Overview

This notebook contains test runs of various model and dataset scenarios.

NOTES:

- A change to yolov5/val.py was required to run this on OSX: change call to create_dataloader(), to include workers=0

  per: https://stackoverflow.com/questions/64772335/pytorch-w-parallelnative-cpp206![image.png](attachment:image.png) [(https://stackoverflow.com/questions/64772335/pytorch-w-parallelnative-cpp206!%5Bimage.png%5D(attachment:image.png))](https://stackoverflow.com/questions/64772335/pytorch-w-parallelnative-cpp206!%5Bimage.png%5D(attachment:image.png))

- DF1 dataset was extracted into a single 4-class set

  For DF1, some images were found to have poorly defined bounding boxes / excessive blank-space. An algorithm was applied to attempt to filter out these images from the training, validation and test sets.

- DF2 dataset was extracted into two sets:
  - 4 classes
  - 11 classes

```
In both DF2 cases, some samples were filtered out.  The criter
ia to include samples were:
    – source=='shop'
    – scale>1
    – occlusion<2
    – zoom<2
    – viewpoint<3
```

All images used were resized to maximum 640x640.

Although Test data was extracted from the Train dataset for DF1 and DF2, the Test is guaranteed to be unseen samples (none were included in the data used for training).

Scenario: 4-class models

DF1-Test data

Model Test 4.A

- Model: DF1-trained 4-class model
- Dataset: DF1-Test

In [1]:
```
!python yolov5/val.py --batch-size 16 --data fashion_test.yaml --weigh
```

val: data=/Users/blairjones/Desktop/w210/yolov5/data/df1_test.yaml, w
eights=['./DeepFashion1/bcj_experiments/exp_DF1_DF2_align/exp2/weight
s/best.pt'], batch_size=16, imgsz=640, conf_thres=0.001, iou_thres=0.
6, task=test, device=, single_cls=False, augment=False, verbose=False
, save_txt=False, save_hybrid=False, save_conf=False, save_json=False
, project=yolov5/runs/val, name=exp, exist_ok=False, half=False
YOLOv5 🚀 v6.0-6-gd0bfeb3 torch 1.9.0 CPU

Fusing layers...
Model Summary: 213 layers, 7020913 parameters, 0 gradients
test: Scanning 'DeepFashion1/fashion/labels/test/1981_Graphic_Ringer_
Tee.cache'

Class	Images	Labels	P	R	mAP@.5	mAP@
all	1707	1707	0.76	0.792	0.84	0.655
long sleeve top	1707	420	0.751	0.698	0.78	0.572
short sleeve top	1707	418	0.784	0.737	0.835	0.652
shorts	1707	430	0.768	0.833	0.866	0.683
trousers	1707	439	0.736	0.902	0.878	0.713

Speed: 0.5ms pre-process, 241.2ms inference, 0.5ms NMS per image at s
hape (16, 3, 640, 640)
Results saved to **yolov5/runs/val/exp27**

Model Test 4.B

- Model: DF2-trained 4-class model
- Dataset: DF1-Test

```
In [2]: al.py --batch-size 16 --data fashion_test.yaml --weights ./DeepFashion2
```

```
val: data=/Users/blairjones/Desktop/w210/yolov5/data/fashion_test.yam
l, weights=['./DeepFashion2/bcj_experiments/exp3/weights/best.pt'], b
atch_size=16, imgsz=640, conf_thres=0.001, iou_thres=0.6, task=test,
device=, single_cls=False, augment=False, verbose=False, save_txt=Fal
se, save_hybrid=False, save_conf=False, save_json=False, project=yolo
v5/runs/val, name=exp, exist_ok=False, half=False
YOLOv5 🚀 v6.0-6-gd0bfeb3 torch 1.9.0 CPU

Fusing layers...
Model Summary: 224 layers, 7062001 parameters, 0 gradients
test: Scanning 'DeepFashion1/fashion/labels/test/1981_Graphic_Ringer_
Tee.cache'
                 Class     Images     Labels          P          R
mAP@.5 mAP@
                   all       1707       1707       0.59      0.658
0.605      0.297
      long sleeve top       1707        420      0.455      0.652
0.467       0.23
     short sleeve top       1707        418      0.542      0.488
0.511      0.287
                shorts       1707        430      0.683       0.66
0.67       0.278
              trousers       1707        439      0.678      0.829
0.772      0.394
Speed: 0.5ms pre-process, 258.4ms inference, 0.5ms NMS per image at s
hape (16, 3, 640, 640)
Results saved to yolov5/runs/val/exp
```

