

Hyperparameter Search Procedure

This document contains the raw training logs from hyperparameter search runs used in selecting the VAE architecture. Each experiment trained a **DualBranchVAE** on the balanced cell mask dataset with input shape (2,64,64,64).

Data was randomly split into an 80/20 train/validation split. Models were trained with the Adam optimizer, and a batch size of 2. A **ReduceLROnPlateau** scheduler halved the learning rate if validation loss plateaued. Early stopping was applied with a patience of 2 epochs, up to a maximum of 20 total epochs.

For each latent dimension considered (16, 32, and 64 dimensions), random candidate configurations from a potential grid of values were generated via the **sample_hyperparams** function. Each configuration specified the learning rate, regularizing β value, convolutional stride, and base number of channels (in terms of latent dimension). Note that *stride* was fixed at 2 after it was observed all other candidate values performed very poorly.

The best-performing configuration on each latent dimension was retained based on minimum validation reconstruction loss. An increase in latent dimension consistently produces lower reconstruction loss, so this was a later trade-off to be weighed in order to keep the latent space compact.

The complete logs below provide detailed information for each run, including per-epoch validation losses and the final selected configuration. This table first quickly summarizes the results.

Table 1:

Config	Latent Dim	LR	beta	stride	base_channels	Total Epochs	Final Val Loss
1/20	16	0.0005	1.0	2	4	8	28266.4226
2/20	16	0.0005	0.2	2	4	12	28077.4129
3/20	16	0.001	2.0	2	4	6	28940.0697
4/20	16	0.001	5.0	2	4	8	28261.2850
5/20	16	0.005	1.0	2	8	7	28689.9959
6/20	16	0.0005	2.0	2	8	7	28818.8120
7/20	16	0.005	5.0	2	8	8	29935.1423
8/20	16	0.0005	5.0	2	8	7	28675.1206
9/20	16	0.001	5.0	2	8	6	28356.4358
10/20	16	0.005	0.2	2	4	7	29308.6580
11/20	16	0.005	2.0	2	8	8	33980.4998
12/20	16	0.001	0.2	2	8	6	28918.4159
13/20	16	0.001	2.0	2	8	8	27952.4631
14/20	16	0.0005	0.5	2	8	8	28515.6237
15/20	16	0.0005	2.0	2	4	10	28007.2793
16/20	16	0.001	0.5	2	8	7	27643.2965
17/20	16	0.0005	0.2	2	8	9	28454.5825
18/20	16	0.0005	0.5	2	4	9	28095.0857
19/20	16	0.005	2.0	2	4	9	29491.6267
20/20	16	0.001	1.0	2	8	7	28696.7415
1/13	32	0.001	0.2	2	16	7	21085.5889
2/13	32	0.0005	1.0	2	16	9	20550.0626
3/13	32	0.005	5.0	2	16	8	23187.8756

4/13	32	0.005	0.5	2	16	10	28323.5683
5/13	32	0.001	1.0	2	16	8	20639.2045
6/13	32	0.0005	0.5	2	16	9	21139.1388
7/13	32	0.001	0.2	2	8	8	20799.2837
8/13	32	0.001	0.5	2	8	8	20933.9833
9/13	32	0.0005	5.0	2	16	8	21327.4789
10/13	32	0.005	0.2	2	16	3	29731.0945
11/13	32	0.0005	1.0	2	8	10	21110.6061
12/13	32	0.001	5.0	2	8	9	20902.4923
13/13	32	0.005	0.2	2	8	9	44957.5468
1/14	64	0.0005	0.5	2	16	9	16764.5864
2/14	64	0.0005	0.2	2	16	10	16455.6263
3/14	64	0.001	2.0	2	16	7	17131.1882
4/14	64	0.001	0.5	2	16	10	17041.2816
5/14	64	0.001	5.0	2	32	10	17730.3488
6/14	64	0.005	0.5	2	16	6	44311.3273
7/14	64	0.005	1.0	2	16	7	41545.0872
8/14	64	0.001	0.2	2	32	9	17074.4890
9/14	64	0.0005	0.2	2	32	9	16826.1244
10/14	64	0.005	2.0	2	16	7	44530.9266
11/14	64	0.001	1.0	2	16	9	17177.1059
12/14	64	0.005	2.0	2	32	8	58234.3451
13/14	64	0.001	5.0	2	16	10	17211.6154
14/14	64	0.001	0.5	2	32	9	16858.0226

Starting search for shape (2, 64, 64, 64), latent dimension 16

[1/20] Testing config: {'lr': 0.0005, 'beta': 1.0, 'stride': 2, 'base_channels': 4}
epoch number: 0
Validation reconstruction loss: 38614.14793100878
epoch number: 1
Validation reconstruction loss: 32161.67421265178
epoch number: 2
Validation reconstruction loss: 30257.541484849306
epoch number: 3
Validation reconstruction loss: 29388.531331309627
epoch number: 4
Validation reconstruction loss: 28744.474052065263
epoch number: 5
Validation reconstruction loss: 28270.768968858414
epoch number: 6
Validation reconstruction loss: 28266.422603398743
epoch number: 7
Validation reconstruction loss: 28283.745931130747
epoch number: 8
Validation reconstruction loss: 28295.465755095403
Completed config 1/20 with val loss: 28266.4226

