Exercise 4-1 PCBdata\_fasterRCNN\_colab

Jirayu Petchhan, D10907801

Starting

Installing package

# install dependencies: (use cu101 because colab has CUDA 10.1)

!pip install -U torch==1.5 torchvision==0.6 -f https://download.pytorch.org/whl/cu101/torch\_stable.html

!pip install cython pyyaml==5.1

!pip install -U 'git+https://github.com/cocodataset/cocoapi.git#subdirectory=PythonAPI'

import torch, torchvision

print(torch.\_\_version\_\_, torch.cuda.is\_available())

!gcc --version

!git clone https://github.com/tangsanli5201/DeepPCB

# install detectron2:

!pip install detectron2==0.1.3 -f https://dl.fbaipublicfiles.com/detectron2/wheels/cu101/torch1.5/index.html

|  |  |
| --- | --- |
| C:\Users\PJirayu\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\DA65AAF7.tmp | C:\Users\PJirayu\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\4DB0071D.tmp |
| Exemplary to be used to reference image (PCB) for detection | |

**Default code [Iteration = 1500]**

from detectron2.engine import DefaultTrainer

from detectron2.config import get\_cfg

cfg = get\_cfg()

cfg.merge\_from\_file(model\_zoo.get\_config\_file("COCO-Detection/faster\_rcnn\_R\_50\_FPN\_3x.yaml"))

cfg.DATASETS.TRAIN = ("PCB\_train",)

cfg.DATASETS.TEST = ()

cfg.DATALOADER.NUM\_WORKERS = 0

cfg.MODEL.WEIGHTS = "detectron2://COCO-Detection/faster\_rcnn\_R\_50\_FPN\_3x/137849458/model\_final\_280758.pkl"  # Let training initialize from model zoo

cfg.SOLVER.IMS\_PER\_BATCH = 2

cfg.SOLVER.BASE\_LR = 0.00025  # pick a good LR

cfg.SOLVER.MAX\_ITER = 1500    # 300 iterations seems good enough for this toy dataset; you may need to train longer for a practical dataset

cfg.MODEL.ROI\_HEADS.BATCH\_SIZE\_PER\_IMAGE = 4096   # faster, and good enough for this toy dataset (default: 512)

cfg.MODEL.ROI\_HEADS.NUM\_CLASSES = 6

os.makedirs(cfg.OUTPUT\_DIR, exist\_ok=True)

trainer = DefaultTrainer(cfg)

trainer.resume\_or\_load(resume=False)

trainer.train()

#It will train about 20 minutes in colab.

The description

As given instruction, at iteration more than about 500 times, the accuracy is falling down

The result of default code

|  |
| --- |
| C:\Users\PJirayu\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\B5348433.tmp  pin-hole  94%  open  85%  spur  79%  cooper  94% |
| C:\Users\PJirayu\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\FF6EFFB9.tmp  short  71%  spur  95%  open  68%  pin-hole  87%  spur  34% |
| Visualization Example of accuracy of prediction on PCB with default code |

Conclusion from default code

[11/04 09:25:38 d2.data.build]: Distribution of instances among all 6 categories:

| category | #instances | category | #instances | category | #instances |

|:----------:|:-------------|:----------:|:-------------|:----------:|:-------------|

| open | 659 | short | 478 | mousebite | 586 |

| spur | 483 | copper | 464 | pin-hole | 470 |

| | | | | | |

| total | 3140 | | | | |

[11/04 09:25:38 d2.data.common]: Serializing 500 elements to byte tensors and concatenating them all ...

[11/04 09:25:38 d2.data.common]: Serialized dataset takes 0.28 MiB

[11/04 09:25:38 d2.evaluation.evaluator]: Start inference on 500 images

[11/04 09:25:39 d2.evaluation.evaluator]: Inference done 11/500. 0.0788 s / img. ETA=0:00:48

[11/04 09:25:44 d2.evaluation.evaluator]: Inference done 61/500. 0.0776 s / img. ETA=0:00:44

[11/04 09:25:49 d2.evaluation.evaluator]: Inference done 110/500. 0.0784 s / img. ETA=0:00:40

[11/04 09:25:55 d2.evaluation.evaluator]: Inference done 158/500. 0.0788 s / img. ETA=0:00:35

[11/04 09:26:00 d2.evaluation.evaluator]: Inference done 206/500. 0.0792 s / img. ETA=0:00:30

[11/04 09:26:05 d2.evaluation.evaluator]: Inference done 254/500. 0.0794 s / img. ETA=0:00:25

[11/04 09:26:10 d2.evaluation.evaluator]: Inference done 302/500. 0.0796 s / img. ETA=0:00:20

[11/04 09:26:15 d2.evaluation.evaluator]: Inference done 350/500. 0.0796 s / img. ETA=0:00:15

[11/04 09:26:20 d2.evaluation.evaluator]: Inference done 398/500. 0.0797 s / img. ETA=0:00:10

[11/04 09:26:25 d2.evaluation.evaluator]: Inference done 446/500. 0.0797 s / img. ETA=0:00:05

[11/04 09:26:30 d2.evaluation.evaluator]: Inference done 494/500. 0.0797 s / img. ETA=0:00:00

[11/04 09:26:31 d2.evaluation.evaluator]: Total inference time: 0:00:51.867254 (0.104782 s / img per device, on 1 devices)

[11/04 09:26:31 d2.evaluation.evaluator]: Total inference pure compute time: 0:00:39 (0.079755 s / img per device, on 1 devices)

[11/04 09:26:31 d2.evaluation.coco\_evaluation]: Preparing results for COCO format ...

[11/04 09:26:31 d2.evaluation.coco\_evaluation]: Saving results to ./output/coco\_instances\_results.json

[11/04 09:26:31 d2.evaluation.coco\_evaluation]: Evaluating predictions ...

Loading and preparing results...

DONE (t=0.03s)

creating index...

index created!

Running per image evaluation...

Evaluate annotation type \*bbox\*

DONE (t=1.87s).

Accumulating evaluation results...

DONE (t=0.33s).

Average Precision (AP) @[ IoU=0.50:0.95 | area= all | maxDets=100 ] = 0.590

Average Precision (AP) @[ IoU=0.50 | area= all | maxDets=100 ] = 0.852

Average Precision (AP) @[ IoU=0.75 | area= all | maxDets=100 ] = 0.697

Average Precision (AP) @[ IoU=0.50:0.95 | area= small | maxDets=100 ] = 0.585

Average Precision (AP) @[ IoU=0.50:0.95 | area=medium | maxDets=100 ] = 0.596

Average Precision (AP) @[ IoU=0.50:0.95 | area= large | maxDets=100 ] = 0.000

Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets= 1 ] = 0.540

Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets= 10 ] = 0.706

Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets=100 ] = 0.706

Average Recall (AR) @[ IoU=0.50:0.95 | area= small | maxDets=100 ] = 0.691

Average Recall (AR) @[ IoU=0.50:0.95 | area=medium | maxDets=100 ] = 0.712

Average Recall (AR) @[ IoU=0.50:0.95 | area= large | maxDets=100 ] = 0.000

[11/04 09:26:33 d2.evaluation.coco\_evaluation]: Evaluation results for bbox:

| AP | AP50 | AP75 | APs | APm | APl |

|:------:|:------:|:------:|:------:|:------:|:-----:|

| 58.962 | 85.194 | 69.652 | 58.512 | 59.607 | 0.000 |

[11/04 09:26:33 d2.evaluation.coco\_evaluation]: Per-category bbox AP:

| category | AP | category | AP | category | AP |

|:-----------|:-------|:-----------|:-------|:-----------|:-------|

| open | 49.470 | short | 31.777 | mousebite | 60.334 |

| spur | 58.846 | copper | 77.139 | pin-hole | 76.208 |

OrderedDict([('bbox',

{'AP': 58.96227866375337,

'AP-copper': 77.13877819396738,

'AP-mousebite': 60.33421312935373,

'AP-open': 49.470196992286084,

'AP-pin-hole': 76.20818686754531,

'AP-short': 31.77652467546214,

'AP-spur': 58.84577212390554,

'AP50': 85.19374625611705,

'AP75': 69.65235817888923,

'APl': 0.0,

'APm': 59.60738224996642,

'APs': 58.51235643721091})])

Bounding Box

Average precision (AP) = 58.96 %

| AP | AP50 | AP75 | APs | APm | APl |

|:------:|:------:|:------:|:------:|:------:|:-----:|

| 58.962 | 85.194 | 69.652 | 58.512 | 59.607 | 0.000 |

**Changing new iteration [iteration = 300]**

from detectron2.engine import DefaultTrainer

from detectron2.config import get\_cfg

cfg = get\_cfg()

cfg.merge\_from\_file(model\_zoo.get\_config\_file("COCO-Detection/faster\_rcnn\_R\_50\_FPN\_3x.yaml"))

cfg.DATASETS.TRAIN = ("PCB\_train",)

cfg.DATASETS.TEST = ()

cfg.DATALOADER.NUM\_WORKERS = 0

cfg.MODEL.WEIGHTS = "detectron2://COCO-Detection/faster\_rcnn\_R\_50\_FPN\_3x/137849458/model\_final\_280758.pkl"  # Let training initialize from model zoo

cfg.SOLVER.IMS\_PER\_BATCH = 2

cfg.SOLVER.BASE\_LR = 0.00025  # pick a good LR

cfg.SOLVER.MAX\_ITER = 300    # 300 iterations seems good enough for this toy dataset; you may need to train longer for a practical dataset

cfg.MODEL.ROI\_HEADS.BATCH\_SIZE\_PER\_IMAGE = 4096   # faster, and good enough for this toy dataset (default: 512)

cfg.MODEL.ROI\_HEADS.NUM\_CLASSES = 6

os.makedirs(cfg.OUTPUT\_DIR, exist\_ok=True)

trainer = DefaultTrainer(cfg)

trainer.resume\_or\_load(resume=False)

trainer.train()

#It will train about 20 minutes in colab.

The model trains

[11/04 11:25:57 d2.data.build]: Removed 0 images with no usable annotations. 1000 images left.

[11/04 11:25:57 d2.data.build]: Distribution of instances among all 6 categories:

| category | #instances | category | #instances | category | #instances |

|:----------:|:-------------|:----------:|:-------------|:----------:|:-------------|

| open | 1283 | short | 1028 | mousebite | 1379 |

| spur | 1142 | copper | 1010 | pin-hole | 1031 |

| | | | | | |

| total | 6873 | | | | |

[11/04 11:25:57 d2.data.common]: Serializing 1000 elements to byte tensors and concatenating them all ...

[11/04 11:25:57 d2.data.common]: Serialized dataset takes 0.59 MiB

[11/04 11:25:57 d2.data.detection\_utils]: TransformGens used in training: [ResizeShortestEdge(short\_edge\_length=(640, 672, 704, 736, 768, 800), max\_size=1333, sample\_style='choice'), RandomFlip()]

[11/04 11:25:57 d2.data.build]: Using training sampler TrainingSampler

model\_final\_280758.pkl: 167MB [00:15, 11.1MB/s]

Skip loading parameter 'roi\_heads.box\_predictor.cls\_score.weight' to the model due to incompatible shapes: (81, 1024) in the checkpoint but (7, 1024) in the model! You might want to double check if this is expected.

Skip loading parameter 'roi\_heads.box\_predictor.cls\_score.bias' to the model due to incompatible shapes: (81,) in the checkpoint but (7,) in the model! You might want to double check if this is expected.

