

Progressive Mirror Detection Supplementary Material

Anonymous CVPR submission

Paper ID 9689

In this supplemental, we first present more examples from our proposed benchmark in Figure 1. We then show more qualitative results on both MSD and our benchmark test set. Specially, we compare our results with those of shadow detection methods DSC [4] and BDRAR [13]; semantic segmentation method PSPNet [11]; salient object detection methods R³Net [3], CPDNet [9] and BASNet [7]; and mirror detection method MirrorNet [10] on the MSD dataset [10] and on our benchmark dataset (which is composed of images from ADE20K [12], COCO-Stuff [2], NYUD-V2 [6], Pascal-Context [5], SUNRGBD [8] and MINC [1]).

Noted that for the MSD dataset, we train our model and other baselines on its training dataset and test on its test dataset (Figure 2). For our benchmark dataset, we train on the other 5 datasets in our benchmark dataset, excluding the one that we want to evaluate, and then we test on the excluded one (Figure 3, 4, 5, 6, 7, 8).

References

- [1] Sean Bell, Paul Upchurch, Noah Snavely, and Kavita Bala. Material recognition in the wild with the materials in context database. *CVPR*, 2015. 1, 4, 5, 6, 7
- [2] Holger Caesar, Jasper Uijlings, and Vittorio Ferrari. Coco-stuff: Thing and stuff classes in context. In *CVPR*, June 2018. 1, 4, 5, 6, 7
- [3] Zijun Deng, Xiaowei Hu, Lei Zhu, Xuemiao Xu, Jing Qin, Guoqiang Han, and Pheng-Ann Heng. R3net: Recurrent residual refinement network for saliency detection. In *IJCAI*, pages 684–690. AAAI Press, 2018. 1, 3, 4, 5, 6, 7
- [4] Xiaowei Hu, Lei Zhu, Chi-Wing Fu, Jing Qin, and Pheng-Ann Heng. Direction-aware spatial context features for shadow detection. In *CVPR*, pages 7454–7462, 2018. 1, 3, 4, 5, 6, 7
- [5] Roozbeh Mottaghi, Xianjie Chen, Xiaobai Liu, Nam-Gyu Cho, Seong-Wan Lee, Sanja Fidler, Raquel Urtasun, and Alan Yuille. The role of context for object detection and semantic segmentation in the wild. In *CVPR*, 2014. 1, 4, 5, 6, 7
- [6] Pushmeet Kohli Nathan Silberman, Derek Hoiem and Rob Fergus. Indoor segmentation and support inference from rgb-d images. In *ECCV*, 2012. 1, 4, 5, 6, 7
- [7] Xuebin Qin, Zichen Zhang, Chenyang Huang, Chao Gao, Masood Dehghan, and Martin Jagersand. Basnet: Boundary-aware salient object detection. In *CVPR*, June 2019. 1, 3, 4, 5, 6, 7
- [8] Shuran Song, Samuel P. Lichtenberg, and Jianxiong Xiao. Sun rgb-d: A rgb-d scene understanding benchmark suite. In *CVPR*, June 2015. 1, 4, 5, 6, 7
- [9] Zhe Wu, Li Su, and Qingming Huang. Cascaded partial decoder for fast and accurate salient object detection. In *CVPR*, June 2019. 1, 3, 4, 5, 6, 7
- [10] Xin Yang, Haiyang Mei, Ke Xu, Xiaopeng Wei, Baocai Yin, and Rynson W.H. Lau. Where is my mirror? In *ICCV*, October 2019. 1, 3, 4, 5, 6, 7
- [11] Hengshuang Zhao, Jianping Shi, Xiaojuan Qi, Xiaogang Wang, and Jiaya Jia. Pyramid scene parsing network. In *CVPR*, 2017. 1, 3, 4, 5, 6, 7
- [12] Bolei Zhou, Hang Zhao, Xavier Puig, Sanja Fidler, Adela Barriuso, and Antonio Torralba. Scene parsing through ade20k dataset. In *CVPR*, 2017. 1, 4, 5, 6, 7
- [13] Lei Zhu, Zijun Deng, Xiaowei Hu, Chi-Wing Fu, Xuemiao Xu, Jing Qin, and Pheng-Ann Heng. Bidirectional feature pyramid network with recurrent attention residual modules for shadow detection. In *ECCV*, 2018. 1, 3, 4, 5, 6, 7