[2/20] Testing config: {'lr': 0.0005, 'beta': 0.2, 'stride': 2, 'base_channels': 4}
epoch number: 0
Validation reconstruction loss: 37842.17435494363
epoch number: 1
Validation reconstruction loss: 32526.942531033175
epoch number: 2
Validation reconstruction loss: 30533.96321416956
epoch number: 3
Validation reconstruction loss: 29695.233463654597
epoch number: 4
Validation reconstruction loss: 29270.087550140935
epoch number: 5
Validation reconstruction loss: 28927.37203219861
epoch number: 6
Validation reconstruction loss: 28729.371225878145
epoch number: 7
Validation reconstruction loss: 28349.78561022875
epoch number: 8
Validation reconstruction loss: 28360.23269798894
epoch number: 9
Validation reconstruction loss: 28145.73768328545
epoch number: 10
Validation reconstruction loss: 28077.4128597951
epoch number: 11
Validation reconstruction loss: 28090.632104428663
epoch number: 12

Validation reconstruction loss: 28157.91733521249
Completed config 2/20 with val loss: 28077.4129

[3/20] Testing config: {'lr': 0.001, 'beta': 2.0, 'stride': 2, 'base_channels': 4}
epoch number: 0
Validation reconstruction loss: 34308.180487044665
epoch number: 1
Validation reconstruction loss: 31017.203226637033
epoch number: 2
Validation reconstruction loss: 29697.801492709237
epoch number: 3
Validation reconstruction loss: 29220.716693544015
epoch number: 4
Validation reconstruction loss: 28940.069665410883
epoch number: 5
Validation reconstruction loss: 29028.14581526453
epoch number: 6
Validation reconstruction loss: 29345.151008916957
Completed config 3/20 with val loss: 28940.0697

[4/20] Testing config: {'lr': 0.001, 'beta': 5.0, 'stride': 2, 'base_channels': 4}
epoch number: 0
Validation reconstruction loss: 36373.63548894189
epoch number: 1
Validation reconstruction loss: 30348.12324845512
epoch number: 2
Validation reconstruction loss: 30643.71156426171
epoch number: 3
Validation reconstruction loss: 28743.921963085428
epoch number: 4
Validation reconstruction loss: 28504.738420153946
epoch number: 5
Validation reconstruction loss: 28403.23590971921
epoch number: 6
Validation reconstruction loss: 28261.28496991544
epoch number: 7
Validation reconstruction loss: 28322.034248292497
epoch number: 8
Validation reconstruction loss: 28500.027550411967
Completed config 4/20 with val loss: 28261.2850

[5/20] Testing config: {'lr': 0.005, 'beta': 1.0, 'stride': 2, 'base_channels': 8}
epoch number: 0
Validation reconstruction loss: 31500.033943381397
epoch number: 1
Validation reconstruction loss: 30980.058339657415
epoch number: 2
Validation reconstruction loss: 29613.00237830659
epoch number: 3

Validation reconstruction loss: 29043.572267318952
epoch number: 4
Validation reconstruction loss: 28976.094390313312
epoch number: 5
Validation reconstruction loss: 28689.995934518647
epoch number: 6
Validation reconstruction loss: 28838.584609442758
epoch number: 7
Validation reconstruction loss: 28974.30382019731
Completed config 5/20 with val loss: 28689.9959

[6/20] Testing config: {'lr': 0.0005, 'beta': 2.0, 'stride': 2, 'base_channels': 8}
epoch number: 0
Validation reconstruction loss: 35534.2476115297
epoch number: 1
Validation reconstruction loss: 31320.595867438205
epoch number: 2
Validation reconstruction loss: 29867.26336865785
epoch number: 3
Validation reconstruction loss: 29354.338515692758
epoch number: 4
Validation reconstruction loss: 29000.874224170642
epoch number: 5
Validation reconstruction loss: 28818.812025693842
epoch number: 6
Validation reconstruction loss: 29141.393392915223
epoch number: 7
Validation reconstruction loss: 28943.027018511493
Completed config 6/20 with val loss: 28818.8120

[7/20] Testing config: {'lr': 0.005, 'beta': 5.0, 'stride': 2, 'base_channels': 8}
epoch number: 0
Validation reconstruction loss: 33771.13996435928
epoch number: 1
Validation reconstruction loss: 32291.96728303881
epoch number: 2
Validation reconstruction loss: 31152.52118115785
epoch number: 3
Validation reconstruction loss: 30498.63004797268
epoch number: 4
Validation reconstruction loss: 30124.37773064831
epoch number: 5
Validation reconstruction loss: 30217.416068137467
epoch number: 6
Validation reconstruction loss: 29935.142318950562
epoch number: 7
Validation reconstruction loss: 30565.19690481353
epoch number: 8
Validation reconstruction loss: 30090.63121679857