Skip loading parameter 'roi\_heads.box\_predictor.bbox\_pred.weight' to the model due to incompatible shapes: (320, 1024) in the checkpoint but (24, 1024) in the model! You might want to double check if this is expected.

Skip loading parameter 'roi\_heads.box\_predictor.bbox\_pred.bias' to the model due to incompatible shapes: (320,) in the checkpoint but (24,) in the model! You might want to double check if this is expected.

[11/04 11:26:18 d2.engine.train\_loop]: Starting training from iteration 0

[11/04 11:26:39 d2.utils.events]: eta: 0:04:58 iter: 19 total\_loss: 2.615 loss\_cls: 1.981 loss\_box\_reg: 0.049 loss\_rpn\_cls: 0.448 loss\_rpn\_loc: 0.135 time: 1.0687 data\_time: 0.0446 lr: 0.000005 max\_mem: 1826M

[11/04 11:27:00 d2.utils.events]: eta: 0:04:33 iter: 39 total\_loss: 2.359 loss\_cls: 1.814 loss\_box\_reg: 0.030 loss\_rpn\_cls: 0.402 loss\_rpn\_loc: 0.134 time: 1.0486 data\_time: 0.0423 lr: 0.000010 max\_mem: 1826M

[11/04 11:27:20 d2.utils.events]: eta: 0:04:10 iter: 59 total\_loss: 1.932 loss\_cls: 1.447 loss\_box\_reg: 0.038 loss\_rpn\_cls: 0.262 loss\_rpn\_loc: 0.134 time: 1.0304 data\_time: 0.0414 lr: 0.000015 max\_mem: 1826M

[11/04 11:27:40 d2.utils.events]: eta: 0:03:47 iter: 79 total\_loss: 1.337 loss\_cls: 0.932 loss\_box\_reg: 0.031 loss\_rpn\_cls: 0.262 loss\_rpn\_loc: 0.132 time: 1.0220 data\_time: 0.0425 lr: 0.000020 max\_mem: 1826M

[11/04 11:28:00 d2.utils.events]: eta: 0:03:26 iter: 99 total\_loss: 1.018 loss\_cls: 0.537 loss\_box\_reg: 0.046 loss\_rpn\_cls: 0.248 loss\_rpn\_loc: 0.133 time: 1.0194 data\_time: 0.0417 lr: 0.000025 max\_mem: 1826M

[11/04 11:28:21 d2.utils.events]: eta: 0:03:06 iter: 119 total\_loss: 0.637 loss\_cls: 0.250 loss\_box\_reg: 0.041 loss\_rpn\_cls: 0.200 loss\_rpn\_loc: 0.157 time: 1.0239 data\_time: 0.0440 lr: 0.000030 max\_mem: 1826M

[11/04 11:28:40 d2.utils.events]: eta: 0:02:44 iter: 139 total\_loss: 0.511 loss\_cls: 0.193 loss\_box\_reg: 0.069 loss\_rpn\_cls: 0.134 loss\_rpn\_loc: 0.103 time: 1.0177 data\_time: 0.0440 lr: 0.000035 max\_mem: 1826M

[11/04 11:29:01 d2.utils.events]: eta: 0:02:24 iter: 159 total\_loss: 0.449 loss\_cls: 0.162 loss\_box\_reg: 0.066 loss\_rpn\_cls: 0.121 loss\_rpn\_loc: 0.105 time: 1.0200 data\_time: 0.0435 lr: 0.000040 max\_mem: 1826M

[11/04 11:29:22 d2.utils.events]: eta: 0:02:04 iter: 179 total\_loss: 0.520 loss\_cls: 0.209 loss\_box\_reg: 0.108 loss\_rpn\_cls: 0.089 loss\_rpn\_loc: 0.091 time: 1.0249 data\_time: 0.0417 lr: 0.000045 max\_mem: 1826M

[11/04 11:29:44 d2.utils.events]: eta: 0:01:44 iter: 199 total\_loss: 0.603 loss\_cls: 0.253 loss\_box\_reg: 0.141 loss\_rpn\_cls: 0.083 loss\_rpn\_loc: 0.084 time: 1.0283 data\_time: 0.0428 lr: 0.000050 max\_mem: 1826M

[11/04 11:30:04 d2.utils.events]: eta: 0:01:23 iter: 219 total\_loss: 0.517 loss\_cls: 0.236 loss\_box\_reg: 0.133 loss\_rpn\_cls: 0.069 loss\_rpn\_loc: 0.079 time: 1.0281 data\_time: 0.0434 lr: 0.000055 max\_mem: 1826M

[11/04 11:30:25 d2.utils.events]: eta: 0:01:03 iter: 239 total\_loss: 0.618 loss\_cls: 0.296 loss\_box\_reg: 0.185 loss\_rpn\_cls: 0.074 loss\_rpn\_loc: 0.066 time: 1.0286 data\_time: 0.0411 lr: 0.000060 max\_mem: 1826M

[11/04 11:30:46 d2.utils.events]: eta: 0:00:42 iter: 259 total\_loss: 0.628 loss\_cls: 0.303 loss\_box\_reg: 0.195 loss\_rpn\_cls: 0.072 loss\_rpn\_loc: 0.068 time: 1.0302 data\_time: 0.0422 lr: 0.000065 max\_mem: 1826M

[11/04 11:31:08 d2.utils.events]: eta: 0:00:21 iter: 279 total\_loss: 0.680 loss\_cls: 0.327 loss\_box\_reg: 0.222 loss\_rpn\_cls: 0.057 loss\_rpn\_loc: 0.056 time: 1.0338 data\_time: 0.0431 lr: 0.000070 max\_mem: 1826M

[11/04 11:31:30 d2.utils.events]: eta: 0:00:01 iter: 299 total\_loss: 0.726 loss\_cls: 0.366 loss\_box\_reg: 0.278 loss\_rpn\_cls: 0.048 loss\_rpn\_loc: 0.052 time: 1.0350 data\_time: 0.0422 lr: 0.000075 max\_mem: 1826M

[11/04 11:31:30 d2.engine.hooks]: Overall training speed: 297 iterations in 0:05:08 (1.0385 s / it)

[11/04 11:31:30 d2.engine.hooks]: Total training time: 0:05:10 (0:00:02 on hooks)

The result of default code

|  |
| --- |
| C:\Users\PJirayu\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\6E906196.tmp |
| C:\Users\PJirayu\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\14566D42.tmp |
| Visualization Example of prediction on PCB with iteration = 300 (The result cannot to detect any characteristic missing part and/or germination section) |

Conclusion from default code

[11/04 11:31:49 d2.data.build]: Distribution of instances among all 6 categories:

| category | #instances | category | #instances | category | #instances |

|:----------:|:-------------|:----------:|:-------------|:----------:|:-------------|

| open | 659 | short | 478 | mousebite | 586 |

| spur | 483 | copper | 464 | pin-hole | 470 |

| | | | | | |

| total | 3140 | | | | |

[11/04 11:31:49 d2.data.common]: Serializing 500 elements to byte tensors and concatenating them all ...

[11/04 11:31:49 d2.data.common]: Serialized dataset takes 0.28 MiB

[11/04 11:31:49 d2.evaluation.evaluator]: Start inference on 500 images

[11/04 11:31:52 d2.evaluation.evaluator]: Inference done 11/500. 0.2544 s / img. ETA=0:02:13

[11/04 11:31:58 d2.evaluation.evaluator]: Inference done 30/500. 0.2522 s / img. ETA=0:02:09

[11/04 11:32:03 d2.evaluation.evaluator]: Inference done 49/500. 0.2520 s / img. ETA=0:02:04

[11/04 11:32:08 d2.evaluation.evaluator]: Inference done 68/500. 0.2523 s / img. ETA=0:01:59

[11/04 11:32:13 d2.evaluation.evaluator]: Inference done 87/500. 0.2520 s / img. ETA=0:01:53

[11/04 11:32:19 d2.evaluation.evaluator]: Inference done 106/500. 0.2518 s / img. ETA=0:01:48

[11/04 11:32:24 d2.evaluation.evaluator]: Inference done 125/500. 0.2518 s / img. ETA=0:01:43

[11/04 11:32:29 d2.evaluation.evaluator]: Inference done 144/500. 0.2517 s / img. ETA=0:01:37

[11/04 11:32:34 d2.evaluation.evaluator]: Inference done 163/500. 0.2517 s / img. ETA=0:01:32

[11/04 11:32:39 d2.evaluation.evaluator]: Inference done 181/500. 0.2520 s / img. ETA=0:01:27

[11/04 11:32:44 d2.evaluation.evaluator]: Inference done 199/500. 0.2523 s / img. ETA=0:01:23

[11/04 11:32:49 d2.evaluation.evaluator]: Inference done 217/500. 0.2526 s / img. ETA=0:01:18

[11/04 11:32:54 d2.evaluation.evaluator]: Inference done 235/500. 0.2528 s / img. ETA=0:01:13

[11/04 11:32:59 d2.evaluation.evaluator]: Inference done 253/500. 0.2530 s / img. ETA=0:01:08

[11/04 11:33:04 d2.evaluation.evaluator]: Inference done 271/500. 0.2530 s / img. ETA=0:01:03

[11/04 11:33:09 d2.evaluation.evaluator]: Inference done 289/500. 0.2531 s / img. ETA=0:00:58

[11/04 11:33:14 d2.evaluation.evaluator]: Inference done 307/500. 0.2532 s / img. ETA=0:00:53

[11/04 11:33:20 d2.evaluation.evaluator]: Inference done 326/500. 0.2532 s / img. ETA=0:00:48

[11/04 11:33:25 d2.evaluation.evaluator]: Inference done 344/500. 0.2532 s / img. ETA=0:00:43

[11/04 11:33:30 d2.evaluation.evaluator]: Inference done 362/500. 0.2533 s / img. ETA=0:00:38

[11/04 11:33:35 d2.evaluation.evaluator]: Inference done 380/500. 0.2533 s / img. ETA=0:00:33

[11/04 11:33:40 d2.evaluation.evaluator]: Inference done 399/500. 0.2533 s / img. ETA=0:00:28

[11/04 11:33:45 d2.evaluation.evaluator]: Inference done 417/500. 0.2533 s / img. ETA=0:00:23

[11/04 11:33:50 d2.evaluation.evaluator]: Inference done 435/500. 0.2533 s / img. ETA=0:00:18

[11/04 11:33:55 d2.evaluation.evaluator]: Inference done 454/500. 0.2533 s / img. ETA=0:00:12

[11/04 11:34:01 d2.evaluation.evaluator]: Inference done 473/500. 0.2533 s / img. ETA=0:00:07

[11/04 11:34:06 d2.evaluation.evaluator]: Inference done 491/500. 0.2533 s / img. ETA=0:00:02

[11/04 11:34:08 d2.evaluation.evaluator]: Total inference time: 0:02:17.385194 (0.277546 s / img per device, on 1 devices)

[11/04 11:34:08 d2.evaluation.evaluator]: Total inference pure compute time: 0:02:05 (0.253353 s / img per device, on 1 devices)

[11/04 11:34:08 d2.evaluation.coco\_evaluation]: Preparing results for COCO format ...

[11/04 11:34:08 d2.evaluation.coco\_evaluation]: Saving results to ./output/coco\_instances\_results.json

[11/04 11:34:08 d2.evaluation.coco\_evaluation]: Evaluating predictions ...