108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161

162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215

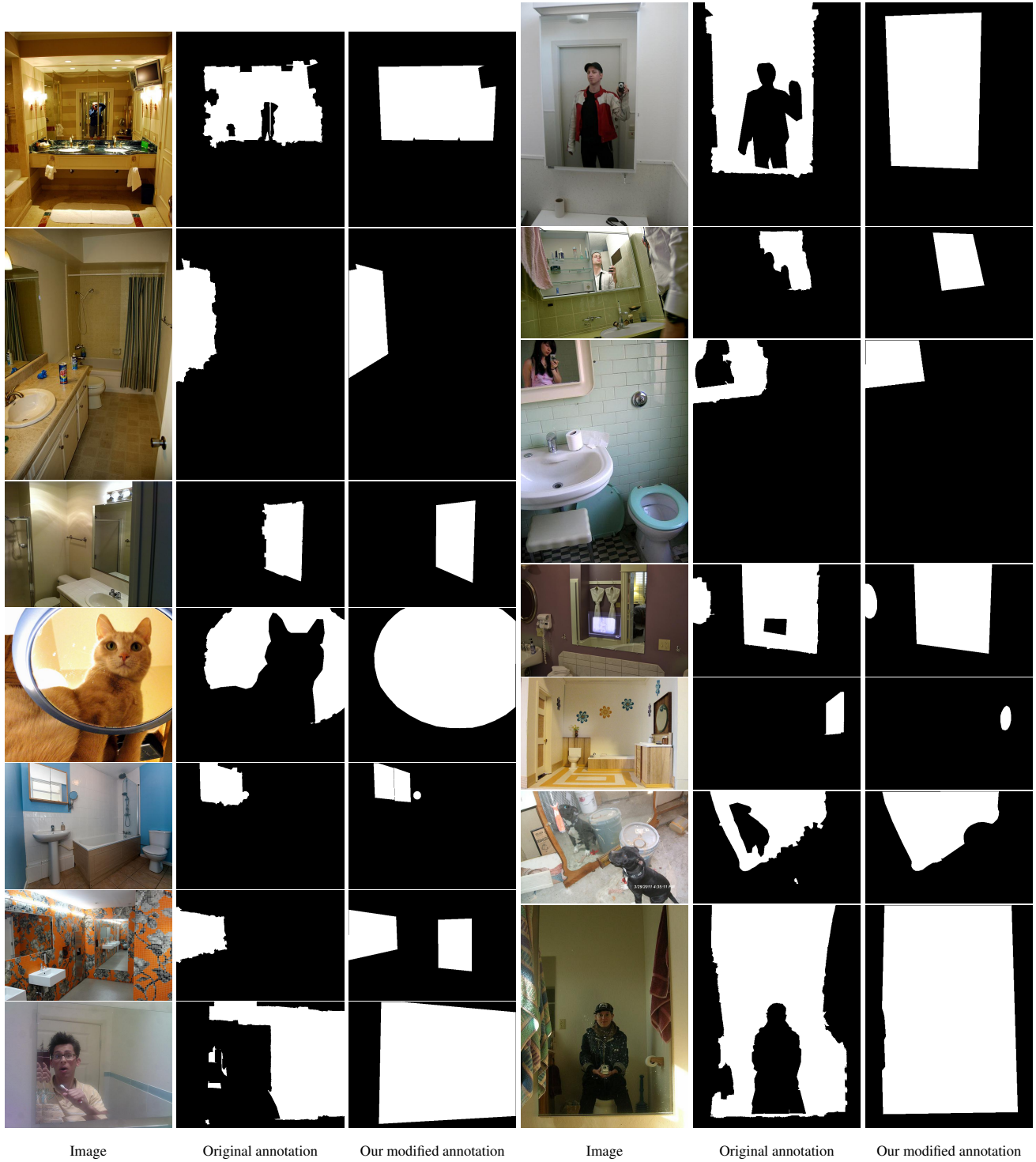


Figure 1: More examples in our proposed benchmark dataset.

