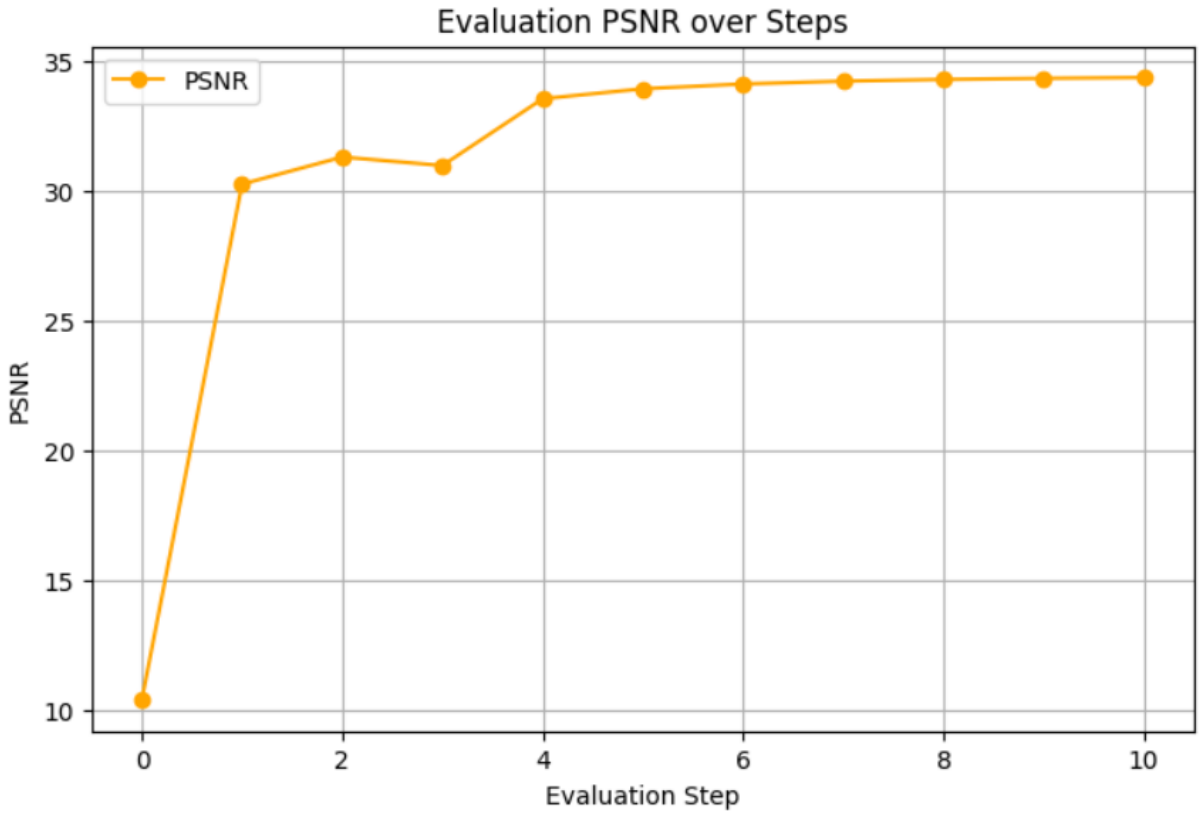
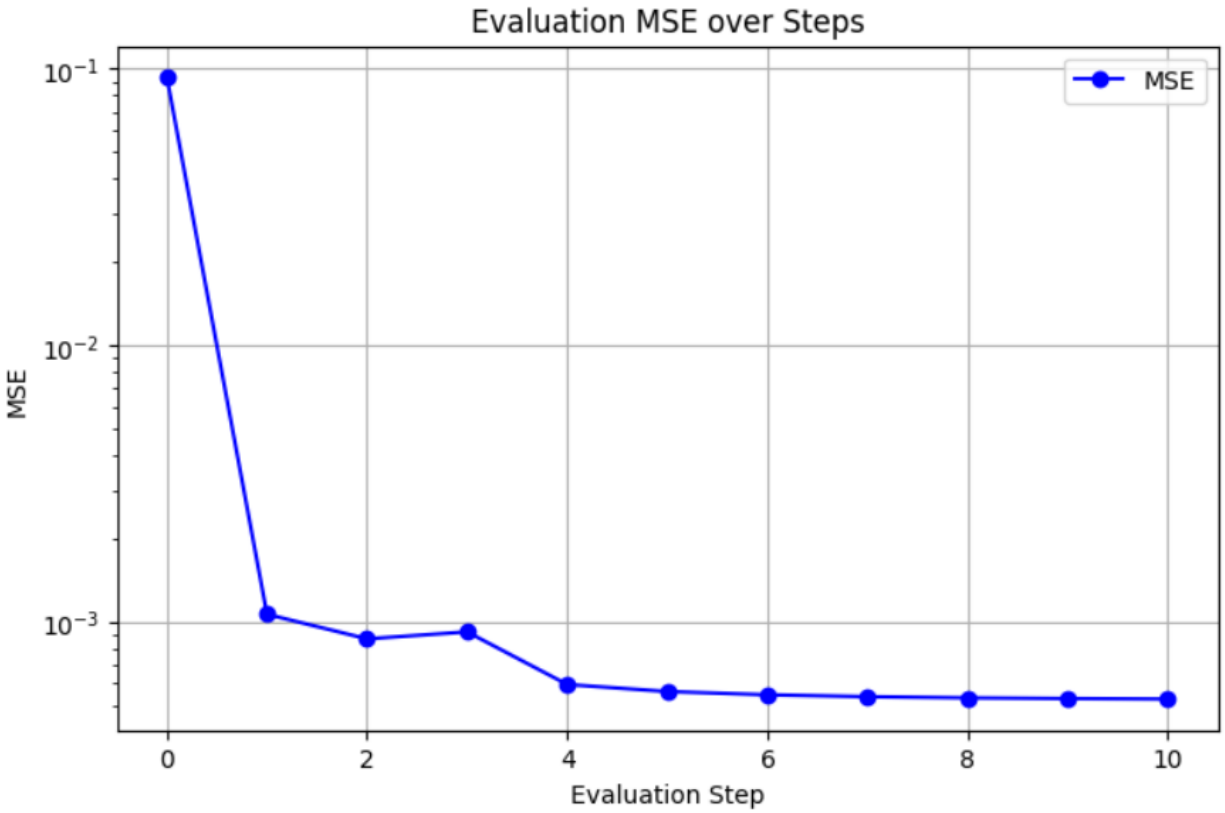
Experimental Results