Loading and preparing results...

DONE (t=0.02s)

creating index...

index created!

Running per image evaluation...

Evaluate annotation type \*bbox\*

DONE (t=1.52s).

Accumulating evaluation results...

DONE (t=0.26s).

Average Precision (AP) @[ IoU=0.50:0.95 | area= all | maxDets=100 ] = 0.022

Average Precision (AP) @[ IoU=0.50 | area= all | maxDets=100 ] = 0.070

Average Precision (AP) @[ IoU=0.75 | area= all | maxDets=100 ] = 0.003

Average Precision (AP) @[ IoU=0.50:0.95 | area= small | maxDets=100 ] = 0.002

Average Precision (AP) @[ IoU=0.50:0.95 | area=medium | maxDets=100 ] = 0.037

Average Precision (AP) @[ IoU=0.50:0.95 | area= large | maxDets=100 ] = 0.000

Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets= 1 ] = 0.038

Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets= 10 ] = 0.068

Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets=100 ] = 0.068

Average Recall (AR) @[ IoU=0.50:0.95 | area= small | maxDets=100 ] = 0.026

Average Recall (AR) @[ IoU=0.50:0.95 | area=medium | maxDets=100 ] = 0.085

Average Recall (AR) @[ IoU=0.50:0.95 | area= large | maxDets=100 ] = 0.000

[11/04 11:34:10 d2.evaluation.coco\_evaluation]: Evaluation results for bbox:

| AP | AP50 | AP75 | APs | APm | APl |

|:-----:|:------:|:------:|:-----:|:-----:|:-----:|

| 2.201 | 7.017 | 0.329 | 0.167 | 3.668 | 0.000 |

[11/04 11:34:10 d2.evaluation.coco\_evaluation]: Per-category bbox AP:

| category | AP | category | AP | category | AP |

|:-----------|:------|:-----------|:-------|:-----------|:------|

| open | 0.008 | short | 0.002 | mousebite | 0.021 |

| spur | 0.037 | copper | 12.927 | pin-hole | 0.213 |

OrderedDict([('bbox',

{'AP': 2.2011765730397457,

'AP-copper': 12.927398937605794,

'AP-mousebite': 0.02081692571963237,

'AP-open': 0.007920792079207921,

'AP-pin-hole': 0.21266557867831906,

'AP-short': 0.001588394133531,

'AP-spur': 0.03666881002199029,

'AP50': 7.0172588721044455,

'AP75': 0.3288934995689029,

'APl': 0.0,

'APm': 3.6679947460796813,

'APs': 0.16675076467741562})])

Bounding Box

Average precision (AP) = 2.2012 %

AP | AP50 | AP75 | APs | APm | APl |

|:-----:|:------:|:------:|:-----:|:-----:|:-----:|

| 2.201 | 7.017 | 0.329 | 0.167 | 3.668 | 0.000 |

We will see that when use iteration less than the default code [iteration = 1500]. Average Precision (AP) fall down from about 58% to 2.2 %.

**Changing new iteration [iteration = 3000]**

The model trains

[11/04 12:02:03 d2.data.build]: Removed 0 images with no usable annotations. 1000 images left.

[11/04 12:02:03 d2.data.build]: Distribution of instances among all 6 categories:

| category | #instances | category | #instances | category | #instances |

|:----------:|:-------------|:----------:|:-------------|:----------:|:-------------|

| open | 1283 | short | 1028 | mousebite | 1379 |

| spur | 1142 | copper | 1010 | pin-hole | 1031 |

| | | | | | |

| total | 6873 | | | | |

[11/04 12:02:03 d2.data.common]: Serializing 1000 elements to byte tensors and concatenating them all ...

[11/04 12:02:03 d2.data.common]: Serialized dataset takes 0.59 MiB

[11/04 12:02:03 d2.data.detection\_utils]: TransformGens used in training: [ResizeShortestEdge(short\_edge\_length=(640, 672, 704, 736, 768, 800), max\_size=1333, sample\_style='choice'), RandomFlip()]

[11/04 12:02:03 d2.data.build]: Using training sampler TrainingSampler

Skip loading parameter 'roi\_heads.box\_predictor.cls\_score.weight' to the model due to incompatible shapes: (81, 1024) in the checkpoint but (7, 1024) in the model! You might want to double check if this is expected.

Skip loading parameter 'roi\_heads.box\_predictor.cls\_score.bias' to the model due to incompatible shapes: (81,) in the checkpoint but (7,) in the model! You might want to double check if this is expected.

Skip loading parameter 'roi\_heads.box\_predictor.bbox\_pred.weight' to the model due to incompatible shapes: (320, 1024) in the checkpoint but (24, 1024) in the model! You might want to double check if this is expected.

Skip loading parameter 'roi\_heads.box\_predictor.bbox\_pred.bias' to the model due to incompatible shapes: (320,) in the checkpoint but (24,) in the model! You might want to double check if this is expected.

[11/04 12:02:06 d2.engine.train\_loop]: Starting training from iteration 0

[11/04 12:02:27 d2.utils.events]: eta: 0:52:41 iter: 19 total\_loss: 2.837 loss\_cls: 2.124 loss\_box\_reg: 0.031 loss\_rpn\_cls: 0.540 loss\_rpn\_loc: 0.148 time: 1.0663 data\_time: 0.0442 lr: 0.000005 max\_mem: 1826M

[11/04 12:02:48 d2.utils.events]: eta: 0:52:03 iter: 39 total\_loss: 2.454 loss\_cls: 1.898 loss\_box\_reg: 0.034 loss\_rpn\_cls: 0.347 loss\_rpn\_loc: 0.140 time: 1.0517 data\_time: 0.0415 lr: 0.000010 max\_mem: 1826M

[11/04 12:03:08 d2.utils.events]: eta: 0:50:55 iter: 59 total\_loss: 1.966 loss\_cls: 1.518 loss\_box\_reg: 0.038 loss\_rpn\_cls: 0.315 loss\_rpn\_loc: 0.121 time: 1.0406 data\_time: 0.0405 lr: 0.000015 max\_mem: 1826M

[11/04 12:03:29 d2.utils.events]: eta: 0:50:30 iter: 79 total\_loss: 1.451 loss\_cls: 1.034 loss\_box\_reg: 0.022 loss\_rpn\_cls: 0.209 loss\_rpn\_loc: 0.151 time: 1.0382 data\_time: 0.0443 lr: 0.000020 max\_mem: 1826M

[11/04 12:03:49 d2.utils.events]: eta: 0:49:54 iter: 99 total\_loss: 0.913 loss\_cls: 0.532 loss\_box\_reg: 0.038 loss\_rpn\_cls: 0.141 loss\_rpn\_loc: 0.134 time: 1.0304 data\_time: 0.0410 lr: 0.000025 max\_mem: 1826M

[11/04 12:04:10 d2.utils.events]: eta: 0:49:39 iter: 119 total\_loss: 0.625 loss\_cls: 0.280 loss\_box\_reg: 0.039 loss\_rpn\_cls: 0.166 loss\_rpn\_loc: 0.130 time: 1.0327 data\_time: 0.0435 lr: 0.000030 max\_mem: 1826M

[11/04 12:04:31 d2.utils.events]: eta: 0:49:28 iter: 139 total\_loss: 0.493 loss\_cls: 0.174 loss\_box\_reg: 0.053 loss\_rpn\_cls: 0.133 loss\_rpn\_loc: 0.107 time: 1.0369 data\_time: 0.0444 lr: 0.000035 max\_mem: 1826M

[11/04 12:04:52 d2.utils.events]: eta: 0:49:32 iter: 159 total\_loss: 0.501 loss\_cls: 0.178 loss\_box\_reg: 0.074 loss\_rpn\_cls: 0.108 loss\_rpn\_loc: 0.112 time: 1.0406 data\_time: 0.0431 lr: 0.000040 max\_mem: 1826M

[11/04 12:05:13 d2.utils.events]: eta: 0:49:11 iter: 179 total\_loss: 0.490 loss\_cls: 0.173 loss\_box\_reg: 0.070 loss\_rpn\_cls: 0.142 loss\_rpn\_loc: 0.101 time: 1.0404 data\_time: 0.0434 lr: 0.000045 max\_mem: 1826M

[11/04 12:05:34 d2.utils.events]: eta: 0:48:55 iter: 199 total\_loss: 0.643 loss\_cls: 0.266 loss\_box\_reg: 0.147 loss\_rpn\_cls: 0.078 loss\_rpn\_loc: 0.088 time: 1.0407 data\_time: 0.0428 lr: 0.000050 max\_mem: 1826M

[11/04 12:05:55 d2.utils.events]: eta: 0:48:38 iter: 219 total\_loss: 0.503 loss\_cls: 0.221 loss\_box\_reg: 0.107 loss\_rpn\_cls: 0.087 loss\_rpn\_loc: 0.081 time: 1.0402 data\_time: 0.0435 lr: 0.000055 max\_mem: 1826M

[11/04 12:06:15 d2.utils.events]: eta: 0:48:13 iter: 239 total\_loss: 0.608 loss\_cls: 0.264 loss\_box\_reg: 0.140 loss\_rpn\_cls: 0.098 loss\_rpn\_loc: 0.084 time: 1.0395 data\_time: 0.0440 lr: 0.000060 max\_mem: 1826M

[11/04 12:06:36 d2.utils.events]: eta: 0:47:46 iter: 259 total\_loss: 0.601 loss\_cls: 0.279 loss\_box\_reg: 0.182 loss\_rpn\_cls: 0.076 loss\_rpn\_loc: 0.066 time: 1.0393 data\_time: 0.0418 lr: 0.000065 max\_mem: 1826M

[11/04 12:06:56 d2.utils.events]: eta: 0:47:24 iter: 279 total\_loss: 0.710 loss\_cls: 0.336 loss\_box\_reg: 0.220 loss\_rpn\_cls: 0.072 loss\_rpn\_loc: 0.071 time: 1.0384 data\_time: 0.0429 lr: 0.000070 max\_mem: 1826M

[11/04 12:07:18 d2.utils.events]: eta: 0:47:06 iter: 299 total\_loss: 0.721 loss\_cls: 0.335 loss\_box\_reg: 0.224 loss\_rpn\_cls: 0.079 loss\_rpn\_loc: 0.052 time: 1.0398 data\_time: 0.0431 lr: 0.000075 max\_mem: 1826M

[11/04 12:07:38 d2.utils.events]: eta: 0:46:40 iter: 319 total\_loss: 0.688 loss\_cls: 0.336 loss\_box\_reg: 0.242 loss\_rpn\_cls: 0.052 loss\_rpn\_loc: 0.055 time: 1.0385 data\_time: 0.0433 lr: 0.000080 max\_mem: 1826M

[11/04 12:07:59 d2.utils.events]: eta: 0:46:17 iter: 339 total\_loss: 0.728 loss\_cls: 0.357 loss\_box\_reg: 0.277 loss\_rpn\_cls: 0.037 loss\_rpn\_loc: 0.041 time: 1.0387 data\_time: 0.0439 lr: 0.000085 max\_mem: 1826M

[11/04 12:08:19 d2.utils.events]: eta: 0:45:56 iter: 359 total\_loss: 0.788 loss\_cls: 0.388 loss\_box\_reg: 0.305 loss\_rpn\_cls: 0.062 loss\_rpn\_loc: 0.050 time: 1.0379 data\_time: 0.0422 lr: 0.000090 max\_mem: 1826M