Model Test 4.C

- Model: Ensemble of DF1-trained and DF2-trained 4-class models
- Dataset: DF1-Test

In [4]: `DF1_DF2_align/exp2/weights/best.pt ./DeepFashion2/bcj_experiments/exp3/`

```
val: data=/Users/blairjones/Desktop/w210/yolov5/data/fashion_test.yam
l, weights=['./DeepFashion1/bcj_experiments/exp_DF1_DF2_align/exp2/we
ights/best.pt', './DeepFashion2/bcj_experiments/exp3/weights/best.pt'
], batch_size=16, imgsz=640, conf_thres=0.001, iou_thres=0.6, task=te
st, device=, single_cls=False, augment=False, verbose=False, save_txt
=False, save_hybrid=False, save_conf=False, save_json=False, project=
yolov5/runs/val, name=exp, exist_ok=False, half=False
YOLOv5 🚀 v6.0-6-gd0bfeb3 torch 1.9.0 CPU

Fusing layers...
Model Summary: 213 layers, 7020913 parameters, 0 gradients
Fusing layers...
Model Summary: 224 layers, 7062001 parameters, 0 gradients
Ensemble created with ['./DeepFashion1/bcj_experiments/exp_DF1_DF2_al
ign/exp2/weights/best.pt', './DeepFashion2/bcj_experiments/exp3/weigh
ts/best.pt']

test: Scanning 'DeepFashion1/fashion/labels/test/1981_Graphic_Ringer_
Tee.cache'
                  Class      Images      Labels           P           R
mAP@.5 mAP@
                    all        1707        1707       0.683       0.765
0.745       0.454
        long sleeve top        1707         420       0.586       0.697
0.596       0.339
       short sleeve top        1707         418       0.707       0.708
0.743       0.506
                 shorts        1707         430       0.737       0.791
0.814       0.489
               trousers        1707         439       0.704       0.866
0.826       0.483
Speed: 0.5ms pre-process, 496.8ms inference, 0.7ms NMS per image at s
hape (16, 3, 640, 640)
Results saved to yolov5/runs/val/exp4
```

In [ ]: `#started-21:11, finished-21:25`

DF2-Test data

Model Test 4.D

- Model: DF1-trained 4-class model
- Dataset: DF2-Test

In [10]:
```
.yaml --weights ./DeepFashion1/bcj_experiments/exp_DF1_DF2_align/exp2/
```

```
val: data=/Users/blairjones/Desktop/w210/yolov5/data/fashion_all_test
_3.yaml, weights=['./DeepFashion1/bcj_experiments/exp_DF1_DF2_align/e
xp2/weights/best.pt'], batch_size=16, imgsz=640, conf_thres=0.001, io
u_thres=0.6, task=test, device=, single_cls=False, augment=False, ver
bose=False, save_txt=False, save_hybrid=False, save_conf=False, save_
json=False, project=yolov5/runs/val, name=exp, exist_ok=False, half=F
alse
YOLOv5 🚀 v6.0-6-gd0bfeb3 torch 1.9.0 CPU

Fusing layers...
Model Summary: 213 layers, 7020913 parameters, 0 gradients
test: Scanning 'DeepFashion2/df2_all/labels/test_3' images and labels
...1598 fou
test: New cache created: DeepFashion2/df2_all/labels/test_3.cache
               Class     Images     Labels          P          R
mAP@.5 mAP@
                 all       1598       1598      0.607      0.817
0.759      0.383
      long sleeve top       1598        400      0.591      0.695
0.672      0.361
     short sleeve top       1598        398      0.532      0.754
0.666      0.414
               shorts       1598        400      0.556       0.94
0.831       0.35
              trousers       1598        400      0.749       0.88
0.868      0.408
Speed: 0.4ms pre-process, 225.9ms inference, 0.5ms NMS per image at s
hape (16, 3, 640, 640)
Results saved to yolov5/runs/val/exp9
```

