Noise

0.3033436650126312 0.5922539540773317

0.6084637992888429 0.9169229636747571

0.6028825406087961 0.48858577994621144

0.3235881819440779 0.5121807547977356

0.4909143115550969 0.3397060348224845

0.46897766307098726 0.6153915096229989

0.1965197588410676 0.2763759527784417

0.6771924113644711 0.31214547614285

0.3182100884891649 0.615083975363216

0.5104933552843417 0.25855507962749447

0.22957652819126478 0.4559211190422565

0.5382212061098974 0.6889898169488874

0.4223939431903166 0.739678451086705

0.35940598413225644 0.562223539026673

0.43728623025082514 0.5648146100690523

0.5241303168035669 0.6305602315481863

0.4082444096179666 0.4518413341099362

0.38793977359569987 0.5274906134551365

0.5229199648224708 0.5711683021072562

0.771675597465223 0.848288915527419

0.5013582308111828 0.37980385406914985

0.44673799266058445 0.5054871264272699

0.4949187630221053 0.7121293403958217

0.5182784816313076 0.6818622839288431

0.5813110700371587 0.4608755997608359

0.7550135786248059 0.2099810007376402

0.14369172580671813 0.4779340204809416

0.48476601331108243 0.6071404510385409

0.37643177798258165 0.5121725097735135

0.9217373034859606 0.28952161875703897

0.46643859761486506 0.3827350201379997

0.8877525796156236 0.20993917038599513

0.7254658585575398 0.636832806131467

0.22374162105941314 0.4285783948234301

0.18213416235372498 0.5305835431912488

0.41609946095949196 0.7617424435007899

0.4790348233080917 0.7096860970541301

0.21739889122858425 0.6513981838330554

0.5333536846400982 0.45573788078524635

0.2737036048418288 0.6011880792540168

0.6737178239950123 0.22024519882335175

0.2853360311694484 0.9169288655786323

0.4724767444214249 0.45531554525477874

-0.012561640572918531 0.3023667371446782

0.650546179244411 0.7480363610993241

Running on NVIDIA L4

Downloading: "<https://download.pytorch.org/models/fasterrcnn_resnet50_fpn_coco-258fb6c6.pth>" to /root/.cache/torch/hub/checkpoints/fasterrcnn\_resnet50\_fpn\_coco-258fb6c6.pth

100%|██████████| 160M/160M [00:00<00:00, 205MB/s]

Epoch 1/10 - Training: 100%|█████████▉| 802/803 [19:00<00:01, 1.42s/it]/usr/local/lib/python3.10/dist-packages/torch/nn/modules/conv.py:456: UserWarning: Plan failed with a cudnnException: CUDNN\_BACKEND\_EXECUTION\_PLAN\_DESCRIPTOR: cudnnFinalize Descriptor Failed cudnn\_status: CUDNN\_STATUS\_NOT\_SUPPORTED (Triggered internally at ../aten/src/ATen/native/cudnn/Conv\_v8.cpp:919.)

return F.conv2d(input, weight, bias, self.stride,

Epoch 1/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 1/10 - Training - Loss: 0.4579797053099569

Epoch 1/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 1/10 - Validation - Loss: 0.31804297805798276

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.1.pth

Epoch 2/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 2/10 - Training - Loss: 0.37437606152903247

Epoch 2/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 2/10 - Validation - Loss: 0.30182655569579864

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.1.pth

Epoch 3/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 3/10 - Training - Loss: 0.3577405672664215

Epoch 3/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 3/10 - Validation - Loss: 0.2934112436724482

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.1.pth

Epoch 4/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 4/10 - Training - Loss: 0.35045205650486955

Epoch 4/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 4/10 - Validation - Loss: 0.30091296619287244

Epoch 5/10 - Training: 100%|██████████| 803/803 [19:01<00:00, 1.42s/it]

Epoch 5/10 - Training - Loss: 0.34410484027521104

Epoch 5/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 5/10 - Validation - Loss: 0.30135958627970133

Validation loss did not improve for 2 epochs. Reducing learning rate and restoring best model weights.

Model loaded from /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.1.pth

Epoch 6/10 - Training: 100%|██████████| 803/803 [18:59<00:00, 1.42s/it]

Epoch 6/10 - Training - Loss: 0.3405479585025854

Epoch 6/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 6/10 - Validation - Loss: 0.282528775088765

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.1.pth

Epoch 7/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 7/10 - Training - Loss: 0.33773472851344094

Epoch 7/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 7/10 - Validation - Loss: 0.2857814020028821

Epoch 8/10 - Training: 100%|██████████| 803/803 [18:59<00:00, 1.42s/it]

Epoch 8/10 - Training - Loss: 0.3357573596025315

Epoch 8/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 8/10 - Validation - Loss: 0.2841585839374198

Validation loss did not improve for 2 epochs. Reducing learning rate and restoring best model weights.

Model loaded from /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.1.pth

Epoch 9/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 9/10 - Training - Loss: 0.3366770519971254

Epoch 9/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 9/10 - Validation - Loss: 0.283898589718673

Epoch 10/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 10/10 - Training - Loss: 0.33641235721512125

Epoch 10/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 10/10 - Validation - Loss: 0.28435670370580973

Validation loss did not improve for 2 epochs. Reducing learning rate and restoring best model weights.

