```
1  ssh://root@103.254.67.181:10006/usr/bin/python -u /home/
   sunfengzhen/pycharm/mnist_pred10_goontrain_result00_predrnnpp/
   train.py
2  clips
3  (2, 2000, 2)
4  dims
5  (1, 3)
6  input_raw_data
7  (40000, 1, 64, 64)
8  clips
9  (2, 10000, 2)
10 dims
11 (1, 3)
12 input_raw_data
13 (200000, 1, 64, 64)
14 Initializing models
15 [128, 64, 64, 64]
16 2019-08-09 16:45:44.228515: I tensorflow/core/platform/
   cpu_feature_guard.cc:141] Your CPU supports instructions that
   this TensorFlow binary was not compiled to use: AVX2 FMA
17 2019-08-09 16:45:44.550640: I tensorflow/core/common_runtime/gpu/
   gpu_device.cc:1432] Found device 0 with properties:
18 name: GeForce GTX 1080 Ti major: 6 minor: 1 memoryClockRate(GHz
   ): 1.582
19 pciBusID: 0000:02:00.0
20 totalMemory: 10.92GiB freeMemory: 10.76GiB
21 2019-08-09 16:45:44.550702: I tensorflow/core/common_runtime/gpu/
   gpu_device.cc:1511] Adding visible gpu devices: 0
22 2019-08-09 16:45:46.283319: I tensorflow/core/common_runtime/gpu/
   gpu_device.cc:982] Device interconnect StreamExecutor with
   strength 1 edge matrix:
23 2019-08-09 16:45:46.283404: I tensorflow/core/common_runtime/gpu/
   gpu_device.cc:988]      0
24 2019-08-09 16:45:46.283423: I tensorflow/core/common_runtime/gpu/
   gpu_device.cc:1001] 0:    N
25 2019-08-09 16:45:46.284046: I tensorflow/core/common_runtime/gpu/
   gpu_device.cc:1115] Created TensorFlow device (/job:localhost/
```

```
25  replica:0/task:0/device:GPU:0 with 10409 MB memory) -> physical
    GPU (device: 0, name: GeForce GTX 1080 Ti, pci bus id: 0000:02:00
    .0, compute capability: 6.1)
26  global_step restore from checkpoint 1
27  itr: 100
28  training loss: 1140.60498046875
29  itr: 200
30  training loss: 1053.96533203125
31  itr: 300
32  training loss: 973.01318359375
33  itr: 400
34  training loss: 866.84619140625
35  itr: 500
36  training loss: 867.6812744140625
37  itr: 600
38  training loss: 980.8042602539062
39  itr: 700
40  training loss: 789.05517578125
41  itr: 800
42  training loss: 892.8272094726562
43  itr: 900
44  training loss: 897.176025390625
45  itr: 1000
46  training loss: 868.1888427734375
47  itr: 1100
48  training loss: 680.3419189453125
49  itr: 1200
50  training loss: 736.1615600585938
51  itr: 1300
52  training loss: 706.157470703125
53  itr: 1400
54  training loss: 802.798095703125
55  itr: 1500
56  training loss: 727.6224365234375
57  itr: 1600
58  training loss: 694.5568237304688
59  itr: 1700
```

```
60  training loss: 640.3355712890625
61  itr: 1800
62  training loss: 668.2882690429688
63  itr: 1900
64  training loss: 656.99951171875
65  itr: 2000
66  training loss: 635.33740234375
67  itr: 2100
68  training loss: 533.60888671875
69  itr: 2200
70  training loss: 578.4615478515625
71  itr: 2300
72  training loss: 591.0761108398438
73  itr: 2400
74  training loss: 540.1070556640625
75  itr: 2500
76  training loss: 564.874755859375
77  itr: 2600
78  training loss: 633.8935546875
79  itr: 2700
80  training loss: 582.7071533203125
81  itr: 2800
82  training loss: 549.3499755859375
83  itr: 2900
84  training loss: 588.9830322265625
85  itr: 3000
86  training loss: 526.0343017578125
87  itr: 3100
88  training loss: 537.21875
89  itr: 3200
90  training loss: 447.4455871582031
91  itr: 3300
92  training loss: 450.959228515625
93  itr: 3400
94  training loss: 546.3687744140625
95  itr: 3500
96  training loss: 455.2218017578125
```

```
 97  itr: 3600
 98  training loss: 509.63775634765625
 99  itr: 3700
100  training loss: 444.40289306640625
101  itr: 3800
102  training loss: 462.82293701171875
103  itr: 3900
104  training loss: 425.28680419921875
105  itr: 4000
106  training loss: 465.0105285644531
107  itr: 4100
108  training loss: 373.48779296875
109  itr: 4200
110  training loss: 412.0321044921875
111  itr: 4300
112  training loss: 444.67474365234375
113  itr: 4400
114  training loss: 440.3906555175781
115  itr: 4500
116  training loss: 471.3636474609375
117  itr: 4600
118  training loss: 397.8602294921875
119  itr: 4700
120  training loss: 467.24017333984375
121  itr: 4800
122  training loss: 400.0526123046875
123  itr: 4900
124  training loss: 413.88031005859375
125  itr: 5000
126  training loss: 384.69317626953125
127  test...
128  mse per seq: 1120.1208240248593
129  37.64844042613324
130  56.80167448664286
131  76.20515005272556
132  96.10896508090467
133  113.20154206915552
```

```
134  127.45586202230798
135  138.91043835375683
136  148.76582416090142
137  157.82862455682104
138  167.1943028155101
139  psnr per frame: 16.311462
140  20.666021
141  18.892656
142  17.607822
143  16.595474
144  15.875948
145  15.3511715
146  14.960208
147  14.652581
148  14.38309
149  14.129661
150  fmae per frame: 205.42435
151  117.39837
152  143.78304
153  166.88586
154  189.46863
155  208.05746
156  223.29852
157  235.58037
158  246.55066
159  256.541
160  266.67935
161  ssim per frame: 0.77068436
162  0.8754916
163  0.8414164
164  0.8113977
165  0.7844975
166  0.7641828
167  0.7480341
168  0.73507154
169  0.72470564
170  0.71570086
```

```
171  0.7063454
172  sharpness per frame: 181.90668
173  208.83183
174  191.3996
175  187.08736
176  184.15411
177  181.23093
178  178.25401
179  175.91165
180  172.84639
181  170.23193
182  169.11897
183  saved to checkpoints/mnist_predrnn_pp
184  itr: 5100
185  training loss: 406.07965087890625
186  itr: 5200
187  training loss: 393.2247314453125
188  itr: 5300
189  training loss: 430.1294860839844
190  itr: 5400
191  training loss: 433.62060546875
192  itr: 5500
193  training loss: 416.9545593261719
194  itr: 5600
195  training loss: 382.1206359863281
196  itr: 5700
197  training loss: 389.93133544921875
198  itr: 5800
199  training loss: 427.97479248046875
200  itr: 5900
201  training loss: 428.947509765625
202  itr: 6000
203  training loss: 390.72894287109375
204  itr: 6100
205  training loss: 376.92340087890625
206  itr: 6200
207  training loss: 379.778076171875
```

```
208  itr: 6300
209  training loss: 361.7440185546875
210  itr: 6400
211  training loss: 362.9857482910156
212  itr: 6500
213  training loss: 319.6186218261719
214  itr: 6600
215  training loss: 352.4761962890625
216  itr: 6700
217  training loss: 382.7824401855469
218  itr: 6800
219  training loss: 376.1092224121094
220  itr: 6900
221  training loss: 359.06134033203125
222  itr: 7000
223  training loss: 365.4244079589844
224  itr: 7100
225  training loss: 338.0509033203125
226  itr: 7200
227  training loss: 316.62213134765625
228  itr: 7300
229  training loss: 324.195068359375
230  itr: 7400
231  training loss: 308.3393249511719
232  itr: 7500
233  training loss: 319.64642333984375
234  itr: 7600
235  training loss: 391.73980712890625
236  itr: 7700
237  training loss: 345.53759765625
238  itr: 7800
239  training loss: 338.03125
240  itr: 7900
241  training loss: 354.37255859375
242  itr: 8000
243  training loss: 346.10650634765625
244  itr: 8100
```

245 training loss: 332.84490966796875
246 itr: 8200
247 training loss: 366.9410400390625
248 itr: 8300
249 training loss: 351.51336669921875
250 itr: 8400
251 training loss: 313.801025390625
252 itr: 8500
253 training loss: 353.32574462890625
254 itr: 8600
255 training loss: 387.53839111328125
256 itr: 8700
257 training loss: 362.5963134765625
258 itr: 8800
259 training loss: 320.41827392578125
260 itr: 8900
261 training loss: 334.60418701171875
262 itr: 9000
263 training loss: 386.353515625
264 itr: 9100
265 training loss: 327.8599548339844
266 itr: 9200
267 training loss: 295.49853515625
268 itr: 9300
269 training loss: 312.5219421386719
270 itr: 9400
271 training loss: 322.3038330078125
272 itr: 9500
273 training loss: 366.71661376953125
274 itr: 9600
275 training loss: 343.7622375488281
276 itr: 9700
277 training loss: 357.92529296875
278 itr: 9800
279 training loss: 401.1473388671875
280 itr: 9900
281 training loss: 347.6481628417969

```
282  itr: 10000
283  training loss: 331.7090759277344
284  test...
285  mse per seq: 927.642948434056
286  28.577012410604333
287  42.07010954738142
288  57.19109094765292
289  73.15371668865403
290  88.78444190580682
291  103.83089018059543
292  116.41177585709048
293  129.38608992243388
294  139.59377399122857
295  148.64404698260816
296  psnr per frame: 17.30511
297  21.960938
298  20.305183
299  18.956745
300  17.874561
301  16.990993
302  16.290545
303  15.770297
304  15.294264
305  14.94858
306  14.6590185
307  fmae per frame: 179.85316
308  103.50326
309  122.69876
310  141.31378
311  159.93254
312  177.1085
313  193.29617
314  206.69012
315  220.80656
316  231.79147
317  241.3904
318  ssim per frame: 0.8260835
```

