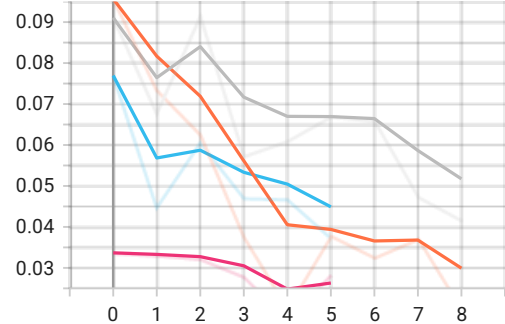
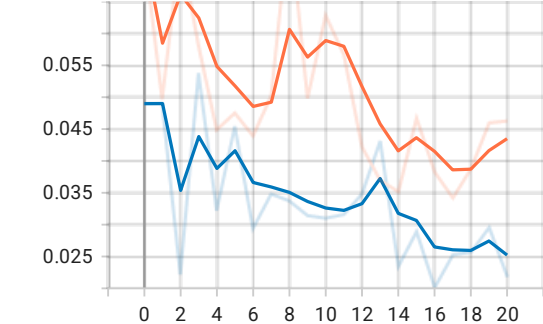
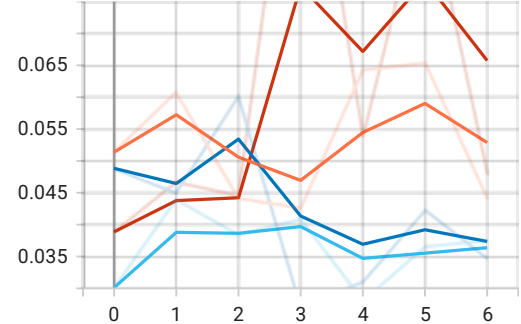
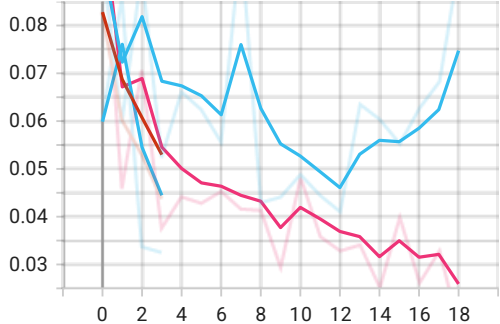