Model loaded from /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.1.pth

Training completed in 12253.80s

Losses saved to /content/experiment/Research/logs/exp1/noise\_0.1.csv

Evaluation: 100%|██████████| 2569/2569 [01:41<00:00, 25.23it/s]

{'map': tensor(0.2384), 'map\_50': tensor(0.4091), 'map\_75': tensor(0.2480), 'map\_small': tensor(0.0940), 'map\_medium': tensor(0.2132), 'map\_large': tensor(0.3447), 'mar\_1': tensor(0.2561), 'mar\_10': tensor(0.3325), 'mar\_100': tensor(0.3333), 'mar\_small': tensor(0.1433), 'mar\_medium': tensor(0.3181), 'mar\_large': tensor(0.4272), 'map\_per\_class': tensor([0.0000, 0.1990, 0.2399, 0.2011, 0.2054, 0.4138, 0.2913, 0.3071, 0.1361,

0.1272, 0.2338, 0.3406, 0.2461, 0.2997, 0.3373, 0.1880, 0.1981, 0.1757,

0.3420, 0.2864]), 'mar\_100\_per\_class': tensor([0.0000, 0.3534, 0.3354, 0.2772, 0.2831, 0.4714, 0.3948, 0.4078, 0.2585,

0.2393, 0.3026, 0.4417, 0.4038, 0.4314, 0.4506, 0.3086, 0.2642, 0.2305,

0.4355, 0.3761]), 'classes': tensor([ 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17,

18, 19], dtype=torch.int32)}

Noise

0.44573942782197185 0.8782828101090742

0.5909454845135903 0.5543604123554767

0.28399230108724316 0.7923968823209766

0.5457380853269099 0.6140913222268994

0.31320864843635454 0.2831374420626728

0.6587966694897504 0.622492944825078

0.2526597436684477 0.47799054190561135

0.7361656489920303 0.6988612359494316

0.38358036312367827 0.496492987108789

0.6725572039990931 0.5312134815198339

0.8327062892263102 0.5199272800648536

0.5110180923111853 0.4301130223591289

0.6522001356939882 0.33600481116148173

0.21110240092547705 0.4208884065528166

0.44961207293223593 0.6206642367026981

0.2632230923690415 0.5560504779613467

0.5411089286622336 0.5270254174663414

0.44052684035334033 0.3899790279811703

0.841271764875904 0.6023389422087728

0.4387545848171978 0.5897462490036322

0.7885876055793921 0.3088526822521963

0.5263294394167227 0.5829602713280163

0.4177455912999977 0.2531435077606303

0.338981720993707 0.6357845238651577

0.4422484822155255 0.4654626987672088

0.3050832715742413 0.6435850529530851

0.5947349738247659 0.8175206569824891

0.588797507348535 0.6312767711862004

0.6222026900710808 0.7832510847389097

0.2660321548838641 0.5927113193942543

0.30170769854912416 0.39549668259631154

0.5699358997021302 0.5278507785690604

Running on NVIDIA L4

Epoch 1/10 - Training: 100%|██████████| 803/803 [18:59<00:00, 1.42s/it]

Epoch 1/10 - Training - Loss: 0.5087404616854407

Epoch 1/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 1/10 - Validation - Loss: 0.31779663623483095

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.2.pth

Epoch 2/10 - Training: 100%|██████████| 803/803 [18:59<00:00, 1.42s/it]

Epoch 2/10 - Training - Loss: 0.43382230378770886

Epoch 2/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 2/10 - Validation - Loss: 0.3128545438801801

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.2.pth

Epoch 3/10 - Training: 100%|██████████| 803/803 [18:59<00:00, 1.42s/it]

Epoch 3/10 - Training - Loss: 0.4215970611661339

Epoch 3/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 3/10 - Validation - Loss: 0.30742009053075753

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.2.pth

Epoch 4/10 - Training: 100%|██████████| 803/803 [18:59<00:00, 1.42s/it]

Epoch 4/10 - Training - Loss: 0.41257948529527316

Epoch 4/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 4/10 - Validation - Loss: 0.30582404385010403

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.2.pth

Epoch 5/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 5/10 - Training - Loss: 0.408600196984607

Epoch 5/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 5/10 - Validation - Loss: 0.30284524460633594

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.2.pth

Epoch 6/10 - Training: 100%|██████████| 803/803 [18:59<00:00, 1.42s/it]

Epoch 6/10 - Training - Loss: 0.402473657098535

Epoch 6/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 6/10 - Validation - Loss: 0.30180269728104275

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.2.pth

Epoch 7/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 7/10 - Training - Loss: 0.4007726920163201

Epoch 7/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 7/10 - Validation - Loss: 0.2998444898812859

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.2.pth

Epoch 8/10 - Training: 100%|██████████| 803/803 [19:01<00:00, 1.42s/it]

Epoch 8/10 - Training - Loss: 0.39698366115651423

Epoch 8/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 8/10 - Validation - Loss: 0.3038446956693574