[11/04 12:08:40 d2.utils.events]: eta: 0:45:28 iter: 379 total\_loss: 0.759 loss\_cls: 0.381 loss\_box\_reg: 0.290 loss\_rpn\_cls: 0.039 loss\_rpn\_loc: 0.039 time: 1.0367 data\_time: 0.0423 lr: 0.000095 max\_mem: 1826M

[11/04 12:09:01 d2.utils.events]: eta: 0:45:09 iter: 399 total\_loss: 0.784 loss\_cls: 0.387 loss\_box\_reg: 0.314 loss\_rpn\_cls: 0.054 loss\_rpn\_loc: 0.041 time: 1.0370 data\_time: 0.0436 lr: 0.000100 max\_mem: 1826M

[11/04 12:09:22 d2.utils.events]: eta: 0:44:54 iter: 419 total\_loss: 0.776 loss\_cls: 0.378 loss\_box\_reg: 0.301 loss\_rpn\_cls: 0.035 loss\_rpn\_loc: 0.042 time: 1.0380 data\_time: 0.0440 lr: 0.000105 max\_mem: 1826M

[11/04 12:09:43 d2.utils.events]: eta: 0:44:33 iter: 439 total\_loss: 0.837 loss\_cls: 0.409 loss\_box\_reg: 0.343 loss\_rpn\_cls: 0.044 loss\_rpn\_loc: 0.045 time: 1.0381 data\_time: 0.0422 lr: 0.000110 max\_mem: 1826M

[11/04 12:10:04 d2.utils.events]: eta: 0:44:12 iter: 459 total\_loss: 0.804 loss\_cls: 0.390 loss\_box\_reg: 0.357 loss\_rpn\_cls: 0.044 loss\_rpn\_loc: 0.040 time: 1.0388 data\_time: 0.0448 lr: 0.000115 max\_mem: 1826M

[11/04 12:10:24 d2.utils.events]: eta: 0:43:49 iter: 479 total\_loss: 0.849 loss\_cls: 0.414 loss\_box\_reg: 0.362 loss\_rpn\_cls: 0.032 loss\_rpn\_loc: 0.038 time: 1.0383 data\_time: 0.0433 lr: 0.000120 max\_mem: 1826M

[11/04 12:10:45 d2.utils.events]: eta: 0:43:30 iter: 499 total\_loss: 0.845 loss\_cls: 0.400 loss\_box\_reg: 0.374 loss\_rpn\_cls: 0.027 loss\_rpn\_loc: 0.030 time: 1.0382 data\_time: 0.0440 lr: 0.000125 max\_mem: 1826M

[11/04 12:11:06 d2.utils.events]: eta: 0:43:07 iter: 519 total\_loss: 0.898 loss\_cls: 0.426 loss\_box\_reg: 0.377 loss\_rpn\_cls: 0.029 loss\_rpn\_loc: 0.043 time: 1.0388 data\_time: 0.0425 lr: 0.000130 max\_mem: 1826M

[11/04 12:11:26 d2.utils.events]: eta: 0:42:47 iter: 539 total\_loss: 0.825 loss\_cls: 0.400 loss\_box\_reg: 0.380 loss\_rpn\_cls: 0.029 loss\_rpn\_loc: 0.033 time: 1.0380 data\_time: 0.0427 lr: 0.000135 max\_mem: 1826M

[11/04 12:11:47 d2.utils.events]: eta: 0:42:26 iter: 559 total\_loss: 0.869 loss\_cls: 0.410 loss\_box\_reg: 0.381 loss\_rpn\_cls: 0.039 loss\_rpn\_loc: 0.039 time: 1.0382 data\_time: 0.0453 lr: 0.000140 max\_mem: 1826M

[11/04 12:12:08 d2.utils.events]: eta: 0:42:05 iter: 579 total\_loss: 0.856 loss\_cls: 0.397 loss\_box\_reg: 0.393 loss\_rpn\_cls: 0.020 loss\_rpn\_loc: 0.030 time: 1.0388 data\_time: 0.0438 lr: 0.000145 max\_mem: 1826M

[11/04 12:12:29 d2.utils.events]: eta: 0:41:45 iter: 599 total\_loss: 0.939 loss\_cls: 0.432 loss\_box\_reg: 0.452 loss\_rpn\_cls: 0.028 loss\_rpn\_loc: 0.029 time: 1.0390 data\_time: 0.0426 lr: 0.000150 max\_mem: 1826M

[11/04 12:12:50 d2.utils.events]: eta: 0:41:22 iter: 619 total\_loss: 0.917 loss\_cls: 0.434 loss\_box\_reg: 0.402 loss\_rpn\_cls: 0.029 loss\_rpn\_loc: 0.037 time: 1.0385 data\_time: 0.0418 lr: 0.000155 max\_mem: 1826M

[11/04 12:13:11 d2.utils.events]: eta: 0:41:01 iter: 639 total\_loss: 0.831 loss\_cls: 0.392 loss\_box\_reg: 0.352 loss\_rpn\_cls: 0.028 loss\_rpn\_loc: 0.038 time: 1.0387 data\_time: 0.0425 lr: 0.000160 max\_mem: 1826M

[11/04 12:13:32 d2.utils.events]: eta: 0:40:40 iter: 659 total\_loss: 0.895 loss\_cls: 0.414 loss\_box\_reg: 0.437 loss\_rpn\_cls: 0.023 loss\_rpn\_loc: 0.034 time: 1.0390 data\_time: 0.0432 lr: 0.000165 max\_mem: 1826M

[11/04 12:13:52 d2.utils.events]: eta: 0:40:17 iter: 679 total\_loss: 0.877 loss\_cls: 0.410 loss\_box\_reg: 0.413 loss\_rpn\_cls: 0.017 loss\_rpn\_loc: 0.032 time: 1.0388 data\_time: 0.0430 lr: 0.000170 max\_mem: 1826M

[11/04 12:14:13 d2.utils.events]: eta: 0:39:55 iter: 699 total\_loss: 0.867 loss\_cls: 0.401 loss\_box\_reg: 0.414 loss\_rpn\_cls: 0.018 loss\_rpn\_loc: 0.025 time: 1.0386 data\_time: 0.0424 lr: 0.000175 max\_mem: 1826M

[11/04 12:14:34 d2.utils.events]: eta: 0:39:33 iter: 719 total\_loss: 0.777 loss\_cls: 0.368 loss\_box\_reg: 0.364 loss\_rpn\_cls: 0.020 loss\_rpn\_loc: 0.030 time: 1.0384 data\_time: 0.0437 lr: 0.000180 max\_mem: 1826M

[11/04 12:14:55 d2.utils.events]: eta: 0:39:13 iter: 739 total\_loss: 0.837 loss\_cls: 0.388 loss\_box\_reg: 0.390 loss\_rpn\_cls: 0.015 loss\_rpn\_loc: 0.033 time: 1.0389 data\_time: 0.0452 lr: 0.000185 max\_mem: 1826M

[11/04 12:15:16 d2.utils.events]: eta: 0:38:52 iter: 759 total\_loss: 0.793 loss\_cls: 0.365 loss\_box\_reg: 0.363 loss\_rpn\_cls: 0.016 loss\_rpn\_loc: 0.029 time: 1.0389 data\_time: 0.0425 lr: 0.000190 max\_mem: 1826M

[11/04 12:15:36 d2.utils.events]: eta: 0:38:30 iter: 779 total\_loss: 0.693 loss\_cls: 0.324 loss\_box\_reg: 0.335 loss\_rpn\_cls: 0.016 loss\_rpn\_loc: 0.026 time: 1.0387 data\_time: 0.0437 lr: 0.000195 max\_mem: 1826M

[11/04 12:15:57 d2.utils.events]: eta: 0:38:10 iter: 799 total\_loss: 0.762 loss\_cls: 0.365 loss\_box\_reg: 0.377 loss\_rpn\_cls: 0.019 loss\_rpn\_loc: 0.024 time: 1.0391 data\_time: 0.0435 lr: 0.000200 max\_mem: 1826M

[11/04 12:16:18 d2.utils.events]: eta: 0:37:48 iter: 819 total\_loss: 0.772 loss\_cls: 0.362 loss\_box\_reg: 0.365 loss\_rpn\_cls: 0.012 loss\_rpn\_loc: 0.031 time: 1.0387 data\_time: 0.0415 lr: 0.000205 max\_mem: 1826M

[11/04 12:16:39 d2.utils.events]: eta: 0:37:28 iter: 839 total\_loss: 0.737 loss\_cls: 0.350 loss\_box\_reg: 0.352 loss\_rpn\_cls: 0.016 loss\_rpn\_loc: 0.031 time: 1.0390 data\_time: 0.0432 lr: 0.000210 max\_mem: 1826M

[11/04 12:17:00 d2.utils.events]: eta: 0:37:06 iter: 859 total\_loss: 0.756 loss\_cls: 0.351 loss\_box\_reg: 0.362 loss\_rpn\_cls: 0.015 loss\_rpn\_loc: 0.027 time: 1.0388 data\_time: 0.0424 lr: 0.000215 max\_mem: 1826M

[11/04 12:17:20 d2.utils.events]: eta: 0:36:43 iter: 879 total\_loss: 0.692 loss\_cls: 0.318 loss\_box\_reg: 0.335 loss\_rpn\_cls: 0.018 loss\_rpn\_loc: 0.027 time: 1.0384 data\_time: 0.0425 lr: 0.000220 max\_mem: 1826M

[11/04 12:17:41 d2.utils.events]: eta: 0:36:22 iter: 899 total\_loss: 0.682 loss\_cls: 0.308 loss\_box\_reg: 0.337 loss\_rpn\_cls: 0.016 loss\_rpn\_loc: 0.032 time: 1.0381 data\_time: 0.0413 lr: 0.000225 max\_mem: 1826M

[11/04 12:18:02 d2.utils.events]: eta: 0:36:04 iter: 919 total\_loss: 0.675 loss\_cls: 0.313 loss\_box\_reg: 0.311 loss\_rpn\_cls: 0.014 loss\_rpn\_loc: 0.025 time: 1.0387 data\_time: 0.0419 lr: 0.000230 max\_mem: 1826M

[11/04 12:18:23 d2.utils.events]: eta: 0:35:45 iter: 939 total\_loss: 0.693 loss\_cls: 0.324 loss\_box\_reg: 0.323 loss\_rpn\_cls: 0.014 loss\_rpn\_loc: 0.026 time: 1.0393 data\_time: 0.0458 lr: 0.000235 max\_mem: 1826M

[11/04 12:18:44 d2.utils.events]: eta: 0:35:23 iter: 959 total\_loss: 0.664 loss\_cls: 0.317 loss\_box\_reg: 0.309 loss\_rpn\_cls: 0.020 loss\_rpn\_loc: 0.025 time: 1.0388 data\_time: 0.0410 lr: 0.000240 max\_mem: 1826M

[11/04 12:19:04 d2.utils.events]: eta: 0:35:02 iter: 979 total\_loss: 0.697 loss\_cls: 0.326 loss\_box\_reg: 0.327 loss\_rpn\_cls: 0.013 loss\_rpn\_loc: 0.027 time: 1.0389 data\_time: 0.0441 lr: 0.000245 max\_mem: 1826M