319 0.92484367
320 0.89852387
321 0.8727381
322 0.84820414
323 0.82649475
324 0.8072022
325 0.7914519
326 0.7756251
327 0.76320535
328 0.7525454
329 sharpness per frame: 214.29996
330 234.4754
331 222.23695
332 217.65111
333 214.47742
334 212.54518
335 211.61647
336 210.40512
337 207.79518
338 206.20934
339 205.58736
340 saved to checkpoints/mnist_predrnn_pp
341 itr: 10100
342 training loss: 318.13494873046875
343 itr: 10200
344 training loss: 314.3168029785156
345 itr: 10300
346 training loss: 312.4490051269531
347 itr: 10400
348 training loss: 289.75567626953125
349 itr: 10500
350 training loss: 304.9422302246094
351 itr: 10600
352 training loss: 308.4114074707031
353 itr: 10700
354 training loss: 327.73095703125
355 itr: 10800

```
356 training loss: 336.1136169433594
357 itr: 10900
358 training loss: 354.04632568359375
359 itr: 11000
360 training loss: 315.9244384765625
361 itr: 11100
362 training loss: 333.841796875
363 itr: 11200
364 training loss: 362.9088134765625
365 itr: 11300
366 training loss: 315.7457275390625
367 itr: 11400
368 training loss: 276.836181640625
369 itr: 11500
370 training loss: 315.8219909667969
371 itr: 11600
372 training loss: 322.6539306640625
373 itr: 11700
374 training loss: 298.1524353027344
375 itr: 11800
376 training loss: 329.67877197265625
377 itr: 11900
378 training loss: 298.6473693847656
379 itr: 12000
380 training loss: 353.29803466796875
381 itr: 12100
382 training loss: 288.9881591796875
383 itr: 12200
384 training loss: 303.5640869140625
385 itr: 12300
386 training loss: 335.4527893066406
387 itr: 12400
388 training loss: 332.9643249511719
389 itr: 12500
390 training loss: 319.91876220703125
391 itr: 12600
392 training loss: 313.5458984375
```

```
393  itr: 12700
394  training loss: 348.1319274902344
395  itr: 12800
396  training loss: 316.3034973144531
397  itr: 12900
398  training loss: 318.80743408203125
399  itr: 13000
400  training loss: 316.1961364746094
401  itr: 13100
402  training loss: 323.7694091796875
403  itr: 13200
404  training loss: 283.2479248046875
405  itr: 13300
406  training loss: 332.5423583984375
407  itr: 13400
408  training loss: 302.361328125
409  itr: 13500
410  training loss: 357.2530517578125
411  itr: 13600
412  training loss: 351.94720458984375
413  itr: 13700
414  training loss: 291.75909423828125
415  itr: 13800
416  training loss: 282.6074523925781
417  itr: 13900
418  training loss: 351.8282165527344
419  itr: 14000
420  training loss: 285.89886474609375
421  itr: 14100
422  training loss: 308.45245361328125
423  itr: 14200
424  training loss: 288.70318603515625
425  itr: 14300
426  training loss: 293.4485778808594
427  itr: 14400
428  training loss: 316.36376953125
429  itr: 14500
```

```
430 training loss: 321.3664855957031
431 itr: 14600
432 training loss: 300.48876953125
433 itr: 14700
434 training loss: 288.8197326660156
435 itr: 14800
436 training loss: 283.56939697265625
437 itr: 14900
438 training loss: 306.4874267578125
439 itr: 15000
440 training loss: 284.9257507324219
441 test...
442 mse per seq: 751.4375325436573
443 24.204370456527037
444 34.16536194062137
445 45.478033487097804
446 57.85583309188904
447 69.43167054509541
448 81.52347121947261
449 93.34075838877973
450 104.72777057938787
451 115.45768694896775
452 125.25257588581867
453 psnr per frame: 18.305395
454 22.768373
455 21.274307
456 20.023003
457 18.971004
458 18.161247
459 17.436829
460 16.822227
461 16.298029
462 15.833541
463 15.465409
464 fmae per frame: 141.47173
465 78.07818
466 93.268814
```

```
467  108.236916
468  123.35793
469  136.63385
470  150.24391
471  163.26346
472  175.77086
473  187.67122
474  198.19214
475  ssim per frame: 0.8546723
476  0.93515426
477  0.9150619
478  0.8948223
479  0.8753073
480  0.8588507
481  0.8423472
482  0.82672507
483  0.81236494
484  0.79866683
485  0.78742236
486  sharpness per frame: 228.39021
487  245.11095
488  234.15813
489  230.45532
490  228.52661
491  227.63855
492  225.55623
493  224.82831
494  223.21236
495  222.247
496  222.16867
497  saved to checkpoints/mnist_predrnn_pp
498  itr: 15100
499  training loss: 295.5091552734375
500  itr: 15200
501  training loss: 250.15530395507812
502  itr: 15300
503  training loss: 288.04559326171875
```

```
504  itr: 15400
505  training loss: 290.3807373046875
506  itr: 15500
507  training loss: 283.7212829589844
508  itr: 15600
509  training loss: 287.7051696777344
510  itr: 15700
511  training loss: 327.62237548828125
512  itr: 15800
513  training loss: 305.53167724609375
514  itr: 15900
515  training loss: 286.79901123046875
516  itr: 16000
517  training loss: 323.00225830078125
518  itr: 16100
519  training loss: 271.253662109375
520  itr: 16200
521  training loss: 287.7889404296875
522  itr: 16300
523  training loss: 277.6903076171875
524  itr: 16400
525  training loss: 272.46832275390625
526  itr: 16500
527  training loss: 300.2657470703125
528  itr: 16600
529  training loss: 281.669189453125
530  itr: 16700
531  training loss: 256.1280517578125
532  itr: 16800
533  training loss: 288.52874755859375
534  itr: 16900
535  training loss: 306.1746520996094
536  itr: 17000
537  training loss: 259.1930236816406
538  itr: 17100
539  training loss: 296.7827453613281
540  itr: 17200
```

541 training loss: 277.4255065917969
542 itr: 17300
543 training loss: 292.4942321777344
544 itr: 17400
545 training loss: 253.84597778320312
546 itr: 17500
547 training loss: 269.4168701171875
548 itr: 17600
549 training loss: 260.2738037109375
550 itr: 17700
551 training loss: 303.5699462890625
552 itr: 17800
553 training loss: 260.42095947265625
554 itr: 17900
555 training loss: 269.1064453125
556 itr: 18000
557 training loss: 258.2342529296875
558 itr: 18100
559 training loss: 249.8924560546875
560 itr: 18200
561 training loss: 258.972412109375
562 itr: 18300
563 training loss: 259.27569580078125
564 itr: 18400
565 training loss: 287.1329345703125
566 itr: 18500
567 training loss: 254.91909790039062
568 itr: 18600
569 training loss: 290.68231201171875
570 itr: 18700
571 training loss: 276.4560852050781
572 itr: 18800
573 training loss: 243.98080444335938
574 itr: 18900
575 training loss: 242.41375732421875
576 itr: 19000
577 training loss: 277.5905456542969

```
578  itr: 19100
579  training loss: 276.29998779296875
580  itr: 19200
581  training loss: 259.40545654296875
582  itr: 19300
583  training loss: 279.7251892089844
584  itr: 19400
585  training loss: 229.13343811035156
586  itr: 19500
587  training loss: 255.76730346679688
588  itr: 19600
589  training loss: 281.6099853515625
590  itr: 19700
591  training loss: 271.383544921875
592  itr: 19800
593  training loss: 279.84820556640625
594  itr: 19900
595  training loss: 286.97247314453125
596  itr: 20000
597  training loss: 217.66590881347656
598  test...
599  mse per seq: 623.7297284727595
600  22.1360641885474
601  30.508601207809754
602  38.69415247200962
603  47.70532693058611
604  57.49718472277783
605  66.78162921767637
606  76.42922143285054
607  85.68663470716362
608  94.76093908103115
609  103.52997451230704
610  psnr per frame: 19.091831
611  23.180643
612  21.805489
613  20.744846
614  19.804398
```