Epoch 9/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 9/10 - Training - Loss: 0.39534341249786603

Epoch 9/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 9/10 - Validation - Loss: 0.29624950416662077

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.2.pth

Epoch 10/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 10/10 - Training - Loss: 0.39311129394756306

Epoch 10/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 10/10 - Validation - Loss: 0.29967818781733513

Training completed in 12253.47s

Losses saved to /content/experiment/Research/logs/exp1/noise\_0.2.csv

Evaluation: 100%|██████████| 2569/2569 [01:41<00:00, 25.30it/s]

{'map': tensor(0.2295), 'map\_50': tensor(0.4034), 'map\_75': tensor(0.2312), 'map\_small': tensor(0.0825), 'map\_medium': tensor(0.2112), 'map\_large': tensor(0.3378), 'mar\_1': tensor(0.2548), 'mar\_10': tensor(0.3210), 'mar\_100': tensor(0.3220), 'mar\_small': tensor(0.1179), 'mar\_medium': tensor(0.3055), 'mar\_large': tensor(0.4211), 'map\_per\_class': tensor([0.0000, 0.1986, 0.2212, 0.1744, 0.2107, 0.4471, 0.2246, 0.2910, 0.1255,

0.2555, 0.2283, 0.3579, 0.1471, 0.2554, 0.3262, 0.1888, 0.1662, 0.1831,

0.3881, 0.2004]), 'mar\_100\_per\_class': tensor([0.0000, 0.3129, 0.3206, 0.2426, 0.2973, 0.5198, 0.3386, 0.3860, 0.2532,

0.3215, 0.3412, 0.4611, 0.3238, 0.3924, 0.4386, 0.2833, 0.2041, 0.2481,

0.4495, 0.3058]), 'classes': tensor([ 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17,

18, 19], dtype=torch.int32)}

Noise

0.42913835281349677 0.17475568130356628

0.3000828683565347 0.37936752646409744

0.47587532246699815 0.6961611157088079

0.7685861656756681 0.41427494577188995

0.327923139682544 0.5289136094530968

0.2552348678037881 0.5475147299832739

0.37359311681215024 0.7613685466989843

0.6695011098701126 0.46350716038111167

0.21531291556531568 0.44732261907194537

0.576852543956878 0.30025499506529774

0.5315082633118269 0.6024124758989096

0.5752854620000228 0.6328041581150092

0.7144955204639066 0.8636039444603272

0.8139226019665927 0.36851815891176287

0.37141385149325123 0.3104741211561469

0.24207391263032968 0.6739095417712637

0.24060220536264953 0.34745736500975055

0.5007830100753073 0.5041198895338186

0.22117753414686975 0.5765774131602998

0.2920620402499825 0.5761395849181392

0.5004109126422432 0.43090132236772066

0.49959148964733163 0.633189299708977

0.1035356416676515 0.31916900138029647

0.39763564331950657 0.3864153854794782

0.9149188551255542 0.27612410295492995

0.3589483603252301 0.2296535851852709

0.38374597965403434 0.6010744085060806

0.47614315850885724 0.40714162677287796

0.4039585039526071 0.48381625644584525

0.29446116889089746 0.6459742317919466

0.5357084532574294 0.3691544766680773

0.5264089571236029 0.3399321751197054

0.7240623692019684 0.7159374236055113

0.3978325171682955 0.25645228484665905

0.7984327925195107 0.688115999837716

0.4620599313263935 0.24696367208767583

0.6571721432472336 0.3140160775114561

0.7205110984916381 0.4252751108884926

0.45545475726416773 0.46244386110714186

0.6143735277301092 0.5371242261226664

0.5769856446983044 0.4279536839483448

0.3417061006975518 0.3138743730846596

0.8380472560284177 0.20515000354792234

0.6977023848630383 0.5879139923170914

0.3646055465333235 0.36395501293942645

0.3848700289613064 0.6388492165309461

0.3435977452840864 0.054658623197393896

0.37713866087262093 0.5886288659458501

0.26423228184164027 0.7348913988637993

0.7522352105685335 0.7569954680050173

Running on NVIDIA L4

Epoch 1/10 - Training: 100%|██████████| 803/803 [19:01<00:00, 1.42s/it]

Epoch 1/10 - Training - Loss: 0.5761213341952854

Epoch 1/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 1/10 - Validation - Loss: 0.3375103268082495

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.3.pth

Epoch 2/10 - Training: 100%|██████████| 803/803 [19:03<00:00, 1.42s/it]

Epoch 2/10 - Training - Loss: 0.4943129279619433

Epoch 2/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 2/10 - Validation - Loss: 0.32593737604717415

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.3.pth

Epoch 3/10 - Training: 100%|██████████| 803/803 [19:01<00:00, 1.42s/it]

Epoch 3/10 - Training - Loss: 0.4827787254288663

Epoch 3/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 3/10 - Validation - Loss: 0.30553911515959986

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.3.pth

Epoch 4/10 - Training: 100%|██████████| 803/803 [19:03<00:00, 1.42s/it]