Completed config 7/20 with val loss: 29935.1423

[8/20] Testing config: {'lr': 0.0005, 'beta': 5.0, 'stride': 2, 'base_channels': 8}

epoch number: 0

Validation reconstruction loss: 34890.72486007968

epoch number: 1

Validation reconstruction loss: 30901.750274419992

epoch number: 2

Validation reconstruction loss: 29757.868561293908

epoch number: 3

Validation reconstruction loss: 28916.901269785343

epoch number: 4

Validation reconstruction loss: 28777.437354320253

epoch number: 5

Validation reconstruction loss: 28675.1206414652

epoch number: 6

Validation reconstruction loss: 29104.9770147848

epoch number: 7

Validation reconstruction loss: 28867.96196234009

Completed config 8/20 with val loss: 28675.1206

[9/20] Testing config: {'lr': 0.001, 'beta': 5.0, 'stride': 2, 'base_channels': 8}

epoch number: 0

Validation reconstruction loss: 31421.328114836295

epoch number: 1

Validation reconstruction loss: 29644.038056293364

epoch number: 2

Validation reconstruction loss: 28541.671234686688

epoch number: 3

Validation reconstruction loss: 28404.820769866652

epoch number: 4

Validation reconstruction loss: 28356.43582298894

epoch number: 5

Validation reconstruction loss: 28428.408275964874

epoch number: 6

Validation reconstruction loss: 28618.239314559843

Completed config 9/20 with val loss: 28356.4358

[10/20] Testing config: {'lr': 0.005, 'beta': 0.2, 'stride': 2, 'base_channels': 4}

epoch number: 0

Validation reconstruction loss: 33286.80738935115

epoch number: 1

Validation reconstruction loss: 30376.776435792497

epoch number: 2

Validation reconstruction loss: 30362.543585348005

epoch number: 3

Validation reconstruction loss: 30127.522302553123

epoch number: 4

Validation reconstruction loss: 29752.03795126843

epoch number: 5
Validation reconstruction loss: 29308.65801679044
epoch number: 6
Validation reconstruction loss: 29430.729003482764
epoch number: 7
Validation reconstruction loss: 29773.778715849956
Completed config 10/20 with val loss: 29308.6580

[11/20] Testing config: {'lr': 0.005, 'beta': 2.0, 'stride': 2, 'base_channels': 8}
epoch number: 0
Validation reconstruction loss: 39162.4468167281
epoch number: 1
Validation reconstruction loss: 35235.65600945902
epoch number: 2
Validation reconstruction loss: 34917.701336188205
epoch number: 3
Validation reconstruction loss: 34659.78297105377
epoch number: 4
Validation reconstruction loss: 34532.54602802472
epoch number: 5
Validation reconstruction loss: 34504.93417308109
epoch number: 6
Validation reconstruction loss: 33980.499823829145
epoch number: 7
Validation reconstruction loss: 34370.29786426713
epoch number: 8
Validation reconstruction loss: 34784.30917308109
Completed config 11/20 with val loss: 33980.4998

[12/20] Testing config: {'lr': 0.001, 'beta': 0.2, 'stride': 2, 'base_channels': 8}
epoch number: 0
Validation reconstruction loss: 34581.95385848059
epoch number: 1
Validation reconstruction loss: 35070.49228574913
epoch number: 2
Validation reconstruction loss: 30972.55395740731
epoch number: 3
Validation reconstruction loss: 29236.512667362316
epoch number: 4
Validation reconstruction loss: 28918.415946173027
epoch number: 5
Validation reconstruction loss: 29873.382561795315
epoch number: 6
Validation reconstruction loss: 30792.551062445793
Completed config 12/20 with val loss: 28918.4159

[13/20] Testing config: {'lr': 0.001, 'beta': 2.0, 'stride': 2, 'base_channels': 8}
epoch number: 0
Validation reconstruction loss: 32029.762684301822

epoch number: 1
Validation reconstruction loss: 29732.953047078274
epoch number: 2
Validation reconstruction loss: 28709.984818815046
epoch number: 3
Validation reconstruction loss: 28449.16850742628
epoch number: 4
Validation reconstruction loss: 28112.667379255203
epoch number: 5
Validation reconstruction loss: 28197.77839061145
epoch number: 6
Validation reconstruction loss: 27952.463107450672
epoch number: 7
Validation reconstruction loss: 28215.015276046182
epoch number: 8
Validation reconstruction loss: 28463.049134730052
Completed config 13/20 with val loss: 27952.4631

[14/20] Testing config: {'lr': 0.0005, 'beta': 0.5, 'stride': 2, 'base_channels': 8}
epoch number: 0
Validation reconstruction loss: 34468.71114416197
epoch number: 1
Validation reconstruction loss: 31209.91592923352
epoch number: 2
Validation reconstruction loss: 29716.220200021682
epoch number: 3
Validation reconstruction loss: 29108.51018233684
epoch number: 4
Validation reconstruction loss: 28835.193550791413
epoch number: 5
Validation reconstruction loss: 28787.139737369904
epoch number: 6
Validation reconstruction loss: 28515.623661779056
epoch number: 7
Validation reconstruction loss: 28679.081228317435
epoch number: 8
Validation reconstruction loss: 28839.744526845727
Completed config 14/20 with val loss: 28515.6237