216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269

270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323

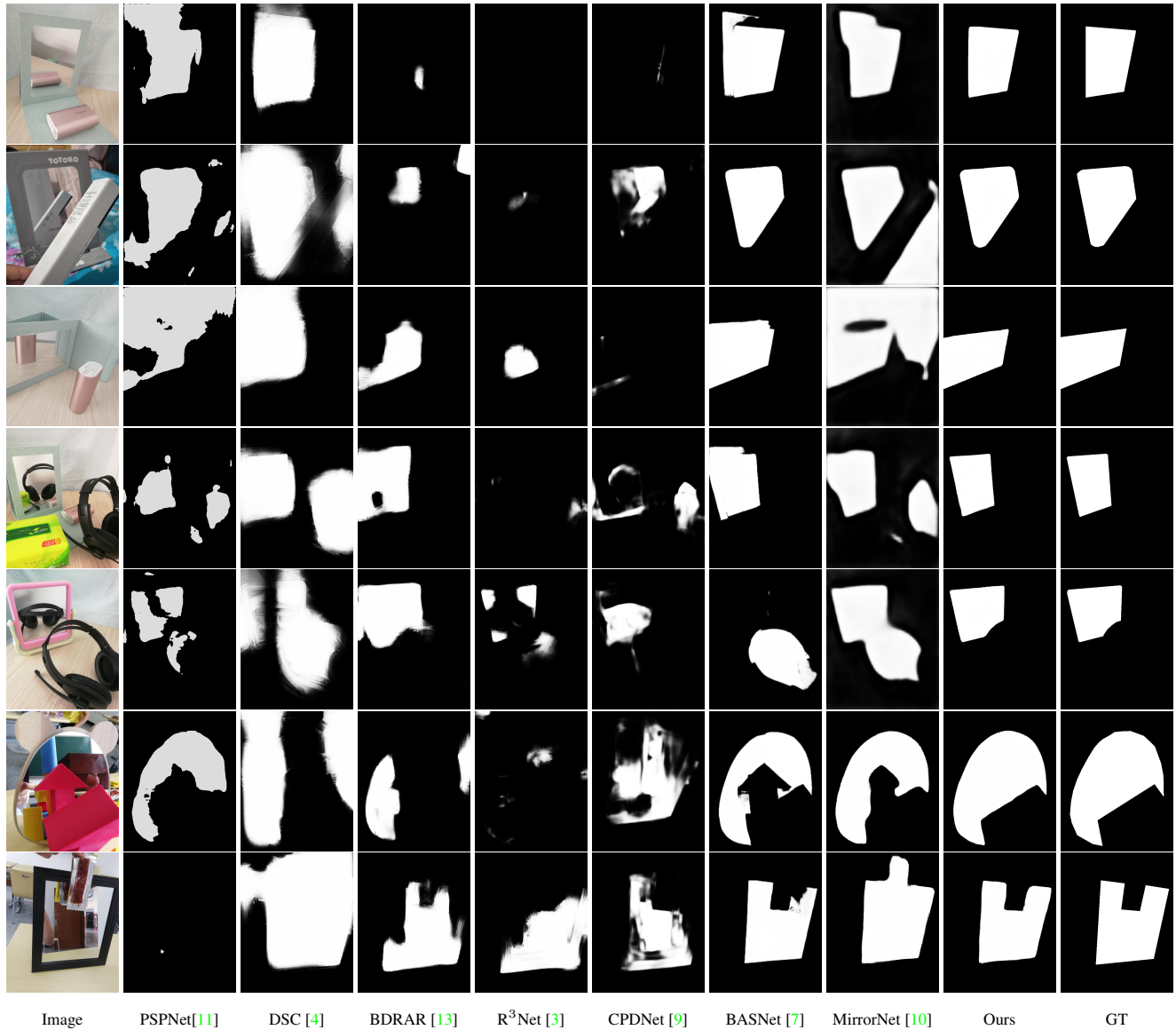


Figure 2: Qualitative results of our method, compared with relevant state-of-the-art methods on the MSD [10] test set. All methods are trained on the MSD training set.