Epoch 4/10 - Training - Loss: 0.4774411472110344

Epoch 4/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 4/10 - Validation - Loss: 0.3038023762680866

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.3.pth

Epoch 5/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 5/10 - Training - Loss: 0.4719890084391365

Epoch 5/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 5/10 - Validation - Loss: 0.2991827113760842

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.3.pth

Epoch 6/10 - Training: 100%|██████████| 803/803 [19:03<00:00, 1.42s/it]

Epoch 6/10 - Training - Loss: 0.46641273572020336

Epoch 6/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 6/10 - Validation - Loss: 0.31297535476861177

Epoch 7/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 7/10 - Training - Loss: 0.46599120205989664

Epoch 7/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 7/10 - Validation - Loss: 0.3083337567470692

Validation loss did not improve for 2 epochs. Reducing learning rate and restoring best model weights.

Model loaded from /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.3.pth

Epoch 8/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 8/10 - Training - Loss: 0.45331881541392277

Epoch 8/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 8/10 - Validation - Loss: 0.3009319308179396

Epoch 9/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 9/10 - Training - Loss: 0.4514948245819895

Epoch 9/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 9/10 - Validation - Loss: 0.2969792614242545

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.3.pth

Epoch 10/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 10/10 - Training - Loss: 0.4500909821776346

Epoch 10/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 10/10 - Validation - Loss: 0.29486774694588447

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.3.pth

Training completed in 12281.55s

Losses saved to /content/experiment/Research/logs/exp1/noise\_0.3.csv

Evaluation: 100%|██████████| 2569/2569 [01:42<00:00, 25.18it/s]

{'map': tensor(0.2520), 'map\_50': tensor(0.4239), 'map\_75': tensor(0.2679), 'map\_small': tensor(0.1092), 'map\_medium': tensor(0.2400), 'map\_large': tensor(0.3562), 'mar\_1': tensor(0.2647), 'mar\_10': tensor(0.3479), 'mar\_100': tensor(0.3511), 'mar\_small': tensor(0.1681), 'mar\_medium': tensor(0.3416), 'mar\_large': tensor(0.4372), 'map\_per\_class': tensor([0.0000, 0.2279, 0.3254, 0.2248, 0.1791, 0.4393, 0.3004, 0.3325, 0.1465,

0.1939, 0.2172, 0.4044, 0.2120, 0.2386, 0.3487, 0.1958, 0.2228, 0.1965,

0.3669, 0.2666]), 'mar\_100\_per\_class': tensor([0.0000, 0.3784, 0.4111, 0.3147, 0.2653, 0.5571, 0.4197, 0.4259, 0.2576,

0.3243, 0.3202, 0.5097, 0.3343, 0.3657, 0.4734, 0.3216, 0.3041, 0.2511,

0.4140, 0.3732]), 'classes': tensor([ 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17,

18, 19], dtype=torch.int32)}

Noise

0.5796802290490425 0.48158835960019053

0.27784543920762134 0.8087386555575891

0.6700619804275764 0.5349653119750446

0.36314076953863716 0.21458310627883748

0.42545601162627805 0.36536277024846403

0.4858084150946387 0.4443599851649548

0.35234756144622137 0.4372299770386651

0.4635908959919356 0.9007167394056922

0.767471560557712 0.46489560357996135

0.32631167392935 0.5231622444395443

0.4981443327671078 0.34968472342213586

0.6341917715439345 0.4679301495296877

0.5877413510454764 0.44299452002522266

0.6499620049447445 0.6532965895556777

0.4987910825561196 0.423829875283564

0.5800781928451761 0.39121408320822926

0.31417119698029994 0.680583131635721

0.2562956954510971 0.24313678411157197

0.5841630546008784 0.3822762200879745

0.39456214234924314 -0.19117769582926492

0.6091772536264836 0.6337288490617077

0.26710740898029156 0.3547074247239822

0.6052250053379135 0.6806891646119624

0.4982345622485293 0.7208418831680435

0.30519954810036587 0.2826878164118508

0.5812985626822053 0.6333184800053748

0.6568715328384332 0.31173799718981343

0.6603729186659134 0.40790656294564376

0.8281341800406531 0.8009578080874229

0.5787860937784773 0.41694794618125264

0.5260928089540411 0.7536034775847176

0.4047664554614474 0.13431477639470873

0.6639173601036369 0.4802072087017448

0.4801543185728355 0.5576196194219043

0.6180068140015499 0.953667789188784

0.6568606184174359 0.535131966402953

0.4963758064683659 0.6359450311743369

0.6584196068460044 0.5793805506378964

0.4679265969526934 0.55249020421469

0.2385971398857618 0.35630031639738524

0.28527239440979646 0.6187320910636293

0.545814566002485 0.11753888155123998

0.7489283025817012 0.3923144831941653

0.3649536431919946 0.16607433055149357

0.45288488667813964 0.5870875832669931

0.5863434991195838 0.6735656475842102

Running on NVIDIA L4

Epoch 1/10 - Training: 100%|██████████| 803/803 [19:01<00:00, 1.42s/it]

Epoch 1/10 - Training - Loss: 0.6327695656906475

Epoch 1/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 1/10 - Validation - Loss: 0.3433345281691463