[11/04 12:19:25 d2.utils.events]: eta: 0:34:41 iter: 999 total\_loss: 0.642 loss\_cls: 0.289 loss\_box\_reg: 0.302 loss\_rpn\_cls: 0.016 loss\_rpn\_loc: 0.025 time: 1.0385 data\_time: 0.0425 lr: 0.000250 max\_mem: 1826M

[11/04 12:19:46 d2.utils.events]: eta: 0:34:20 iter: 1019 total\_loss: 0.683 loss\_cls: 0.320 loss\_box\_reg: 0.310 loss\_rpn\_cls: 0.010 loss\_rpn\_loc: 0.029 time: 1.0387 data\_time: 0.0432 lr: 0.000250 max\_mem: 1826M

[11/04 12:20:07 d2.utils.events]: eta: 0:34:00 iter: 1039 total\_loss: 0.644 loss\_cls: 0.297 loss\_box\_reg: 0.289 loss\_rpn\_cls: 0.007 loss\_rpn\_loc: 0.030 time: 1.0390 data\_time: 0.0425 lr: 0.000250 max\_mem: 1826M

[11/04 12:20:28 d2.utils.events]: eta: 0:33:40 iter: 1059 total\_loss: 0.608 loss\_cls: 0.289 loss\_box\_reg: 0.287 loss\_rpn\_cls: 0.014 loss\_rpn\_loc: 0.029 time: 1.0396 data\_time: 0.0437 lr: 0.000250 max\_mem: 1826M

[11/04 12:20:49 d2.utils.events]: eta: 0:33:19 iter: 1079 total\_loss: 0.580 loss\_cls: 0.261 loss\_box\_reg: 0.269 loss\_rpn\_cls: 0.011 loss\_rpn\_loc: 0.024 time: 1.0392 data\_time: 0.0419 lr: 0.000250 max\_mem: 1826M

[11/04 12:21:09 d2.utils.events]: eta: 0:33:00 iter: 1099 total\_loss: 0.644 loss\_cls: 0.301 loss\_box\_reg: 0.294 loss\_rpn\_cls: 0.014 loss\_rpn\_loc: 0.027 time: 1.0389 data\_time: 0.0417 lr: 0.000250 max\_mem: 1826M

[11/04 12:21:31 d2.utils.events]: eta: 0:32:40 iter: 1119 total\_loss: 0.582 loss\_cls: 0.270 loss\_box\_reg: 0.281 loss\_rpn\_cls: 0.009 loss\_rpn\_loc: 0.025 time: 1.0396 data\_time: 0.0438 lr: 0.000250 max\_mem: 1826M

[11/04 12:21:52 d2.utils.events]: eta: 0:32:18 iter: 1139 total\_loss: 0.514 loss\_cls: 0.245 loss\_box\_reg: 0.249 loss\_rpn\_cls: 0.011 loss\_rpn\_loc: 0.024 time: 1.0398 data\_time: 0.0429 lr: 0.000250 max\_mem: 1826M

[11/04 12:22:13 d2.utils.events]: eta: 0:31:57 iter: 1159 total\_loss: 0.557 loss\_cls: 0.263 loss\_box\_reg: 0.266 loss\_rpn\_cls: 0.006 loss\_rpn\_loc: 0.025 time: 1.0397 data\_time: 0.0415 lr: 0.000250 max\_mem: 1826M

[11/04 12:22:34 d2.utils.events]: eta: 0:31:36 iter: 1179 total\_loss: 0.531 loss\_cls: 0.266 loss\_box\_reg: 0.235 loss\_rpn\_cls: 0.010 loss\_rpn\_loc: 0.026 time: 1.0401 data\_time: 0.0425 lr: 0.000250 max\_mem: 1826M

[11/04 12:22:54 d2.utils.events]: eta: 0:31:15 iter: 1199 total\_loss: 0.578 loss\_cls: 0.279 loss\_box\_reg: 0.244 loss\_rpn\_cls: 0.016 loss\_rpn\_loc: 0.025 time: 1.0399 data\_time: 0.0410 lr: 0.000250 max\_mem: 1826M

[11/04 12:23:15 d2.utils.events]: eta: 0:30:54 iter: 1219 total\_loss: 0.556 loss\_cls: 0.270 loss\_box\_reg: 0.265 loss\_rpn\_cls: 0.014 loss\_rpn\_loc: 0.028 time: 1.0399 data\_time: 0.0425 lr: 0.000250 max\_mem: 1826M

[11/04 12:23:35 d2.utils.events]: eta: 0:30:32 iter: 1239 total\_loss: 0.528 loss\_cls: 0.254 loss\_box\_reg: 0.237 loss\_rpn\_cls: 0.012 loss\_rpn\_loc: 0.026 time: 1.0393 data\_time: 0.0402 lr: 0.000250 max\_mem: 1826M

[11/04 12:23:56 d2.utils.events]: eta: 0:30:13 iter: 1259 total\_loss: 0.557 loss\_cls: 0.271 loss\_box\_reg: 0.239 loss\_rpn\_cls: 0.013 loss\_rpn\_loc: 0.030 time: 1.0395 data\_time: 0.0426 lr: 0.000250 max\_mem: 1826M

[11/04 12:24:18 d2.utils.events]: eta: 0:29:54 iter: 1279 total\_loss: 0.491 loss\_cls: 0.216 loss\_box\_reg: 0.240 loss\_rpn\_cls: 0.012 loss\_rpn\_loc: 0.026 time: 1.0401 data\_time: 0.0448 lr: 0.000250 max\_mem: 1826M

[11/04 12:24:39 d2.utils.events]: eta: 0:29:32 iter: 1299 total\_loss: 0.507 loss\_cls: 0.238 loss\_box\_reg: 0.229 loss\_rpn\_cls: 0.012 loss\_rpn\_loc: 0.025 time: 1.0399 data\_time: 0.0444 lr: 0.000250 max\_mem: 1826M

[11/04 12:24:59 d2.utils.events]: eta: 0:29:12 iter: 1319 total\_loss: 0.491 loss\_cls: 0.221 loss\_box\_reg: 0.240 loss\_rpn\_cls: 0.007 loss\_rpn\_loc: 0.022 time: 1.0395 data\_time: 0.0396 lr: 0.000250 max\_mem: 1826M

[11/04 12:25:20 d2.utils.events]: eta: 0:28:51 iter: 1339 total\_loss: 0.482 loss\_cls: 0.217 loss\_box\_reg: 0.223 loss\_rpn\_cls: 0.008 loss\_rpn\_loc: 0.027 time: 1.0398 data\_time: 0.0433 lr: 0.000250 max\_mem: 1826M

[11/04 12:25:41 d2.utils.events]: eta: 0:28:31 iter: 1359 total\_loss: 0.499 loss\_cls: 0.231 loss\_box\_reg: 0.237 loss\_rpn\_cls: 0.012 loss\_rpn\_loc: 0.026 time: 1.0397 data\_time: 0.0432 lr: 0.000250 max\_mem: 1826M

[11/04 12:26:02 d2.utils.events]: eta: 0:28:11 iter: 1379 total\_loss: 0.471 loss\_cls: 0.218 loss\_box\_reg: 0.239 loss\_rpn\_cls: 0.007 loss\_rpn\_loc: 0.030 time: 1.0399 data\_time: 0.0434 lr: 0.000250 max\_mem: 1826M

[11/04 12:26:23 d2.utils.events]: eta: 0:27:51 iter: 1399 total\_loss: 0.463 loss\_cls: 0.211 loss\_box\_reg: 0.219 loss\_rpn\_cls: 0.011 loss\_rpn\_loc: 0.027 time: 1.0402 data\_time: 0.0432 lr: 0.000250 max\_mem: 1826M

[11/04 12:26:44 d2.utils.events]: eta: 0:27:29 iter: 1419 total\_loss: 0.457 loss\_cls: 0.199 loss\_box\_reg: 0.209 loss\_rpn\_cls: 0.013 loss\_rpn\_loc: 0.023 time: 1.0403 data\_time: 0.0433 lr: 0.000250 max\_mem: 1826M

[11/04 12:27:06 d2.utils.events]: eta: 0:27:09 iter: 1439 total\_loss: 0.501 loss\_cls: 0.234 loss\_box\_reg: 0.228 loss\_rpn\_cls: 0.010 loss\_rpn\_loc: 0.023 time: 1.0410 data\_time: 0.0447 lr: 0.000250 max\_mem: 1826M

[11/04 12:27:27 d2.utils.events]: eta: 0:26:50 iter: 1459 total\_loss: 0.473 loss\_cls: 0.216 loss\_box\_reg: 0.225 loss\_rpn\_cls: 0.007 loss\_rpn\_loc: 0.024 time: 1.0413 data\_time: 0.0431 lr: 0.000250 max\_mem: 1826M

[11/04 12:27:48 d2.utils.events]: eta: 0:26:31 iter: 1479 total\_loss: 0.484 loss\_cls: 0.218 loss\_box\_reg: 0.221 loss\_rpn\_cls: 0.008 loss\_rpn\_loc: 0.025 time: 1.0416 data\_time: 0.0437 lr: 0.000250 max\_mem: 1826M

[11/04 12:28:10 d2.utils.events]: eta: 0:26:10 iter: 1499 total\_loss: 0.439 loss\_cls: 0.196 loss\_box\_reg: 0.199 loss\_rpn\_cls: 0.010 loss\_rpn\_loc: 0.024 time: 1.0419 data\_time: 0.0419 lr: 0.000250 max\_mem: 1826M

[11/04 12:28:31 d2.utils.events]: eta: 0:25:51 iter: 1519 total\_loss: 0.448 loss\_cls: 0.190 loss\_box\_reg: 0.204 loss\_rpn\_cls: 0.008 loss\_rpn\_loc: 0.026 time: 1.0421 data\_time: 0.0426 lr: 0.000250 max\_mem: 1826M

[11/04 12:28:53 d2.utils.events]: eta: 0:25:32 iter: 1539 total\_loss: 0.403 loss\_cls: 0.180 loss\_box\_reg: 0.200 loss\_rpn\_cls: 0.006 loss\_rpn\_loc: 0.024 time: 1.0432 data\_time: 0.0450 lr: 0.000250 max\_mem: 1826M

[11/04 12:29:14 d2.utils.events]: eta: 0:25:11 iter: 1559 total\_loss: 0.466 loss\_cls: 0.198 loss\_box\_reg: 0.233 loss\_rpn\_cls: 0.008 loss\_rpn\_loc: 0.028 time: 1.0431 data\_time: 0.0438 lr: 0.000250 max\_mem: 1826M

[11/04 12:29:36 d2.utils.events]: eta: 0:24:52 iter: 1579 total\_loss: 0.406 loss\_cls: 0.185 loss\_box\_reg: 0.192 loss\_rpn\_cls: 0.007 loss\_rpn\_loc: 0.020 time: 1.0435 data\_time: 0.0420 lr: 0.000250 max\_mem: 1826M

[11/04 12:29:59 d2.utils.events]: eta: 0:24:34 iter: 1599 total\_loss: 0.393 loss\_cls: 0.163 loss\_box\_reg: 0.199 loss\_rpn\_cls: 0.004 loss\_rpn\_loc: 0.025 time: 1.0448 data\_time: 0.0434 lr: 0.000250 max\_mem: 1826M