Default configuration

Total training time: 1434.22 seconds

psnr	mse
10.394205320609437	0.09309229403734207
30.254894154650987	0.0010675487370463087
31.29935910560142	0.0008701394312083721
30.971972081477922	0.0009219684638082981
33.54427906978676	0.0005951463172095828
33.92792562919941	0.0005612799650407396
34.112664442764256	0.0005462527042254806
34.2211714614668	0.0005376882036216557
34.28697741251921	0.0005324569348886144
34.33004933885536	0.0005294219467032235
34.35964083583323	0.0005271846930554602





Set 1

--lr_sigma 10.0 \

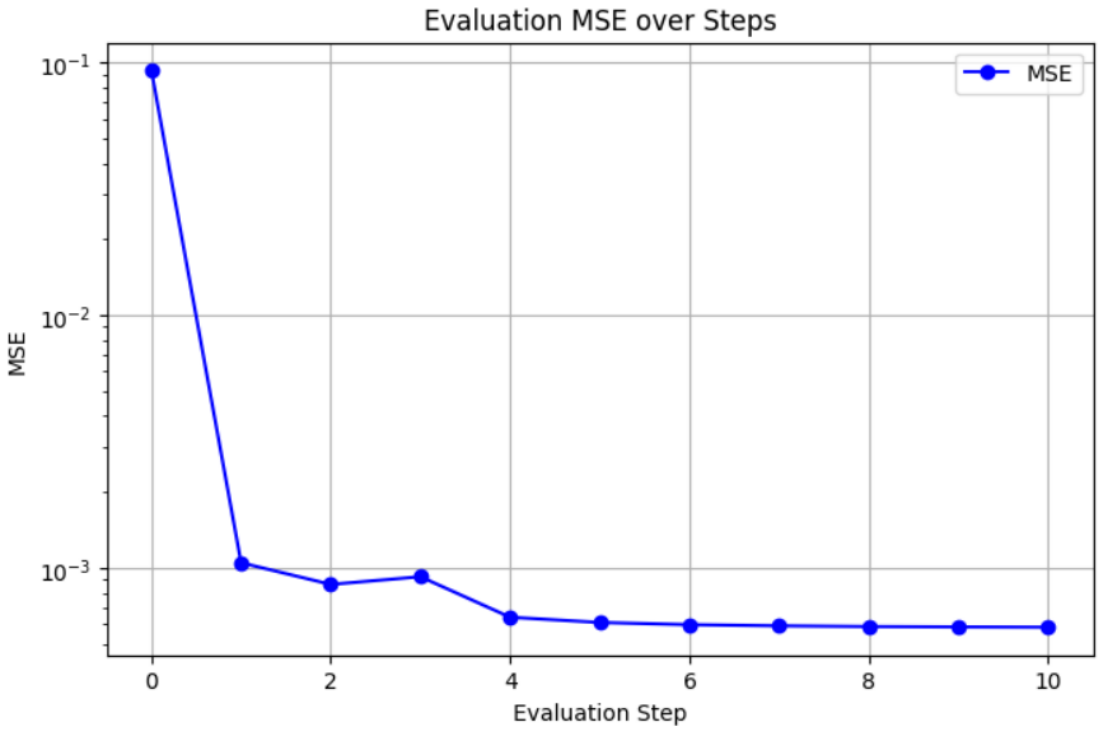
--lr_sigma_final 0.1 \

