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1 D:\Projects\UnderWaterObjectDetection\.venv\Scripts\  
  python.exe "D:\Projects\UnderWaterObjectDetection -  
    Nano\model-dataset-4.py"  
2  
3 ⚠ System RAM: 7.8 GB  
4 ⚠⚠ Warning: Low RAM (<8GB). Expect slow training on  
  CPU.  
5  
6 Press ENTER to start training...  
7  
8 ======  
  =====  
9         UNDERWATER OBJECT DETECTION - TRAINING START  
10 ======  
  =====  
11  
12 ⚡ Dataset: D:\Projects\UnderWaterObjectDetection\  
  Dataset-4\Underwater  
13  
14 ⚡ Found existing data.yaml  
15 ✓ Using existing class configuration  
16 ✓ Classes: {0: 'holothurian', 1: 'echinus', 2: '  
  scallop', 3: 'starfish', 4: 'fish', 5: 'corals', 6: '  
  diver', 7: 'cuttlefish', 8: 'turtle', 9: 'jellyfish'}  
17  
18 ⚡ Loading model: yolov8n.pt  
19  
20 ⚡ Starting training...  
21  
22 New https://pypi.org/project/ultralytics/8.3.225  
  available Update with 'pip install -U ultralytics'  
23 Ultralytics 8.3.223 Python-3.10.0 torch-2.5.1+cu121  
  CUDA:0 (NVIDIA GeForce GTX 1650, 4096MiB)  
24 engine\trainer: agnostic_nms=False, amp=True, augment  
  =True, auto_augment=randaugment, batch=8, bgr=0.0,  
  box=7.5, cache=False, cfg=None, classes=None,  
  close_mosaic=10, cls=0.5, compile=False, conf=None,  
  copy_paste=0.0, copy_paste_mode=flip, cos_lr=False,  
  cutmix=0.0, data=D:\Projects\  
  UnderWaterObjectDetection - Nano\underwater_data.yaml  
  , degrees=10.0, deterministic=True, device=0, dfl=1.5
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24 , dnn=False, dropout=0.0, dynamic=False, embed=None,
    epochs=100, erasing=0.4, exist_ok=True, fliplr=0.5,
    flipud=0.5, format=torchscript, fraction=1.0, freeze=
    None, half=False, hsv_h=0.015, hsv_s=0.7, hsv_v=0.4,
    imgsz=640, int8=False, iou=0.7, keras=False, kobj=1.0
    , line_width=None, lr0=0.01, lrf=0.01, mask_ratio=4,
    max_det=300, mixup=0.0, mode=train, model=yolov8n.pt
    , momentum=0.937, mosaic=1.0, multi_scale=False, name
    =training_run, nbs=64, nms=False, opset=None,
    optimize=False, optimizer=SGD, overlap_mask=True,
    patience=20, perspective=0.0, plots=True, pose=12.0,
    pretrained=True, profile=False, project=
    underwater_detection, rect=False, resume=False,
    retina_masks=False, save=True, save_conf=False,
    save_crop=False, save_dir=D:\Projects\
UnderWaterObjectDetection - Nano\underwater_detection
\training_run, save_frames=False, save_json=False,
save_period=5, save_txt=False, scale=0.5, seed=42,
shear=0.0, show=False, show_boxes=True, show_conf=
True, show_labels=True, simplify=True, single_cls=
False, source=None, split=val, stream_buffer=False,
task=detect, time=None, tracker=botsort.yaml,
translate=0.2, val=True, verbose=True, vid_stride=1,
visualize=False, warmup_bias_lr=0.1, warmup_epochs=3.
0, warmup_momentum=0.8, weight_decay=0.0005, workers=
2, workspace=None
25 Overriding model.yaml nc=80 with nc=10
26
27             from   n      params   module
                                         arguments
28     0                  -1   1      464 ultralytics.nn.
    modules.conv.Conv           [3, 16, 3, 2
    ]
29     1                  -1   1     4672 ultralytics.nn.
    modules.conv.Conv          [16, 32, 3, 2
    ]
30     2                  -1   1     7360 ultralytics.nn.
    modules.block.C2f          [32, 32, 1, True
    ]
31     3                  -1   1    18560 ultralytics.nn.

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31	modules.conv.Conv		[32, 64, 3, 2]
]		
32	4	-1 2	49664 ultralytics.nn. [64, 64, 2, True]
	modules.block.C2f		
]		
33	5	-1 1	73984 ultralytics.nn. [64, 128, 3, 2]
	modules.conv.Conv		
]		
34	6	-1 2	197632 ultralytics.nn. [128, 128, 2, True]
	modules.block.C2f		
]		
35	7	-1 1	295424 ultralytics.nn. [128, 256, 3, 2]
	modules.conv.Conv		
]		
36	8	-1 1	460288 ultralytics.nn. [256, 256, 1, True]
	modules.block.C2f		
]		
37	9	-1 1	164608 ultralytics.nn. [256, 256, 5]
	modules.block.SPPF		
]		
38	10	-1 1	0 torch.nn. [None, 2, ' nearest']
	modules.upsampling.Upsample		
39	11	[-1, 6] 1	0 ultralytics.nn. [1
	modules.conv.Concat		
]		
40	12	-1 1	148224 ultralytics.nn. [384, 128, 1]
	modules.block.C2f		
]		
41	13	-1 1	0 torch.nn. [None, 2, ' nearest']
	modules.upsampling.Upsample		
42	14	[-1, 4] 1	0 ultralytics.nn. [1
	modules.conv.Concat		
]		
43	15	-1 1	37248 ultralytics.nn. [192, 64, 1]
	modules.block.C2f		
]		
44	16	-1 1	36992 ultralytics.nn. [64, 64, 3, 2]
	modules.conv.Conv		
]		

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45 17           [-1, 12] 1          0 ultralytics.nn.
    modules.conv.Concat           [1
    ]
46 18           -1  1      123648 ultralytics.nn.
    modules.block.C2f           [192, 128, 1
    ]
47 19           -1  1      147712 ultralytics.nn.
    modules.conv.Conv            [128, 128, 3, 2
    ]
48 20           [-1, 9] 1          0 ultralytics.nn.
    modules.conv.Concat           [1
    ]
49 21           -1  1      493056 ultralytics.nn.
    modules.block.C2f           [384, 256, 1
    ]
50 22           [15, 18, 21] 1     753262 ultralytics.nn.
    modules.head.Detect          [10, [64, 128, 256
    ]]
51 Model summary: 129 layers, 3,012,798 parameters, 3,
    012,782 gradients, 8.2 GFLOPs
52
53 Transferred 319/355 items from pretrained weights
54 Freezing layer 'model.22.dfl.conv.weight'
55 WARNING AMP: checks failed . AMP training on NVIDIA
    GeForce GTX 1650 GPU may cause NaN losses or zero-mAP
    results, so AMP will be disabled during training.
56 train: Fast image access (ping: 0.30.1 ms, read: 112
    .7154.5 MB/s, size: 184.5 KB)
57 train: Scanning D:\Projects\UnderWaterObjectDetection
    \dataset-4\Underwater\train\labels.cache... 17425
    images, 57 backgrounds, 0 corrupt: 100% ━━━━━━━━
    17425/17425 0.0s
58 train: D:\Projects\UnderWaterObjectDetection\dataset-
    4\Underwater\train\images\ruod_004013.jpg: corrupt
    JPEG restored and saved
59 train: D:\Projects\UnderWaterObjectDetection\dataset-
    4\Underwater\train\images\ruod_006347.jpg: corrupt
    JPEG restored and saved
60 train: D:\Projects\UnderWaterObjectDetection\dataset-
    4\Underwater\train\images\ruod_007262.jpg: corrupt
    JPEG restored and saved

