# RepVGG++

Torch1.9.0：

Python: 3.7.10

**PyTorch: 1.9.0+cu102**

**TorchVision: 0.10.0+cu102**

OpenCV: 4.5.2

**MMCV: 1.3.8**

MMCV Compiler: GCC 8.3

MMCV CUDA Compiler: 10.2

**MMSegmentation: 0.13.0+66b0525**

# 0.实验结论

* repvgg++相对repvgg: 75.37->75.74, +0.4%

* 某repvgg++(plus code)baseline, 73.60， +L2\_loss\_1e-5, 74.30, +L2\_loss\_1e-5+2aux\_loss, 74.58

关于bn的实验结果可认为是波动造成的。

* sycnbn vs bn, 75.08->75.37

* syncbn\_eps1e-3 vs syncbn\_eps1e-5, 74.05->75.37

# 1.repseg++

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| EXP | crop\_size/train\_size=1024\*512, test\_size：1024x2048  seed=0, deterministic=False, **torch1.9.0**+mmseg0.13.0  RepSeg\_D2\_RepVGG3\_baseline\_32-64-128\_3-7-14\_ds0\_b16\_g4\_s4\_w4\_  ALLsyncbn1e-5\_160k\_repvgg++\_wd5e-5.py **: conv3x3 conv1x1 shotcut**  lr+iter：syncbn lr=0.01 160k， batch\_size：b16\_g4\_s4\_w4  backbone: RepSeg\_bmseg  head: RepSeg\_PSPHead, no aux, with ppm(2,3,4,6), d=2/4/8/16  运算量评估分辨率：512\*256  耗时评估分辨率：1024x2048， 1080Ti | | | | | | | | |
| num | backbone | head(noaux) | miou | time | 大小G | paramM | bacbone  1080tifps | total | exp\_name |
| EXP1 | deep\_stem=False,  num\_blocks=[3, 7, 14],channels=[32, 64, 128],  dilation=[2, 4, 8, 16]  stage0增加至3个block  use noplus code  95%bn，eps=1e-5  5%synbn, eps=1e-3 | use\_ppm=True,  bins=(2, 3, 4, 6),  drop\_ratio=0.1,  in\_channels=128,  channels=128,  95%bn，eps=1e-5  5%synbn, eps=1e-3 | 75.08 |  | t: 7.3  b: 6.3 | t: 2.6  b: 2.2 | 213 | 186 | RepSeg\_D2\_RepVGG3\_baseline\_32-64-128\_3-7-14\_ds0\_b16\_g4\_s4\_w4\_syncbn\_160k.py |
| EXP1' | EXP1+all\_syncbn, eps1e-3 | EXP1+all\_syncbn, eps1e-3 | 74.05 |  |  |  |  |  |  |
| EXP1'' | EXP1+all\_syncbn, eps1e-5 | EXP1+all\_syncbn, eps1e-5 | 75.37 |  |  |  |  |  |  |
| EXP1\_fuxian(plus code) | 同EXP1: use plus code  95%bn，eps=1e-5  5%synbn, eps=1e-3 | 同EXP1: use plus code  95%bn，eps=1e-5  5%synbn, eps=1e-3 | 73.60 |  |  |  |  |  |  |
| EXP1\_fuxian2(plus code) | 同EXP1+all\_syncbn, eps1e-3  use plus code | 同EXP1+all\_syncbn, eps1e-3  use plus code | 74.04 |  |  |  |  |  |  |
| EXP1\_fuxian3(plus code) | 同EXP1+all\_syncbn, eps1e-5  use plus code | 同EXP1+all\_syncbn, eps1e-5  use plus code | 74.44?  为啥这么低？ |  |  |  |  |  |  |
| EXP2\_RepVGG++ | EXP1\_fuxian(plus code)+  use\_custom\_l2=True,  stage1\_ues\_aux=True,  stage2\_ues\_aux=True  custom\_weight\_decay=1e-4  95%bn，eps=1e-5  5%synbn, eps=1e-3 | EXP1\_fuxian(plus code)+  stage1\_auxiliary\_head，weight=0.1  stage2\_auxiliary\_head，weight=0.1  95%bn，eps=1e-5  5%synbn, eps=1e-3 | 74.58 |  |  |  |  |  | [📎RepSeg\_D2\_RepVGG3\_baseline\_32-64-128\_3-7-14\_ds0\_b16\_g4\_s4\_w4\_syncbn\_160k\_convtransformer2.py](https://yuque.antfin.com/attachments/lark/0/2021/py/310699/1630669769856-2c854a98-93ed-46ac-b40b-a21530c7229f.py) |
| EXP2'\_RepVGG++ | EXP1\_fuxian(plus code)+  use\_custom\_l2=True,  stage1\_ues\_aux=True,  stage2\_ues\_aux=True  custom\_weight\_decay=1e-4  all\_syncbn, eps1e-5 | EXP1\_fuxian(plus code)+  stage1\_auxiliary\_head，weight=0.1  stage2\_auxiliary\_head，weight=0.1  all\_syncbn, eps1e-5 | 75.42 |  |  |  |  |  |  |
| EXP2''\_RepVGG++ | EXP1\_fuxian(plus code)+  use\_custom\_l2=True,  stage1\_ues\_aux=True,  stage2\_ues\_aux=True  **custom\_weight\_decay=5e-4**  all\_syncbn, eps1e-5 | EXP1\_fuxian(plus code)+  stage1\_auxiliary\_head，weight=0.1  stage2\_auxiliary\_head，weight=0.1  all\_syncbn, eps1e-5 | 75.74 |  |  |  |  |  |  |
|  | | | |  |  |  |  |  |  |
| EXP3\_RepVGG++ | EXP1\_fuxian(plus code)+  use\_custom\_l2=True,  custom\_weight\_decay=1e-4  95%bn，eps=1e-5  5%synbn, eps=1e-3 | EXP1\_fuxian(plus code)+  noaux, onlyl2  95%bn，eps=1e-5  5%synbn, eps=1e-3 | 74.30 |  |  |  |  |  |  |
| 以下所有实验，all\_syncbn, eps=1e-5, l2wd=5e-5 | | | |  |  |  |  |  |  |
| EXP4 | 32-64-128\_3-7-14\_erfhead2-2  plus code, 320k, b1236 | 32-64-128\_3-7-14\_erfhead2-2  plus code, 320k, b1236 | 75.68  太低了  期望77% |  |  |  |  |  |  |
| EXP5 | 32-64-128\_3-7-14-psphead  plus code, 320k, b1236 | 32-64-128\_3-7-14-psphead  plus code, 320k, b1236 | 76.87  太低了  期望78% |  |  |  |  |  |  |