--lr_sigma_decay_steps 100000

Total training time: 1473.72 seconds

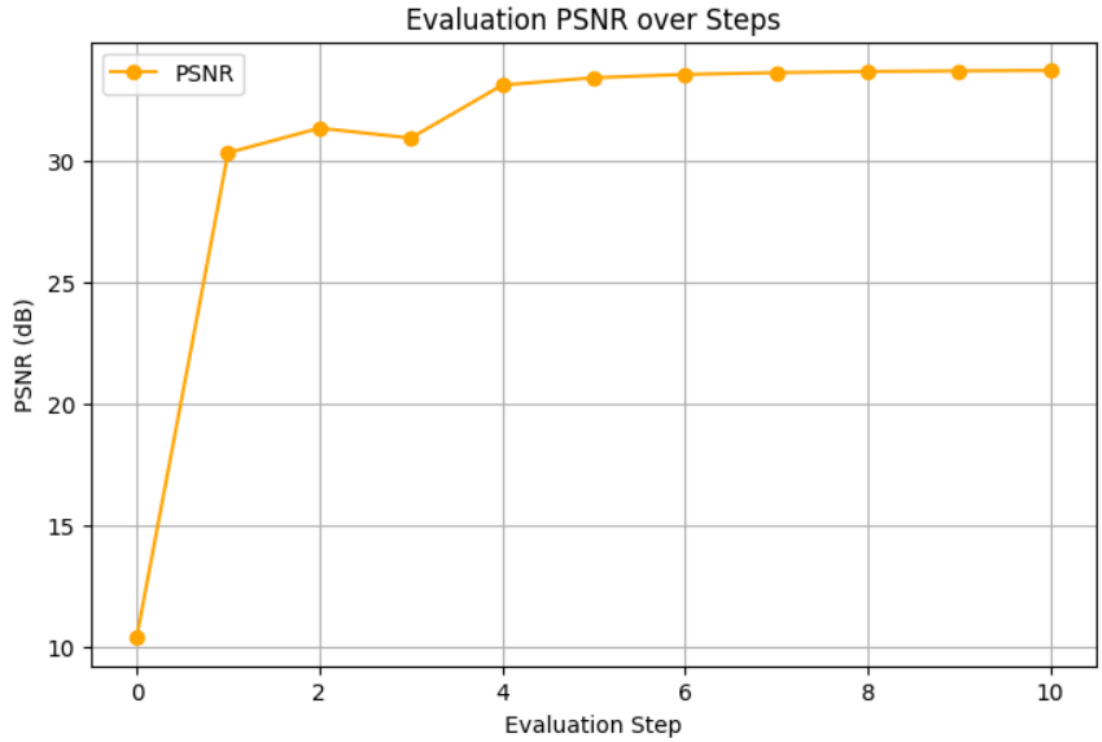
Mse

[0.09309229403734207, 0.001051616109907627, 0.000863382697571069, 0.000926025997614488, 0.0006402658509614412, 0.0006105383399699349, 0.0005983633200230543, 0.0005921480791585054, 0.0005882852419745177, 0.0005862508791324217, 0.000584615165280411]



psnr

[10.394205320609437, 30.338784816696233, 31.35417158591212, 30.947219946061466, 33.12343428461264, 33.42753413260301, 33.56399109852903, 33.637207909879336, 33.68197950430806, 33.70805197782793, 33.72789600685097]