615 18.990997
616 18.34186
617 17.731234
618 17.221392
619 16.74643
620 16.351027
621 fmae per frame: 131.97472
622 78.407036
623 91.52771
624 103.69799
625 116.23567
626 128.54962
627 139.3584
628 150.31514
629 160.71901
630 170.71565
631 180.22092
632 ssim per frame: 0.85537755
633 0.92491096
634 0.9080356
635 0.89145607
636 0.8745229
637 0.85858
638 0.84486103
639 0.83115804
640 0.81849146
641 0.8064069
642 0.79535323
643 sharpness per frame: 232.06555
644 251.22992
645 244.50803
646 237.5246
647 231.07278
648 227.51958
649 226.18173
650 225.74046
651 225.50151

```
652  225.66115
653  225.71587
654  saved to checkpoints/mnist_predrnn_pp
655  itr: 20100
656  training loss: 300.5836181640625
657  itr: 20200
658  training loss: 253.96063232421875
659  itr: 20300
660  training loss: 275.1519775390625
661  itr: 20400
662  training loss: 269.7677917480469
663  itr: 20500
664  training loss: 302.52911376953125
665  itr: 20600
666  training loss: 254.03823852539062
667  itr: 20700
668  training loss: 265.3665771484375
669  itr: 20800
670  training loss: 267.5513916015625
671  itr: 20900
672  training loss: 272.8327331542969
673  itr: 21000
674  training loss: 267.8450012207031
675  itr: 21100
676  training loss: 270.74066162109375
677  itr: 21200
678  training loss: 290.96441650390625
679  itr: 21300
680  training loss: 262.95574951171875
681  itr: 21400
682  training loss: 246.3638916015625
683  itr: 21500
684  training loss: 272.1258239746094
685  itr: 21600
686  training loss: 255.4136505126953
687  itr: 21700
688  training loss: 275.70654296875
```

```
689  itr: 21800
690  training loss: 300.4033203125
691  itr: 21900
692  training loss: 241.97402954101562
693  itr: 22000
694  training loss: 251.42271423339844
695  itr: 22100
696  training loss: 256.7278747558594
697  itr: 22200
698  training loss: 240.69488525390625
699  itr: 22300
700  training loss: 266.25408935546875
701  itr: 22400
702  training loss: 276.1934814453125
703  itr: 22500
704  training loss: 225.295654296875
705  itr: 22600
706  training loss: 244.45968627929688
707  itr: 22700
708  training loss: 226.8728485107422
709  itr: 22800
710  training loss: 267.6281433105469
711  itr: 22900
712  training loss: 244.4949188232422
713  itr: 23000
714  training loss: 241.20709228515625
715  itr: 23100
716  training loss: 285.3241882324219
717  itr: 23200
718  training loss: 258.6104431152344
719  itr: 23300
720  training loss: 280.0684814453125
721  itr: 23400
722  training loss: 230.47360229492188
723  itr: 23500
724  training loss: 269.44281005859375
725  itr: 23600
```

726 training loss: 242.19674682617188
727 itr: 23700
728 training loss: 271.947265625
729 itr: 23800
730 training loss: 260.6263122558594
731 itr: 23900
732 training loss: 279.56353759765625
733 itr: 24000
734 training loss: 251.10235595703125
735 itr: 24100
736 training loss: 264.06317138671875
737 itr: 24200
738 training loss: 241.155517578125
739 itr: 24300
740 training loss: 251.7443389892578
741 itr: 24400
742 training loss: 269.3477478027344
743 itr: 24500
744 training loss: 268.16619873046875
745 itr: 24600
746 training loss: 305.9349365234375
747 itr: 24700
748 training loss: 236.82516479492188
749 itr: 24800
750 training loss: 251.98651123046875
751 itr: 24900
752 training loss: 271.1802978515625
753 itr: 25000
754 training loss: 243.03887939453125
755 test...
756 mse per seq: 535.225684694497
757 21.700083686644774
758 29.126122692981397
759 36.64897183337843
760 44.10026775497988
761 51.2997227404491
762 58.07545082061645

763 64.6332241809033
764 71.27677987952788
765 76.59911300475339
766 81.76594810026238
767 psnr per frame: 19.584827
768 23.26827
769 21.999884
770 20.95266
771 20.123356
772 19.42345
773 18.860575
774 18.375671
775 17.942533
776 17.597885
777 17.303982
778 fmae per frame: 137.65213
779 81.59244
780 93.514984
781 107.57645
782 122.01584
783 135.50696
784 147.02243
785 157.81607
786 168.46863
787 177.33434
788 185.67325
789 ssim per frame: 0.79037064
790 0.8902115
791 0.881647
792 0.8536306
793 0.82276475
794 0.79164225
795 0.769159
796 0.7478142
797 0.72983354
798 0.7150375
799 0.70196605

```
800  sharpness per frame: 191.7877
801  251.7997
802  244.25502
803  228.03665
804  207.17921
805  191.04468
806  177.84137
807  167.10593
808  158.126
809  149.99197
810  142.49649
811  saved to checkpoints/mnist_predrnn_pp
812  itr: 25100
813  training loss: 228.74839782714844
814  itr: 25200
815  training loss: 254.32122802734375
816  itr: 25300
817  training loss: 274.468017578125
818  itr: 25400
819  training loss: 248.89111328125
820  itr: 25500
821  training loss: 281.2385559082031
822  itr: 25600
823  training loss: 262.3450927734375
824  itr: 25700
825  training loss: 262.7020568847656
826  itr: 25800
827  training loss: 233.0544891357422
828  itr: 25900
829  training loss: 268.95306396484375
830  itr: 26000
831  training loss: 227.6686248779297
832  itr: 26100
833  training loss: 266.39825439453125
834  itr: 26200
835  training loss: 254.41421508789062
836  itr: 26300
```