[15/20] Testing config: {'lr': 0.0005, 'beta': 2.0, 'stride': 2, 'base_channels': 4}
epoch number: 0
Validation reconstruction loss: 38746.98764432459
epoch number: 1
Validation reconstruction loss: 32365.426150531224
epoch number: 2
Validation reconstruction loss: 30274.56316911047
epoch number: 3
Validation reconstruction loss: 29112.555429450345
epoch number: 4

Validation reconstruction loss: 28556.698034678557
epoch number: 5
Validation reconstruction loss: 28266.4354062771
epoch number: 6
Validation reconstruction loss: 28222.433678447527
epoch number: 7
Validation reconstruction loss: 28070.482586188205
epoch number: 8
Validation reconstruction loss: 28007.279349387467
epoch number: 9
Validation reconstruction loss: 28621.18623970078
epoch number: 10
Validation reconstruction loss: 28099.91376267075
Completed config 15/20 with val loss: 28007.2793

[16/20] Testing config: {'lr': 0.001, 'beta': 0.5, 'stride': 2, 'base_channels': 8}
epoch number: 0
Validation reconstruction loss: 31841.465880447744
epoch number: 1
Validation reconstruction loss: 29468.62664990785
epoch number: 2
Validation reconstruction loss: 28487.932140340417
epoch number: 3
Validation reconstruction loss: 28041.138727775367
epoch number: 4
Validation reconstruction loss: 27999.968948192214
epoch number: 5
Validation reconstruction loss: 27643.29648200347
epoch number: 6
Validation reconstruction loss: 27714.50624390178
epoch number: 7
Validation reconstruction loss: 27828.42827474523
Completed config 16/20 with val loss: 27643.2965

[17/20] Testing config: {'lr': 0.0005, 'beta': 0.2, 'stride': 2, 'base_channels': 8}
epoch number: 0
Validation reconstruction loss: 35044.72616272767
epoch number: 1
Validation reconstruction loss: 31091.1448361611
epoch number: 2
Validation reconstruction loss: 29682.221924463356
epoch number: 3
Validation reconstruction loss: 29251.703592530357
epoch number: 4
Validation reconstruction loss: 28756.629668527752
epoch number: 5
Validation reconstruction loss: 28562.955748929424
epoch number: 6
Validation reconstruction loss: 28474.913513660016

epoch number: 7
Validation reconstruction loss: 28454.58251741381
epoch number: 8
Validation reconstruction loss: 28702.569807702734
epoch number: 9
Validation reconstruction loss: 28814.722571552473
Completed config 17/20 with val loss: 28454.5825

[18/20] Testing config: {'lr': 0.0005, 'beta': 0.5, 'stride': 2, 'base_channels': 4}
epoch number: 0
Validation reconstruction loss: 48082.747581038595
epoch number: 1
Validation reconstruction loss: 34121.765879092585
epoch number: 2
Validation reconstruction loss: 30585.544703355376
epoch number: 3
Validation reconstruction loss: 29390.86045574046
epoch number: 4
Validation reconstruction loss: 28848.74185379174
epoch number: 5
Validation reconstruction loss: 28507.163810101367
epoch number: 6
Validation reconstruction loss: 28280.16937472897
epoch number: 7
Validation reconstruction loss: 28095.085659692108
epoch number: 8
Validation reconstruction loss: 28780.396431862533
epoch number: 9
Validation reconstruction loss: 28579.941231773093
Completed config 18/20 with val loss: 28095.0857

[19/20] Testing config: {'lr': 0.005, 'beta': 2.0, 'stride': 2, 'base_channels': 4}
epoch number: 0
Validation reconstruction loss: 34044.19114199371
epoch number: 1
Validation reconstruction loss: 31795.871801821337
epoch number: 2
Validation reconstruction loss: 30208.739192595403
epoch number: 3
Validation reconstruction loss: 30610.553803257804
epoch number: 4
Validation reconstruction loss: 29975.16120311145
epoch number: 5
Validation reconstruction loss: 29945.517525612533
epoch number: 6
Validation reconstruction loss: 29772.394876815913
epoch number: 7
Validation reconstruction loss: 29491.626660071553
epoch number: 8

Validation reconstruction loss: 29741.944587489157
epoch number: 9
Validation reconstruction loss: 29517.68074791305
Completed config 19/20 with val loss: 29491.6267

[20/20] Testing config: {'lr': 0.001, 'beta': 1.0, 'stride': 2, 'base_channels': 8}
epoch number: 0
Validation reconstruction loss: 33014.60977816024
epoch number: 1
Validation reconstruction loss: 29965.67253902862
epoch number: 2
Validation reconstruction loss: 29325.84684484768
epoch number: 3
Validation reconstruction loss: 28750.464139066564
epoch number: 4
Validation reconstruction loss: 28835.473672620337
epoch number: 5
Validation reconstruction loss: 28696.741452325456
epoch number: 6
Validation reconstruction loss: 28754.265089711622
epoch number: 7
Validation reconstruction loss: 29019.337085998483
Completed config 20/20 with val loss: 28696.7415