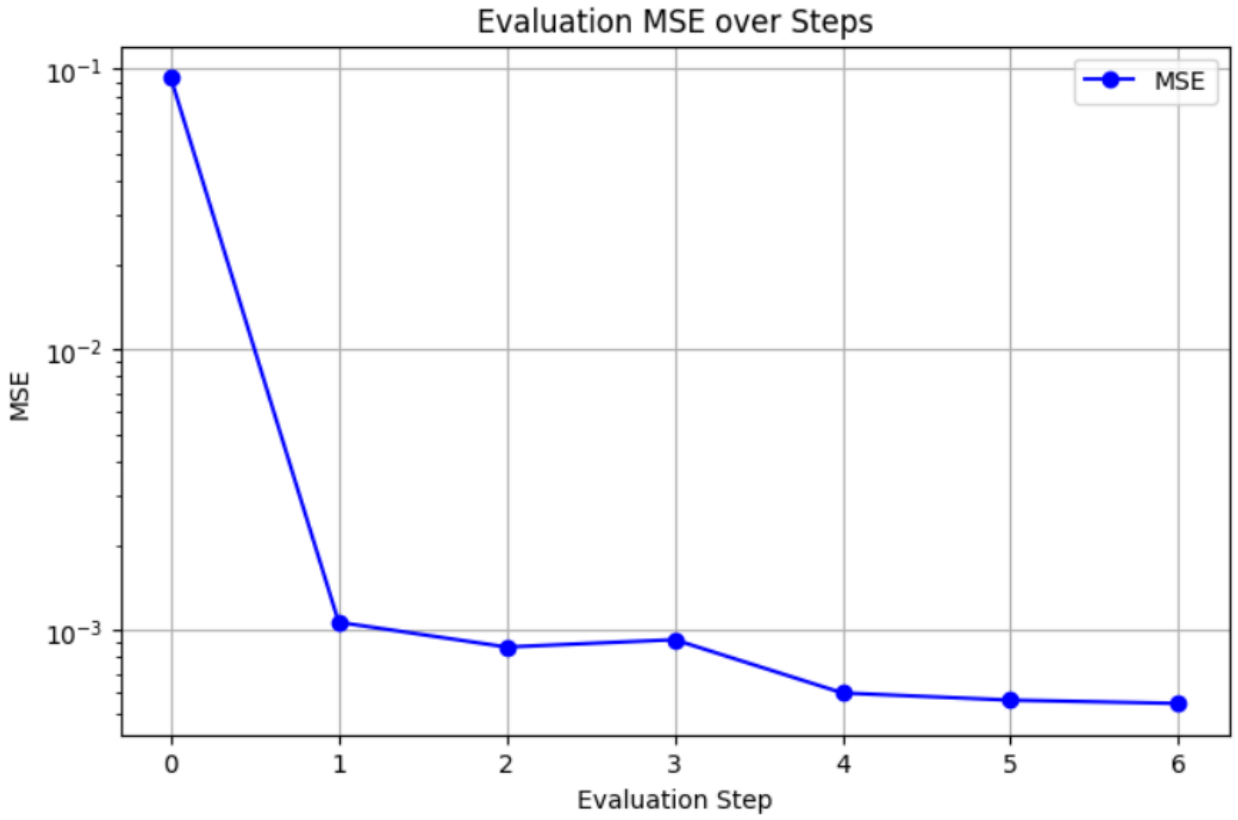
Set 2

N_iters = 70000

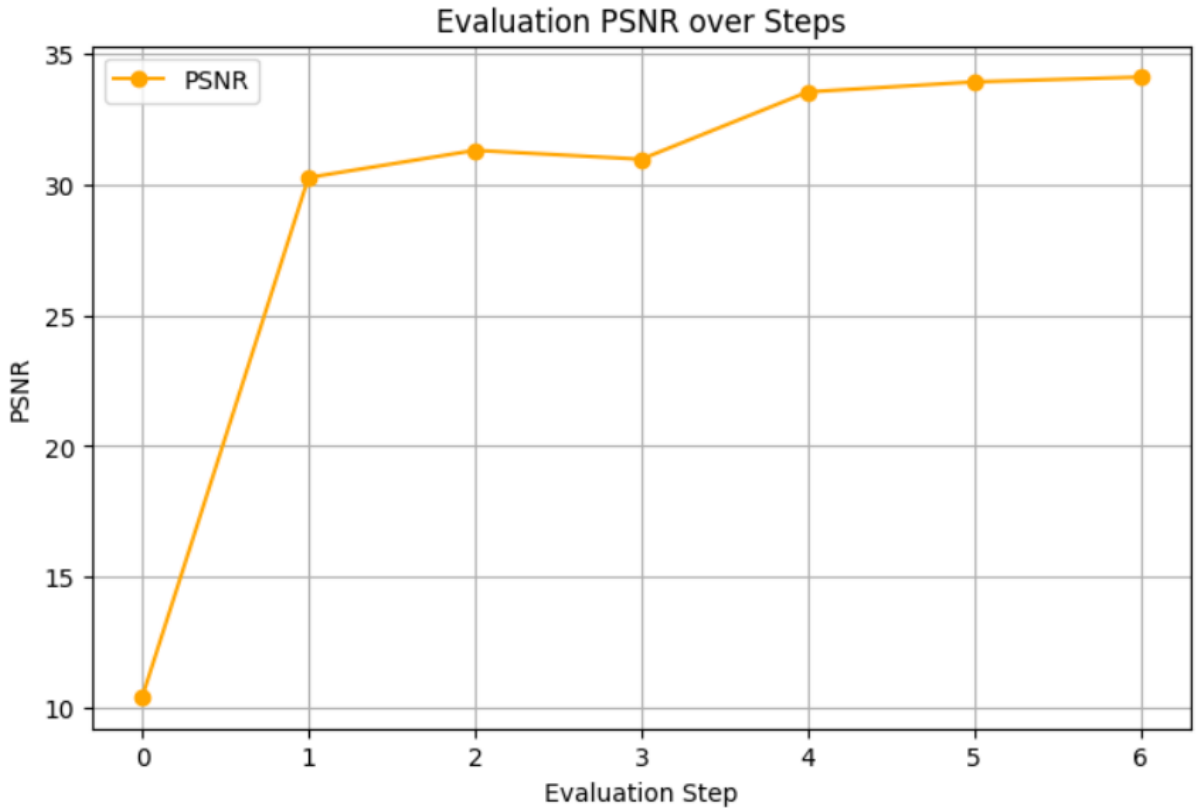
Total training time: 893.22 seconds

0.01276

Mse = [0.09309229403734207, 0.0010661095730029047, 0.0008700628488440998, 0.0009240777348168194, 0.0005968169883999508, 0.000562789255491225, 0.0005477362145029474]



psnr = [10.394205320609437, 30.260736900406403, 31.300459032464868, 30.960523339562958, 33.533288946695, 33.91612028233971, 34.10031370135247]



Set 3

--n_iters 70000 \

--lr_sigma 25.0 \

--lr_sigma_final 0.05 \

--lr_sigma_decay_steps 50000 \

--lr_sh 1.5 \

--lr_sh_final 0.001 \

--lr_sh_decay_steps 50000 \

--lr_basis 1.0 \

--lr_basis_final 0.001 \

--lr_basis_decay_steps 50000

Total training time: 943.75 seconds

0.013482

[0.09309229403734207, 0.0010339363827370108, 0.0008872839040122926, 0.0009724202041979879, 0.0007728706535999663, 0.0007422184062306769, 0.000724715372780338]

[10.394205320609437, 30.450901396096732, 31.250414993691503, 30.716824441140897, 32.06940700139878, 32.31484735635961, 32.46139010327559]

Set 4

--n_iters 70000 \

--lr_sigma 50 \

--lr_sigma_final 0.05 \

--lr_sigma_decay_steps 50000 \

--lr_sigma_delay_steps 0 \

--lr_sh 1 \

--lr_sh_final 0.001 \

--lr_sh_decay_steps 50000 \

--lr_basis 1.0 \

--lr_basis_final 0.001 \

--lr_basis_decay_steps 50000

Total training time: 919.32 seconds

0.013133

[0.09309229403734207, 0.0009921332690282724, 0.000863873380876612, 0.000950496135919820 5, 0.0007519503255025483, 0.0007235443241370376, 0.0007072964821418281]