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61 train: D:\Projects\UnderWaterObjectDetection\dataset-4\Underwater\train\images\ruod_008836.jpg: corrupt JPEG restored and saved
62 val: Fast image access (ping: 0.30.1 ms, read: 187.5172.5 MB/s, size: 265.6 KB)
63 val: Scanning D:\Projects\UnderWaterObjectDetection\dataset-4\Underwater\val\labels.cache... 2178 images, 3 backgrounds, 1 corrupt: 100% ━━━━━━━━ 2178/2178 0.0s
64 val: D:\Projects\UnderWaterObjectDetection\dataset-4\Underwater\val\images\ruod_003875.jpg: corrupt JPEG restored and saved
65 val: D:\Projects\UnderWaterObjectDetection\dataset-4\Underwater\val\images\ruod_004748.jpg: corrupt JPEG restored and saved
66 val: D:\Projects\UnderWaterObjectDetection\dataset-4\Underwater\val\images\ruod_008431.jpg: ignoring corrupt image/label: non-normalized or out of bounds coordinates [1.270132]
67 Plotting labels to D:\Projects\UnderWaterObjectDetection - Nano\underwater_detection\training_run\labels.jpg...
68 optimizer: SGD(lr=0.01, momentum=0.937) with parameter groups 57 weight(decay=0.0), 64 weight(decay=0.0005), 63 bias(decay=0.0)
69 Image sizes 640 train, 640 val
70 Using 2 dataloader workers
71 Logging results to D:\Projects\UnderWaterObjectDetection - Nano\underwater_detection\training_run
72 Starting training for 100 epochs...
73
74      Epoch      GPU_mem    box_loss    cls_loss
75      dfl_loss  Instances       Size
76      1/100      2.23G        1.6      2.518      1.
77      443          11        640: 100% ━━━━━━━━ 2179/2179 4.0it/s 9:08
78
79      Class      Images  Instances
80      Box(P      R      mAP50  mAP50-95): 100
81      % ━━━━━━ 137/137 5.6it/s 24.6s
82
83      all        2177      15135      0.

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77	525	0.448	0.452	0.235	
78					
79	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
80	2/100	2.29G	1.509	1.722	1.
	382	4	640: 100%	—————	2179/
	2179	4.1it/s	8:47		
81	Class	Images	Instances		
	Box(P	R	mAP50	mAP50-95): 100	
	% —————	137/137	5.8it/s	23.5s	
82	all	2177	15135		0.
	563	0.515	0.517	0.284	
83					
84	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
85	3/100	2.23G	1.52	1.636	1.
	387	3	640: 100%	—————	2179/
	2179	4.2it/s	8:44		
86	Class	Images	Instances		
	Box(P	R	mAP50	mAP50-95): 100	
	% —————	137/137	5.9it/s	23.2s	
87	all	2177	15135		0.
	574	0.513	0.527	0.276	
88					
89	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
90	4/100	1.97G	1.506	1.559	1.
	381	4	640: 100%	—————	2179/
	2179	4.2it/s	8:44		
91	Class	Images	Instances		
	Box(P	R	mAP50	mAP50-95): 100	
	% —————	137/137	5.9it/s	23.1s	
92	all	2177	15135		0.
	672	0.541	0.602	0.341	
93					
94	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
95	5/100	2.13G	1.468	1.444	1.
	358	8	640: 100%	—————	2179/
	2179	4.2it/s	8:44		
96	Class	Images	Instances		

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96 Box(P R mAP50 mAP50-95): 100
% ━━━━━━ 137/137 5.7it/s 23.9s
97 all 2177 15135
0.7 0.565 0.628 0.362
98
99 Epoch GPU_mem box_loss cls_loss
dfl_loss Instances Size
100 6/100 2.05G 1.428 1.374 1.
342 16 640: 100% ━━━━━━ 2179/
2179 4.1it/s 8:46
101 Class Images Instances
Box(P R mAP50 mAP50-95): 100
% ━━━━━━ 137/137 5.9it/s 23.3s
102 all 2177 15135 0.
685 0.605 0.646 0.367
103
104 Epoch GPU_mem box_loss cls_loss
dfl_loss Instances Size
105 7/100 2.18G 1.41 1.329 1.
324 9 640: 100% ━━━━━━ 2179/
2179 4.1it/s 8:45
106 Class Images Instances
Box(P R mAP50 mAP50-95): 100
% ━━━━━━ 137/137 6.0it/s 22.8s
107 all 2177 15135 0.
727 0.599 0.676 0.403
108
109 Epoch GPU_mem box_loss cls_loss
dfl_loss Instances Size
110 8/100 2.07G 1.38 1.272 1.
306 22 640: 100% ━━━━━━ 2179/
2179 4.2it/s 8:45
111 Class Images Instances
Box(P R mAP50 mAP50-95): 100
% ━━━━━━ 137/137 6.1it/s 22.4s
112 all 2177 15135 0.
753 0.62 0.701 0.426
113
114 Epoch GPU_mem box_loss cls_loss
dfl_loss Instances Size
115 9/100 2.22G 1.367 1.24

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115 1.3          37          640: 100% ━━━━━━━━ 2179/
2179 4.1it/s 8:45
116          Class      Images  Instances
    Box(P      R      mAP50  mAP50-95): 100
    % ━━━━━━ 137/137 6.1it/s 22.4s
117          all       2177     15135     0.
    746      0.637      0.71      0.436
118
119          Epoch      GPU_mem   box_loss   cls_loss
    dfL_loss  Instances      Size
120          10/100     2.18G     1.35      1.208     1.
    285      13          640: 100% ━━━━━━━━ 2179/
2179 4.2it/s 8:45
121          Class      Images  Instances
    Box(P      R      mAP50  mAP50-95): 100
    % ━━━━━━ 137/137 6.1it/s 22.3s
122          all       2177     15135     0.
    765      0.631      0.713     0.448
123
124          Epoch      GPU_mem   box_loss   cls_loss
    dfL_loss  Instances      Size
125          11/100     2.16G     1.336     1.182     1.
    274      1          640: 100% ━━━━━━━━ 2179/
2179 4.2it/s 8:45
126          Class      Images  Instances
    Box(P      R      mAP50  mAP50-95): 100
    % ━━━━━━ 137/137 6.1it/s 22.5s
127          all       2177     15135     0.
    745      0.661      0.723     0.459
128
129          Epoch      GPU_mem   box_loss   cls_loss
    dfL_loss  Instances      Size
130          12/100     2.22G     1.325     1.158     1.
    272      5          640: 100% ━━━━━━━━ 2179/
2179 4.2it/s 8:45
131          Class      Images  Instances
    Box(P      R      mAP50  mAP50-95): 100
    % ━━━━━━ 137/137 6.0it/s 22.9s
132          all       2177     15135     0.
    761      0.67       0.738     0.473
133