324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377

378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431

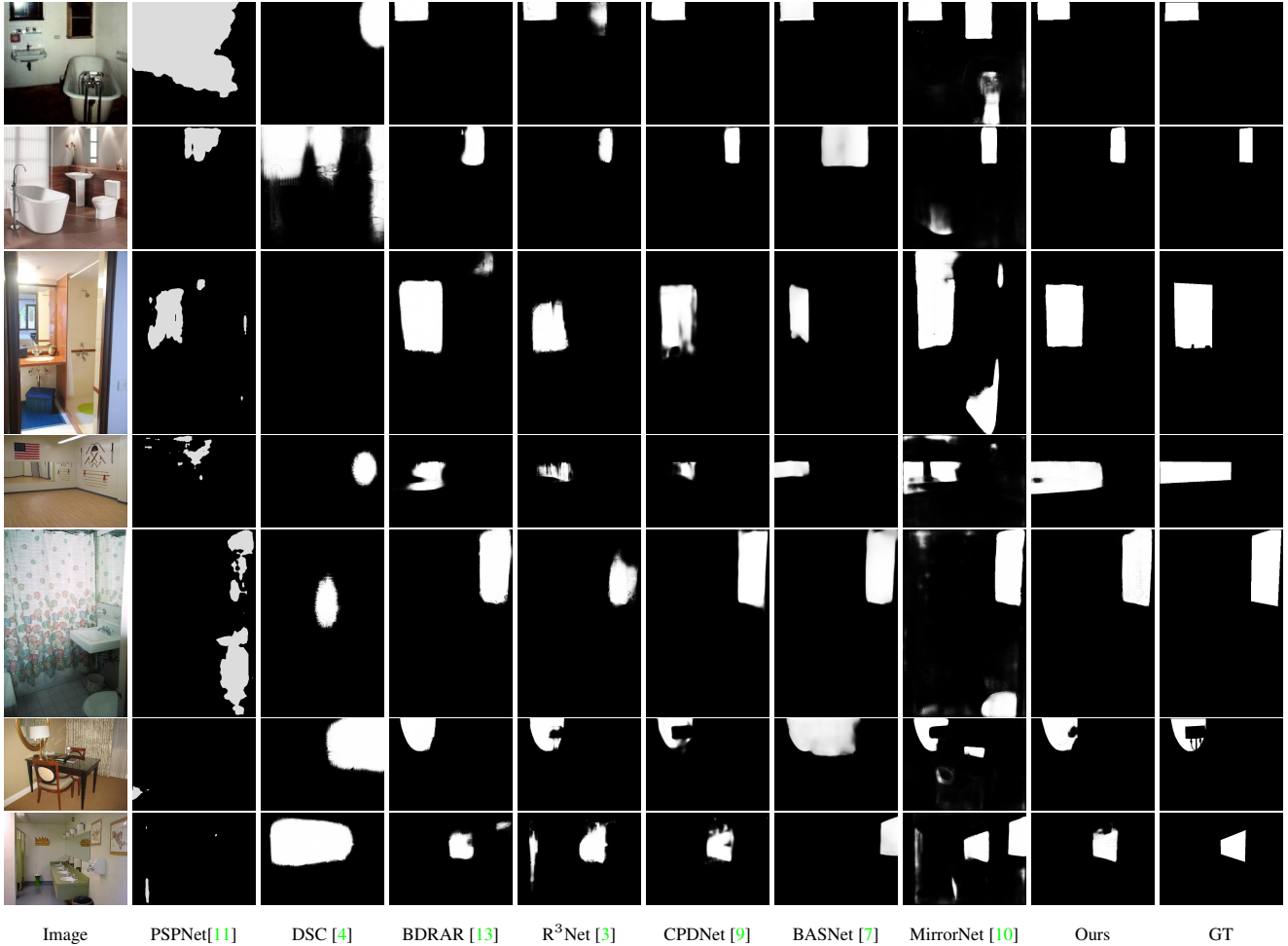


Figure 3: Qualitative results of our method, compared with relevant state-of-the-art methods on the ADE20K [12] dataset. All methods are trained on the COCO-Stuff [2], MINC [1], NYUD-V2 [6], Pascal-Context [5], and SUNRGBD [8] datasets.