[10.394205320609437, 30.667593086414804, 31.38539416037845, 30.84600040524675, 32.21727148159919, 32.45199968548677, 32.593060624292946]

Set 5

--lr_sigma 50 \

--lr_sigma_final 0.05 \

--lr_sh 1 \

--lr_sh_final 0.001 \

--lr_basis 1.0 \

--lr_basis_final 0.001 \

Total training time: 1521.44 seconds

0.011886

[0.09309229403734207, 0.0011114677734440192, 0.000929129117866978, 0.0009729911282192916, 0.0006214426139194984, 0.0005892714783840347, 0.0005742645720602013, 0.0005655859720718581, 0.0005589009160757996, 0.0005563060658460017, 0.0005533804731385316]

[10.394205320609437, 30.038648316885578, 30.93125308209712, 30.677999733438497, 33.24439659267067, 33.58155379479662, 33.761463999919066, 33.87201676318874, 33.95802450449655, 34.00260024986449, 34.04672842889521]

Set 5

Sh dim = 4
Total training time: 837.13 seconds

0.0119

[0.09309229403734207, 0.0010624551301589235, 0.0008775822250754572, 0.0009436804713914171, 0.0006225536926649511, 0.0005862263242306653, 0.000570201830851147]

[10.394205320609437, 30.267182674892062, 31.245062663167552, 30.852200258146915, 33.23830635330362, 33.61464544870943, 33.79454650869997]

Set 6

Unified tv with 0.001
Total training time: 1114.60 seconds

0.0159

[0.09309229403734207, 0.0013698937458684669, 0.001069327990990132, 0.001040705741615966, 0.000661280719214119, 0.000620731629896909, 0.0006031253295077476]

[10.394205320609437, 29.034878512654252, 30.264444100881622, 30.408748214223984, 33.02890525121533, 33.4381601001043, 33.634411847264865]

Cosine Annealing

Set 1

--n_iters 76800 \

--use_cosine_annealing \

--cosine_T_max 76800 \

--cosine_eta_min 1e-4 \

--cosine_warmup_steps 2000

Total training time: 883.99 seconds

[0.09309229403734207, 0.0011547722417162732, 0.0009625770733691752, 0.0009622471698094159, 0.0005975566513370722, 0.0005628845901810564, 0.0005545853055082262]

[10.394205320609437, 29.84534627236611, 30.73698751659528, 30.71194613900297, 33.51277529611137, 33.92567013540552, 34.03766689923713]

Set 2

--use_cosine_annealing \

  --cosine_T_max 150000 \

  --cosine_eta_min 3e-4 \

  --cosine_warmup_steps 1000

Total training time: 867.10 seconds

[0.09309229403734207, 0.0011512533819768578, 0.0010015086823841556, 0.0010285690310411154, 0.000639819214848103, 0.0005988206088659353, 0.00057332963187946]

[10.394205320609437, 29.858813450812562, 30.523689715739106, 30.38190213495207, 33.03906228391127, 33.468356379603044, 33.77502092260896]

Set 3

--use_cosine_annealing \

  --cosine_T_max 40000 \

  --cosine_eta_min 1e-5 \

  --cosine_warmup_steps 4000

Total training time: 862.19 seconds

[0.09309229403734207, 0.0011570504691917449, 0.0008777277922490612, 0.0009104420809308067, 0.0008105375221930444, 0.0008066727998084389, 0.0008030200435314328]

[10.394205320609437, 29.84563329902099, 31.266858497072896, 31.02016410501584, 31.714225469122653, 31.742932880960165, 31.77017173128391]

Cyclic Learning Rates

Set 1

--n_iters 76800 \

--use_cyclic_lr \

--cyclic_base_lr 1e-4 \

--cyclic_max_lr 1e-2 \

--cyclic_step_size 19200 \

--cyclic_mode triangular \

--cyclic_gamma 1.0

Total training time: 2515.17 seconds

[0.09309229403734207, 0.006878358044195921, 0.003977902740007267, 0.003677668207092211, 0.003453117504250258, 0.0032590429298579695, 0.003204402618575841]

[10.394205320609437, 21.88872181290848, 24.395173423601758, 24.745885938789698, 25.10201636578241, 25.436095537542915, 25.537555228934977]