[11/04 12:30:20 d2.utils.events]: eta: 0:24:14 iter: 1619 total\_loss: 0.384 loss\_cls: 0.170 loss\_box\_reg: 0.175 loss\_rpn\_cls: 0.010 loss\_rpn\_loc: 0.022 time: 1.0453 data\_time: 0.0439 lr: 0.000250 max\_mem: 1826M

[11/04 12:30:42 d2.utils.events]: eta: 0:23:54 iter: 1639 total\_loss: 0.482 loss\_cls: 0.206 loss\_box\_reg: 0.230 loss\_rpn\_cls: 0.004 loss\_rpn\_loc: 0.032 time: 1.0456 data\_time: 0.0433 lr: 0.000250 max\_mem: 1826M

[11/04 12:31:03 d2.utils.events]: eta: 0:23:33 iter: 1659 total\_loss: 0.386 loss\_cls: 0.167 loss\_box\_reg: 0.186 loss\_rpn\_cls: 0.008 loss\_rpn\_loc: 0.023 time: 1.0458 data\_time: 0.0424 lr: 0.000250 max\_mem: 1826M

[11/04 12:31:24 d2.utils.events]: eta: 0:23:14 iter: 1679 total\_loss: 0.421 loss\_cls: 0.172 loss\_box\_reg: 0.214 loss\_rpn\_cls: 0.007 loss\_rpn\_loc: 0.024 time: 1.0460 data\_time: 0.0435 lr: 0.000250 max\_mem: 1826M

[11/04 12:31:46 d2.utils.events]: eta: 0:22:54 iter: 1699 total\_loss: 0.427 loss\_cls: 0.184 loss\_box\_reg: 0.209 loss\_rpn\_cls: 0.010 loss\_rpn\_loc: 0.024 time: 1.0465 data\_time: 0.0434 lr: 0.000250 max\_mem: 1826M

[11/04 12:32:08 d2.utils.events]: eta: 0:22:34 iter: 1719 total\_loss: 0.504 loss\_cls: 0.214 loss\_box\_reg: 0.246 loss\_rpn\_cls: 0.004 loss\_rpn\_loc: 0.029 time: 1.0468 data\_time: 0.0456 lr: 0.000250 max\_mem: 1826M

[11/04 12:32:29 d2.utils.events]: eta: 0:22:14 iter: 1739 total\_loss: 0.421 loss\_cls: 0.187 loss\_box\_reg: 0.194 loss\_rpn\_cls: 0.002 loss\_rpn\_loc: 0.021 time: 1.0474 data\_time: 0.0425 lr: 0.000250 max\_mem: 1826M

[11/04 12:32:51 d2.utils.events]: eta: 0:21:53 iter: 1759 total\_loss: 0.405 loss\_cls: 0.171 loss\_box\_reg: 0.202 loss\_rpn\_cls: 0.005 loss\_rpn\_loc: 0.020 time: 1.0475 data\_time: 0.0438 lr: 0.000250 max\_mem: 1826M

[11/04 12:33:11 d2.utils.events]: eta: 0:21:33 iter: 1779 total\_loss: 0.433 loss\_cls: 0.196 loss\_box\_reg: 0.233 loss\_rpn\_cls: 0.005 loss\_rpn\_loc: 0.024 time: 1.0472 data\_time: 0.0399 lr: 0.000250 max\_mem: 1826M

[11/04 12:33:32 d2.utils.events]: eta: 0:21:12 iter: 1799 total\_loss: 0.389 loss\_cls: 0.173 loss\_box\_reg: 0.186 loss\_rpn\_cls: 0.004 loss\_rpn\_loc: 0.021 time: 1.0473 data\_time: 0.0423 lr: 0.000250 max\_mem: 1826M

[11/04 12:33:54 d2.utils.events]: eta: 0:20:54 iter: 1819 total\_loss: 0.428 loss\_cls: 0.180 loss\_box\_reg: 0.214 loss\_rpn\_cls: 0.008 loss\_rpn\_loc: 0.025 time: 1.0477 data\_time: 0.0427 lr: 0.000250 max\_mem: 1826M

[11/04 12:34:14 d2.utils.events]: eta: 0:20:32 iter: 1839 total\_loss: 0.388 loss\_cls: 0.156 loss\_box\_reg: 0.195 loss\_rpn\_cls: 0.005 loss\_rpn\_loc: 0.020 time: 1.0474 data\_time: 0.0424 lr: 0.000250 max\_mem: 1826M

[11/04 12:34:36 d2.utils.events]: eta: 0:20:12 iter: 1859 total\_loss: 0.404 loss\_cls: 0.172 loss\_box\_reg: 0.209 loss\_rpn\_cls: 0.004 loss\_rpn\_loc: 0.023 time: 1.0476 data\_time: 0.0422 lr: 0.000250 max\_mem: 1826M

[11/04 12:34:57 d2.utils.events]: eta: 0:19:52 iter: 1879 total\_loss: 0.362 loss\_cls: 0.149 loss\_box\_reg: 0.177 loss\_rpn\_cls: 0.006 loss\_rpn\_loc: 0.024 time: 1.0477 data\_time: 0.0425 lr: 0.000250 max\_mem: 1826M

[11/04 12:35:19 d2.utils.events]: eta: 0:19:31 iter: 1899 total\_loss: 0.388 loss\_cls: 0.164 loss\_box\_reg: 0.197 loss\_rpn\_cls: 0.005 loss\_rpn\_loc: 0.021 time: 1.0483 data\_time: 0.0440 lr: 0.000250 max\_mem: 1826M

[11/04 12:35:40 d2.utils.events]: eta: 0:19:10 iter: 1919 total\_loss: 0.417 loss\_cls: 0.177 loss\_box\_reg: 0.211 loss\_rpn\_cls: 0.009 loss\_rpn\_loc: 0.024 time: 1.0484 data\_time: 0.0432 lr: 0.000250 max\_mem: 1826M

[11/04 12:36:01 d2.utils.events]: eta: 0:18:50 iter: 1939 total\_loss: 0.415 loss\_cls: 0.177 loss\_box\_reg: 0.213 loss\_rpn\_cls: 0.005 loss\_rpn\_loc: 0.023 time: 1.0485 data\_time: 0.0418 lr: 0.000250 max\_mem: 1826M

[11/04 12:36:23 d2.utils.events]: eta: 0:18:29 iter: 1959 total\_loss: 0.453 loss\_cls: 0.194 loss\_box\_reg: 0.227 loss\_rpn\_cls: 0.006 loss\_rpn\_loc: 0.025 time: 1.0488 data\_time: 0.0447 lr: 0.000250 max\_mem: 1826M

[11/04 12:36:44 d2.utils.events]: eta: 0:18:08 iter: 1979 total\_loss: 0.394 loss\_cls: 0.163 loss\_box\_reg: 0.203 loss\_rpn\_cls: 0.005 loss\_rpn\_loc: 0.022 time: 1.0490 data\_time: 0.0418 lr: 0.000250 max\_mem: 1826M

[11/04 12:37:06 d2.utils.events]: eta: 0:17:48 iter: 1999 total\_loss: 0.380 loss\_cls: 0.157 loss\_box\_reg: 0.199 loss\_rpn\_cls: 0.005 loss\_rpn\_loc: 0.020 time: 1.0492 data\_time: 0.0433 lr: 0.000250 max\_mem: 1826M

[11/04 12:37:27 d2.utils.events]: eta: 0:17:27 iter: 2019 total\_loss: 0.418 loss\_cls: 0.166 loss\_box\_reg: 0.213 loss\_rpn\_cls: 0.010 loss\_rpn\_loc: 0.024 time: 1.0494 data\_time: 0.0433 lr: 0.000250 max\_mem: 1826M

[11/04 12:37:47 d2.utils.events]: eta: 0:17:05 iter: 2039 total\_loss: 0.449 loss\_cls: 0.187 loss\_box\_reg: 0.206 loss\_rpn\_cls: 0.008 loss\_rpn\_loc: 0.024 time: 1.0490 data\_time: 0.0407 lr: 0.000250 max\_mem: 1826M

[11/04 12:38:08 d2.utils.events]: eta: 0:16:43 iter: 2059 total\_loss: 0.370 loss\_cls: 0.165 loss\_box\_reg: 0.185 loss\_rpn\_cls: 0.006 loss\_rpn\_loc: 0.020 time: 1.0490 data\_time: 0.0420 lr: 0.000250 max\_mem: 1826M

[11/04 12:38:30 d2.utils.events]: eta: 0:16:23 iter: 2079 total\_loss: 0.388 loss\_cls: 0.170 loss\_box\_reg: 0.179 loss\_rpn\_cls: 0.005 loss\_rpn\_loc: 0.019 time: 1.0494 data\_time: 0.0431 lr: 0.000250 max\_mem: 1826M

[11/04 12:38:51 d2.utils.events]: eta: 0:16:02 iter: 2099 total\_loss: 0.358 loss\_cls: 0.149 loss\_box\_reg: 0.174 loss\_rpn\_cls: 0.005 loss\_rpn\_loc: 0.022 time: 1.0496 data\_time: 0.0430 lr: 0.000250 max\_mem: 1826M

[11/04 12:39:13 d2.utils.events]: eta: 0:15:41 iter: 2119 total\_loss: 0.313 loss\_cls: 0.120 loss\_box\_reg: 0.169 loss\_rpn\_cls: 0.005 loss\_rpn\_loc: 0.021 time: 1.0496 data\_time: 0.0419 lr: 0.000250 max\_mem: 1826M

[11/04 12:39:34 d2.utils.events]: eta: 0:15:20 iter: 2139 total\_loss: 0.377 loss\_cls: 0.142 loss\_box\_reg: 0.185 loss\_rpn\_cls: 0.004 loss\_rpn\_loc: 0.023 time: 1.0500 data\_time: 0.0435 lr: 0.000250 max\_mem: 1826M

[11/04 12:39:56 d2.utils.events]: eta: 0:15:00 iter: 2159 total\_loss: 0.407 loss\_cls: 0.159 loss\_box\_reg: 0.203 loss\_rpn\_cls: 0.006 loss\_rpn\_loc: 0.025 time: 1.0500 data\_time: 0.0430 lr: 0.000250 max\_mem: 1826M

[11/04 12:40:17 d2.utils.events]: eta: 0:14:38 iter: 2179 total\_loss: 0.363 loss\_cls: 0.141 loss\_box\_reg: 0.188 loss\_rpn\_cls: 0.004 loss\_rpn\_loc: 0.023 time: 1.0501 data\_time: 0.0412 lr: 0.000250 max\_mem: 1826M

[11/04 12:40:39 d2.utils.events]: eta: 0:14:17 iter: 2199 total\_loss: 0.375 loss\_cls: 0.143 loss\_box\_reg: 0.179 loss\_rpn\_cls: 0.008 loss\_rpn\_loc: 0.024 time: 1.0505 data\_time: 0.0447 lr: 0.000250 max\_mem: 1826M

[11/04 12:41:00 d2.utils.events]: eta: 0:13:57 iter: 2219 total\_loss: 0.413 loss\_cls: 0.173 loss\_box\_reg: 0.201 loss\_rpn\_cls: 0.005 loss\_rpn\_loc: 0.027 time: 1.0506 data\_time: 0.0417 lr: 0.000250 max\_mem: 1826M