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.4.pth

Epoch 2/10 - Training: 100%|██████████| 803/803 [19:01<00:00, 1.42s/it]

Epoch 2/10 - Training - Loss: 0.5599549613883754

Epoch 2/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 2/10 - Validation - Loss: 0.3330210341071641

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.4.pth

Epoch 3/10 - Training: 100%|██████████| 803/803 [19:01<00:00, 1.42s/it]

Epoch 3/10 - Training - Loss: 0.5443397338779302

Epoch 3/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 3/10 - Validation - Loss: 0.322305285130386

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.4.pth

Epoch 4/10 - Training: 100%|██████████| 803/803 [19:01<00:00, 1.42s/it]

Epoch 4/10 - Training - Loss: 0.5419771498345201

Epoch 4/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.26it/s]

Epoch 4/10 - Validation - Loss: 0.31382674958418916

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.4.pth

Epoch 5/10 - Training: 100%|██████████| 803/803 [19:01<00:00, 1.42s/it]

Epoch 5/10 - Training - Loss: 0.5366757231883955

Epoch 5/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 5/10 - Validation - Loss: 0.32429702517886955

Epoch 6/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 6/10 - Training - Loss: 0.5313503584855818

Epoch 6/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 6/10 - Validation - Loss: 0.3179282312867818

Validation loss did not improve for 2 epochs. Reducing learning rate and restoring best model weights.

Model loaded from /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.4.pth

Epoch 7/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 7/10 - Training - Loss: 0.5280735692749284

Epoch 7/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 7/10 - Validation - Loss: 0.31299181737833554

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.4.pth

Epoch 8/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 8/10 - Training - Loss: 0.5236367315684873

Epoch 8/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 8/10 - Validation - Loss: 0.3136569491967007

Epoch 9/10 - Training: 100%|██████████| 803/803 [19:01<00:00, 1.42s/it]

Epoch 9/10 - Training - Loss: 0.5215282656373004

Epoch 9/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 9/10 - Validation - Loss: 0.30529344123270774

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.4.pth

Epoch 10/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 10/10 - Training - Loss: 0.5175338576398186

Epoch 10/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.26it/s]

Epoch 10/10 - Validation - Loss: 0.309198801578195

Training completed in 12273.27s

Losses saved to /content/experiment/Research/logs/exp1/noise\_0.4.csv

Evaluation: 100%|██████████| 2569/2569 [01:42<00:00, 25.03it/s]

{'map': tensor(0.2386), 'map\_50': tensor(0.4063), 'map\_75': tensor(0.2537), 'map\_small': tensor(0.1228), 'map\_medium': tensor(0.2228), 'map\_large': tensor(0.3490), 'mar\_1': tensor(0.2548), 'mar\_10': tensor(0.3364), 'mar\_100': tensor(0.3403), 'mar\_small': tensor(0.1668), 'mar\_medium': tensor(0.3285), 'mar\_large': tensor(0.4277), 'map\_per\_class': tensor([0.0000, 0.1916, 0.3144, 0.1598, 0.2046, 0.3731, 0.2765, 0.3106, 0.1372,

0.2342, 0.2167, 0.3442, 0.1951, 0.2264, 0.3453, 0.1799, 0.2909, 0.1758,

0.3290, 0.2671]), 'mar\_100\_per\_class': tensor([0.0000, 0.3457, 0.4090, 0.2566, 0.2973, 0.4670, 0.3850, 0.4399, 0.2254,

0.3243, 0.3184, 0.4866, 0.3381, 0.3724, 0.4676, 0.3099, 0.3578, 0.2237,

0.3935, 0.3877]), 'classes': tensor([ 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17,

18, 19], dtype=torch.int32)}

Noise

0.32785472943485783 0.6193529573542675

0.319809196478383 0.4314491254566012

0.3162028276440305 0.6448344292143223

0.41930668014938155 0.5368328022119381

0.533563495654381 0.5321103024916585

0.3838095613462155 0.34820185111464524

0.5911117098761813 0.39124400034241597

0.6398492377212439 0.7102333675421564

0.4885231827582903 0.3712896304088125

0.4322627288370645 0.22143537089673665

0.5189814623286698 0.6302362602208709

0.35985462761979664 0.5988342425643147

0.19937436477511233 0.31870798433302805

0.2543318528729976 0.5158573072688898

0.498670884506687 0.31313977237738816

0.2997077758644643 0.628612519528079

0.827472968016134 0.31093440916773385

0.6652966087048162 0.6081968358343491

0.587055758544916 0.5069701611653535

0.73372307855696 0.3006973542739915

0.3833779429817351 0.4554932429689407

0.44332088222242483 0.17837716101746004

0.5109093217719046 0.4502035187852225

0.5701978253252828 0.7581856061779351

0.3219623475881773 0.5200449368884449

0.4862003970855108 0.599736912061768

0.3646020123127158 0.12491306887935999

0.1551895385233104 0.5558589918839609

0.5676290341629083 0.7188577089007095

0.7155289604568214 0.3663874211349173

0.6337419169005583 0.6571869339629985

0.3185023676808198 0.5769430089156066

0.6618682706457567 0.4633026834347606

0.4302221012517653 0.5834901922900688

0.5529488316777014 0.6582090620803727

Running on NVIDIA L4

Epoch 1/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 1/10 - Training - Loss: 0.6928017978947308