Starting search for shape (2, 64, 64, 64), latent dimension 32

[1/ 13] Testing config: {'lr': 0.001, 'beta': 0.2, 'stride': 2, 'base_channels': 16}
epoch number: 0
Validation reconstruction loss: 25878.31300818517
epoch number: 1
Validation reconstruction loss: 22756.647155179424
epoch number: 2
Validation reconstruction loss: 21729.67775978426
epoch number: 3
Validation reconstruction loss: 25766.759738521792
epoch number: 4
Validation reconstruction loss: 21085.58894765015
epoch number: 5
Validation reconstruction loss: 21347.897250040656
epoch number: 6
Validation reconstruction loss: 21287.186785152862
Completed config 1/ 13 with val loss: 21085.5889

[2/ 13] Testing config: {'lr': 0.0005, 'beta': 1.0, 'stride': 2, 'base_channels': 16}
epoch number: 0
Validation reconstruction loss: 27806.968678854075
epoch number: 1
Validation reconstruction loss: 22973.079127818735
epoch number: 2
Validation reconstruction loss: 21526.806259486122
epoch number: 3
Validation reconstruction loss: 21173.5270388389
epoch number: 4
Validation reconstruction loss: 20671.501512697854
epoch number: 5
Validation reconstruction loss: 20719.029129173894
epoch number: 6
Validation reconstruction loss: 20550.062627046293
epoch number: 7
Validation reconstruction loss: 20599.979554016696
epoch number: 8
Validation reconstruction loss: 20758.00174307513
Completed config 2/ 13 with val loss: 20550.0626

[3/ 13] Testing config: {'lr': 0.005, 'beta': 5.0, 'stride': 2, 'base_channels': 16}
epoch number: 0
Validation reconstruction loss: 28574.634330279707
epoch number: 1
Validation reconstruction loss: 25121.82719332719
epoch number: 2
Validation reconstruction loss: 24207.906348249133
epoch number: 3
Validation reconstruction loss: 23954.390469156548
epoch number: 4
Validation reconstruction loss: 23974.71675791414
epoch number: 5
Validation reconstruction loss: 23187.875577637144
epoch number: 6
Validation reconstruction loss: 23477.082132887033
epoch number: 7
Validation reconstruction loss: 23992.41988630204
Completed config 3/ 13 with val loss: 23187.8756

[4/ 13] Testing config: {'lr': 0.005, 'beta': 0.5, 'stride': 2, 'base_channels': 16}
epoch number: 0
Validation reconstruction loss: 34770.87271655464
epoch number: 1
Validation reconstruction loss: 32401.36019148417
epoch number: 2
Validation reconstruction loss: 29529.993850959454
epoch number: 3

Validation reconstruction loss: 30190.12548108196
epoch number: 4
Validation reconstruction loss: 28841.236458559193
epoch number: 5
Validation reconstruction loss: 28849.478524094753
epoch number: 6
Validation reconstruction loss: 28426.410556022332
epoch number: 7
Validation reconstruction loss: 28323.56832380204
epoch number: 8
Validation reconstruction loss: 28491.50050818517
epoch number: 9
Validation reconstruction loss: 29070.500789380963
Completed config 4/ 13 with val loss: 28323.5683

[5/ 13] Testing config: {'lr': 0.001, 'beta': 1.0, 'stride': 2, 'base_channels': 16}
epoch number: 0
Validation reconstruction loss: 25407.840695807132
epoch number: 1
Validation reconstruction loss: 22291.88536697745
epoch number: 2
Validation reconstruction loss: 21563.815904840634
epoch number: 3
Validation reconstruction loss: 20885.681749037834
epoch number: 4
Validation reconstruction loss: 20648.06848133944
epoch number: 5
Validation reconstruction loss: 20639.20453944872
epoch number: 6
Validation reconstruction loss: 20986.226664137033
epoch number: 7
Validation reconstruction loss: 21033.504695630963
Completed config 5/ 13 with val loss: 20639.2045

[6/ 13] Testing config: {'lr': 0.0005, 'beta': 0.5, 'stride': 2, 'base_channels': 16}
epoch number: 0
Validation reconstruction loss: 26832.855001219643
epoch number: 1
Validation reconstruction loss: 23786.792048934843
epoch number: 2
Validation reconstruction loss: 22627.622133835644
epoch number: 3
Validation reconstruction loss: 21631.11265110039
epoch number: 4
Validation reconstruction loss: 21686.69597652862
epoch number: 5
Validation reconstruction loss: 21326.296593804207
epoch number: 6
Validation reconstruction loss: 21139.138780287834

epoch number: 7
Validation reconstruction loss: 21392.093719508888
epoch number: 8
Validation reconstruction loss: 21472.487810331742
Completed config 6/ 13 with val loss: 21139.1388

[7/ 13] Testing config: {'lr': 0.001, 'beta': 0.2, 'stride': 2, 'base_channels': 8}
epoch number: 0
Validation reconstruction loss: 25923.467864063856
epoch number: 1
Validation reconstruction loss: 22892.307192852884
epoch number: 2
Validation reconstruction loss: 21816.346661901018
epoch number: 3
Validation reconstruction loss: 21241.226010272116
epoch number: 4
Validation reconstruction loss: 21052.923965334994
epoch number: 5
Validation reconstruction loss: 20799.283692676712
epoch number: 6
Validation reconstruction loss: 20802.793700536644
epoch number: 7
Validation reconstruction loss: 20822.467061131287
Completed config 7/ 13 with val loss: 20799.2837