[11/04 12:41:21 d2.utils.events]: eta: 0:13:36 iter: 2239 total\_loss: 0.364 loss\_cls: 0.144 loss\_box\_reg: 0.185 loss\_rpn\_cls: 0.004 loss\_rpn\_loc: 0.022 time: 1.0508 data\_time: 0.0436 lr: 0.000250 max\_mem: 1826M

[11/04 12:41:43 d2.utils.events]: eta: 0:13:15 iter: 2259 total\_loss: 0.409 loss\_cls: 0.167 loss\_box\_reg: 0.210 loss\_rpn\_cls: 0.005 loss\_rpn\_loc: 0.023 time: 1.0511 data\_time: 0.0416 lr: 0.000250 max\_mem: 1826M

[11/04 12:42:04 d2.utils.events]: eta: 0:12:53 iter: 2279 total\_loss: 0.379 loss\_cls: 0.140 loss\_box\_reg: 0.208 loss\_rpn\_cls: 0.005 loss\_rpn\_loc: 0.028 time: 1.0509 data\_time: 0.0415 lr: 0.000250 max\_mem: 1826M

[11/04 12:42:25 d2.utils.events]: eta: 0:12:33 iter: 2299 total\_loss: 0.363 loss\_cls: 0.140 loss\_box\_reg: 0.196 loss\_rpn\_cls: 0.007 loss\_rpn\_loc: 0.022 time: 1.0511 data\_time: 0.0438 lr: 0.000250 max\_mem: 1826M

[11/04 12:42:47 d2.utils.events]: eta: 0:12:12 iter: 2319 total\_loss: 0.362 loss\_cls: 0.155 loss\_box\_reg: 0.182 loss\_rpn\_cls: 0.006 loss\_rpn\_loc: 0.020 time: 1.0513 data\_time: 0.0421 lr: 0.000250 max\_mem: 1826M

[11/04 12:43:08 d2.utils.events]: eta: 0:11:50 iter: 2339 total\_loss: 0.352 loss\_cls: 0.144 loss\_box\_reg: 0.190 loss\_rpn\_cls: 0.010 loss\_rpn\_loc: 0.021 time: 1.0514 data\_time: 0.0434 lr: 0.000250 max\_mem: 1826M

[11/04 12:43:29 d2.utils.events]: eta: 0:11:29 iter: 2359 total\_loss: 0.370 loss\_cls: 0.152 loss\_box\_reg: 0.186 loss\_rpn\_cls: 0.006 loss\_rpn\_loc: 0.020 time: 1.0516 data\_time: 0.0448 lr: 0.000250 max\_mem: 1826M

[11/04 12:43:51 d2.utils.events]: eta: 0:11:08 iter: 2379 total\_loss: 0.357 loss\_cls: 0.148 loss\_box\_reg: 0.185 loss\_rpn\_cls: 0.003 loss\_rpn\_loc: 0.022 time: 1.0518 data\_time: 0.0416 lr: 0.000250 max\_mem: 1826M

[11/04 12:44:12 d2.utils.events]: eta: 0:10:46 iter: 2399 total\_loss: 0.317 loss\_cls: 0.120 loss\_box\_reg: 0.172 loss\_rpn\_cls: 0.003 loss\_rpn\_loc: 0.022 time: 1.0519 data\_time: 0.0433 lr: 0.000250 max\_mem: 1826M

[11/04 12:44:33 d2.utils.events]: eta: 0:10:25 iter: 2419 total\_loss: 0.359 loss\_cls: 0.145 loss\_box\_reg: 0.177 loss\_rpn\_cls: 0.006 loss\_rpn\_loc: 0.024 time: 1.0519 data\_time: 0.0422 lr: 0.000250 max\_mem: 1826M

[11/04 12:44:55 d2.utils.events]: eta: 0:10:03 iter: 2439 total\_loss: 0.371 loss\_cls: 0.146 loss\_box\_reg: 0.203 loss\_rpn\_cls: 0.005 loss\_rpn\_loc: 0.022 time: 1.0522 data\_time: 0.0438 lr: 0.000250 max\_mem: 1826M

[11/04 12:45:16 d2.utils.events]: eta: 0:09:42 iter: 2459 total\_loss: 0.354 loss\_cls: 0.143 loss\_box\_reg: 0.179 loss\_rpn\_cls: 0.006 loss\_rpn\_loc: 0.021 time: 1.0523 data\_time: 0.0430 lr: 0.000250 max\_mem: 1826M

[11/04 12:45:37 d2.utils.events]: eta: 0:09:20 iter: 2479 total\_loss: 0.360 loss\_cls: 0.142 loss\_box\_reg: 0.198 loss\_rpn\_cls: 0.006 loss\_rpn\_loc: 0.020 time: 1.0523 data\_time: 0.0430 lr: 0.000250 max\_mem: 1826M

[11/04 12:45:59 d2.utils.events]: eta: 0:08:59 iter: 2499 total\_loss: 0.341 loss\_cls: 0.131 loss\_box\_reg: 0.181 loss\_rpn\_cls: 0.005 loss\_rpn\_loc: 0.018 time: 1.0525 data\_time: 0.0429 lr: 0.000250 max\_mem: 1826M

[11/04 12:46:20 d2.utils.events]: eta: 0:08:37 iter: 2519 total\_loss: 0.333 loss\_cls: 0.131 loss\_box\_reg: 0.179 loss\_rpn\_cls: 0.006 loss\_rpn\_loc: 0.018 time: 1.0523 data\_time: 0.0419 lr: 0.000250 max\_mem: 1826M

[11/04 12:46:41 d2.utils.events]: eta: 0:08:15 iter: 2539 total\_loss: 0.337 loss\_cls: 0.131 loss\_box\_reg: 0.180 loss\_rpn\_cls: 0.004 loss\_rpn\_loc: 0.018 time: 1.0523 data\_time: 0.0407 lr: 0.000250 max\_mem: 1826M

[11/04 12:47:01 d2.utils.events]: eta: 0:07:53 iter: 2559 total\_loss: 0.331 loss\_cls: 0.135 loss\_box\_reg: 0.171 loss\_rpn\_cls: 0.004 loss\_rpn\_loc: 0.021 time: 1.0521 data\_time: 0.0400 lr: 0.000250 max\_mem: 1826M

[11/04 12:47:22 d2.utils.events]: eta: 0:07:31 iter: 2579 total\_loss: 0.328 loss\_cls: 0.128 loss\_box\_reg: 0.169 loss\_rpn\_cls: 0.005 loss\_rpn\_loc: 0.019 time: 1.0522 data\_time: 0.0428 lr: 0.000250 max\_mem: 1826M

[11/04 12:47:44 d2.utils.events]: eta: 0:07:09 iter: 2599 total\_loss: 0.340 loss\_cls: 0.122 loss\_box\_reg: 0.196 loss\_rpn\_cls: 0.003 loss\_rpn\_loc: 0.021 time: 1.0523 data\_time: 0.0429 lr: 0.000250 max\_mem: 1826M

[11/04 12:48:05 d2.utils.events]: eta: 0:06:48 iter: 2619 total\_loss: 0.389 loss\_cls: 0.146 loss\_box\_reg: 0.203 loss\_rpn\_cls: 0.003 loss\_rpn\_loc: 0.022 time: 1.0524 data\_time: 0.0436 lr: 0.000250 max\_mem: 1826M

[11/04 12:48:26 d2.utils.events]: eta: 0:06:26 iter: 2639 total\_loss: 0.392 loss\_cls: 0.153 loss\_box\_reg: 0.195 loss\_rpn\_cls: 0.004 loss\_rpn\_loc: 0.023 time: 1.0525 data\_time: 0.0419 lr: 0.000250 max\_mem: 1826M

[11/04 12:48:48 d2.utils.events]: eta: 0:06:05 iter: 2659 total\_loss: 0.337 loss\_cls: 0.129 loss\_box\_reg: 0.180 loss\_rpn\_cls: 0.003 loss\_rpn\_loc: 0.025 time: 1.0526 data\_time: 0.0423 lr: 0.000250 max\_mem: 1826M

[11/04 12:49:10 d2.utils.events]: eta: 0:05:44 iter: 2679 total\_loss: 0.378 loss\_cls: 0.146 loss\_box\_reg: 0.196 loss\_rpn\_cls: 0.008 loss\_rpn\_loc: 0.021 time: 1.0529 data\_time: 0.0423 lr: 0.000250 max\_mem: 1826M

[11/04 12:49:31 d2.utils.events]: eta: 0:05:22 iter: 2699 total\_loss: 0.354 loss\_cls: 0.140 loss\_box\_reg: 0.188 loss\_rpn\_cls: 0.004 loss\_rpn\_loc: 0.023 time: 1.0531 data\_time: 0.0449 lr: 0.000250 max\_mem: 1826M

[11/04 12:49:52 d2.utils.events]: eta: 0:05:01 iter: 2719 total\_loss: 0.335 loss\_cls: 0.126 loss\_box\_reg: 0.179 loss\_rpn\_cls: 0.006 loss\_rpn\_loc: 0.020 time: 1.0529 data\_time: 0.0413 lr: 0.000250 max\_mem: 1826M

[11/04 12:50:13 d2.utils.events]: eta: 0:04:39 iter: 2739 total\_loss: 0.311 loss\_cls: 0.119 loss\_box\_reg: 0.164 loss\_rpn\_cls: 0.002 loss\_rpn\_loc: 0.019 time: 1.0528 data\_time: 0.0442 lr: 0.000250 max\_mem: 1826M

[11/04 12:50:33 d2.utils.events]: eta: 0:04:17 iter: 2759 total\_loss: 0.309 loss\_cls: 0.137 loss\_box\_reg: 0.182 loss\_rpn\_cls: 0.003 loss\_rpn\_loc: 0.018 time: 1.0527 data\_time: 0.0420 lr: 0.000250 max\_mem: 1826M

[11/04 12:50:54 d2.utils.events]: eta: 0:03:56 iter: 2779 total\_loss: 0.363 loss\_cls: 0.129 loss\_box\_reg: 0.186 loss\_rpn\_cls: 0.006 loss\_rpn\_loc: 0.023 time: 1.0526 data\_time: 0.0420 lr: 0.000250 max\_mem: 1826M

[11/04 12:51:15 d2.utils.events]: eta: 0:03:34 iter: 2799 total\_loss: 0.352 loss\_cls: 0.136 loss\_box\_reg: 0.180 loss\_rpn\_cls: 0.004 loss\_rpn\_loc: 0.019 time: 1.0525 data\_time: 0.0414 lr: 0.000250 max\_mem: 1826M

[11/04 12:51:37 d2.utils.events]: eta: 0:03:13 iter: 2819 total\_loss: 0.299 loss\_cls: 0.126 loss\_box\_reg: 0.159 loss\_rpn\_cls: 0.003 loss\_rpn\_loc: 0.019 time: 1.0527 data\_time: 0.0448 lr: 0.000250 max\_mem: 1826M

[11/04 12:51:58 d2.utils.events]: eta: 0:02:52 iter: 2839 total\_loss: 0.324 loss\_cls: 0.127 loss\_box\_reg: 0.172 loss\_rpn\_cls: 0.004 loss\_rpn\_loc: 0.021 time: 1.0529 data\_time: 0.0444 lr: 0.000250 max\_mem: 1826M

[11/04 12:52:20 d2.utils.events]: eta: 0:02:30 iter: 2859 total\_loss: 0.332 loss\_cls: 0.125 loss\_box\_reg: 0.180 loss\_rpn\_cls: 0.006 loss\_rpn\_loc: 0.023 time: 1.0531 data\_time: 0.0420 lr: 0.000250 max\_mem: 1826M