Epoch 1/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 1/10 - Validation - Loss: 0.35157865113406267

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.5.pth

Epoch 2/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 2/10 - Training - Loss: 0.6152053155088484

Epoch 2/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 2/10 - Validation - Loss: 0.34150361807809937

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.5.pth

Epoch 3/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 3/10 - Training - Loss: 0.6082301912539329

Epoch 3/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 3/10 - Validation - Loss: 0.3324684554504024

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.5.pth

Epoch 4/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 4/10 - Training - Loss: 0.5989043496985216

Epoch 4/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 4/10 - Validation - Loss: 0.3419494404009095

Epoch 5/10 - Training: 100%|██████████| 803/803 [19:03<00:00, 1.42s/it]

Epoch 5/10 - Training - Loss: 0.5958013513762211

Epoch 5/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 5/10 - Validation - Loss: 0.3300559729061745

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.5.pth

Epoch 6/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 6/10 - Training - Loss: 0.5943824273637341

Epoch 6/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 6/10 - Validation - Loss: 0.33057693309254116

Epoch 7/10 - Training: 100%|██████████| 803/803 [19:03<00:00, 1.42s/it]

Epoch 7/10 - Training - Loss: 0.5875682609612737

Epoch 7/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.26it/s]

Epoch 7/10 - Validation - Loss: 0.33133973788332055

Validation loss did not improve for 2 epochs. Reducing learning rate and restoring best model weights.

Model loaded from /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.5.pth

Epoch 8/10 - Training: 100%|██████████| 803/803 [19:03<00:00, 1.42s/it]

Epoch 8/10 - Training - Loss: 0.5789574651537025

Epoch 8/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 8/10 - Validation - Loss: 0.3174492160755175

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.5.pth

Epoch 9/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 9/10 - Training - Loss: 0.5775300355287151

Epoch 9/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 9/10 - Validation - Loss: 0.31221684951473166

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.5.pth

Epoch 10/10 - Training: 100%|██████████| 803/803 [19:04<00:00, 1.42s/it]

Epoch 10/10 - Training - Loss: 0.5802991390228271

Epoch 10/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 10/10 - Validation - Loss: 0.3250575623026601

Training completed in 12272.79s

Losses saved to /content/experiment/Research/logs/exp1/noise\_0.5.csv

Evaluation: 100%|██████████| 2569/2569 [01:41<00:00, 25.21it/s]

{'map': tensor(0.2352), 'map\_50': tensor(0.4080), 'map\_75': tensor(0.2404), 'map\_small': tensor(0.1119), 'map\_medium': tensor(0.2368), 'map\_large': tensor(0.3256), 'mar\_1': tensor(0.2527), 'mar\_10': tensor(0.3357), 'mar\_100': tensor(0.3389), 'mar\_small': tensor(0.1672), 'mar\_medium': tensor(0.3397), 'mar\_large': tensor(0.4115), 'map\_per\_class': tensor([0.0000, 0.1544, 0.2214, 0.1766, 0.2063, 0.4805, 0.2773, 0.3846, 0.1091,

0.1776, 0.1738, 0.3338, 0.1566, 0.2785, 0.3370, 0.1775, 0.2671, 0.1902,

0.3331, 0.2681]), 'mar\_100\_per\_class': tensor([0.0000, 0.2905, 0.3196, 0.2765, 0.2907, 0.5879, 0.3983, 0.4798, 0.2057,

0.3178, 0.2579, 0.4478, 0.3162, 0.4114, 0.4651, 0.3142, 0.3500, 0.2603,

0.4118, 0.3775]), 'classes': tensor([ 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17,