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134	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
135	13/100	2.23G	1.311	1.141	1.
	258	7	640: 100%	██████████	2179/
	2179	4.2it/s	8:45		
136		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95):	100
	%	██████████	137/137	6.1it/s	22.4s
137		all	2177	15135	0.
	766	0.667	0.744	0.479	
138					
139	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
140	14/100	2.36G	1.304	1.129	1.
	253	26	640: 100%	██████████	2179/
	2179	4.1it/s	8:47		
141		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95):	100
	%	██████████	137/137	5.3it/s	25.8s
142		all	2177	15135	0.
	793	0.664	0.752	0.481	
143					
144	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
145	15/100	2.41G	1.3	1.12	1.
	247	8	640: 100%	██████████	2179/
	2179	4.1it/s	8:56		
146		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95):	100
	%	██████████	137/137	6.1it/s	22.6s
147		all	2177	15135	0.
	799	0.674	0.762	0.494	
148					
149	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
150	16/100	2.31G	1.29	1.102	1.
	238	4	640: 100%	██████████	2179/
	2179	4.2it/s	8:45		
151		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95):	100
	%	██████████	137/137	6.0it/s	22.7s

152		all	2177	15135	0.
775	0.684	0.755	0.493		
153					
154	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
155	17/100	2.3G	1.28	1.089	1.
236	52	640: 100%	—————	2179/	
2179	4.2it/s	8:45			
156		Class	Images	Instances	
Box(P	R	mAP50	mAP50-95):	100	
%	—————	137/137	6.2it/s	22.3s	
157		all	2177	15135	0.
786	0.678	0.761	0.499		
158					
159	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
160	18/100	2.08G	1.28	1.084	1.
235	5	640: 100%	—————	2179/	
2179	4.1it/s	8:50			
161		Class	Images	Instances	
Box(P	R	mAP50	mAP50-95):	100	
%	—————	137/137	6.1it/s	22.5s	
162		all	2177	15135	0.
793	0.689	0.77	0.51		
163					
164	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
165	19/100	2.24G	1.269	1.064	1.
223	8	640: 100%	—————	2179/	
2179	4.1it/s	8:47			
166		Class	Images	Instances	
Box(P	R	mAP50	mAP50-95):	100	
%	—————	137/137	6.0it/s	22.8s	
167		all	2177	15135	0.
786	0.699	0.775	0.52		
168					
169	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
170	20/100	2.19G	1.264	1.054	1
.22	8	640: 100%	—————	2179/	
2179	4.1it/s	8:49			

		Class	Images	Instances	
171		Box(P	R	mAP50	mAP50-95): 100
	%	—————	137/137	6.1it/s	22.5s
172			all	2177	15135
806	0.689		0.778	0.522	0.
173					
174	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances		Size	
175	21/100	2.05G	1.257	1.052	1.
217	9	640: 100%	—————	2179/	
2179	4.1it/s	8:50			
176		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95): 100	
	—————	137/137	6.1it/s	22.4s	
177			all	2177	15135
808	0.697		0.784	0.531	0.
178					
179	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances		Size	
180	22/100	1.95G	1.26	1.047	1.
216	21	640: 100%	—————	2179/	
2179	4.1it/s	8:49			
181		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95): 100	
	—————	137/137	6.1it/s	22.5s	
182			all	2177	15135
818	0.697		0.786	0.531	0.
183					
184	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances		Size	
185	23/100	2.12G	1.246	1.029	1.
209	2	640: 100%	—————	2179/	
2179	4.1it/s	8:49			
186		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95): 100	
	—————	137/137	6.1it/s	22.6s	
187			all	2177	15135
809	0.709		0.789	0.529	0.
188					
189	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances		Size	

190	24/100	2.12G	1.241	1.023	1.
204	11	640: 100%	—	2179/	
2179	4.1it/s 8:49				
191		Class Images Instances			
Box(P	R	mAP50 mAP50-95): 100			
% —	137/137	6.2it/s 22.3s			
192		all 2177 15135 0.			
807	0.714	0.792	0.536		
193					
194	Epoch GPU_mem box_loss cls_loss				
dfl_loss Instances Size					
195	25/100 2.44G	1.245	1.018	1.	
207	39	640: 100%	—	2179/	
2179	4.1it/s 8:50				
196		Class Images Instances			
Box(P	R	mAP50 mAP50-95): 100			
% —	137/137	6.0it/s 22.7s			
197		all 2177 15135 0.			
818	0.708	0.797	0.541		
198					
199	Epoch GPU_mem box_loss cls_loss				
dfl_loss Instances Size					
200	26/100 2.31G	1.239	1.009	1.	
204	2	640: 100%	—	2179/	
2179	4.1it/s 8:50				
201		Class Images Instances			
Box(P	R	mAP50 mAP50-95): 100			
% —	137/137	6.1it/s 22.6s			
202		all 2177 15135 0.			
811	0.722	0.799	0.547		
203					
204	Epoch GPU_mem box_loss cls_loss				
dfl_loss Instances Size					
205	27/100 2.52G	1.234	1.006	1.	
199	9	640: 100%	—	2179/	
2179	4.1it/s 8:49				
206		Class Images Instances			
Box(P	R	mAP50 mAP50-95): 100			
% —	137/137	6.0it/s 22.7s			
207		all 2177 15135 0.			
821	0.718	0.8	0.548		

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208
209      Epoch      GPU_mem    box_loss    cls_loss
210      dfl_loss   Instances   Size
210      28/100     2.24G      1.228      0.9941      1.
210      199        18          640: 100% ━━━━━━━━ 2179/
210      2179 4.1it/s 8:50
211      Class      Images   Instances
211      Box(P      R       mAP50  mAP50-95): 100
211      % ━━━━━━ 137/137 6.0it/s 22.8s
212      all        2177      15135      0
212      .81        0.728     0.802      0.554
213
214      Epoch      GPU_mem    box_loss    cls_loss
214      dfl_loss   Instances   Size
215      29/100     2.28G      1.225      0.9882      1.
215      193        17          640: 100% ━━━━━━━━ 2179/
215      2179 4.1it/s 8:50
216      Class      Images   Instances
216      Box(P      R       mAP50  mAP50-95): 100
216      % ━━━━━━ 137/137 6.0it/s 23.0s
217      all        2177      15135      0.
217      811        0.724     0.802      0.554
218
219      Epoch      GPU_mem    box_loss    cls_loss
219      dfl_loss   Instances   Size
220      30/100     2.19G      1.222      0.9854      1.
220      191        12          640: 100% ━━━━━━━━ 2179/
220      2179 4.1it/s 8:50
221      Class      Images   Instances
221      Box(P      R       mAP50  mAP50-95): 100
221      % ━━━━━━ 137/137 6.0it/s 23.0s
222      all        2177      15135      0.
222      807        0.732     0.806      0.557
223
224      Epoch      GPU_mem    box_loss    cls_loss
224      dfl_loss   Instances   Size
225      31/100     2.16G      1.214      0.9783      1.
225      186        3           640: 100% ━━━━━━━━ 2179/
225      2179 4.1it/s 8:50
226      Class      Images   Instances
226      Box(P      R       mAP50  mAP50-95): 100

```