[8/ 13] Testing config: {'lr': 0.001, 'beta': 0.5, 'stride': 2, 'base_channels': 8}
epoch number: 0
Validation reconstruction loss: 26178.6063699317
epoch number: 1
Validation reconstruction loss: 23325.34682113237
epoch number: 2
Validation reconstruction loss: 21596.847495324695
epoch number: 3
Validation reconstruction loss: 21231.707461513444
epoch number: 4
Validation reconstruction loss: 21015.765197277484
epoch number: 5
Validation reconstruction loss: 20933.98327647306
epoch number: 6
Validation reconstruction loss: 21004.067343004663
epoch number: 7
Validation reconstruction loss: 21247.667674849577
Completed config 8/ 13 with val loss: 20933.9833

[9/ 13] Testing config: {'lr': 0.0005, 'beta': 5.0, 'stride': 2, 'base_channels': 16}
epoch number: 0
Validation reconstruction loss: 27130.8753049111
epoch number: 1
Validation reconstruction loss: 23515.044823625867

epoch number: 2
Validation reconstruction loss: 22147.77761647604
epoch number: 3
Validation reconstruction loss: 22023.147048460538
epoch number: 4
Validation reconstruction loss: 21542.737751043474
epoch number: 5
Validation reconstruction loss: 21327.478857803013
epoch number: 6
Validation reconstruction loss: 21442.916578016586
epoch number: 7
Validation reconstruction loss: 21583.390946850606
Completed config 9/ 13 with val loss: 21327.4789

[10/ 13] Testing config: {'lr': 0.005, 'beta': 0.2, 'stride': 2, 'base_channels': 16}
epoch number: 0
Validation reconstruction loss: 29731.094541074912
epoch number: 1
Validation reconstruction loss: 47267.590727992196
epoch number: 2
Validation reconstruction loss: 47264.95128198179
Completed config 10/ 13 with val loss: 29731.0945

[11/ 13] Testing config: {'lr': 0.0005, 'beta': 1.0, 'stride': 2, 'base_channels': 8}
epoch number: 0
Validation reconstruction loss: 27743.053088410667
epoch number: 1
Validation reconstruction loss: 23826.389855946443
epoch number: 2
Validation reconstruction loss: 22419.790465091068
epoch number: 3
Validation reconstruction loss: 21801.912143254012
epoch number: 4
Validation reconstruction loss: 21466.931686361666
epoch number: 5
Validation reconstruction loss: 21113.509992614374
epoch number: 6
Validation reconstruction loss: 21278.85780640178
epoch number: 7
Validation reconstruction loss: 21110.60607349035
epoch number: 8
Validation reconstruction loss: 21415.8952816701
epoch number: 9
Validation reconstruction loss: 21294.631772414356
Completed config 11/ 13 with val loss: 21110.6061

[12/ 13] Testing config: {'lr': 0.001, 'beta': 5.0, 'stride': 2, 'base_channels': 8}
epoch number: 0
Validation reconstruction loss: 27059.990917037077

epoch number: 1
Validation reconstruction loss: 23422.587126653296
epoch number: 2
Validation reconstruction loss: 22291.017982979185
epoch number: 3
Validation reconstruction loss: 21598.74780972192
epoch number: 4
Validation reconstruction loss: 21064.976506599633
epoch number: 5
Validation reconstruction loss: 21085.559876070576
epoch number: 6
Validation reconstruction loss: 20902.49230946444
epoch number: 7
Validation reconstruction loss: 20943.753804612967
epoch number: 8
Validation reconstruction loss: 21075.441612911967
Completed config 12/ 13 with val loss: 20902.4923

[13/ 13] Testing config: {'lr': 0.005, 'beta': 0.2, 'stride': 2, 'base_channels': 8}

epoch number: 0
Validation reconstruction loss: 52359.46009052472
epoch number: 1
Validation reconstruction loss: 48660.7878530193
epoch number: 2
Validation reconstruction loss: 48294.2166359497
epoch number: 3
Validation reconstruction loss: 46175.411548677366
epoch number: 4
Validation reconstruction loss: 46159.7064417552
epoch number: 5
Validation reconstruction loss: 45173.85102043582
epoch number: 6
Validation reconstruction loss: 44957.54675981136
epoch number: 7
Validation reconstruction loss: 45941.38631220187
epoch number: 8
Validation reconstruction loss: 70725.17199018864
Completed config 13/ 13 with val loss: 44957.5468