18, 19], dtype=torch.int32)}

Noise

0.3033436650126312 0.5922539540773317

0.6084637992888429 0.9169229636747571

0.6028825406087961 0.48858577994621144

0.3235881819440779 0.5121807547977356

0.4909143115550969 0.3397060348224845

0.46897766307098726 0.6153915096229989

0.1965197588410676 0.2763759527784417

0.6771924113644711 0.31214547614285

0.3182100884891649 0.615083975363216

0.5104933552843417 0.25855507962749447

0.22957652819126478 0.4559211190422565

0.5382212061098974 0.6889898169488874

0.4223939431903166 0.739678451086705

0.35940598413225644 0.562223539026673

0.43728623025082514 0.5648146100690523

0.5241303168035669 0.6305602315481863

0.4082444096179666 0.4518413341099362

0.38793977359569987 0.5274906134551365

0.5229199648224708 0.5711683021072562

0.771675597465223 0.848288915527419

0.5013582308111828 0.37980385406914985

0.44673799266058445 0.5054871264272699

0.4949187630221053 0.7121293403958217

0.5182784816313076 0.6818622839288431

0.5813110700371587 0.4608755997608359

0.7550135786248059 0.2099810007376402

0.14369172580671813 0.4779340204809416

0.48476601331108243 0.6071404510385409

0.37643177798258165 0.5121725097735135

0.9217373034859606 0.28952161875703897

0.46643859761486506 0.3827350201379997

0.8877525796156236 0.20993917038599513

0.7254658585575398 0.636832806131467

0.22374162105941314 0.4285783948234301

0.18213416235372498 0.5305835431912488

0.41609946095949196 0.7617424435007899

0.4790348233080917 0.7096860970541301

0.21739889122858425 0.6513981838330554

0.5333536846400982 0.45573788078524635

0.2737036048418288 0.6011880792540168

0.6737178239950123 0.22024519882335175

0.2853360311694484 0.9169288655786323

0.4724767444214249 0.45531554525477874

-0.012561640572918531 0.3023667371446782

0.650546179244411 0.7480363610993241

Running on NVIDIA L4

Downloading: "<https://download.pytorch.org/models/fasterrcnn_resnet50_fpn_coco-258fb6c6.pth>" to /root/.cache/torch/hub/checkpoints/fasterrcnn\_resnet50\_fpn\_coco-258fb6c6.pth

100%|██████████| 160M/160M [00:00<00:00, 205MB/s]

Epoch 1/10 - Training: 100%|█████████▉| 802/803 [19:00<00:01, 1.42s/it]/usr/local/lib/python3.10/dist-packages/torch/nn/modules/conv.py:456: UserWarning: Plan failed with a cudnnException: CUDNN\_BACKEND\_EXECUTION\_PLAN\_DESCRIPTOR: cudnnFinalize Descriptor Failed cudnn\_status: CUDNN\_STATUS\_NOT\_SUPPORTED (Triggered internally at ../aten/src/ATen/native/cudnn/Conv\_v8.cpp:919.)

return F.conv2d(input, weight, bias, self.stride,

Epoch 1/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 1/10 - Training - Loss: 0.4579797053099569

Epoch 1/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 1/10 - Validation - Loss: 0.31804297805798276

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.1.pth

Epoch 2/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 2/10 - Training - Loss: 0.37437606152903247

Epoch 2/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 2/10 - Validation - Loss: 0.30182655569579864

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.1.pth

Epoch 3/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 3/10 - Training - Loss: 0.3577405672664215

Epoch 3/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 3/10 - Validation - Loss: 0.2934112436724482

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.1.pth

Epoch 4/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 4/10 - Training - Loss: 0.35045205650486955

Epoch 4/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 4/10 - Validation - Loss: 0.30091296619287244

Epoch 5/10 - Training: 100%|██████████| 803/803 [19:01<00:00, 1.42s/it]

Epoch 5/10 - Training - Loss: 0.34410484027521104

Epoch 5/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 5/10 - Validation - Loss: 0.30135958627970133

Validation loss did not improve for 2 epochs. Reducing learning rate and restoring best model weights.

Model loaded from /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.1.pth

Epoch 6/10 - Training: 100%|██████████| 803/803 [18:59<00:00, 1.42s/it]

Epoch 6/10 - Training - Loss: 0.3405479585025854

Epoch 6/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 6/10 - Validation - Loss: 0.282528775088765

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.1.pth

Epoch 7/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 7/10 - Training - Loss: 0.33773472851344094

Epoch 7/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 7/10 - Validation - Loss: 0.2857814020028821

Epoch 8/10 - Training: 100%|██████████| 803/803 [18:59<00:00, 1.42s/it]

Epoch 8/10 - Training - Loss: 0.3357573596025315

Epoch 8/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 8/10 - Validation - Loss: 0.2841585839374198

Validation loss did not improve for 2 epochs. Reducing learning rate and restoring best model weights.

Model loaded from /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.1.pth

Epoch 9/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 9/10 - Training - Loss: 0.3366770519971254

Epoch 9/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 9/10 - Validation - Loss: 0.283898589718673

Epoch 10/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 10/10 - Training - Loss: 0.33641235721512125

Epoch 10/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 10/10 - Validation - Loss: 0.28435670370580973

Validation loss did not improve for 2 epochs. Reducing learning rate and restoring best model weights.

Model loaded from /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.1.pth

Training completed in 12253.80s

Losses saved to /content/experiment/Research/logs/exp1/noise\_0.1.csv

Evaluation: 100%|██████████| 2569/2569 [01:41<00:00, 25.23it/s]

{'map': tensor(0.2384), 'map\_50': tensor(0.4091), 'map\_75': tensor(0.2480), 'map\_small': tensor(0.0940), 'map\_medium': tensor(0.2132), 'map\_large': tensor(0.3447), 'mar\_1': tensor(0.2561), 'mar\_10': tensor(0.3325), 'mar\_100': tensor(0.3333), 'mar\_small': tensor(0.1433), 'mar\_medium': tensor(0.3181), 'mar\_large': tensor(0.4272), 'map\_per\_class': tensor([0.0000, 0.1990, 0.2399, 0.2011, 0.2054, 0.4138, 0.2913, 0.3071, 0.1361,