Set 2

--n_iters 76800 \

--use_cyclic_lr \

--cyclic_base_lr 5e-5 \

--cyclic_max_lr 5e-3 \

--cyclic_step_size 9600 \

--cyclic_mode triangular2 \

--cyclic_gamma 1.0

Total training time: 2754.70 seconds

[0.09309229403734207, 0.007475466374307871, 0.0060893605463206765, 0.0053298498853109775, 0.005205012229271233, 0.005154587246943265, 0.0051011557690799235]

[10.394205320609437, 21.51474366703148, 22.441242141110166, 23.03799796110735, 23.157934383318267, 23.20728392494809, 23.26027197775178]

Set 3

--use_cyclic_lr \

--cyclic_base_lr 1e-5 \

--cyclic_max_lr 1e-3 \

--cyclic_step_size 4800 \

--cyclic_mode exp_range \

--cyclic_gamma 0.9998

Total training time: 7059.02 seconds

[0.09309229403734207, 0.055020786449313165, 0.05097630023956299, 0.05043109133839607, 0.050054310169070956, 0.04968625120818615, 0.049322766903787854, 0.04896375583484769, 0.04860886642709374, 0.04825829295441508, 0.047911880258470776]

[10.394205320609437, 12.68387380647518, 13.01143750549341, 13.068186104807248, 13.100252492804888, 13.131817090643782, 13.16322572081152, 13.194482213056428, 13.225614112288564, 13.256599033968403, 13.28744450080409]

Set 3

--n_iters 76800 \

--use_progressive_tv \

--progressive_tv_start 1e-3 \

--progressive_tv_end 1e-5 \

--progressive_tv_sh_start 1e-3 \

--progressive_tv_sh_end 1e-6 \

--progressive_sparsity_start 0.01 \

--progressive_sparsity_end 0.001

Total training time: 959.48 seconds

[0.09309229403734207, 0.0010675257653929293, 0.0008705471773282625, 0.000923462412902154, 0.0005967416960629635, 0.0005626517180644441, 0.0005473240176797845]

[10.394205320609437, 30.256111679848537, 31.296746451542116, 30.962275923977536, 33.533863401217204, 33.917369414122895, 34.103516966932716]

Progressive TV Regularisation

Set 1

--n_iters 76800 \

--use_progressive_tv \

--progressive_tv_start 5e-3 \

--progressive_tv_end 5e-6 \

--progressive_tv_sh_start 1e-2 \

--progressive_tv_sh_end 1e-6 \

--progressive_sparsity_start 0.02 \

--progressive_sparsity_end 0.001

Total training time: 1067.57 seconds

[0.09309229403734207, 0.001832364680012688, 0.0013892452319851146, 0.0012385969166643918, 0.0006604465910641011, 0.0006081506471673492, 0.000587219548469875]

[10.394205320609437, 27.639923076558738, 28.947120772477064, 29.509760092671616, 32.97533647357712, 33.49947186700317, 33.73426375055307]

Set 2

--n_iters 76800 \

--use_progressive_tv \

--progressive_tv_start 1e-3 \

--progressive_tv_end 1e-5 \

--progressive_tv_sh_start 5e-4 \

--progressive_tv_sh_end 5e-7 \

--progressive_sparsity_start 0.015 \

--progressive_sparsity_end 0.002

Total training time: 1040.73 seconds

[0.09309229403734207, 0.001416626150603406, 0.0011215191014343872, 0.0010908644937444479, 0.0006922656815731898, 0.0006497240516182501, 0.0006319766187516506]

[10.394205320609437, 28.886104670437383, 30.042442938851288, 30.18919878665023, 32.80240240204994, 33.21080837415549, 33.39961824783211]

Set 3

--n_iters 76800 \

--use_progressive_tv \

--progressive_tv_start 2e-3 \

--progressive_tv_end 2e-5 \

--progressive_tv_sh_start 2e-3 \

--progressive_tv_sh_end 2e-6 \

--progressive_sparsity_start 0.008 \

--progressive_sparsity_end 0.0005

Total training time: 1019.04 seconds

[0.09309229403734207, 0.0015111833665287123, 0.0011655752139631658, 0.0011004744766978547, 0.000661591840616893, 0.0006166403625684324, 0.0005982920614769682]

[10.394205320609437, 28.555240199231047, 29.81770838207326, 30.11345473644281, 33.00744708296622, 33.45749114039519, 33.66338114126895]