837 training loss: 220.73736572265625
838 itr: 26400
839 training loss: 220.89349365234375
840 itr: 26500
841 training loss: 268.18304443359375
842 itr: 26600
843 training loss: 279.14178466796875
844 itr: 26700
845 training loss: 234.28439331054688
846 itr: 26800
847 training loss: 285.8263854980469
848 itr: 26900
849 training loss: 227.82028198242188
850 itr: 27000
851 training loss: 231.1181182861328
852 itr: 27100
853 training loss: 243.57559204101562
854 itr: 27200
855 training loss: 247.91387939453125
856 itr: 27300
857 training loss: 247.67233276367188
858 itr: 27400
859 training loss: 273.65960693359375
860 itr: 27500
861 training loss: 225.79916381835938
862 itr: 27600
863 training loss: 217.29336547851562
864 itr: 27700
865 training loss: 233.4400634765625
866 itr: 27800
867 training loss: 211.57225036621094
868 itr: 27900
869 training loss: 232.22662353515625
870 itr: 28000
871 training loss: 233.15869140625
872 itr: 28100
873 training loss: 231.78871154785156

```
874 itr: 28200
875 training loss: 230.70445251464844
876 itr: 28300
877 training loss: 239.16091918945312
878 itr: 28400
879 training loss: 214.80397033691406
880 itr: 28500
881 training loss: 252.1068878173828
882 itr: 28600
883 training loss: 230.54507446289062
884 itr: 28700
885 training loss: 234.65774536132812
886 itr: 28800
887 training loss: 233.91908264160156
888 itr: 28900
889 training loss: 238.48631286621094
890 itr: 29000
891 training loss: 255.43881225585938
892 itr: 29100
893 training loss: 235.83456420898438
894 itr: 29200
895 training loss: 248.61105346679688
896 itr: 29300
897 training loss: 214.488525390625
898 itr: 29400
899 training loss: 214.43048095703125
900 itr: 29500
901 training loss: 242.90576171875
902 itr: 29600
903 training loss: 248.29525756835938
904 itr: 29700
905 training loss: 245.5379638671875
906 itr: 29800
907 training loss: 232.21755981445312
908 itr: 29900
909 training loss: 267.8663024902344
910 itr: 30000
```

```
911  training loss: 246.439208984375
912  test...
913  mse per seq: 509.7517384755085
914  21.12550407624149
915  28.32917299998333
916  35.146550159377746
917  42.15223935904752
918  49.3030639096915
919  55.326757974892736
920  61.39724883113999
921  67.42554582649446
922  72.1193151052697
923  77.42634023337
924  psnr per frame: 19.825624
925  23.390589
926  22.138224
927  21.162384
928  20.36939
929  19.649725
930  19.141603
931  18.662636
932  18.241135
933  17.91738
934  17.583172
935  fmae per frame: 121.56637
936  72.22638
937  83.20517
938  94.569984
939  106.604675
940  118.37729
941  128.61049
942  138.7867
943  149.03096
944  157.5368
945  166.71516
946  ssim per frame: 0.8702899
947  0.94141024
```

```
948  0.9277996
949  0.9118015
950  0.894264
951  0.87681055
952  0.860887
953  0.84507155
954  0.8291402
955  0.8152365
956  0.8004777
957  sharpness per frame: 198.37555
958  251.86446
959  246.66667
960  235.76707
961  221.20532
962  204.70583
963  190.28514
964  176.4528
965  163.61095
966  151.86546
967  141.33183
968  saved to checkpoints/mnist_predrnn_pp
969  itr: 30100
970  training loss: 261.4740905761719
971  itr: 30200
972  training loss: 236.0091552734375
973  itr: 30300
974  training loss: 233.74053955078125
975  itr: 30400
976  training loss: 216.61834716796875
977  itr: 30500
978  training loss: 246.38180541992188
979  itr: 30600
980  training loss: 237.97317504882812
981  itr: 30700
982  training loss: 233.98646545410156
983  itr: 30800
984  training loss: 251.17929077148438
```

```
985  itr: 30900
986  training loss: 232.21412658691406
987  itr: 31000
988  training loss: 225.69439697265625
989  itr: 31100
990  training loss: 260.7007751464844
991  itr: 31200
992  training loss: 242.6429901123047
993  itr: 31300
994  training loss: 241.90394592285156
995  itr: 31400
996  training loss: 229.35650634765625
997  itr: 31500
998  training loss: 243.62826538085938
999  itr: 31600
1000 training loss: 241.722412109375
1001 itr: 31700
1002 training loss: 245.62322998046875
1003 itr: 31800
1004 training loss: 269.38165283203125
1005 itr: 31900
1006 training loss: 217.82122802734375
1007 itr: 32000
1008 training loss: 277.126220703125
1009 itr: 32100
1010 training loss: 231.83248901367188
1011 itr: 32200
1012 training loss: 256.97918701171875
1013 itr: 32300
1014 training loss: 213.68817138671875
1015 itr: 32400
1016 training loss: 236.9898223876953
1017 itr: 32500
1018 training loss: 233.84280395507812
1019 itr: 32600
1020 training loss: 249.7972412109375
1021 itr: 32700
```

```
1022 training loss: 224.16546630859375
1023 itr: 32800
1024 training loss: 236.240966796875
1025 itr: 32900
1026 training loss: 202.61453247070312
1027 itr: 33000
1028 training loss: 229.0104522705078
1029 itr: 33100
1030 training loss: 260.82330322265625
1031 itr: 33200
1032 training loss: 233.02468872070312
1033 itr: 33300
1034 training loss: 232.64071655273438
1035 itr: 33400
1036 training loss: 275.2818908691406
1037 itr: 33500
1038 training loss: 224.09664916992188
1039 itr: 33600
1040 training loss: 241.84396362304688
1041 itr: 33700
1042 training loss: 241.810302734375
1043 itr: 33800
1044 training loss: 224.1597900390625
1045 itr: 33900
1046 training loss: 197.0403289794922
1047 itr: 34000
1048 training loss: 198.10935974121094
1049 itr: 34100
1050 training loss: 186.4393310546875
1051 itr: 34200
1052 training loss: 216.65545654296875
1053 itr: 34300
1054 training loss: 226.720703125
1055 itr: 34400
1056 training loss: 255.59613037109375
1057 itr: 34500
1058 training loss: 264.22747802734375
```

```
1059  itr: 34600
1060  training loss: 261.19488525390625
1061  itr: 34700
1062  training loss: 195.85760498046875
1063  itr: 34800
1064  training loss: 241.36219787597656
1065  itr: 34900
1066  training loss: 262.1995849609375
1067  itr: 35000
1068  training loss: 227.57337951660156
1069  test...
1070  mse per seq: 506.71191266454366
1071  21.45793825555518
1072  28.67827731059737
1073  35.62286825831157
1074  42.31272833031344
1075  49.51784693859667
1076  55.46733123901858
1077  61.05619407561888
1078  66.29115624791648
1079  70.78163828715742
1080  75.5259337214581
1081  psnr per frame: 19.843998
1082  23.347702
1083  22.124092
1084  21.144512
1085  20.3817
1086  19.662476
1087  19.151394
1088  18.69113
1089  18.301216
1090  17.971651
1091  17.66411
1092  fmae per frame: 125.730515
1093  74.63084
1094  84.62157
1095  96.28359
```

```
1096  108.118774
1097  121.19975
1098  132.73853
1099  144.12683
1100  155.17908
1101  165.18013
1102  175.22614
1103  ssim per frame: 0.85436237
1104  0.9282664
1105  0.9216486
1106  0.90363836
1107  0.88558036
1108  0.8637126
1109  0.8438388
1110  0.82426894
1111  0.8062904
1112  0.7904275
1113  0.77595204
1114  sharpness per frame: 199.51797
1115  253.50903
1116  250.18474
1117  242.71938
1118  230.77258
1119  213.96637
1120  195.79066
1121  177.10843
1122  159.30171
1123  143.41064
1124  128.41617
1125  saved to checkpoints/mnist_predrnn_pp
1126  itr: 35100
1127  training loss: 257.9282531738281
1128  itr: 35200
1129  training loss: 198.67123413085938
1130  itr: 35300
1131  training loss: 203.61924743652344
1132  itr: 35400
```

```
1133 training loss: 264.30499267578125
1134 itr: 35500
1135 training loss: 239.5722198486328
1136 itr: 35600
1137 training loss: 229.34597778320312
1138 itr: 35700
1139 training loss: 243.30841064453125
1140 itr: 35800
1141 training loss: 221.2730255126953
1142 itr: 35900
1143 training loss: 247.38247680664062
1144 itr: 36000
1145 training loss: 202.7167510986328
1146 itr: 36100
1147 training loss: 193.16278076171875
1148 itr: 36200
1149 training loss: 228.50064086914062
1150 itr: 36300
1151 training loss: 230.72842407226562
1152 itr: 36400
1153 training loss: 236.24554443359375
1154 itr: 36500
1155 training loss: 265.06396484375
1156 itr: 36600
1157 training loss: 233.35250854492188
1158 itr: 36700
1159 training loss: 235.12005615234375
1160 itr: 36800
1161 training loss: 234.9084014892578
1162 itr: 36900
1163 training loss: 250.68643188476562
1164 itr: 37000
1165 training loss: 214.42642211914062
1166 itr: 37100
1167 training loss: 262.61822509765625
1168 itr: 37200
1169 training loss: 254.91732788085938
```

```
1170  itr: 37300
1171  training loss: 254.1928253173828
1172  itr: 37400
1173  training loss: 252.15841674804688
1174  itr: 37500
1175  training loss: 263.3769836425781
1176  itr: 37600
1177  training loss: 259.8843994140625
1178  itr: 37700
1179  training loss: 238.736572265625
1180  itr: 37800
1181  training loss: 213.48764038085938
1182  itr: 37900
1183  training loss: 240.34033203125
1184  itr: 38000
1185  training loss: 225.32290649414062
1186  itr: 38100
1187  training loss: 222.50563049316406
1188  itr: 38200
1189  training loss: 245.3260040283203
1190  itr: 38300
1191  training loss: 219.06875610351562
1192  itr: 38400
1193  training loss: 249.91757202148438
1194  itr: 38500
1195  training loss: 239.23971557617188
1196  itr: 38600
1197  training loss: 196.68478393554688
1198  itr: 38700
1199  training loss: 234.4775390625
1200  itr: 38800
1201  training loss: 207.37632751464844
1202  itr: 38900
1203  training loss: 213.96263122558594
1204  itr: 39000
1205  training loss: 221.6341552734375
1206  itr: 39100
```

```
1207  training loss: 216.1208953857422
1208  itr: 39200
1209  training loss: 228.50924682617188
1210  itr: 39300
1211  training loss: 207.70956420898438
1212  itr: 39400
1213  training loss: 221.34584045410156
1214  itr: 39500
1215  training loss: 228.95591735839844
1216  itr: 39600
1217  training loss: 225.80677795410156
1218  itr: 39700
1219  training loss: 236.15013122558594
1220  itr: 39800
1221  training loss: 229.3477783203125
1222  itr: 39900
1223  training loss: 230.4438934326172
1224  itr: 40000
1225  training loss: 226.87527465820312
1226  test...
1227  mse per seq: 496.2815682782705
1228  21.089768348448725
1229  28.225857072087177
1230  35.20234638045591
1231  42.04782265352915
1232  48.43230789828013
1233  54.23926377200697
1234  59.940488485926124
1235  64.56764150719087
1236  68.92175004951446
1237  73.61432211083103
1238  psnr per frame: 19.946629
1239  23.408567
1240  22.209446
1241  21.210802
1242  20.427074
1243  19.76894
```

```
1244  19.27163
1245  18.789457
1246  18.443403
1247  18.13473
1248  17.802216
1249  fmae per frame: 118.653336
1250  70.659676
1251  82.00616
1252  92.93727
1253  103.82506
1254  114.425255
1255  124.614395
1256  135.18039
1257  144.80966
1258  154.12457
1259  163.95096
1260  ssim per frame: 0.8711153
1261  0.94214153
1262  0.9266426
1263  0.91053194
1264  0.89511263
1265  0.87953925
1266  0.8638702
1267  0.84695333
1268  0.83105654
1269  0.8155438
1270  0.79976153
1271  sharpness per frame: 212.63252
1272  253.66415
1273  251.39006
1274  248.07028
1275  240.75853
1276  228.8243
1277  213.95782
1278  196.76907
1279  180.13504
1280  163.81425
```

```
1281  148.94177
1282  saved to checkpoints/mnist_predrnn_pp
1283  itr: 40100
1284  training loss: 191.96372985839844
1285  itr: 40200
1286  training loss: 231.12437438964844
1287  itr: 40300
1288  training loss: 242.17141723632812
1289  itr: 40400
1290  training loss: 222.38583374023438
1291  itr: 40500
1292  training loss: 192.07498168945312
1293  itr: 40600
1294  training loss: 210.2228546142578
1295  itr: 40700
1296  training loss: 210.72389221191406
1297  itr: 40800
1298  training loss: 194.36428833007812
1299  itr: 40900
1300  training loss: 234.4375
1301  itr: 41000
1302  training loss: 292.2954406738281
1303  itr: 41100
1304  training loss: 225.15057373046875
1305  itr: 41200
1306  training loss: 224.51202392578125
1307  itr: 41300
1308  training loss: 207.78915405273438
1309  itr: 41400
1310  training loss: 231.67703247070312
1311  itr: 41500
1312  training loss: 212.8821258544922
1313  itr: 41600
1314  training loss: 202.4364013671875
1315  itr: 41700
1316  training loss: 207.2673797607422
1317  itr: 41800
```

```
1318  training loss: 230.1953125
1319  itr: 41900
1320  training loss: 223.51956176757812
1321  itr: 42000
1322  training loss: 212.8369903564453
1323  itr: 42100
1324  training loss: 206.18060302734375
1325  itr: 42200
1326  training loss: 208.74664306640625
1327  itr: 42300
1328  training loss: 220.81471252441406
1329  itr: 42400
1330  training loss: 236.5592041015625
1331  itr: 42500
1332  training loss: 243.7917938232422
1333  itr: 42600
1334  training loss: 270.82012939453125
1335  itr: 42700
1336  training loss: 222.92535400390625
1337  itr: 42800
1338  training loss: 196.28550720214844
1339  itr: 42900
1340  training loss: 251.775634765625
1341  itr: 43000
1342  training loss: 212.51368713378906
1343  itr: 43100
1344  training loss: 220.95608520507812
1345  itr: 43200
1346  training loss: 238.74114990234375
1347  itr: 43300
1348  training loss: 215.14947509765625
1349  itr: 43400
1350  training loss: 248.16079711914062
1351  itr: 43500
1352  training loss: 215.9916229248047
1353  itr: 43600
1354  training loss: 268.573974609375
```

```
1355  itr: 43700
1356  training loss: 239.81060791015625
1357  itr: 43800
1358  training loss: 210.9952392578125
1359  itr: 43900
1360  training loss: 233.27670288085938
1361  itr: 44000
1362  training loss: 255.84217834472656
1363  itr: 44100
1364  training loss: 244.13409423828125
1365  itr: 44200
1366  training loss: 217.5494842529297
1367  itr: 44300
1368  training loss: 264.20733642578125
1369  itr: 44400
1370  training loss: 197.06057739257812
1371  itr: 44500
1372  training loss: 213.32696533203125
1373  itr: 44600
1374  training loss: 253.66070556640625
1375  itr: 44700
1376  training loss: 229.37051391601562
1377  itr: 44800
1378  training loss: 249.29893493652344
1379  itr: 44900
1380  training loss: 210.8732147216797
1381  itr: 45000
1382  training loss: 249.2047882080078
1383  test...
1384  mse per seq: 497.0803003234557
1385  21.002336184183758
1386  28.167207036152423
1387  35.07694808163318
1388  41.70172104586559
1389  48.86984679593618
1390  54.187464350198645
1391  60.1608344081894
```