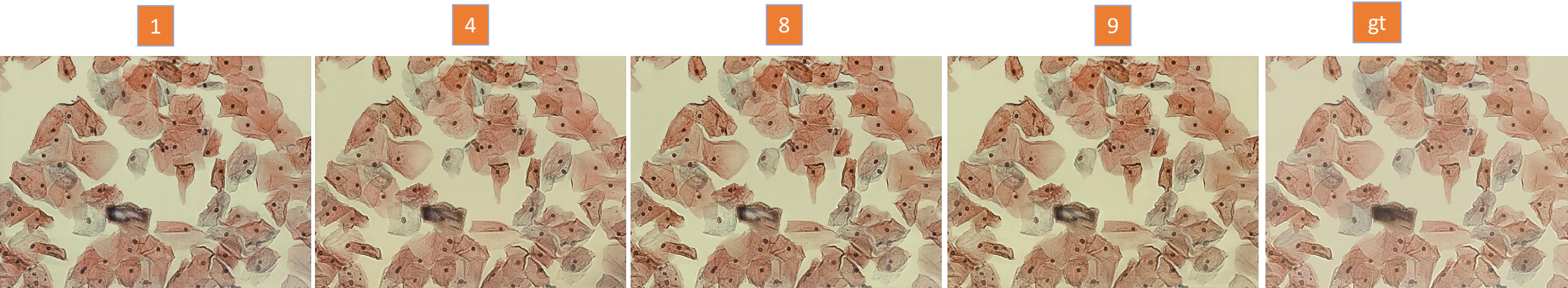
Trial No.	Qualitative view				Quantitative analysis							
	Seamless background	Color reconstruction at shaded regions	Artifact at shaded regions	Black spots' reconstruction	MSE	SSIM	NIQE	PSNR	Entropy	Correction Score	PIQE	BRISQUE
1 (pix2pix_1600x1200) (100L1)	☑	✗	✗	✗	0.004 1	0.961 0	3.7767	23.9226	6.9378	-0.4858	34.9138	43.3225
2 (GenWang_400x300) (20L1_80MSE-ssim)	✗	☑	☑	☑	0.010 0	0.900 0	6.1174	20.0033	7.0728	-0.8033	48.1529	30.9664
3 (GenWng_400x300) (20L1_80MSE-ssim)	✗	☑	☑	☑	0.012 3	0.873 7	6.0417	19.1172	7.1702	-0.3408	48.3678	30.5754
4 (pix2pix_1600x1200) 20L1_80MSE-ssim)	☑	--	✗	✗	0.003 7	0.967 3	4.2108	24.2652	6.7637	0.2510	38.9623	43.5726
5 (pix2pix_256x256) (20L1_80ssim)	✗	--	✗	☑	0.007 3	0.909 3	9.9630	21.4276	7.0876	0.4782	54.0100	32.3674
6 (pix2pix_800x600) (80L1_20MSE_gp)	☑	✗	✗	✗	0.007 4	0.951 9	4.2615	21.3410	6.9307	0.2831	32.3954	32.4402
7 (pix2pix_800x600) (80L1_20ssim_gp)	☑	✗	☑	✗	0.006 7	0.954 0	4.5047	21.7904	6.8811	0.2696	33.1529	28.6512
8 (pix2pix_1600x1200) (80L1_15MSE_5(-ssim)_gp)	☑	--	☑	✗	0.004 2	0.964 1	4.0226	23.7869	6.8801	0.2554	41.3587	44.5299
9 (pix2pix_1600x1200) (50L1_25MSE_25(-ssim)_gp)	☑	--	✗	✗	0.005 0	0.948 2	4.0786	23.5466	6.9129	0.2999	40.3191	44.5207
10 (GenWang_1600x1200) (60L1_40ssim_gp)	☑	✗	✗	--	0.004 7	0.966 8	4.6324	23.2695	6.8625	0.2223	38.7156	44.3383
11 (GenWang_400x300) (80L1_15MSE_5ssim_gp)	✗	☑	☑	☑	0.013 4	0.850 3	5.8908	18.7420	7.2852	0.6197	46.5385	29.8054
12 (GenWang_400x300) (BS4_60L1_40ssim_gp)	--	☑	☑	☑	0.009 8	0.895 2	6.5935	20.0905	7.2153	0.5008	50.3894	32.0856

Trial No.	Qualitative view				Quantitative analysis							
	Seamless background	Color reconstruction at shaded regions	Artifact at shaded regions	Black spots' reconstruction	MSE	SSIM	NIQE	PSNR	Entropy	Correction Score	PIQE	BRISQUE
13 (GenWang_800x600) (convT_80l1_15mse_5(-ssim)_discAdd)	بسیار کم	☑	✖ لکه های قرمز	☑	0.0075	0.9569	4.5588	21.2721	6.9841	0.2600	33.4789	26.9367
14 (GenWang_800x600) (80l1_15mse_5(-ssim)_WOinit)	--	☑	✖	☑	0.0084	0.9427	4.6591	20.7830	7.0495	0.3341	31.5714	30.6346
15 (GenWang_800x600) (80l1_15mse_5(-ssim)_Woinit_WOinpConcat)	--	--	✖	☑	0.0086	0.9431	4.7121	20.6653	7.0721	0.3299	32.4343	29.1780
16 (pix2pix_UpGen_1600x1200) (80l1_15mse_5(-ssim)_WOinit)	--	✖	--	☑	0.0044	0.9609	4.1968	23.6275	7.0350	0.2787	42.3867	45.1300
17 (pix2pix_256x256) (20l1_80LPIPS)	✖	☑	✖	☑	0.0070	0.9114	9.9374	21.6309	7.0140	0.4829	54.4349	32.9061
18 (pix2pix_UpWang_800x600) (WOinit_80l1_20LPIPS)	--	☑	لکه قرمز	☑	0.0062	0.9551	4.3139	22.1317	7.0018	0.2862	33.4196	29.1182
19 (pix2pix_UpWang_800x600) (SN_80l1_20LPIPS)	--	☑	لکه سفید	☑	0.0063	0.9483	4.3114	22.0582	7.0445	0.3271	33.1920	28.6830
20 (pix2pix_UpWang_800x600) (SN_WOinit_80l1_20LPIPS)	--	☑	لکه سفید	☑	0.0054	0.9600	4.1932	22.7179	6.9567	0.2741	34.0027	29.9873
21 (pix2pix_ModifiedGen_800x600) (SN_100huber_5SSIM)	--	☑	لکه زرد	☑	0.0048	0.9591	4.1580	23.2139	6.9735	0.2941	33.6911	30.5139
22 (pix2pix_ModifiedGen_800x600) (SN_100huber_5LPIPS)	--	☑	لکه زرد	☑	0.0065	0.9525	4.1644	21.9230	7.0263	0.2966	34.4046	30.3428