Starting search for shape (2, 64, 64, 64), latent dimension 64

[1/14] Testing config: {'lr': 0.0005, 'beta': 0.5, 'stride': 2, 'base_channels': 16}

epoch number: 0

Validation reconstruction loss: 24019.505012399717

epoch number: 1

Validation reconstruction loss: 19989.992390774067

epoch number: 2

Validation reconstruction loss: 18514.793249945793

epoch number: 3

Validation reconstruction loss: 17859.24949350878

epoch number: 4

Validation reconstruction loss: 17103.39528675195

epoch number: 5

Validation reconstruction loss: 16906.196828585755

epoch number: 6

Validation reconstruction loss: 16764.58642789869

epoch number: 7

Validation reconstruction loss: 16816.20295983982

epoch number: 8

Validation reconstruction loss: 16815.12379221325

Completed config 1/14 with val loss: 16764.5864

[2/14] Testing config: {'lr': 0.0005, 'beta': 0.2, 'stride': 2, 'base_channels': 16}

epoch number: 0

Validation reconstruction loss: 24737.746232653946

epoch number: 1

Validation reconstruction loss: 20227.19694208044

epoch number: 2

Validation reconstruction loss: 18214.487334331636

epoch number: 3

Validation reconstruction loss: 17406.16007663432

epoch number: 4

Validation reconstruction loss: 16972.379232335483

epoch number: 5

Validation reconstruction loss: 16754.872633551062

epoch number: 6

Validation reconstruction loss: 16876.66169859199

epoch number: 7

Validation reconstruction loss: 16455.626299260082

epoch number: 8

Validation reconstruction loss: 16615.905076939234

epoch number: 9

Validation reconstruction loss: 16936.938302932565

Completed config 2/14 with val loss: 16455.6263

[3/14] Testing config: {'lr': 0.001, 'beta': 2.0, 'stride': 2, 'base_channels': 16}

epoch number: 0

Validation reconstruction loss: 23934.07365297051

epoch number: 1
Validation reconstruction loss: 20120.717687892997
epoch number: 2
Validation reconstruction loss: 18529.841324262794
epoch number: 3
Validation reconstruction loss: 17877.87801015015
epoch number: 4
Validation reconstruction loss: 17131.188249573126
epoch number: 5
Validation reconstruction loss: 17136.08838102369
epoch number: 6
Validation reconstruction loss: 17134.883052194004
Completed config 3/14 with val loss: 17131.1882

[4/14] Testing config: {'lr': 0.001, 'beta': 0.5, 'stride': 2, 'base_channels': 16}

epoch number: 0
Validation reconstruction loss: 28719.285369687772
epoch number: 1
Validation reconstruction loss: 23899.00690962435
epoch number: 2
Validation reconstruction loss: 20425.364675371315
epoch number: 3
Validation reconstruction loss: 18718.58921360039
epoch number: 4
Validation reconstruction loss: 17761.1680441308
epoch number: 5
Validation reconstruction loss: 17474.925472104023
epoch number: 6
Validation reconstruction loss: 17424.054663784693
epoch number: 7
Validation reconstruction loss: 17041.281643843507
epoch number: 8
Validation reconstruction loss: 17236.219538533987
epoch number: 9
Validation reconstruction loss: 17570.401305358304
Completed config 4/14 with val loss: 17041.2816

[5/14] Testing config: {'lr': 0.001, 'beta': 5.0, 'stride': 2, 'base_channels': 32}

epoch number: 0
Validation reconstruction loss: 25469.277496205552
epoch number: 1
Validation reconstruction loss: 22316.724563638334
epoch number: 2
Validation reconstruction loss: 20085.25925574588
epoch number: 3
Validation reconstruction loss: 18482.355035098655
epoch number: 4
Validation reconstruction loss: 18016.820691944926
epoch number: 5

Validation reconstruction loss: 18125.479872479402
epoch number: 6
Validation reconstruction loss: 17782.26850979781
epoch number: 7
Validation reconstruction loss: 17730.34882168799
epoch number: 8
Validation reconstruction loss: 18825.63202989484
epoch number: 9
Validation reconstruction loss: 18102.59263199263
Completed config 5/14 with val loss: 17730.3488

[6/14] Testing config: {'lr': 0.005, 'beta': 0.5, 'stride': 2, 'base_channels': 16}
epoch number: 0
Validation reconstruction loss: 47896.71444736557
epoch number: 1
Validation reconstruction loss: 45606.62671089007
epoch number: 2
Validation reconstruction loss: 44966.79201674978
epoch number: 3
Validation reconstruction loss: 44311.327298352124
epoch number: 4
Validation reconstruction loss: 46455.434271330225
epoch number: 5
Validation reconstruction loss: 58497.7058285451
Completed config 6/14 with val loss: 44311.3273

[7/14] Testing config: {'lr': 0.005, 'beta': 1.0, 'stride': 2, 'base_channels': 16}
epoch number: 0
Validation reconstruction loss: 48143.72127398634
epoch number: 1
Validation reconstruction loss: 44651.1150666739
epoch number: 2
Validation reconstruction loss: 43779.65100214115
epoch number: 3
Validation reconstruction loss: 41899.448039760406
epoch number: 4
Validation reconstruction loss: 41545.08720457502
epoch number: 5
Validation reconstruction loss: 41927.511291874456
epoch number: 6
Validation reconstruction loss: 58288.56905220078
Completed config 7/14 with val loss: 41545.0872

[8/14] Testing config: {'lr': 0.001, 'beta': 0.2, 'stride': 2, 'base_channels': 32}
epoch number: 0
Validation reconstruction loss: 24308.548890801172
epoch number: 1
Validation reconstruction loss: 19905.237158160777
epoch number: 2