1392 64.85134095647727
1393 68.94911345516343
1394 74.11348800965581
1395 psnr per frame: 19.974962
1396 23.464657
1397 22.21716
1398 21.242672
1399 20.482067
1400 19.756262
1401 19.307856
1402 18.825897
1403 18.45852
1404 18.16713
1405 17.827389
1406 fmae per frame: 115.85686
1407 75.799126
1408 82.81875
1409 92.090126
1410 102.82636
1411 113.28551
1412 121.21831
1413 130.5311
1414 138.65704
1415 146.13026
1416 155.21208
1417 ssim per frame: 0.87676686
1418 0.9184528
1419 0.92339265
1420 0.9111436
1421 0.8950347
1422 0.8808161
1423 0.8706856
1424 0.85805917
1425 0.8473203
1426 0.83722174
1427 0.8255417
1428 sharpness per frame: 220.54553

```
1429 253.86647
1430 252.23143
1431 249.23293
1432 244.60593
1433 236.76907
1434 223.9222
1435 209.35994
1436 194.06274
1437 178.5
1438 162.90462
1439 saved to checkpoints/mnist_predrnn_pp
1440 itr: 45100
1441 training loss: 243.41143798828125
1442 itr: 45200
1443 training loss: 269.4921569824219
1444 itr: 45300
1445 training loss: 261.67315673828125
1446 itr: 45400
1447 training loss: 231.6294708251953
1448 itr: 45500
1449 training loss: 215.1922607421875
1450 itr: 45600
1451 training loss: 226.866455078125
1452 itr: 45700
1453 training loss: 232.82977294921875
1454 itr: 45800
1455 training loss: 262.56060791015625
1456 itr: 45900
1457 training loss: 206.00802612304688
1458 itr: 46000
1459 training loss: 251.14923095703125
1460 itr: 46100
1461 training loss: 233.54661560058594
1462 itr: 46200
1463 training loss: 223.57437133789062
1464 itr: 46300
1465 training loss: 226.32281494140625
```

```
1466  itr: 46400
1467  training loss: 220.04241943359375
1468  itr: 46500
1469  training loss: 251.39950561523438
1470  itr: 46600
1471  training loss: 246.339111328125
1472  itr: 46700
1473  training loss: 202.73233032226562
1474  itr: 46800
1475  training loss: 221.98751831054688
1476  itr: 46900
1477  training loss: 220.62411499023438
1478  itr: 47000
1479  training loss: 216.7050323486328
1480  itr: 47100
1481  training loss: 224.36416625976562
1482  itr: 47200
1483  training loss: 227.14508056640625
1484  itr: 47300
1485  training loss: 203.29736328125
1486  itr: 47400
1487  training loss: 211.9490203857422
1488  itr: 47500
1489  training loss: 245.71519470214844
1490  itr: 47600
1491  training loss: 267.18267822265625
1492  itr: 47700
1493  training loss: 210.30715942382812
1494  itr: 47800
1495  training loss: 237.216064453125
1496  itr: 47900
1497  training loss: 243.55226135253906
1498  itr: 48000
1499  training loss: 218.04019165039062
1500  itr: 48100
1501  training loss: 212.71954345703125
1502  itr: 48200
```

```
1503  training loss: 237.855712890625
1504  itr: 48300
1505  training loss: 234.35350036621094
1506  itr: 48400
1507  training loss: 190.41366577148438
1508  itr: 48500
1509  training loss: 259.8359375
1510  itr: 48600
1511  training loss: 224.55331420898438
1512  itr: 48700
1513  training loss: 192.783203125
1514  itr: 48800
1515  training loss: 223.59226989746094
1516  itr: 48900
1517  training loss: 253.44322204589844
1518  itr: 49000
1519  training loss: 237.83497619628906
1520  itr: 49100
1521  training loss: 223.5055694580078
1522  itr: 49200
1523  training loss: 248.13156127929688
1524  itr: 49300
1525  training loss: 218.4976043701172
1526  itr: 49400
1527  training loss: 227.57980346679688
1528  itr: 49500
1529  training loss: 256.2639465332031
1530  itr: 49600
1531  training loss: 238.22860717773438
1532  itr: 49700
1533  training loss: 218.61129760742188
1534  itr: 49800
1535  training loss: 193.53170776367188
1536  itr: 49900
1537  training loss: 237.51101684570312
1538  itr: 50000
1539  training loss: 195.72552490234375
```

```
1540  test...
1541  mse per seq: 492.72250286163575
1542  21.134357961784882
1543  28.341353136851605
1544  34.54079375209579
1545  41.23445462606039
1546  47.61966630253926
1547  53.35216883770433
1548  58.691653347398386
1549  64.56928320582134
1550  69.00769900892632
1551  74.23107268245344
1552  psnr per frame: 20.000187
1553  23.416048
1554  22.1903
1555  21.299904
1556  20.523632
1557  19.861607
1558  19.361658
1559  18.920464
1560  18.483086
1561  18.14468
1562  17.800497
1563  fmae per frame: 114.89058
1564  72.13508
1565  82.63114
1566  91.1466
1567  100.889725
1568  110.53106
1569  119.65034
1570  128.70816
1571  138.79823
1572  147.36978
1573  157.04572
1574  ssim per frame: 0.8822139
1575  0.9379994
1576  0.9246019
```

1577 0.9136999
1578 0.9010996
1579 0.88847715
1580 0.87627405
1581 0.86415946
1582 0.85074127
1583 0.8388888
1584 0.82619673
1585 sharpness per frame: 218.57877
1586 253.68022
1587 252.28413
1588 249.59286
1589 244.84789
1590 235.69377
1591 222.05923
1592 206.4779
1593 189.79468
1594 173.18774
1595 158.16917
1596 saved to checkpoints/mnist_predrnn_pp
1597 itr: 50100
1598 training loss: 243.2037353515625
1599 itr: 50200
1600 training loss: 238.68893432617188
1601 itr: 50300
1602 training loss: 215.8587646484375
1603 itr: 50400
1604 training loss: 207.5898895263672
1605 itr: 50500
1606 training loss: 240.31527709960938
1607 itr: 50600
1608 training loss: 265.662109375
1609 itr: 50700
1610 training loss: 219.4635772705078
1611 itr: 50800
1612 training loss: 224.2498779296875
1613 itr: 50900