Input Size	1600x1200 (18 epoch) 1	1600x1200 (14 epoch) 4	1600x1200 (20 epoch) 8	1600x1200 (20 epoch) 9
Down sample	Conv2D(strides=2, pad='same') Batch Normalization Leaky ReLU	Conv2D(strides=2, pad='same') Batch Normalization Leaky ReLU	Conv2D(strides=2, pad='same') Batch Normalization Leaky ReLU	Conv2D(strides=2, pad='same') Batch Normalization Leaky ReLU
Up sample	Conv2DTranspos (strides=2,pad='same') Batch Normalization ReLU	Conv2DTranspos(strides=2,pad='s ame') Batch Normalization ReLU	Conv2DTranspos(strides=2,pad='s ame') Batch Normalization ReLU	Conv2DTranspose(strides=2,pad=' same') Batch Normalization ReLU
Generator	Down [(64, 4); (128, 4); (256, 4); (512, 4)] Up [(256, 4); (128, 4); (64, 4)] Concatenate Last =Conv2DTranspose(3,strides= 2,'same','tanh')	Down [(64, 4); (128, 4); (256, 4); (512, 4)] Up [(256, 4); (128, 4); (64, 4)] Concatenate Last =Conv2DTranspose(3,strides= 2,'same','tanh')	Down [(64, 4); (128, 4); (256, 4); (512, 4)] Up [(256, 4); (128, 4); (64, 4)] Concatenate Last =Conv2DTranspose(3,strides= 2,'same','tanh')	Down [(64, 4); (128, 4); (256, 4); (512, 4)] Up [(256, 4); (128, 4); (64, 4)] Concatenate Last =Conv2DTranspose(3,strides= 2,'same','tanh')
Discriminat or	Down [(64, 4); (128, 4); (256, 4)] Out put size = 198x148x1	Down [(64, 4); (128, 4); (256, 4)] Out put size = 198x148x1	Down [(64, 4); (128, 4); (256, 4)] Out put size = 198x148x1	Down [(64, 4); (128, 4); (256, 4)] Out put size = 198x148x1
Generator Loss	100*L1	20*L1 + 80*MSE+(-SSIM)	80*L1 + 15*MSE + 5*(-SSIM)	50*L1 + 25*MSE + 25*(-SSIM)
Gradient Penalty	✕	✕	☑	☑