Validation reconstruction loss: 18254.201349739807
epoch number: 3
Validation reconstruction loss: 17253.44632378849
epoch number: 4
Validation reconstruction loss: 17140.11763470295
epoch number: 5
Validation reconstruction loss: 17283.551424951213
epoch number: 6
Validation reconstruction loss: 17074.48900456689
epoch number: 7
Validation reconstruction loss: 17626.078829683436
epoch number: 8
Validation reconstruction loss: 17667.031556605052
Completed config 8/14 with val loss: 17074.4890

[9/14] Testing config: {'lr': 0.0005, 'beta': 0.2, 'stride': 2, 'base_channels': 32}
epoch number: 0
Validation reconstruction loss: 25281.358373875217
epoch number: 1
Validation reconstruction loss: 20062.193940400044
epoch number: 2
Validation reconstruction loss: 18557.92271350553
epoch number: 3
Validation reconstruction loss: 17264.22529711893
epoch number: 4
Validation reconstruction loss: 16915.89035566186
epoch number: 5
Validation reconstruction loss: 17113.029969373372
epoch number: 6
Validation reconstruction loss: 16826.124422362856
epoch number: 7
Validation reconstruction loss: 17172.145813570576
epoch number: 8
Validation reconstruction loss: 17561.27307160668
Completed config 9/14 with val loss: 16826.1244

[10/14] Testing config: {'lr': 0.005, 'beta': 2.0, 'stride': 2, 'base_channels': 16}
epoch number: 0
Validation reconstruction loss: 48500.29740351257
epoch number: 1
Validation reconstruction loss: 48938.76270801713
epoch number: 2
Validation reconstruction loss: 44665.16940183218
epoch number: 3
Validation reconstruction loss: 47864.73175954033
epoch number: 4
Validation reconstruction loss: 44530.92655369145
epoch number: 5
Validation reconstruction loss: 58790.1340152049

epoch number: 6
Validation reconstruction loss: 57536.65026357871
Completed config 10/14 with val loss: 44530.9266

[11/14] Testing config: {'lr': 0.001, 'beta': 1.0, 'stride': 2, 'base_channels': 16}
epoch number: 0
Validation reconstruction loss: 24785.069902563962
epoch number: 1
Validation reconstruction loss: 20421.480578856786
epoch number: 2
Validation reconstruction loss: 18447.759723276235
epoch number: 3
Validation reconstruction loss: 17854.54281968235
epoch number: 4
Validation reconstruction loss: 17269.00324222138
epoch number: 5
Validation reconstruction loss: 17343.368278404163
epoch number: 6
Validation reconstruction loss: 17177.105875298137
epoch number: 7
Validation reconstruction loss: 17329.610946986122
epoch number: 8
Validation reconstruction loss: 17296.708549029707
Completed config 11/14 with val loss: 17177.1059

[12/14] Testing config: {'lr': 0.005, 'beta': 2.0, 'stride': 2, 'base_channels': 32}
epoch number: 0
Validation reconstruction loss: 59231.92369769081
epoch number: 1
Validation reconstruction loss: 58682.03092137359
epoch number: 2
Validation reconstruction loss: 58627.468739836295
epoch number: 3
Validation reconstruction loss: 58460.29338884974
epoch number: 4
Validation reconstruction loss: 58554.533706228314
epoch number: 5
Validation reconstruction loss: 58234.345115324155
epoch number: 6
Validation reconstruction loss: 58313.65670059085
epoch number: 7
Validation reconstruction loss: 58455.46536548677
Completed config 12/14 with val loss: 58234.3451

[13/14] Testing config: {'lr': 0.001, 'beta': 5.0, 'stride': 2, 'base_channels': 16}
epoch number: 0
Validation reconstruction loss: 25148.104437134105
epoch number: 1
Validation reconstruction loss: 20482.53945719048

epoch number: 2
Validation reconstruction loss: 18788.118915329575
epoch number: 3
Validation reconstruction loss: 17878.28954696986
epoch number: 4
Validation reconstruction loss: 17812.181221372237
epoch number: 5
Validation reconstruction loss: 17287.99892772929
epoch number: 6
Validation reconstruction loss: 17455.137872330335
epoch number: 7
Validation reconstruction loss: 17211.615379207775
epoch number: 8
Validation reconstruction loss: 17419.850485147443
epoch number: 9
Validation reconstruction loss: 17708.562212028402
Completed config 13/14 with val loss: 17211.6154

[14/14] Testing config: {'lr': 0.001, 'beta': 0.5, 'stride': 2, 'base_channels': 32}

epoch number: 0
Validation reconstruction loss: 25869.907240961078
epoch number: 1
Validation reconstruction loss: 21200.043548081092
epoch number: 2
Validation reconstruction loss: 18441.080387270977
epoch number: 3
Validation reconstruction loss: 17395.75524701187
epoch number: 4
Validation reconstruction loss: 16872.06177837706
epoch number: 5
Validation reconstruction loss: 17344.234056537294
epoch number: 6
Validation reconstruction loss: 16858.02259560657
epoch number: 7
Validation reconstruction loss: 17389.20366537023
epoch number: 8
Validation reconstruction loss: 17732.958056937066
Completed config 14/14 with val loss: 16858.0226