In [ ]:
```
#started-09:25, finished-09:30
```

Model Test 4.E

- Model: DF2-trained 4-class model
- Dataset: DF2-Test

```
In [11]:  !python yolov5/val.py --batch-size 16 --data fashion_all_test_3.yaml ⌐
```

val: data=/Users/blairjones/Desktop/w210/yolov5/data/fashion_all_test
_3.yaml, weights=['./DeepFashion2/bcj_experiments/exp3/weights/best.p
t'], batch_size=16, imgsz=640, conf_thres=0.001, iou_thres=0.6, task=
test, device=, single_cls=False, augment=False, verbose=False, save_t
xt=False, save_hybrid=False, save_conf=False, save_json=False, projec
t=yolov5/runs/val, name=exp, exist_ok=False, half=False
YOLOv5 🚀 v6.0-6-gd0bfeb3 torch 1.9.0 CPU

Fusing layers...
Model Summary: 224 layers, 7062001 parameters, 0 gradients
test: Scanning 'DeepFashion2/df2_all/labels/test_3.cache' images and
labels... 1

Class	Images	Labels	P	R	mAP@.5	mAP@
all	1598	1598	0.805	0.919	0.915	0.742
long sleeve top	1598	400	0.809	0.905	0.897	0.668
short sleeve top	1598	398	0.757	0.852	0.868	0.683
shorts	1598	400	0.808	0.94	0.938	0.792
trousers	1598	400	0.846	0.98	0.957	0.823

Speed: 0.4ms pre-process, 235.1ms inference, 0.5ms NMS per image at s
hape (16, 3, 640, 640)
Results saved to **yolov5/runs/val/exp10**

```
In [ ]:  #started-09:30, finished-09:37
```

Model Test 4.F

- Model: Ensemble of DF1-trained and DF2-trained 4-class models
- Dataset: DF2-Test

In [13]: `!python yolov5/val.py --batch-size 16 --data fashion_all_test_3.yaml -`

val: data=/Users/blairjones/Desktop/w210/yolov5/data/fashion_all_test
_3.yaml, weights=['./DeepFashion1/bcj_experiments/exp_DF1_DF2_align/e
xp2/weights/best.pt', './DeepFashion2/bcj_experiments/exp3/weights/be
st.pt'], batch_size=16, imgsz=640, conf_thres=0.001, iou_thres=0.6, t
ask=test, device=, single_cls=False, augment=False, verbose=False, sa
ve_txt=False, save_hybrid=False, save_conf=False, save_json=False, pr
oject=yolov5/runs/val, name=exp, exist_ok=False, half=False
YOLOv5 🚀 v6.0-6-gd0bfeb3 torch 1.9.0 CPU

Fusing layers...
Model Summary: 213 layers, 7020913 parameters, 0 gradients
Fusing layers...
Model Summary: 224 layers, 7062001 parameters, 0 gradients
Ensemble created with ['./DeepFashion1/bcj_experiments/exp_DF1_DF2_al
ign/exp2/weights/best.pt', './DeepFashion2/bcj_experiments/exp3/weigh
ts/best.pt']

test: Scanning 'DeepFashion2/df2_all/labels/test_3.cache' images and
labels... 1

Class	Images	Labels	P	R	mAP@.5	mAP@
all	1598	1598	0.787	0.879	0.9	0.692
long sleeve top	1598	400	0.838	0.802	0.888	0.657
short sleeve top	1598	398	0.766	0.812	0.848	0.646
shorts	1598	400	0.723	0.934	0.917	0.686
trousers	1598	400	0.82	0.968	0.948	0.779

Speed: 0.4ms pre-process, 452.2ms inference, 0.6ms NMS per image at s
hape (16, 3, 640, 640)
Results saved to **yolov5/runs/val/exp11**

In [ ]: `#started-09:44, finished-10:02`

Scenario: 11-class models

Model Test 11.A

- Model: DF2-trained 11-class model
- Dataset: DF2-Test-1. Composed of random sample from Train data, only 1,312 samples per class were used for training. Despite the random sampling, this data could contain some samples that were in the training data.