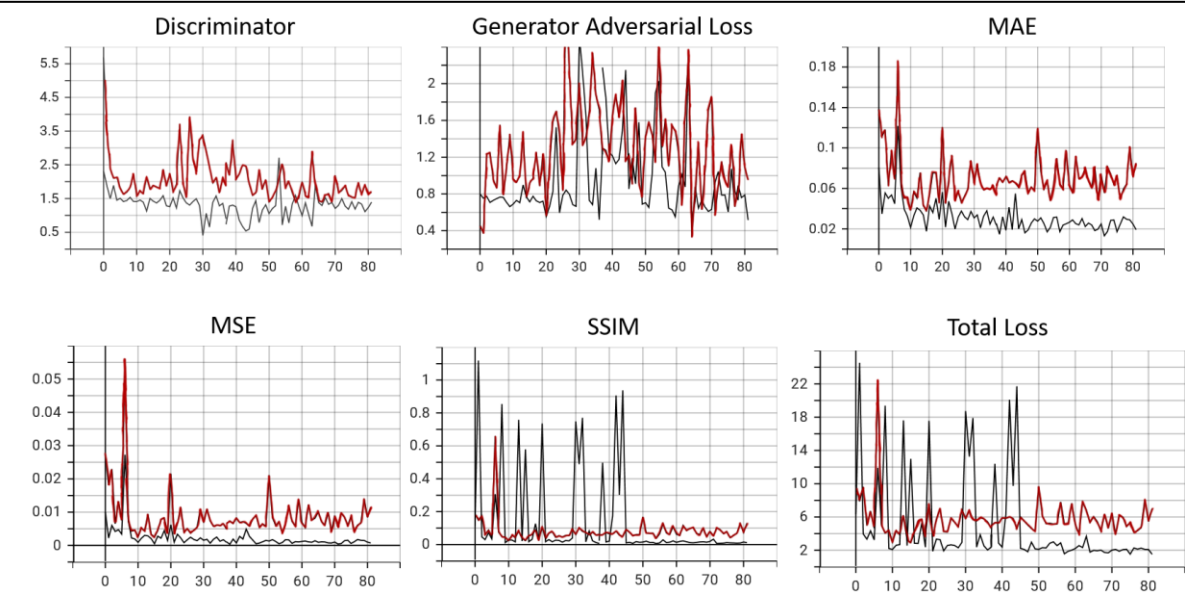


Trial No.	Qualitative view				Quantitative analysis							
	Seamless background	Color reconstruction at shaded regions	Artifact at shaded regions	Black spots' reconstruction	MSE	SSIM	NIQE	PSNR	Entropy	Correction Score	PIQE	BRISQUE
1 (pix2pix_1600x1200) (100*L1)	☑	✗	✗	✗	0.0041	0.9610	3.7767	23.9226	6.9378	-0.4858	34.9138	43.3225
4 (pix2pix_1600x1200) (20*L1+80*MSE-SSIM)	☑	--	✗	✗	0.0037	0.9673	4.2108	24.2652	6.7637	0.2510	38.9623	43.5726
8 (pix2pix_1600x1200) (80*L1+15*MSE+5*(-ssim)_gp)	☑	--	☑	✗	0.0042	0.9641	4.0226	23.7869	6.8801	0.2554	41.3587	44.5299
9 (pix2pix_1600x1200) (50L1_25MSE_25(-ssim)_gp)	☑	--	✗	✗	0.0050	0.9482	4.0786	23.5466	6.9129	0.2999	40.3191	44.5207



Less L1 → better restoration for dark object

Input Size	512x512, (84 epoch), Batch Size = 1
Down sample	<ul style="list-style-type: none">Pix2pix (kernel size = 3)
Up sample	<ul style="list-style-type: none">Pix2pix (kernel size = 3)
Generator	<ul style="list-style-type: none">pix2pix (kernel size = 3)Without Drop out*** Bottleneck size = (16x16)*** No Jitter
Discriminator	Pix2pix (kernel size = 3) Output size: 64x64x1
Generator Loss	40*L1 + 5*MSE + 20*modSSIM
Using Gradient Penalty	☑



Input Size	512x512, (100epoch), Batch Size = 1
Down sample	<ul style="list-style-type: none">Pix2pix (kernel size = 4)
Up sample	<ul style="list-style-type: none">Pix2pix (kernel size = 4)
Generator	<ul style="list-style-type: none">pix2pix (kernel size = 4)Without Drop out*** Bottleneck size = (16x16)
Discriminator	Pix2pix (kernel size = 4) Output Size: 62x62x1
Generator Loss	40*L1 + 20*modSSIM + 5*MSE
Using Gradient Penalty	☑