```

226 % ━━━━━━ 137/137 6.0it/s 22.8s
227                               all      2177      15135      0.
825       0.725       0.809       0.56
228
229       Epoch      GPU_mem      box_loss      cls_loss
dfl_loss Instances          Size
230       32/100     2.02G     1.215     0.9692      1.
187           3         640: 100% ━━━━━━ 2179/
2179 4.1it/s 8:50
231       Class      Images      Instances
Box(P      R      mAP50      mAP50-95): 100
% ━━━━━━ 137/137 6.1it/s 22.5s
232                               all      2177      15135      0.
822       0.729       0.81       0.562
233
234       Epoch      GPU_mem      box_loss      cls_loss
dfl_loss Instances          Size
235       33/100     2.12G     1.212     0.9672      1.
.18        18         640: 100% ━━━━━━ 2179/
2179 4.1it/s 8:51
236       Class      Images      Instances
Box(P      R      mAP50      mAP50-95): 100
% ━━━━━━ 137/137 6.0it/s 22.8s
237                               all      2177      15135      0.
827       0.726       0.812       0.566
238
239       Epoch      GPU_mem      box_loss      cls_loss
dfl_loss Instances          Size
240       34/100     2.06G     1.209     0.9608      1.
181           3         640: 100% ━━━━━━ 2179/
2179 4.1it/s 8:50
241       Class      Images      Instances
Box(P      R      mAP50      mAP50-95): 100
% ━━━━━━ 137/137 6.0it/s 23.0s
242                               all      2177      15135      0.
822       0.733       0.812       0.565
243
244       Epoch      GPU_mem      box_loss      cls_loss
dfl_loss Instances          Size
245       35/100     2.05G     1.203     0.9574      1.
177           4         640: 100% ━━━━━━ 2179/

```

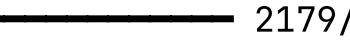
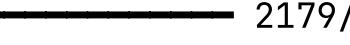
```

245 2179 4.1it/s 8:50
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	Class	Images	Instances		
Box(P	R	mAP50	mAP50-95): 100		
% ━━━━	137/137	6.0it/s	22.7s		
247	all	2177	15135	0.	
822	0.733	0.813	0.57		
248					
249	Epoch	GPU_mem	box_loss	cls_loss	
dfl_loss	Instances		Size		
250	36/100	2.16G	1.206	0.9563	1.
177	6	640: 100%	━	2179/	
2179	4.1it/s 8:50				
251	Class	Images	Instances		
Box(P	R	mAP50	mAP50-95): 100		
% ━━━━	137/137	6.0it/s	22.7s		
252	all	2177	15135	0.	
828	0.735	0.817	0.57		
253					
254	Epoch	GPU_mem	box_loss	cls_loss	
dfl_loss	Instances		Size		
255	37/100	2.11G	1.198	0.9491	1.
175	12	640: 100%	━	2179/	
2179	4.1it/s 8:49				
256	Class	Images	Instances		
Box(P	R	mAP50	mAP50-95): 100		
% ━━━━	137/137	6.1it/s	22.4s		
257	all	2177	15135	0	
.84	0.73	0.818	0.572		
258					
259	Epoch	GPU_mem	box_loss	cls_loss	
dfl_loss	Instances		Size		
260	38/100	2.1G	1.196	0.9395	1.
171	6	640: 100%	━	2179/	
2179	4.1it/s 8:49				
261	Class	Images	Instances		
Box(P	R	mAP50	mAP50-95): 100		
% ━━━━	137/137	5.9it/s	23.4s		
262	all	2177	15135	0	
.83	0.732	0.818	0.573		
263					
264	Epoch	GPU_mem	box_loss	cls_loss	

	dfl_loss	Instances	Size		
264	39/100	2.12G	1.196	0.9452	1.
265	175	8	640: 100%	—————	2179/
	2179	4.1it/s 8:49			
266		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95): 100	
	% —————	137/137	6.0it/s	23.0s	
267		all	2177	15135	0.
831	0.734	0.82	0.574		
268					
269	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
270	40/100	2.12G	1.192	0.9381	1.
169	10	640: 100%	—————	2179/	
2179	4.1it/s 8:50				
271		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95): 100	
	% —————	137/137	6.1it/s	22.6s	
272		all	2177	15135	0.
834	0.736	0.821	0.576		
273					
274	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
275	41/100	2.12G	1.188	0.9317	1.
167	17	640: 100%	—————	2179/	
2179	4.1it/s 8:49				
276		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95): 100	
	% —————	137/137	6.0it/s	22.7s	
277		all	2177	15135	0.
839	0.738	0.823	0.578		
278					
279	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
280	42/100	1.93G	1.183	0.9238	1.
166	9	640: 100%	—————	2179/	
2179	4.1it/s 8:49				
281		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95): 100	
	% —————	137/137	6.0it/s	22.7s	
282		all	2177	15135	0.

282	839	0.738	0.823	0.58	
283					
284	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
285	43/100	2.24G	1.181	0.9227	1.
	163	23	640: 100%		2179/
	2179	4.1it/s	8:49		
286	Class	Images	Instances		
	Box(P	R	mAP50	mAP50-95): 100	
	% 	137/137	6.1it/s	22.4s	
287	all	2177	15135	0	
	.83	0.74	0.824	0.581	
288					
289	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
290	44/100	2.29G	1.177	0.9209	1.
	163	11	640: 100%		2179/
	2179	4.1it/s	8:49		
291	Class	Images	Instances		
	Box(P	R	mAP50	mAP50-95): 100	
	% 	137/137	6.0it/s	22.9s	
292	all	2177	15135	0.	
	834	0.74	0.825	0.582	
293					
294	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
295	45/100	1.99G	1.178	0.921	1.
	159	10	640: 100%		2179/
	2179	4.1it/s	8:50		
296	Class	Images	Instances		
	Box(P	R	mAP50	mAP50-95): 100	
	% 	137/137	6.0it/s	22.7s	
297	all	2177	15135	0.	
	831	0.743	0.826	0.583	
298					
299	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
300	46/100	2.58G	1.18	0.9148	1.
	158	6	640: 100%		2179/
	2179	4.1it/s	8:49		
301	Class	Images	Instances		