432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485

486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539

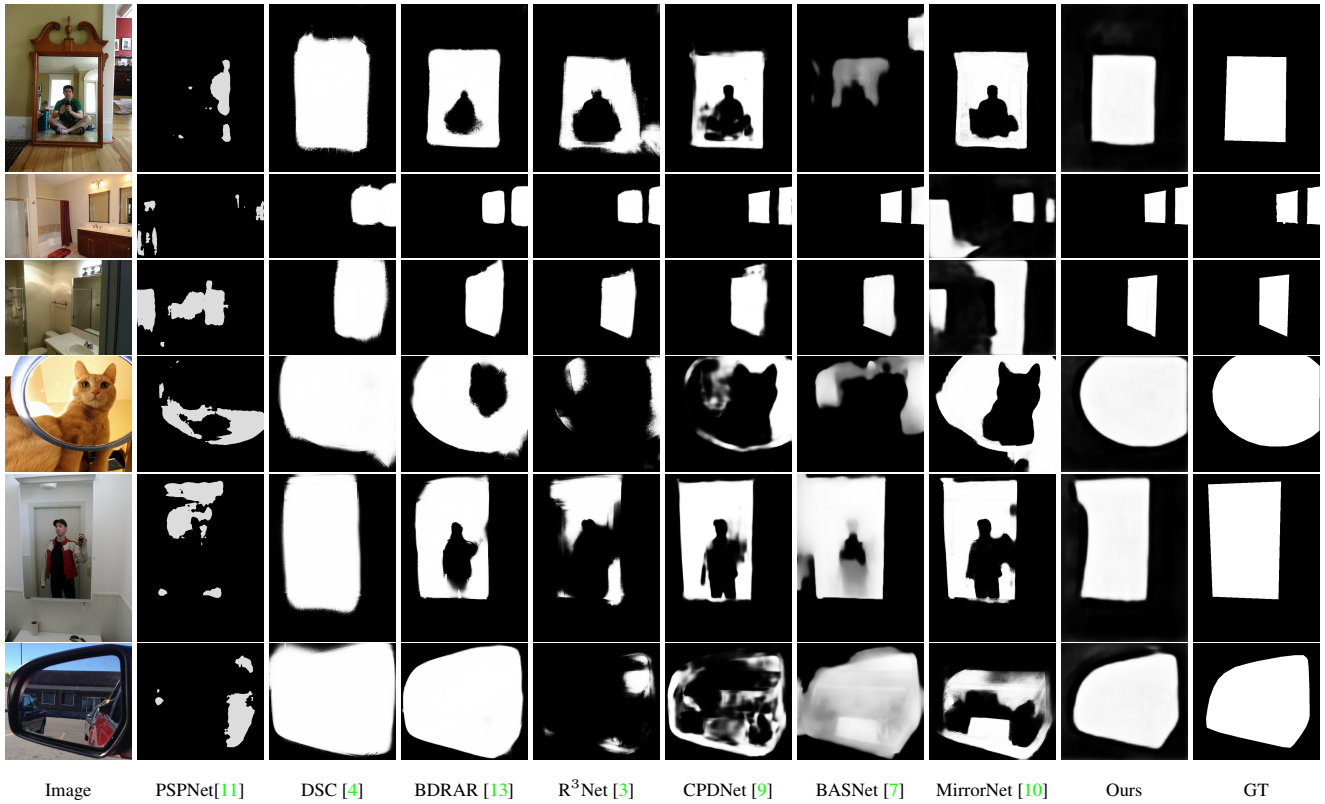


Figure 4: Qualitative results of our method, compared with relevant state-of-the-art methods on the COCO-Stuff [2] dataset. All methods are trained on the ADE20K [12], MINC [1], NYUD-V2 [6], Pascal-Context [5], and SUNRGBD [8] datasets.