1614 `training loss: 224.59799194335938`
1615 `itr: 51000`
1616 `training loss: 224.36331176757812`
1617 `itr: 51100`
1618 `training loss: 216.68527221679688`
1619 `itr: 51200`
1620 `training loss: 217.43048095703125`
1621 `itr: 51300`
1622 `training loss: 244.68197631835938`
1623 `itr: 51400`
1624 `training loss: 209.16534423828125`
1625 `itr: 51500`
1626 `training loss: 226.7506866455078`
1627 `itr: 51600`
1628 `training loss: 228.07557678222656`
1629 `itr: 51700`
1630 `training loss: 249.2691192626953`
1631 `itr: 51800`
1632 `training loss: 229.66152954101562`
1633 `itr: 51900`
1634 `training loss: 198.751708984375`
1635 `itr: 52000`
1636 `training loss: 191.27059936523438`
1637 `itr: 52100`
1638 `training loss: 227.4917449951172`
1639 `itr: 52200`
1640 `training loss: 201.6019287109375`
1641 `itr: 52300`
1642 `training loss: 214.32093811035156`
1643 `itr: 52400`
1644 `training loss: 208.71157836914062`
1645 `itr: 52500`
1646 `training loss: 237.7701416015625`
1647 `itr: 52600`
1648 `training loss: 206.91046142578125`
1649 `itr: 52700`
1650 `training loss: 222.582275390625`

1651 itr: 52800
1652 training loss: 244.803955078125
1653 itr: 52900
1654 training loss: 215.2275390625
1655 itr: 53000
1656 training loss: 177.1094207763672
1657 itr: 53100
1658 training loss: 224.47213745117188
1659 itr: 53200
1660 training loss: 216.7027587890625
1661 itr: 53300
1662 training loss: 191.62582397460938
1663 itr: 53400
1664 training loss: 239.42710876464844
1665 itr: 53500
1666 training loss: 218.64663696289062
1667 itr: 53600
1668 training loss: 216.17794799804688
1669 itr: 53700
1670 training loss: 206.78712463378906
1671 itr: 53800
1672 training loss: 213.64761352539062
1673 itr: 53900
1674 training loss: 239.796875
1675 itr: 54000
1676 training loss: 220.02755737304688
1677 itr: 54100
1678 training loss: 219.10726928710938
1679 itr: 54200
1680 training loss: 229.90867614746094
1681 itr: 54300
1682 training loss: 235.18858337402344
1683 itr: 54400
1684 training loss: 211.509765625
1685 itr: 54500
1686 training loss: 221.7669677734375
1687 itr: 54600

```
1688  training loss: 213.51702880859375
1689  itr: 54700
1690  training loss: 184.3248291015625
1691  itr: 54800
1692  training loss: 214.91278076171875
1693  itr: 54900
1694  training loss: 234.34996032714844
1695  itr: 55000
1696  training loss: 196.34597778320312
1697  test...
1698  mse per seq: 492.3639484658299
1699  21.183112795573162
1700  28.297966846021783
1701  34.83071526370374
1702  40.849743640087695
1703  47.315245157264805
1704  52.8632680594203
1705  58.851532932266174
1706  64.16054416947576
1707  69.18429657350103
1708  74.82752302851543
1709  psnr per frame: 20.050531
1710  23.416363
1711  22.21618
1712  21.296526
1713  20.613285
1714  19.937756
1715  19.456673
1716  18.958448
1717  18.568274
1718  18.206692
1719  17.835114
1720  fmae per frame: 111.76845
1721  69.67972
1722  80.79823
1723  89.994156
1724  98.78949
```

1725 108.315094
1726 116.54263
1727 125.67479
1728 134.12717
1729 142.34256
1730 151.42061
1731 ssim per frame: 0.89030266
1732 0.9448593
1733 0.9307622
1734 0.91877615
1735 0.9074794
1736 0.8949371
1737 0.8839837
1738 0.8720792
1739 0.86114115
1740 0.8503301
1741 0.83867824
1742 sharpness per frame: 226.90964
1743 254.16766
1744 252.99097
1745 250.9498
1746 246.80974
1747 239.53313
1748 229.1275
1749 216.99347
1750 205.52258
1751 192.68774
1752 180.31375
1753 saved to checkpoints/mnist_predrnn_pp
1754 itr: 55100
1755 training loss: 239.47088623046875
1756 itr: 55200
1757 training loss: 214.10330200195312
1758 itr: 55300
1759 training loss: 224.94467163085938
1760 itr: 55400
1761 training loss: 251.83181762695312

```
1762  itr: 55500
1763  training loss: 215.11264038085938
1764  itr: 55600
1765  training loss: 208.30824279785156
1766  itr: 55700
1767  training loss: 191.62600708007812
1768  itr: 55800
1769  training loss: 230.80178833007812
1770  itr: 55900
1771  training loss: 235.64633178710938
1772  itr: 56000
1773  training loss: 213.7870635986328
1774  itr: 56100
1775  training loss: 202.87078857421875
1776  itr: 56200
1777  training loss: 212.9326171875
1778  itr: 56300
1779  training loss: 180.35317993164062
1780  itr: 56400
1781  training loss: 261.37835693359375
1782  itr: 56500
1783  training loss: 203.63531494140625
1784  itr: 56600
1785  training loss: 237.98475646972656
1786  itr: 56700
1787  training loss: 214.4123077392578
1788  itr: 56800
1789  training loss: 189.78012084960938
1790  itr: 56900
1791  training loss: 216.7307586669922
1792  itr: 57000
1793  training loss: 212.262939453125
1794  itr: 57100
1795  training loss: 228.85528564453125
1796  itr: 57200
1797  training loss: 196.79730224609375
1798  itr: 57300
```

1799 training loss: 201.4993896484375
1800 itr: 57400
1801 training loss: 217.12539672851562
1802 itr: 57500
1803 training loss: 218.79342651367188
1804 itr: 57600
1805 training loss: 212.44992065429688
1806 itr: 57700
1807 training loss: 223.02005004882812
1808 itr: 57800
1809 training loss: 182.69322204589844
1810 itr: 57900
1811 training loss: 197.92547607421875
1812 itr: 58000
1813 training loss: 179.5770263671875
1814 itr: 58100
1815 training loss: 193.33543395996094
1816 itr: 58200
1817 training loss: 169.37498474121094
1818 itr: 58300
1819 training loss: 199.52853393554688
1820 itr: 58400
1821 training loss: 172.162353515625
1822 itr: 58500
1823 training loss: 213.68960571289062
1824 itr: 58600
1825 training loss: 241.3558349609375
1826 itr: 58700
1827 training loss: 208.8848114013672
1828 itr: 58800
1829 training loss: 236.70440673828125
1830 itr: 58900
1831 training loss: 186.60940551757812
1832 itr: 59000
1833 training loss: 191.95913696289062
1834 itr: 59100
1835 training loss: 198.42257690429688

```
1836  itr: 59200
1837  training loss: 202.67916870117188
1838  itr: 59300
1839  training loss: 202.90806579589844
1840  itr: 59400
1841  training loss: 196.49632263183594
1842  itr: 59500
1843  training loss: 167.74371337890625
1844  itr: 59600
1845  training loss: 223.86744689941406
1846  itr: 59700
1847  training loss: 195.9642333984375
1848  itr: 59800
1849  training loss: 210.96282958984375
1850  itr: 59900
1851  training loss: 208.57568359375
1852  itr: 60000
1853  training loss: 186.05398559570312
1854  test...
1855  mse per seq: 505.4452774553414
1856  21.13088653748294
1857  28.382389673746253
1858  35.11752112515001
1859  41.60864961003683
1860  49.17881091627251
1861  54.61444937464702
1862  61.227263469772645
1863  66.4934444810492
1864  71.28163162292725
1865  76.41023064425671
1866  psnr per frame: 19.938978
1867  23.435999
1868  22.198256
1869  21.263857
1870  20.512514
1871  19.755915
1872  19.286839
```