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301 Box(P R mAP50 mAP50-95): 100
% ━━━━━━ 137/137 6.0it/s 22.8s
302 all 2177 15135 0.
833 0.743 0.827 0.584
303
304 Epoch GPU_mem box_loss cls_loss
dfl_loss Instances Size
305 47/100 2.51G 1.175 0.9147 1
.16 10 640: 100% ━━━━━━ 2179/
2179 4.1it/s 8:50
306 Class Images Instances
Box(P R mAP50 mAP50-95): 100
% ━━━━━━ 137/137 6.1it/s 22.4s
307 all 2177 15135 0.
834 0.744 0.827 0.585
308
309 Epoch GPU_mem box_loss cls_loss
dfl_loss Instances Size
310 48/100 2.1G 1.172 0.9069 1.
155 37 640: 100% ━━━━━━ 2179/
2179 4.1it/s 8:49
311 Class Images Instances
Box(P R mAP50 mAP50-95): 100
% ━━━━━━ 137/137 6.1it/s 22.4s
312 all 2177 15135 0.
837 0.743 0.829 0.586
313
314 Epoch GPU_mem box_loss cls_loss
dfl_loss Instances Size
315 49/100 2.23G 1.167 0.8973 1.
154 10 640: 100% ━━━━━━ 2179/
2179 4.1it/s 8:49
316 Class Images Instances
Box(P R mAP50 mAP50-95): 100
% ━━━━━━ 137/137 6.0it/s 22.8s
317 all 2177 15135 0.
838 0.742 0.829 0.587
318
319 Epoch GPU_mem box_loss cls_loss
dfl_loss Instances Size
320 50/100 2.28G 1.163 0.9017 1.

