습



```
(base) yeonju52@yeonjuui-MacBookPro yolov3 % ls
LICENSE          LICENSE.meta     README.md       examples        results
LICENSE.fuck     LICENSE.mit      backup          include         scripts
LICENSE.gen      LICENSE.v1       cfg             obj             src
LICENSE.gpl      Makefile        data            python
```

Make 명령어 실행 후 모습



```
(base) yeonju52@yeonjuui-MacBookPro darknet % ls
2007_test.txt      LICENSE.meta      examples
2007_train.txt     LICENSE.mit       include
2007_val.txt       LICENSE.v1        libdarknet.a
2012_train.txt     Makefile          libdarknet.so
2012_val.txt       Original.jpg      obj
C1.jpg             README.md         predictions.jpg
C2.jpg             VOCdevkit         python
C3.jpg             VOCtest_06-Nov-2007.tar results
C4.jpg             VOCtrainval_06-Nov-2007.tar scripts
Gray.jpg           VOCtrainval_11-May-2012.tar src
LICENSE            backup            voc_label.py
LICENSE.fuck       cfg              yolov1.weights
LICENSE.gen        darknet
LICENSE.gpl        data
(base) yeonju52@yeonjuui-MacBookPro darknet %
```

데이터 세팅 및 ./darknet 실행 후 모습