1873	18.769793
1874	18.382416
1875	18.047953
1876	17.736233
1877	fmae per frame: 112.87787
1878	72.605835
1879	80.46859
1880	89.65054
1881	98.86594
1882	109.560104
1883	117.403564
1884	127.14614
1885	135.8516
1886	144.24612
1887	152.98024
1888	ssim per frame: 0.88555604
1889	0.93395114
1890	0.9292322
1891	0.9171642
1892	0.90512305
1893	0.8910172
1894	0.8805922
1895	0.86738306
1896	0.855614
1897	0.8438736
1898	0.83161
1899	sharpness per frame: 231.38945
1900	253.95833
1901	253.14256
1902	251.04518
1903	248.01355
1904	243.4473
1905	235.94377
1906	226.18224
1907	214.05823
1908	201.0281
1909	187.0753

```
1910  saved to checkpoints/mnist_predrnn_pp
1911  itr: 60100
1912  training loss: 224.1638641357422
1913  itr: 60200
1914  training loss: 189.01687622070312
1915  itr: 60300
1916  training loss: 163.86587524414062
1917  itr: 60400
1918  training loss: 205.0712890625
1919  itr: 60500
1920  training loss: 211.3707275390625
1921  itr: 60600
1922  training loss: 173.9316864013672
1923  itr: 60700
1924  training loss: 213.75204467773438
1925  itr: 60800
1926  training loss: 217.96405029296875
1927  itr: 60900
1928  training loss: 214.2101593017578
1929  itr: 61000
1930  training loss: 202.01690673828125
1931  itr: 61100
1932  training loss: 173.39169311523438
1933  itr: 61200
1934  training loss: 207.7236328125
1935  itr: 61300
1936  training loss: 199.0097198486328
1937  itr: 61400
1938  training loss: 214.43992614746094
1939  itr: 61500
1940  training loss: 202.94972229003906
1941  itr: 61600
1942  training loss: 193.70794677734375
1943  itr: 61700
1944  training loss: 206.31883239746094
1945  itr: 61800
1946  training loss: 179.02879333496094
```

1947 itr: 61900
1948 training loss: 188.12551879882812
1949 itr: 62000
1950 training loss: 192.79708862304688
1951 itr: 62100
1952 training loss: 185.74755859375
1953 itr: 62200
1954 training loss: 187.75250244140625
1955 itr: 62300
1956 training loss: 172.93707275390625
1957 itr: 62400
1958 training loss: 170.43043518066406
1959 itr: 62500
1960 training loss: 189.33114624023438
1961 itr: 62600
1962 training loss: 166.47177124023438
1963 itr: 62700
1964 training loss: 179.87229919433594
1965 itr: 62800
1966 training loss: 176.129150390625
1967 itr: 62900
1968 training loss: 194.03343200683594
1969 itr: 63000
1970 training loss: 226.02822875976562
1971 itr: 63100
1972 training loss: 195.89149475097656
1973 itr: 63200
1974 training loss: 188.44757080078125
1975 itr: 63300
1976 training loss: 213.6158447265625
1977 itr: 63400
1978 training loss: 207.40216064453125
1979 itr: 63500
1980 training loss: 189.35211181640625
1981 itr: 63600
1982 training loss: 180.93072509765625
1983 itr: 63700

1984 training loss: 193.34727478027344
1985 itr: 63800
1986 training loss: 171.38571166992188
1987 itr: 63900
1988 training loss: 210.0025177001953
1989 itr: 64000
1990 training loss: 193.96002197265625
1991 itr: 64100
1992 training loss: 200.5238037109375
1993 itr: 64200
1994 training loss: 191.16085815429688
1995 itr: 64300
1996 training loss: 187.43939208984375
1997 itr: 64400
1998 training loss: 168.7141876220703
1999 itr: 64500
2000 training loss: 174.14610290527344
2001 itr: 64600
2002 training loss: 172.05148315429688
2003 itr: 64700
2004 training loss: 174.31658935546875
2005 itr: 64800
2006 training loss: 172.688232421875
2007 itr: 64900
2008 training loss: 190.5823974609375
2009 itr: 65000
2010 training loss: 188.29852294921875
2011 test...
2012 mse per seq: 489.3439346183256
2013 21.134781082949964
2014 28.043430071757978
2015 34.4665232815417
2016 40.63216594711365
2017 47.58985457362899
2018 52.89913774206935
2019 58.520984098135706
2020 63.80591953997631

2021	68.57322591758636
2022	73.6779123635656
2023	psnr per frame: 20.07735
2024	23.45219
2025	22.259579
2026	21.351261
2027	20.643175
2028	19.910364
2029	19.453028
2030	18.972164
2031	18.575125
2032	18.244946
2033	17.91166
2034	fmae per frame: 113.40263
2035	77.75783
2036	82.33771
2037	91.12717
2038	100.30526
2039	110.48684
2040	118.02917
2041	126.32988
2042	134.8195
2043	142.31688
2044	150.51617
2045	ssim per frame: 0.88010865
2046	0.89605427
2047	0.9235036
2048	0.91339016
2049	0.90099746
2050	0.8871553
2051	0.8778558
2052	0.8667124
2053	0.8555145
2054	0.8454531
2055	0.83444965
2056	sharpness per frame: 232.76802
2057	254.40361

```
2058  253.75954
2059  252.01355
2060  249.3494
2061  244.26155
2062  236.53313
2063  226.92319
2064  215.60994
2065  203.97389
2066  190.85242
2067  saved to checkpoints/mnist_predrnn_pp
2068  itr: 65100
2069  training loss: 191.10833740234375
2070  itr: 65200
2071  training loss: 202.19454956054688
2072  itr: 65300
2073  training loss: 199.05482482910156
2074  itr: 65400
2075  training loss: 189.2147216796875
2076  itr: 65500
2077  training loss: 195.85040283203125
2078  itr: 65600
2079  training loss: 157.50961303710938
2080  itr: 65700
2081  training loss: 207.11587524414062
2082  itr: 65800
2083  training loss: 206.74557495117188
2084  itr: 65900
2085  training loss: 199.5185546875
2086  itr: 66000
2087  training loss: 181.28976440429688
2088  itr: 66100
2089  training loss: 185.85052490234375
2090  itr: 66200
2091  training loss: 186.64013671875
2092  itr: 66300
2093  training loss: 200.750244140625
2094  itr: 66400
```

```
2095 training loss: 210.59744262695312
2096 itr: 66500
2097 training loss: 195.0506134033203
2098 itr: 66600
2099 training loss: 170.41941833496094
2100 itr: 66700
2101 training loss: 201.37620544433594
2102 itr: 66800
2103 training loss: 186.43760681152344
2104 itr: 66900
2105 training loss: 169.27081298828125
2106 itr: 67000
2107 training loss: 188.55606079101562
2108 itr: 67100
2109 training loss: 174.06842041015625
2110 itr: 67200
2111 training loss: 197.0994873046875
2112 itr: 67300
2113 training loss: 164.76071166992188
2114 itr: 67400
2115 training loss: 184.24850463867188
2116 itr: 67500
2117 training loss: 200.04635620117188
2118 itr: 67600
2119 training loss: 177.15765380859375
2120 itr: 67700
2121 training loss: 186.24606323242188
2122 itr: 67800
2123 training loss: 172.1246337890625
2124 itr: 67900
2125 training loss: 187.42648315429688
2126 itr: 68000
2127 training loss: 175.75982666015625
2128 itr: 68100
2129 training loss: 197.90127563476562
2130 itr: 68200
2131 training loss: 197.82144165039062
```

```
2132 itr: 68300
2133 training loss: 174.50918579101562
2134 itr: 68400
2135 training loss: 180.31288146972656
2136 itr: 68500
2137 training loss: 212.4299774169922
2138 itr: 68600
2139 training loss: 164.9374542236328
2140 itr: 68700
2141 training loss: 158.9527130126953
2142 itr: 68800
2143 training loss: 198.9983673095703
2144 itr: 68900
2145 training loss: 177.50912475585938
2146 itr: 69000
2147 training loss: 169.46176147460938
2148 itr: 69100
2149 training loss: 210.65687561035156
2150 itr: 69200
2151 training loss: 170.94915771484375
2152 itr: 69300
2153 training loss: 170.35809326171875
2154 itr: 69400
2155 training loss: 166.42880249023438
2156 itr: 69500
2157 training loss: 171.86178588867188
2158 itr: 69600
2159 training loss: 176.56602478027344
2160 itr: 69700
2161 training loss: 173.21737670898438
2162 itr: 69800
2163 training loss: 160.20034790039062
2164 itr: 69900
2165 training loss: 199.88226318359375
2166 itr: 70000
2167 training loss: 192.32354736328125
2168 test...
```