540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593

594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647

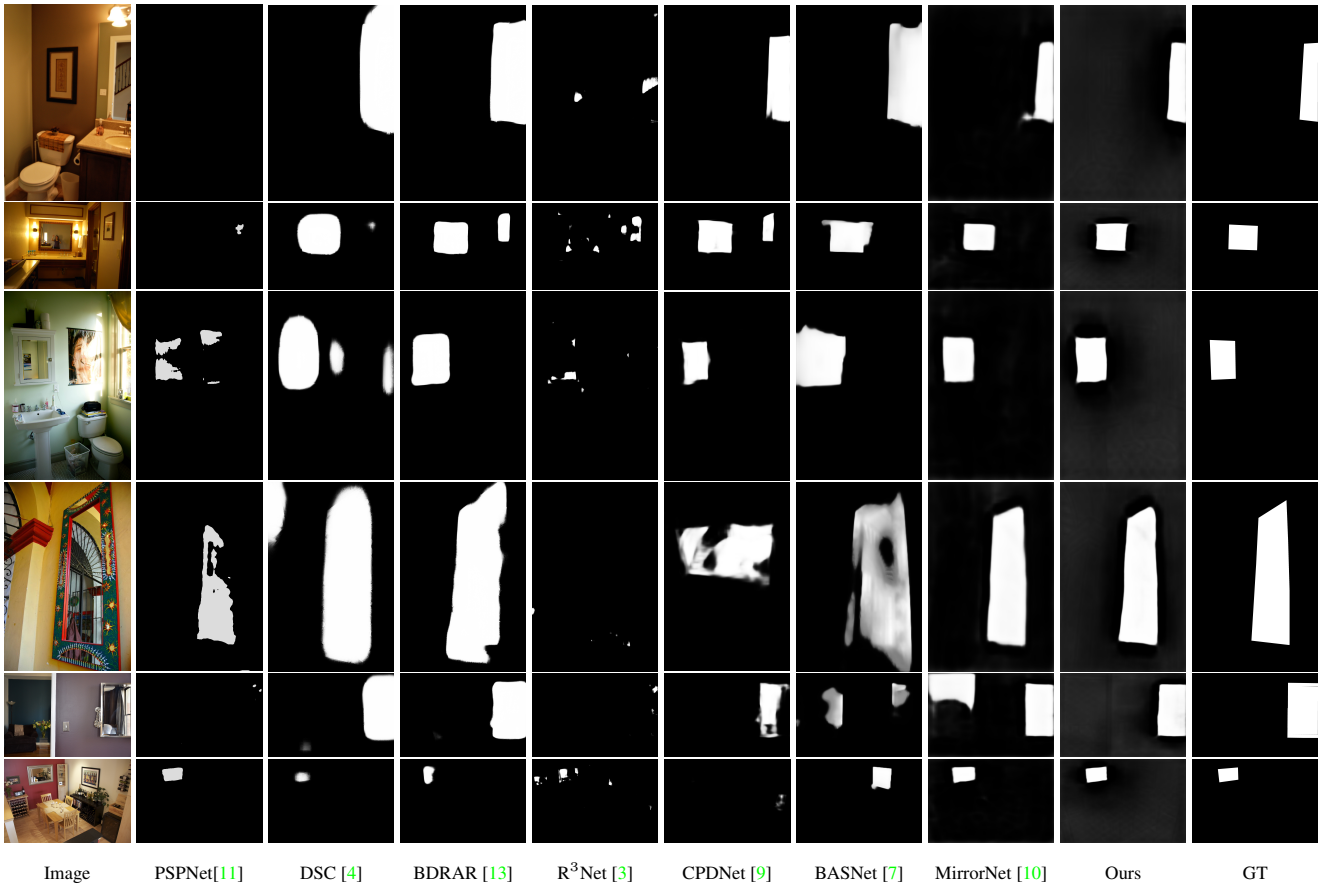


Figure 5: Qualitative results of our method, compared with relevant state-of-the-art methods on the MINC [1] dataset. All methods are trained on the ADE20K [12], COCO-Stuff [2], NYUD-V2 [6], Pascal-Context [5], and SUNRGBD [8] datasets.