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320 151           8           640: 100% ━━━━━━━━ 2179/
2179 4.1it/s 8:49
321             Class   Images Instances
Box(P          R      mAP50  mAP50-95): 100
% ━━━━━━ 137/137 6.0it/s 22.7s
322             all     2177    15135      0
.84        0.741       0.83       0.589
323
324             Epoch   GPU_mem   box_loss   cls_loss
dfl_loss Instances           Size
325      51/100      2.04G      1.161      0.8896      1
.15        3           640: 100% ━━━━━━━━ 2179/
2179 4.1it/s 8:50
326             Class   Images Instances
Box(P          R      mAP50  mAP50-95): 100
% ━━━━━━ 137/137 6.0it/s 22.9s
327             all     2177    15135      0.
833        0.744       0.831       0.589
328
329             Epoch   GPU_mem   box_loss   cls_loss
dfl_loss Instances           Size
330      52/100      2.33G      1.162      0.8906      1.
149        18           640: 100% ━━━━━━━━ 2179/
2179 4.1it/s 8:49
331             Class   Images Instances
Box(P          R      mAP50  mAP50-95): 100
% ━━━━━━ 137/137 6.1it/s 22.6s
332             all     2177    15135      0.
829        0.747       0.831       0.59
333
334             Epoch   GPU_mem   box_loss   cls_loss
dfl_loss Instances           Size
335      53/100      2.32G      1.162      0.8886      1
.15        2           640: 100% ━━━━━━━━ 2179/
2179 4.1it/s 8:49
336             Class   Images Instances
Box(P          R      mAP50  mAP50-95): 100
% ━━━━━━ 137/137 6.0it/s 22.9s
337             all     2177    15135      0.
831        0.748       0.832       0.59
338

```

339	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
340	54/100	2.17G	1.161	0.8893	1
.15	5	640: 100%	██████████	2179/	
2179	4.1it/s	8:49			
341		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95):	100
%	██████████	137/137	6.1it/s	22.6s	
342		all	2177	15135	0.
829	0.75	0.832	0.591		
343					
344	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
345	55/100	2.01G	1.156	0.8824	1.
149	10	640: 100%	██████████	2179/	
2179	4.1it/s	8:49			
346		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95):	100
%	██████████	137/137	6.0it/s	22.8s	
347		all	2177	15135	0.
835	0.748	0.832	0.592		
348					
349	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
350	56/100	2.26G	1.152	0.8772	1.
143	8	640: 100%	██████████	2179/	
2179	4.1it/s	8:48			
351		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95):	100
%	██████████	137/137	6.1it/s	22.6s	
352		all	2177	15135	0.
839	0.745	0.832	0.592		
353					
354	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
355	57/100	2.25G	1.151	0.8803	1.
146	14	640: 100%	██████████	2179/	
2179	4.1it/s	8:49			
356		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95):	100
%	██████████	137/137	6.1it/s	22.6s	

357		all	2177	15135	0.
841	0.745	0.833	0.593		
358					
359	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
360	58/100	2.05G	1.144	0.8723	1.
141	1	640: 100%	—————	2179/	
2179	3.6it/s	10:10			
361		Class	Images	Instances	
Box(P	R	mAP50	mAP50-95):	100	
% —————	137/137	3.9it/s	35.2s		
362		all	2177	15135	0.
835	0.75	0.834	0.593		
363					
364	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
365	59/100	2.13G	1.145	0.8718	1.
139	12	640: 100%	—————	2179/	
2179	3.4it/s	10:34			
366		Class	Images	Instances	
Box(P	R	mAP50	mAP50-95):	100	
% —————	137/137	5.5it/s	25.0s		
367		all	2177	15135	0.
835	0.751	0.835	0.594		
368					
369	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
370	60/100	2.23G	1.143	0.8674	1
.14	8	640: 100%	—————	2179/	
2179	3.9it/s	9:25			
371		Class	Images	Instances	
Box(P	R	mAP50	mAP50-95):	100	
% —————	137/137	5.7it/s	23.8s		
372		all	2177	15135	0.
833	0.755	0.835	0.594		
373					
374	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
375	61/100	2.05G	1.14	0.8643	1.
135	13	640: 100%	—————	2179/	
2179	4.1it/s	8:47			

376		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95): 100	
%	—————	137/137	6.0it/s	22.8s	
377		all	2177	15135	0.
838	0.751	0.835	0.595		
378					
379	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
380	62/100	2.34G	1.137	0.8598	1.
134	10	640: 100%	—————	2179/	
2179	4.1it/s	8:46			
381		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95): 100	
%	—————	137/137	6.0it/s	22.9s	
382		all	2177	15135	0.
838	0.752	0.836	0.595		
383					
384	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
385	63/100	2.18G	1.132	0.8563	1.
131	12	640: 100%	—————	2179/	
2179	4.1it/s	8:45			
386		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95): 100	
%	—————	137/137	6.0it/s	22.7s	
387		all	2177	15135	0.
839	0.75	0.836	0.595		
388					
389	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
390	64/100	2.1G	1.135	0.8535	1.
131	13	640: 100%	—————	2179/	
2179	4.1it/s	8:45			
391		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95): 100	
%	—————	137/137	6.0it/s	22.7s	
392		all	2177	15135	0
.84	0.752	0.837	0.596		
393					
394	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		

395	65/100	2.23G	1.135	0.8522	1.
134	50	640: 100%	—	2179/	
2179	4.1it/s 8:45				
396	Class	Images	Instances		
Box(P	R	mAP50	mAP50-95): 100		
% —————	137/137	6.0it/s 22.7s			
397	all	2177	15135	0	
.84	0.752	0.837	0.597		
398					
399	Epoch	GPU_mem	box_loss	cls_loss	
dfl_loss	Instances		Size		
400	66/100	2.16G	1.128	0.8505	1.
131	15	640: 100%	—	2179/	
2179	4.1it/s 8:46				
401	Class	Images	Instances		
Box(P	R	mAP50	mAP50-95): 100		
% —————	137/137	6.0it/s 22.7s			
402	all	2177	15135	0	
.84	0.753	0.837	0.597		
403					
404	Epoch	GPU_mem	box_loss	cls_loss	
dfl_loss	Instances		Size		
405	67/100	2.24G	1.127	0.8454	1
.13	3	640: 100%	—	2179/	
2179	4.1it/s 8:46				
406	Class	Images	Instances		
Box(P	R	mAP50	mAP50-95): 100		
% —————	137/137	6.2it/s 22.3s			
407	all	2177	15135	0	
.84	0.755	0.838	0.598		
408					
409	Epoch	GPU_mem	box_loss	cls_loss	
dfl_loss	Instances		Size		
410	68/100	2.12G	1.124	0.8438	1.
129	19	640: 100%	—	2179/	
2179	4.1it/s 8:45				
411	Class	Images	Instances		
Box(P	R	mAP50	mAP50-95): 100		
% —————	137/137	6.0it/s 22.9s			
412	all	2177	15135	0	
.84	0.755	0.838	0.599		

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413
414      Epoch      GPU_mem      box_loss      cls_loss
        dfl_loss    Instances      Size
415      69/100      2.05G      1.126      0.8417      1.
        128          2          640: 100% ━━━━━━━━ 2179/
        2179 4.1it/s 8:45
416          Class      Images      Instances
        Box(P      R      mAP50      mAP50-95): 100
        % ━━━━━━ 137/137 6.0it/s 22.7s
417          all      2177      15135      0.
        842      0.753      0.838      0.599
418
419      Epoch      GPU_mem      box_loss      cls_loss
        dfl_loss    Instances      Size
420      70/100      2.51G      1.124      0.8347      1.
        128          7          640: 100% ━━━━━━━━ 2179/
        2179 4.1it/s 8:46
421          Class      Images      Instances
        Box(P      R      mAP50      mAP50-95): 100
        % ━━━━━━ 137/137 6.1it/s 22.5s
422          all      2177      15135      0
        .84      0.754      0.838      0.599
423
424      Epoch      GPU_mem      box_loss      cls_loss
        dfl_loss    Instances      Size
425      71/100      2.14G      1.118      0.8307      1.
        122          16         640: 100% ━━━━━━━━ 2179/
        2179 4.1it/s 8:46
426          Class      Images      Instances
        Box(P      R      mAP50      mAP50-95): 100
        % ━━━━━━ 137/137 6.1it/s 22.5s
427          all      2177      15135      0.
        839      0.756      0.838      0.599
428
429      Epoch      GPU_mem      box_loss      cls_loss
        dfl_loss    Instances      Size
430      72/100      2.32G      1.119      0.8329      1.
        125          2          640: 100% ━━━━━━━━ 2179/
        2179 4.1it/s 8:46
431          Class      Images      Instances
        Box(P      R      mAP50      mAP50-95): 100

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431 % ━━━━━━ 137/137 5.9it/s 23.2s
432                               all      2177      15135      0
     .84      0.755      0.839      0.6
433
434      Epoch      GPU_mem      box_loss      cls_loss
      dfl_loss    Instances       Size
435      73/100      2.24G      1.11      0.8238      1.
     118          11      640: 100% ━━━━━━ 2179/
2179 4.1it/s 8:46
436      Class      Images      Instances
      Box(P      R      mAP50      mAP50-95): 100
     % ━━━━━━ 137/137 6.1it/s 22.4s
437                               all      2177      15135      0.
     .841      0.755      0.839      0.6
438
439      Epoch      GPU_mem      box_loss      cls_loss
      dfl_loss    Instances       Size
440      74/100      2.09G      1.11      0.8262      1.
     118          3      640: 100% ━━━━━━ 2179/
2179 4.1it/s 8:46
441      Class      Images      Instances
      Box(P      R      mAP50      mAP50-95): 100
     % ━━━━━━ 137/137 6.1it/s 22.5s
442                               all      2177      15135      0
     .84      0.757      0.84      0.601
443
444      Epoch      GPU_mem      box_loss      cls_loss
      dfl_loss    Instances       Size
445      75/100      2.04G      1.111      0.8207      1
     .12          13      640: 100% ━━━━━━ 2179/
2179 4.1it/s 8:46
446      Class      Images      Instances
      Box(P      R      mAP50      mAP50-95): 100
     % ━━━━━━ 137/137 6.1it/s 22.5s
447                               all      2177      15135      0.
     .841      0.757      0.84      0.602
448
449      Epoch      GPU_mem      box_loss      cls_loss
      dfl_loss    Instances       Size
450      76/100      2.24G      1.106      0.8186      1.
     116          11      640: 100% ━━━━━━ 2179/

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450 2179 4.1it/s 8:46
451
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	Class	Images	Instances		
Box(P	R	mAP50	mAP50-95): 100		
% ━━━━	137/137	6.1it/s	22.6s		
452	all	2177	15135	0	
.84	0.757	0.84	0.602		
453					
454	Epoch	GPU_mem	box_loss	cls_loss	
dfl_loss	Instances		Size		
455	77/100	2.06G	1.102	0.8133	1.
113	24	640: 100%	━	2179/	
2179	4.1it/s	8:45			
456	Class	Images	Instances		
Box(P	R	mAP50	mAP50-95): 100		
% ━━━━	137/137	6.1it/s	22.3s		
457	all	2177	15135	0.	
844	0.754	0.841	0.603		
458					
459	Epoch	GPU_mem	box_loss	cls_loss	
dfl_loss	Instances		Size		
460	78/100	2.29G	1.105	0.8129	1.
117	6	640: 100%	━	2179/	
2179	4.1it/s	8:46			
461	Class	Images	Instances		
Box(P	R	mAP50	mAP50-95): 100		
% ━━━━	137/137	6.0it/s	23.0s		
462	all	2177	15135	0.	
844	0.755	0.841	0.603		
463					
464	Epoch	GPU_mem	box_loss	cls_loss	
dfl_loss	Instances		Size		
465	79/100	2.21G	1.102	0.812	1.
114	4	640: 100%	━	2179/	
2179	4.1it/s	8:46			
466	Class	Images	Instances		
Box(P	R	mAP50	mAP50-95): 100		
% ━━━━	137/137	6.0it/s	22.7s		
467	all	2177	15135	0.	
842	0.756	0.841	0.603		
468					
469	Epoch	GPU_mem	box_loss	cls_loss	

	dfl_loss	Instances	Size		
469	80/100	2.22G	1.095	0.8049	1.
470	112	3	640: 100%	—————	2179/
	2179	4.1it/s 8:46			
471		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95): 100	
	% —————	137/137	6.0it/s	22.8s	
472		all	2177	15135	0.
842	0.756	0.841	0.603		
473					
474	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
475	81/100	2G	1.093	0.7989	1.
112	3	640: 100%	—————	2179/	
2179	4.1it/s 8:46				
476		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95): 100	
	% —————	137/137	6.2it/s	22.2s	
477		all	2177	15135	0.
843	0.756	0.841	0.603		
478					
479	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
480	82/100	2.53G	1.094	0.8016	1
.11	8	640: 100%	—————	2179/	
2179	4.1it/s 8:46				
481		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95): 100	
	% —————	137/137	6.1it/s	22.4s	
482		all	2177	15135	0.
844	0.754	0.841	0.604		
483					
484	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
485	83/100	2.29G	1.088	0.7963	1.
109	11	640: 100%	—————	2179/	
2179	4.1it/s 8:46				
486		Class	Images	Instances	
	Box(P	R	mAP50	mAP50-95): 100	
	% —————	137/137	6.1it/s	22.3s	
487		all	2177	15135	0.

487	844	0.756	0.842	0.604	
488					
489	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
490	84/100	2.14G	1.089	0.7893	1.
	105	30	640: 100%	—————	2179/
	2179	4.1it/s	8:46		
491	Class	Images	Instances		
	Box(P	R	mAP50	mAP50-95): 100	
	%	—————	137/137	6.1it/s	22.6s
492	all	2177	15135		0.
	844	0.755	0.842	0.604	
493					
494	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
495	85/100	2.16G	1.087	0.7896	1.
	104	19	640: 100%	—————	2179/
	2179	4.1it/s	8:46		
496	Class	Images	Instances		
	Box(P	R	mAP50	mAP50-95): 100	
	%	—————	137/137	6.1it/s	22.5s
497	all	2177	15135		0.
	847	0.753	0.842	0.605	
498					
499	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
500	86/100	2.7G	1.087	0.7893	1.
	106	4	640: 100%	—————	2179/
	2179	4.1it/s	8:45		
501	Class	Images	Instances		
	Box(P	R	mAP50	mAP50-95): 100	
	%	—————	137/137	6.1it/s	22.6s
502	all	2177	15135		0.
	848	0.753	0.842	0.605	
503					
504	Epoch	GPU_mem	box_loss	cls_loss	
	dfl_loss	Instances	Size		
505	87/100	2.05G	1.077	0.7855	1.
	102	8	640: 100%	—————	2179/
	2179	4.1it/s	8:47		
506	Class	Images	Instances		