2169 mse per seq: 495.0633219944904
2170 21.141818008269652
2171 28.089768719960407
2172 34.702735341696375
2173 40.820108114954934
2174 47.6000974800692
2175 53.11568231850743
2176 59.627124771056884
2177 64.99960993571453
2178 70.0013492231867
2179 74.9650280810743
2180 psnr per frame: 20.069246
2181 23.465096
2182 22.26905
2183 21.335638
2184 20.643776
2185 19.940447
2186 19.46483
2187 18.933706
2188 18.545368
2189 18.196709
2190 17.89784
2191 fmae per frame: 110.86544
2192 72.722374
2193 80.769104
2194 89.57642
2195 98.02892
2196 107.29604
2197 114.9791
2198 124.16685
2199 132.3732
2200 140.31992
2201 148.42252
2202 ssim per frame: 0.8889018
2203 0.93314254
2204 0.9282993
2205 0.91748244

```
2206 0.9066178
2207 0.8945994
2208 0.88473284
2209 0.87244976
2210 0.861635
2211 0.8505796
2212 0.83947974
2213 sharpness per frame: 240.49496
2214 254.62701
2215 254.38303
2216 253.749
2217 252.32732
2218 250.13554
2219 245.98494
2220 238.82831
2221 230.1506
2222 218.47942
2223 206.28464
2224 saved to checkpoints/mnist_predrnn_pp
2225 itr: 70100
2226 training loss: 176.1277313232422
2227 itr: 70200
2228 training loss: 215.468017578125
2229 itr: 70300
2230 training loss: 175.60684204101562
2231 itr: 70400
2232 training loss: 159.4086151123047
2233 itr: 70500
2234 training loss: 163.3134765625
2235 itr: 70600
2236 training loss: 192.09384155273438
2237 itr: 70700
2238 training loss: 164.27891540527344
2239 itr: 70800
2240 training loss: 178.664794921875
2241 itr: 70900
2242 training loss: 164.6168212890625
```

```
2243 itr: 71000
2244 training loss: 181.45242309570312
2245 itr: 71100
2246 training loss: 195.96820068359375
2247 itr: 71200
2248 training loss: 208.47789001464844
2249 itr: 71300
2250 training loss: 183.25448608398438
2251 itr: 71400
2252 training loss: 186.6461181640625
2253 itr: 71500
2254 training loss: 164.23460388183594
2255 itr: 71600
2256 training loss: 156.0497589111328
2257 itr: 71700
2258 training loss: 179.1498565673828
2259 itr: 71800
2260 training loss: 191.7646484375
2261 itr: 71900
2262 training loss: 165.35421752929688
2263 itr: 72000
2264 training loss: 196.63401794433594
2265 itr: 72100
2266 training loss: 155.85997009277344
2267 itr: 72200
2268 training loss: 167.01272583007812
2269 itr: 72300
2270 training loss: 161.22567749023438
2271 itr: 72400
2272 training loss: 215.50360107421875
2273 itr: 72500
2274 training loss: 186.66070556640625
2275 itr: 72600
2276 training loss: 173.081298828125
2277 itr: 72700
2278 training loss: 158.9893798828125
2279 itr: 72800
```

```
2280 training loss: 192.34649658203125
2281 itr: 72900
2282 training loss: 155.14324951171875
2283 itr: 73000
2284 training loss: 172.48046875
2285 itr: 73100
2286 training loss: 181.93603515625
2287 itr: 73200
2288 training loss: 176.37298583984375
2289 itr: 73300
2290 training loss: 181.3391571044922
2291 itr: 73400
2292 training loss: 179.5867462158203
2293 itr: 73500
2294 training loss: 172.76722717285156
2295 itr: 73600
2296 training loss: 173.76193237304688
2297 itr: 73700
2298 training loss: 202.33506774902344
2299 itr: 73800
2300 training loss: 155.797607421875
2301 itr: 73900
2302 training loss: 157.31161499023438
2303 itr: 74000
2304 training loss: 161.75485229492188
2305 itr: 74100
2306 training loss: 132.86044311523438
2307 itr: 74200
2308 training loss: 178.64511108398438
2309 itr: 74300
2310 training loss: 179.9677276611328
2311 itr: 74400
2312 training loss: 154.04910278320312
2313 itr: 74500
2314 training loss: 199.2112579345703
2315 itr: 74600
2316 training loss: 143.85658264160156
```

2317 itr: 74700
2318 training loss: 157.034423828125
2319 itr: 74800
2320 training loss: 174.89041137695312
2321 itr: 74900
2322 training loss: 188.55825805664062
2323 itr: 75000
2324 training loss: 159.74461364746094
2325 test...
2326 mse per seq: 482.09681255080136
2327 21.033084597453534
2328 27.906688793596015
2329 34.405320324572216
2330 40.24374756564098
2331 46.7622628192825
2332 51.962437258188025
2333 57.714700154990076
2334 62.67647287453035
2335 67.407531906802
2336 71.98456625574563
2337 psnr per frame: 20.145212
2338 23.500572
2339 22.297781
2340 21.370094
2341 20.69368
2342 19.98821
2343 19.535526
2344 19.039843
2345 18.676487
2346 18.333208
2347 18.0167
2348 fmae per frame: 108.373886
2349 70.04238
2350 78.44262
2351 87.97529
2352 96.1263
2353 105.4069

```
2354 113.012825
2355 121.51816
2356 129.3596
2357 137.02396
2358 144.83076
2359 ssim per frame: 0.8931389
2360 0.9389769
2361 0.93116677
2362 0.9197675
2363 0.9090398
2364 0.89737034
2365 0.8878176
2366 0.876818
2367 0.8669246
2368 0.85683537
2369 0.8466724
2370 sharpness per frame: 235.9858
2371 254.65512
2372 254.21687
2373 253.20734
2374 251.24248
2375 247.82631
2376 241.73595
2377 232.9493
2378 221.58585
2379 208.54266
2380 193.89609
2381 saved to checkpoints/mnist_predrnn_pp
2382 itr: 75100
2383 training loss: 159.53936767578125
2384 itr: 75200
2385 training loss: 184.60777282714844
2386 itr: 75300
2387 training loss: 190.565185546875
2388 itr: 75400
2389 training loss: 187.4881591796875
2390 itr: 75500
```

```
2391 training loss: 160.47402954101562
2392 itr: 75600
2393 training loss: 155.82489013671875
2394 itr: 75700
2395 training loss: 158.47882080078125
2396 itr: 75800
2397 training loss: 162.1439208984375
2398 itr: 75900
2399 training loss: 169.99111938476562
2400 itr: 76000
2401 training loss: 158.30975341796875
2402 itr: 76100
2403 training loss: 163.76470947265625
2404 itr: 76200
2405 training loss: 155.74559020996094
2406 itr: 76300
2407 training loss: 193.18875122070312
2408 itr: 76400
2409 training loss: 169.17599487304688
2410 itr: 76500
2411 training loss: 181.63099670410156
2412 itr: 76600
2413 training loss: 179.68679809570312
2414 itr: 76700
2415 training loss: 164.15415954589844
2416 itr: 76800
2417 training loss: 156.5080108642578
2418 itr: 76900
2419 training loss: 200.68698120117188
2420 itr: 77000
2421 training loss: 169.62551879882812
2422 itr: 77100
2423 training loss: 167.09158325195312
2424 itr: 77200
2425 training loss: 155.61306762695312
2426 itr: 77300
2427 training loss: 162.99191284179688
```

```
2428  itr: 77400
2429  training loss: 177.359375
2430  itr: 77500
2431  training loss: 144.43099975585938
2432  itr: 77600
2433  training loss: 151.93991088867188
2434  itr: 77700
2435  training loss: 162.76744079589844
2436  itr: 77800
2437  training loss: 167.77890014648438
2438  itr: 77900
2439  training loss: 201.60092163085938
2440  itr: 78000
2441  training loss: 174.86740112304688
2442  itr: 78100
2443  training loss: 148.6988525390625
2444  itr: 78200
2445  training loss: 147.66357421875
2446  itr: 78300
2447  training loss: 164.77804565429688
2448  itr: 78400
2449  training loss: 157.51693725585938
2450  itr: 78500
2451  training loss: 169.8194580078125
2452  itr: 78600
2453  training loss: 188.7738494873047
2454  itr: 78700
2455  training loss: 163.12405395507812
2456  itr: 78800
2457  training loss: 199.80227661132812
2458  itr: 78900
2459  training loss: 161.87535095214844
2460  itr: 79000
2461  training loss: 164.75656127929688
2462  itr: 79100
2463  training loss: 155.91989135742188
2464  itr: 79200
```

2465 training loss: 172.83482360839844
2466 itr: 79300
2467 training loss: 172.73348999023438
2468 itr: 79400
2469 training loss: 156.3747100830078
2470 itr: 79500
2471 training loss: 185.43124389648438
2472 itr: 79600
2473 training loss: 164.7778778076172
2474 itr: 79700
2475 training loss: 163.36354064941406
2476 itr: 79800
2477 training loss: 165.71717834472656
2478 itr: 79900
2479 training loss: 152.7459716796875
2480 itr: 80000
2481 training loss: 173.08697509765625
2482 test...
2483 mse per seq: 495.20833938859073
2484 21.250447602635884
2485 28.629315579272657
2486 34.92476518470121
2487 41.389502866201134
2488 47.94692241714662
2489 53.07537621187876
2490 59.00101045049338
2491 64.81841129471499
2492 69.57333067622051
2493 74.5992571053256
2494 psnr per frame: 20.056473
2495 23.472908
2496 22.1996
2497 21.31803
2498 20.586811
2499 19.903606
2500 19.45929
2501 18.967655

```
2502  18.54951
2503  18.211176
2504  17.896128
2505  fmae per frame: 110.40432
2506  68.52532
2507  80.55908
2508  89.14773
2509  98.29998
2510  107.65302
2511  115.034706
2512  123.75933
2513  132.56586
2514  140.20024
2515  148.2979
2516  ssim per frame: 0.89117163
2517  0.9454143
2518  0.9301014
2519  0.91890764
2520  0.90711415
2521  0.89497143
2522  0.88530195
2523  0.87386537
2524  0.8624872
2525  0.85211045
2526  0.84144187
2527  sharpness per frame: 242.10014
2528  254.81978
2529  254.66365
2530  254.08333
2531  252.7746
2532  250.45734
2533  246.75452
2534  240.68774
2535  232.83585
2536  222.78716
2537  211.13754
2538  saved to checkpoints/mnist_predrnn_pp
```

2539

2540 `Process finished with exit code 0`

2541