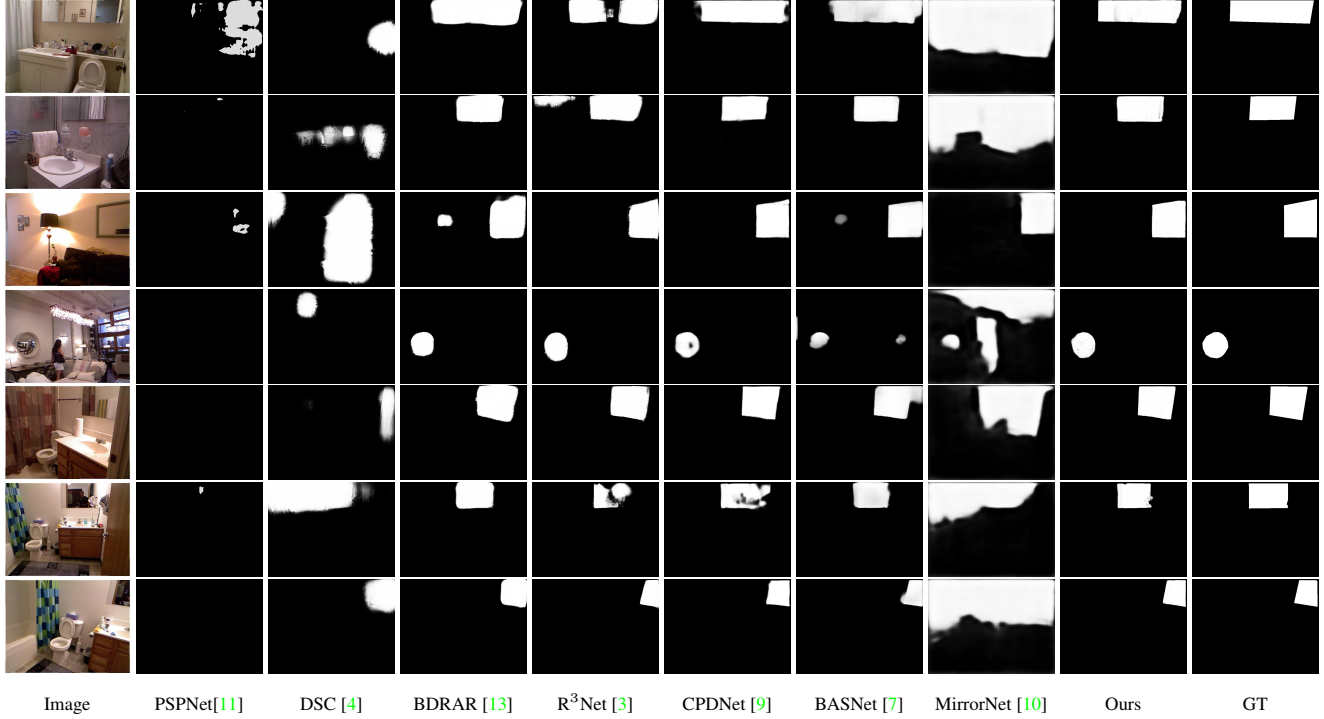


Figure 6: Qualitative results of our method, compared with relevant state-of-the-art methods on the NYUD-V2 [6] dataset. All methods are trained on the ADE20K [12], COCO-Stuff [2], MINC [1], Pascal-Context [5], and SUNRGBD [8] datasets.