```

506 Box(P R mAP50 mAP50-95): 100
% ━━━━━━ 137/137 6.1it/s 22.5s
507 all 2177 15135 0.
848 0.754 0.843 0.605
508
509 Epoch GPU_mem box_loss cls_loss
dfl_loss Instances Size
510 88/100 2.4G 1.085 0.7886 1.
106 4 640: 100% ━━━━━━ 2179/
2179 4.1it/s 8:57
511 Class Images Instances
Box(P R mAP50 mAP50-95): 100
% ━━━━━━ 137/137 5.9it/s 23.1s
512 all 2177 15135 0.
849 0.754 0.843 0.606
513
514 Epoch GPU_mem box_loss cls_loss
dfl_loss Instances Size
515 89/100 2.41G 1.076 0.7793 1.
102 3 640: 100% ━━━━━━ 2179/
2179 4.1it/s 8:46
516 Class Images Instances
Box(P R mAP50 mAP50-95): 100
% ━━━━━━ 137/137 6.1it/s 22.6s
517 all 2177 15135 0.
848 0.754 0.843 0.606
518
519 Epoch GPU_mem box_loss cls_loss
dfl_loss Instances Size
520 90/100 2.11G 1.073 0.7781 1.
098 6 640: 100% ━━━━━━ 2179/
2179 4.1it/s 8:47
521 Class Images Instances
Box(P R mAP50 mAP50-95): 100
% ━━━━━━ 137/137 6.1it/s 22.6s
522 all 2177 15135 0
.85 0.754 0.843 0.606
523 Closing dataloader mosaic
524
525 Epoch GPU_mem box_loss cls_loss
dfl_loss Instances Size

```

526	91/100	2.08G	1.04	0.7177	1.
091	2	640: 100%	—	2179/	
2179	4.2it/s 8:42				
527		Class Images Instances			
Box(P	R	mAP50 mAP50-95): 100			
% —	137/137	6.1it/s 22.3s			
528		all 2177 15135 0			
.85	0.754	0.843	0.607		
529					
530	Epoch GPU_mem box_loss cls_loss				
dfl_loss Instances Size					
531	92/100 2.2G 1.03 0.7039 1.				
085	3 640: 100%	—	2179/		
2179	4.2it/s 8:42				
532		Class Images Instances			
Box(P	R	mAP50 mAP50-95): 100			
% —	137/137	6.2it/s 22.2s			
533		all 2177 15135 0.			
848	0.755	0.844	0.607		
534					
535	Epoch GPU_mem box_loss cls_loss				
dfl_loss Instances Size					
536	93/100 2.2G 1.029 0.7003 1.				
083	2 640: 100%	—	2179/		
2179	4.2it/s 8:42				
537		Class Images Instances			
Box(P	R	mAP50 mAP50-95): 100			
% —	137/137	6.0it/s 22.8s			
538		all 2177 15135 0.			
846	0.755	0.844	0.607		
539					
540	Epoch GPU_mem box_loss cls_loss				
dfl_loss Instances Size					
541	94/100 2.26G 1.021 0.6937 1.				
081	4 640: 100%	—	2179/		
2179	4.2it/s 8:42				
542		Class Images Instances			
Box(P	R	mAP50 mAP50-95): 100			
% —	137/137	6.1it/s 22.5s			
543		all 2177 15135 0.			
848	0.756	0.844	0.607		