[11/04 12:52:41 d2.utils.events]: eta: 0:02:09 iter: 2879 total\_loss: 0.352 loss\_cls: 0.141 loss\_box\_reg: 0.183 loss\_rpn\_cls: 0.006 loss\_rpn\_loc: 0.020 time: 1.0533 data\_time: 0.0430 lr: 0.000250 max\_mem: 1826M

[11/04 12:53:03 d2.utils.events]: eta: 0:01:48 iter: 2899 total\_loss: 0.362 loss\_cls: 0.134 loss\_box\_reg: 0.193 loss\_rpn\_cls: 0.008 loss\_rpn\_loc: 0.022 time: 1.0533 data\_time: 0.0415 lr: 0.000250 max\_mem: 1826M

[11/04 12:53:23 d2.utils.events]: eta: 0:01:26 iter: 2919 total\_loss: 0.322 loss\_cls: 0.128 loss\_box\_reg: 0.174 loss\_rpn\_cls: 0.002 loss\_rpn\_loc: 0.020 time: 1.0532 data\_time: 0.0428 lr: 0.000250 max\_mem: 1826M

[11/04 12:53:44 d2.utils.events]: eta: 0:01:05 iter: 2939 total\_loss: 0.347 loss\_cls: 0.129 loss\_box\_reg: 0.189 loss\_rpn\_cls: 0.003 loss\_rpn\_loc: 0.021 time: 1.0531 data\_time: 0.0430 lr: 0.000250 max\_mem: 1826M

[11/04 12:54:06 d2.utils.events]: eta: 0:00:43 iter: 2959 total\_loss: 0.319 loss\_cls: 0.116 loss\_box\_reg: 0.160 loss\_rpn\_cls: 0.006 loss\_rpn\_loc: 0.019 time: 1.0533 data\_time: 0.0425 lr: 0.000250 max\_mem: 1826M

[11/04 12:54:27 d2.utils.events]: eta: 0:00:22 iter: 2979 total\_loss: 0.381 loss\_cls: 0.151 loss\_box\_reg: 0.190 loss\_rpn\_cls: 0.008 loss\_rpn\_loc: 0.022 time: 1.0534 data\_time: 0.0426 lr: 0.000250 max\_mem: 1826M

[11/04 12:54:50 d2.utils.events]: eta: 0:00:01 iter: 2999 total\_loss: 0.352 loss\_cls: 0.137 loss\_box\_reg: 0.194 loss\_rpn\_cls: 0.006 loss\_rpn\_loc: 0.022 time: 1.0537 data\_time: 0.0432 lr: 0.000250 max\_mem: 1826M

[11/04 12:54:51 d2.engine.hooks]: Overall training speed: 2997 iterations in 0:52:38 (1.0540 s / it)

[11/04 12:54:51 d2.engine.hooks]: Total training time: 0:52:43 (0:00:04 on hooks)

The result of default code

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| --- |
| C:\Users\PJirayu\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\3E573DAE.tmp  short  62%  open  99%  Pin-hole  99%  spur  98%  copper  99% |
| C:\Users\PJirayu\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\A1EBA5EC.tmp  short  97%  Spur  97%  Pin-hole  98%  copper  99%  short  70%  short  65% |
| Visualization Example of accuracy of prediction on PCB with changing iteration to 3000 |

Short

49%

Open

51%

Conclusion from default code

[11/04 12:55:07 d2.data.build]: Distribution of instances among all 6 categories:

| category | #instances | category | #instances | category | #instances |

|:----------:|:-------------|:----------:|:-------------|:----------:|:-------------|

| open | 659 | short | 478 | mousebite | 586 |

| spur | 483 | copper | 464 | pin-hole | 470 |

| | | | | | |

| total | 3140 | | | | |

[11/04 12:55:07 d2.data.common]: Serializing 500 elements to byte tensors and concatenating them all ...

[11/04 12:55:07 d2.data.common]: Serialized dataset takes 0.28 MiB

[11/04 12:55:07 d2.evaluation.evaluator]: Start inference on 500 images

[11/04 12:55:10 d2.evaluation.evaluator]: Inference done 11/500. 0.2561 s / img. ETA=0:02:15

[11/04 12:55:15 d2.evaluation.evaluator]: Inference done 29/500. 0.2556 s / img. ETA=0:02:11

[11/04 12:55:20 d2.evaluation.evaluator]: Inference done 47/500. 0.2555 s / img. ETA=0:02:06

[11/04 12:55:25 d2.evaluation.evaluator]: Inference done 65/500. 0.2552 s / img. ETA=0:02:01

[11/04 12:55:30 d2.evaluation.evaluator]: Inference done 83/500. 0.2551 s / img. ETA=0:01:56

[11/04 12:55:35 d2.evaluation.evaluator]: Inference done 101/500. 0.2554 s / img. ETA=0:01:51

[11/04 12:55:40 d2.evaluation.evaluator]: Inference done 119/500. 0.2557 s / img. ETA=0:01:46

[11/04 12:55:45 d2.evaluation.evaluator]: Inference done 137/500. 0.2557 s / img. ETA=0:01:41

[11/04 12:55:50 d2.evaluation.evaluator]: Inference done 155/500. 0.2556 s / img. ETA=0:01:36

[11/04 12:55:55 d2.evaluation.evaluator]: Inference done 173/500. 0.2555 s / img. ETA=0:01:31

[11/04 12:56:00 d2.evaluation.evaluator]: Inference done 191/500. 0.2556 s / img. ETA=0:01:26

[11/04 12:56:05 d2.evaluation.evaluator]: Inference done 209/500. 0.2555 s / img. ETA=0:01:21

[11/04 12:56:10 d2.evaluation.evaluator]: Inference done 227/500. 0.2556 s / img. ETA=0:01:16

[11/04 12:56:15 d2.evaluation.evaluator]: Inference done 245/500. 0.2555 s / img. ETA=0:01:11

[11/04 12:56:20 d2.evaluation.evaluator]: Inference done 263/500. 0.2555 s / img. ETA=0:01:06

[11/04 12:56:25 d2.evaluation.evaluator]: Inference done 281/500. 0.2555 s / img. ETA=0:01:01

[11/04 12:56:30 d2.evaluation.evaluator]: Inference done 299/500. 0.2555 s / img. ETA=0:00:56

[11/04 12:56:35 d2.evaluation.evaluator]: Inference done 317/500. 0.2555 s / img. ETA=0:00:51

[11/04 12:56:40 d2.evaluation.evaluator]: Inference done 335/500. 0.2555 s / img. ETA=0:00:46

[11/04 12:56:45 d2.evaluation.evaluator]: Inference done 353/500. 0.2554 s / img. ETA=0:00:41

[11/04 12:56:50 d2.evaluation.evaluator]: Inference done 371/500. 0.2555 s / img. ETA=0:00:36

[11/04 12:56:55 d2.evaluation.evaluator]: Inference done 389/500. 0.2555 s / img. ETA=0:00:31

[11/04 12:57:00 d2.evaluation.evaluator]: Inference done 407/500. 0.2555 s / img. ETA=0:00:26

[11/04 12:57:05 d2.evaluation.evaluator]: Inference done 425/500. 0.2555 s / img. ETA=0:00:20

[11/04 12:57:11 d2.evaluation.evaluator]: Inference done 443/500. 0.2554 s / img. ETA=0:00:15

[11/04 12:57:16 d2.evaluation.evaluator]: Inference done 461/500. 0.2555 s / img. ETA=0:00:10

[11/04 12:57:21 d2.evaluation.evaluator]: Inference done 479/500. 0.2555 s / img. ETA=0:00:05

[11/04 12:57:26 d2.evaluation.evaluator]: Inference done 497/500. 0.2555 s / img. ETA=0:00:00

[11/04 12:57:27 d2.evaluation.evaluator]: Total inference time: 0:02:18.492245 (0.279782 s / img per device, on 1 devices)

[11/04 12:57:27 d2.evaluation.evaluator]: Total inference pure compute time: 0:02:06 (0.255541 s / img per device, on 1 devices)

[11/04 12:57:27 d2.evaluation.coco\_evaluation]: Preparing results for COCO format ...

[11/04 12:57:27 d2.evaluation.coco\_evaluation]: Saving results to ./output/coco\_instances\_results.json

[11/04 12:57:27 d2.evaluation.coco\_evaluation]: Evaluating predictions ...

Loading and preparing results...

DONE (t=0.01s)

creating index...

index created!

Running per image evaluation...

Evaluate annotation type \*bbox\*

DONE (t=1.96s).

Accumulating evaluation results...

DONE (t=0.30s).

Average Precision (AP) @[ IoU=0.50:0.95 | area= all | maxDets=100 ] = 0.666

Average Precision (AP) @[ IoU=0.50 | area= all | maxDets=100 ] = 0.938

Average Precision (AP) @[ IoU=0.75 | area= all | maxDets=100 ] = 0.802

Average Precision (AP) @[ IoU=0.50:0.95 | area= small | maxDets=100 ] = 0.651

Average Precision (AP) @[ IoU=0.50:0.95 | area=medium | maxDets=100 ] = 0.677

Average Precision (AP) @[ IoU=0.50:0.95 | area= large | maxDets=100 ] = 0.750

Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets= 1 ] = 0.590

Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets= 10 ] = 0.743

Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets=100 ] = 0.744

Average Recall (AR) @[ IoU=0.50:0.95 | area= small | maxDets=100 ] = 0.739

Average Recall (AR) @[ IoU=0.50:0.95 | area=medium | maxDets=100 ] = 0.746

Average Recall (AR) @[ IoU=0.50:0.95 | area= large | maxDets=100 ] = 0.800

[11/04 12:57:29 d2.evaluation.coco\_evaluation]: Evaluation results for bbox:

| AP | AP50 | AP75 | APs | APm | APl |

|:------:|:------:|:------:|:------:|:------:|:------:|

| 66.643 | 93.751 | 80.181 | 65.119 | 67.663 | 75.000 |

[11/04 12:57:29 d2.evaluation.coco\_evaluation]: Per-category bbox AP:

| category | AP | category | AP | category | AP |

|:-----------|:-------|:-----------|:-------|:-----------|:-------|

| open | 62.321 | short | 46.646 | mousebite | 62.215 |

| spur | 69.116 | copper | 83.530 | pin-hole | 76.030 |

OrderedDict([('bbox',

{'AP': 66.6430532880407,

'AP-copper': 83.52963249248944,

'AP-mousebite': 62.215071818822345,

'AP-open': 62.321416471190496,

'AP-pin-hole': 76.0302843227506,

'AP-short': 46.64625068008085,

'AP-spur': 69.11566394291046,

'AP50': 93.7505990860381,

'AP75': 80.18068914876652,

'APl': 74.99999999999999,

'APm': 67.66297886804988,

'APs': 65.11873078791588})])

Bounding Box

Average precision (AP) = 66.643 %

| AP | AP50 | AP75 | APs | APm | APl |

|:------:|:------:|:------:|:------:|:------:|:------:|

| 66.643 | 93.751 | 80.181 | 65.119 | 67.663 | 75.000 |

We will see that when use iteration less than the default code [iteration = 3000]. Average Precision (AP) rise up from default code about 58% to 66.643 %.