648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701

702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755

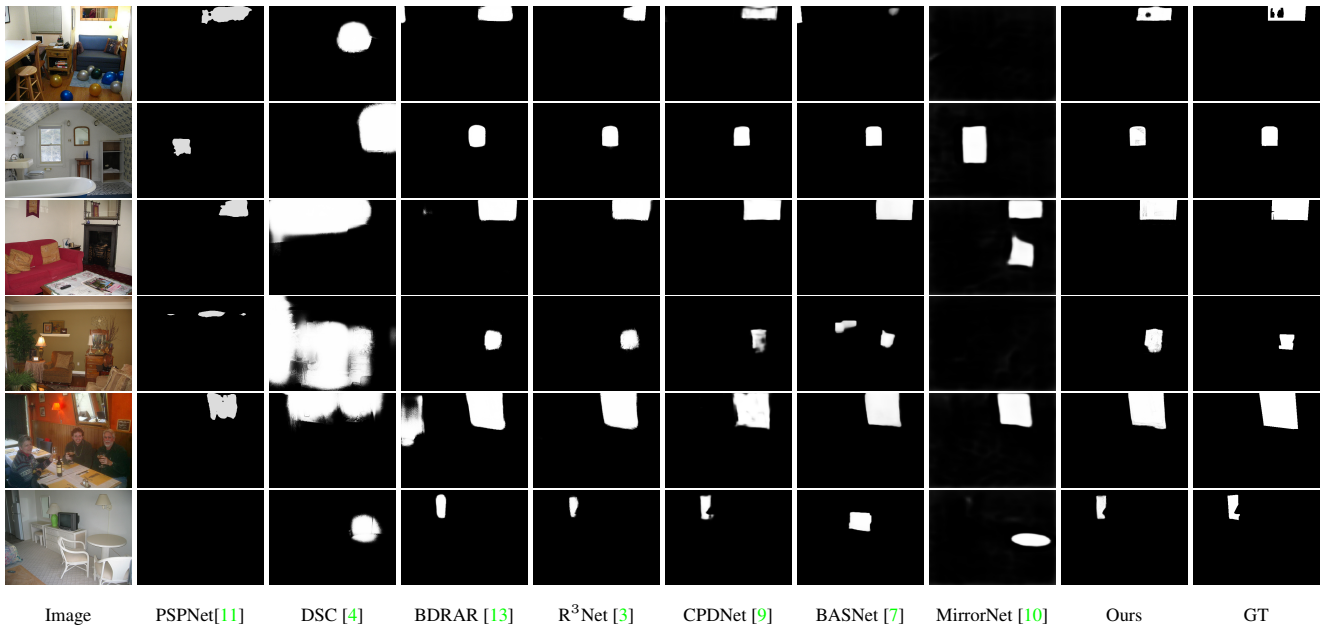


Figure 7: Qualitative results of our method, compared with relevant state-of-the-art methods on the Pascal-Context [5] dataset. All methods are trained on the ADE20K [12], COCO-Stuff [2], MINC [1], NYUD-V2 [6], and SUNRGBD [8] datasets.

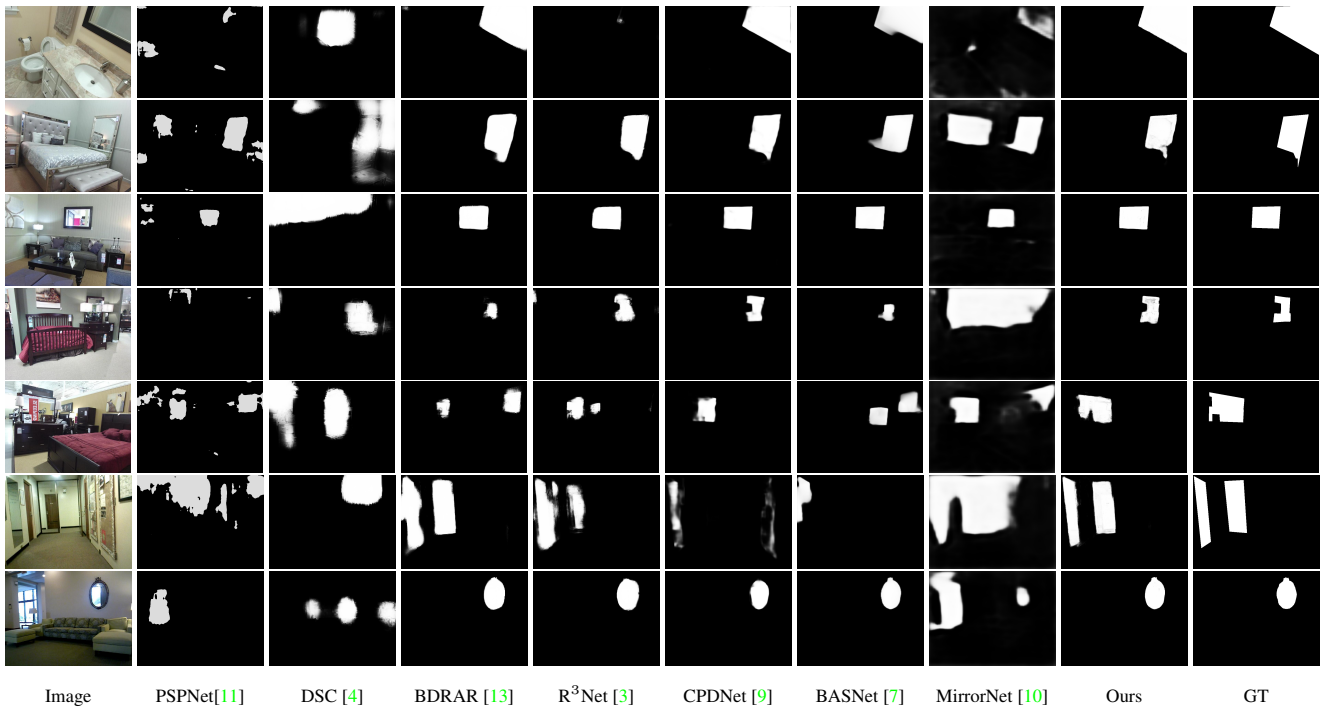


Figure 8: Qualitative results of our method, compared with relevant state-of-the-art methods on the SUNRGBD [8] dataset. All methods are trained on the ADE20K [12], COCO-Stuff [2], MINC [1], NYUD-V2 [6], and Pascal-Context [5] datasets.