```

544
545      Epoch      GPU_mem      box_loss      cls_loss
      dfl_loss    Instances      Size
546      95/100      2.26G      1.02      0.6915      1.
      081          1      640: 100% ━━━━━━━━ 2179/
      2179 4.2it/s 8:42
547          Class      Images      Instances
      Box(P      R      mAP50      mAP50-95): 100
      % ━━━━━━ 137/137 6.0it/s 22.7s
548          all      2177      15135      0.
      847      0.757      0.844      0.608
549
550      Epoch      GPU_mem      box_loss      cls_loss
      dfl_loss    Instances      Size
551      96/100      2.09G      1.014      0.6866      1.
      078          15      640: 100% ━━━━━━━━ 2179/
      2179 4.2it/s 8:45
552          Class      Images      Instances
      Box(P      R      mAP50      mAP50-95): 100
      % ━━━━━━ 137/137 5.4it/s 25.6s
553          all      2177      15135      0.
      846      0.758      0.844      0.608
554
555      Epoch      GPU_mem      box_loss      cls_loss
      dfl_loss    Instances      Size
556      97/100      2.12G      1.013      0.6808      1.
      079          3      640: 100% ━━━━━━━━ 2179/
      2179 4.0it/s 9:11
557          Class      Images      Instances
      Box(P      R      mAP50      mAP50-95): 100
      % ━━━━━━ 137/137 5.9it/s 23.1s
558          all      2177      15135      0.
      846      0.759      0.845      0.608
559
560      Epoch      GPU_mem      box_loss      cls_loss
      dfl_loss    Instances      Size
561      98/100      2.15G      1.009      0.6802      1.
      076          2      640: 100% ━━━━━━━━ 2179/
      2179 4.2it/s 8:41
562          Class      Images      Instances
      Box(P      R      mAP50      mAP50-95): 100

```

```
562 % ━━━━━━ 137/137 6.0it/s 22.9s
563 all 2177 15135 0.
845 0.76 0.845 0.609
564
565 Epoch GPU_mem box_loss cls_loss
dfl_loss Instances Size
566 99/100 2.21G 1.004 0.6762 1.
073 6 640: 100% ━━━━━━ 2179/
2179 4.2it/s 8:42
567 Class Images Instances
Box(P R mAP50 mAP50-95): 100
% ━━━━━━ 137/137 5.9it/s 23.3s
568 all 2177 15135 0.
848 0.758 0.845 0.609
569
570 Epoch GPU_mem box_loss cls_loss
dfl_loss Instances Size
571 100/100 2.11G 1.005 0.6737 1.
071 2 640: 100% ━━━━━━ 2179/
2179 4.2it/s 8:42
572 Class Images Instances
Box(P R mAP50 mAP50-95): 100
% ━━━━━━ 137/137 6.1it/s 22.4s
573 all 2177 15135 0.
848 0.759 0.846 0.609
574
575 100 epochs completed in 15.376 hours.
576 Optimizer stripped from D:\Projects\
UnderWaterObjectDetection - Nano\
underwater_detection\training_run\weights\last.pt, 6
.2MB
577 Optimizer stripped from D:\Projects\
UnderWaterObjectDetection - Nano\
underwater_detection\training_run\weights\best.pt, 6
.2MB
578
579 Validating D:\Projects\UnderWaterObjectDetection -
Nano\underwater_detection\training_run\weights\best.
pt...
580 Ultralytics 8.3.223 Python-3.10.0 torch-2.5.1+cu121
CUDA:0 (NVIDIA GeForce GTX 1650, 4096MiB)
```

```

581 Model summary (fused): 72 layers, 3,007,598
parameters, 0 gradients, 8.1 GFLOPs
582             Class      Images Instances
Box(P          R       mAP50   mAP50-95): 100
% —————— 137/137 3.9it/s 34.7s
583             all       2177    15135    0.
845       0.756     0.843     0.611
584             holothurian    595    1538    0.
841       0.682     0.805     0.506
585             echinus     963    6245    0.
905       0.813     0.914     0.642
586             scallop     176     929    0.
795       0.561      0.7      0.434
587             starfish    741    2163    0.
882       0.833     0.909     0.637
588             fish       361    1480    0.
836       0.645      0.78     0.525
589             corals     296    1038    0.
806       0.641     0.745     0.538
590             diver      306     644    0.
857       0.843     0.904     0.659
591             cuttlefish   258     486    0.
869       0.93      0.949     0.765
592             turtle     299     387    0.
905       0.941     0.971     0.82
593             jellyfish    97     225    0.
752       0.676      0.75     0.58
594 Speed: 0.2ms preprocess, 10.1ms inference, 0.0ms
loss, 1.5ms postprocess per image
595 Results saved to D:\Projects\
UnderWaterObjectDetection - Nano\
underwater_detection\training_run
596
597 🎉 Training complete! Validating model...
598
599 Ultralytics 8.3.223 Python-3.10.0 torch-2.5.1+cu121
CUDA:0 (NVIDIA GeForce GTX 1650, 4096MiB)
600 Model summary (fused): 72 layers, 3,007,598
parameters, 0 gradients, 8.1 GFLOPs
601 val: Fast image access (ping: 0.00.0 ms, read: 790.
5771.8 MB/s, size: 159.4 KB)

```

```

602 val: Scanning D:\Projects\UnderWaterObjectDetection\dataset-4\Underwater\val\labels.cache... 2178 images
, 3 backgrounds, 1 corrupt: 100% ━━━━━━━━ 2178/2178 2.3Mit/s 0.0s
603 val: D:\Projects\UnderWaterObjectDetection\dataset-4\Underwater\val\images\rvod_003875.jpg: corrupt JPEG
restored and saved
604 val: D:\Projects\UnderWaterObjectDetection\dataset-4\Underwater\val\images\rvod_004748.jpg: corrupt JPEG
restored and saved
605 val: D:\Projects\UnderWaterObjectDetection\dataset-4\Underwater\val\images\rvod_008431.jpg: ignoring
corrupt image/label: non-normalized or out of bounds
coordinates [1.270132]
606
      Class   Images Instances
Box(P
% ━━━━━━ 137/137 5.4it/s 25.5s
607 WARNING ConfusionMatrix plot failure: Unable to
allocate 19.0 MiB for an array with shape (1578,
1578) and data type float64
608 WARNING ConfusionMatrix plot failure: Unable to
allocate 19.0 MiB for an array with shape (1578,
1578) and data type float64
609
      all    2177    15135    0.
848    0.759    0.846    0.609
610
      holothurian    595    1538    0.
863    0.687    0.816    0.511
611
      echinus    963    6245    0.
902    0.827    0.917    0.651
612
      scallop    176    929    0.
766    0.572    0.709    0.437
613
      starfish    741    2163    0
.88    0.834    0.911    0.641
614
      fish     361    1480    0.
816    0.659    0.784    0.534
615
      corals    296    1038    0.
811    0.652    0.751    0.54
616
      diver     306    644    0.
896    0.831    0.905    0.658
617
      cuttlefish    258    486    0.
897    0.922    0.953    0.771

```

```
618                      turtle      299      387      0.  
919          0.946      0.975      0.787  
619          jellyfish      97      225      0.  
735          0.662      0.736      0.564  
620 Speed: 1.3ms preprocess, 3.8ms inference, 0.0ms loss  
       , 1.6ms postprocess per image  
621 Results saved to D:\Projects\  
       UnderWaterObjectDetection\runs\detect\val9  
622 ┌ mAP50: 0.8456  
623 ┌ mAP50-95: 0.6095  
624  
625 ┌ Model saved at: D:\Projects\  
       UnderWaterObjectDetection - Nano\  
       underwater_detection\training_run\weights\best.pt  
626 =====  
       =====  
627  
628 Process finished with exit code 0  
629
```