In [6]: `!python yolov5/val.py --batch-size 16 --data fashion_all_test_1.yaml -`

val: data=/Users/blairjones/Desktop/w210/yolov5/data/fashion_all_test
.yaml, weights=['./DeepFashion2/bcj_experiments/df2_all/exp2/weights/
best.pt'], batch_size=16, imgsz=640, conf_thres=0.001, iou_thres=0.6,
task=test, device=, single_cls=False, augment=False, verbose=False, s
ave_txt=False, save_hybrid=False, save_conf=False, save_json=False, p
roject=yolov5/runs/val, name=exp, exist_ok=False, half=False
YOLOv5 🚀 v6.0-6-gd0bfeb3 torch 1.9.0 CPU

Fusing layers...
Model Summary: 224 layers, 7080880 parameters, 0 gradients
test: Scanning 'DeepFashion2/df2_all/labels/test' images and labels..
.4383 found
test: New cache created: DeepFashion2/df2_all/labels/test.cache

Class	Images	Labels	P	R	mAP@.5	mAP@
all	4383	4383	0.84	0.897	0.908	0.78
short sleeve top	4383	393	0.735	0.73	0.802	0.685
long sleeve top	4383	397	0.754	0.761	0.788	0.631
trousers	4383	400	0.855	0.948	0.964	0.841
shorts	4383	398	0.794	0.922	0.915	0.795
short sleeve dress	4383	400	0.892	0.865	0.922	0.804
long sleeve outwear	4383	399	0.927	0.925	0.956	0.778
skirt	4383	396	0.719	0.873	0.818	0.712
vest dress	4383	400	0.918	0.951	0.965	0.85
vest	4383	400	0.853	0.927	0.933	0.774
long sleeve dress	4383	400	0.84	0.968	0.943	0.84
sling dress	4383	400	0.946	0.993	0.98	0.866

Speed: 0.4ms pre-process, 226.9ms inference, 0.5ms NMS per image at s
hape (16, 3, 640, 640)
Results saved to **yolov5/runs/val/exp6**

In [ ]: *#started-21:56, eta-22:05*

Model Test 11.B

- Model: DF2-trained 11-class model
- Dataset: DF2-Test-1. Composed of random sample from Train data. All data in this set is guaranteed to have not been used in training, except for the category 'sling dress'.

In [8]: `!python yolov5/val.py --batch-size 16 --data fashion_all_test_2.yaml`

val: data=/Users/blairjones/Desktop/w210/yolov5/data/fashion_all_test
_2.yaml, weights=['./DeepFashion2/bcj_experiments/df2_all/exp2/weight
s/best.pt'], batch_size=16, imgsz=640, conf_thres=0.001, iou_thres=0.
6, task=test, device=, single_cls=False, augment=False, verbose=False
, save_txt=False, save_hybrid=False, save_conf=False, save_json=False
, project=yolov5/runs/val, name=exp, exist_ok=False, half=False
YOLOv5 🚀 v6.0-6-gd0bfeb3 torch 1.9.0 CPU

Fusing layers...
Model Summary: 224 layers, 7080880 parameters, 0 gradients
test: Scanning 'DeepFashion2/df2_all/labels/test_2' images and labels
...4364 fou
test: New cache created: DeepFashion2/df2_all/labels/test_2.cache

Class	Images	Labels	P	R	mAP@.5	mAP@
all	4364	4364	0.796	0.864	0.881	0.746
short sleeve top	4364	394	0.682	0.736	0.776	0.646
long sleeve top	4364	397	0.695	0.729	0.777	0.631
trousers	4364	400	0.86	0.934	0.961	0.831
shorts	4364	397	0.78	0.89	0.903	0.784
short sleeve dress	4364	400	0.803	0.813	0.867	0.746
long sleeve outwear	4364	400	0.868	0.889	0.922	0.72
skirt	4364	397	0.686	0.839	0.793	0.683
vest dress	4364	400	0.865	0.892	0.931	0.811
vest	4364	400	0.845	0.887	0.925	0.744
long sleeve dress	4364	379	0.775	0.894	0.873	0.764
sling dress	4364	400	0.9	0.995	0.966	0.848

Speed: 0.4ms pre-process, 245.6ms inference, 0.5ms NMS per image at s
hape (16, 3, 640, 640)
Results saved to **yolov5/runs/val/exp8**

In [ ]: *#started-09:02, finish-09:22*