0.1272, 0.2338, 0.3406, 0.2461, 0.2997, 0.3373, 0.1880, 0.1981, 0.1757,

0.3420, 0.2864]), 'mar\_100\_per\_class': tensor([0.0000, 0.3534, 0.3354, 0.2772, 0.2831, 0.4714, 0.3948, 0.4078, 0.2585,

0.2393, 0.3026, 0.4417, 0.4038, 0.4314, 0.4506, 0.3086, 0.2642, 0.2305,

0.4355, 0.3761]), 'classes': tensor([ 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17,

18, 19], dtype=torch.int32)}

Noise

0.44573942782197185 0.8782828101090742

0.5909454845135903 0.5543604123554767

0.28399230108724316 0.7923968823209766

0.5457380853269099 0.6140913222268994

0.31320864843635454 0.2831374420626728

0.6587966694897504 0.622492944825078

0.2526597436684477 0.47799054190561135

0.7361656489920303 0.6988612359494316

0.38358036312367827 0.496492987108789

0.6725572039990931 0.5312134815198339

0.8327062892263102 0.5199272800648536

0.5110180923111853 0.4301130223591289

0.6522001356939882 0.33600481116148173

0.21110240092547705 0.4208884065528166

0.44961207293223593 0.6206642367026981

0.2632230923690415 0.5560504779613467

0.5411089286622336 0.5270254174663414

0.44052684035334033 0.3899790279811703

0.841271764875904 0.6023389422087728

0.4387545848171978 0.5897462490036322

0.7885876055793921 0.3088526822521963

0.5263294394167227 0.5829602713280163

0.4177455912999977 0.2531435077606303

0.338981720993707 0.6357845238651577

0.4422484822155255 0.4654626987672088

0.3050832715742413 0.6435850529530851

0.5947349738247659 0.8175206569824891

0.588797507348535 0.6312767711862004

0.6222026900710808 0.7832510847389097

0.2660321548838641 0.5927113193942543

0.30170769854912416 0.39549668259631154

0.5699358997021302 0.5278507785690604

Running on NVIDIA L4

Epoch 1/10 - Training: 100%|██████████| 803/803 [18:59<00:00, 1.42s/it]

Epoch 1/10 - Training - Loss: 0.5087404616854407

Epoch 1/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 1/10 - Validation - Loss: 0.31779663623483095

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.2.pth

Epoch 2/10 - Training: 100%|██████████| 803/803 [18:59<00:00, 1.42s/it]

Epoch 2/10 - Training - Loss: 0.43382230378770886

Epoch 2/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 2/10 - Validation - Loss: 0.3128545438801801

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.2.pth

Epoch 3/10 - Training: 100%|██████████| 803/803 [18:59<00:00, 1.42s/it]

Epoch 3/10 - Training - Loss: 0.4215970611661339

Epoch 3/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 3/10 - Validation - Loss: 0.30742009053075753

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.2.pth

Epoch 4/10 - Training: 100%|██████████| 803/803 [18:59<00:00, 1.42s/it]

Epoch 4/10 - Training - Loss: 0.41257948529527316

Epoch 4/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 4/10 - Validation - Loss: 0.30582404385010403

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.2.pth

Epoch 5/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 5/10 - Training - Loss: 0.408600196984607

Epoch 5/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 5/10 - Validation - Loss: 0.30284524460633594

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.2.pth

Epoch 6/10 - Training: 100%|██████████| 803/803 [18:59<00:00, 1.42s/it]

Epoch 6/10 - Training - Loss: 0.402473657098535

Epoch 6/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 6/10 - Validation - Loss: 0.30180269728104275

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.2.pth

Epoch 7/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 7/10 - Training - Loss: 0.4007726920163201

Epoch 7/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 7/10 - Validation - Loss: 0.2998444898812859

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.2.pth

Epoch 8/10 - Training: 100%|██████████| 803/803 [19:01<00:00, 1.42s/it]

Epoch 8/10 - Training - Loss: 0.39698366115651423

Epoch 8/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 8/10 - Validation - Loss: 0.3038446956693574

Epoch 9/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 9/10 - Training - Loss: 0.39534341249786603

Epoch 9/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 9/10 - Validation - Loss: 0.29624950416662077

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.2.pth

Epoch 10/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 10/10 - Training - Loss: 0.39311129394756306

Epoch 10/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 10/10 - Validation - Loss: 0.29967818781733513

Training completed in 12253.47s

Losses saved to /content/experiment/Research/logs/exp1/noise\_0.2.csv

Evaluation: 100%|██████████| 2569/2569 [01:41<00:00, 25.30it/s]

{'map': tensor(0.2295), 'map\_50': tensor(0.4034), 'map\_75': tensor(0.2312), 'map\_small': tensor(0.0825), 'map\_medium': tensor(0.2112), 'map\_large': tensor(0.3378), 'mar\_1': tensor(0.2548), 'mar\_10': tensor(0.3210), 'mar\_100': tensor(0.3220), 'mar\_small': tensor(0.1179), 'mar\_medium': tensor(0.3055), 'mar\_large': tensor(0.4211), 'map\_per\_class': tensor([0.0000, 0.1986, 0.2212, 0.1744, 0.2107, 0.4471, 0.2246, 0.2910, 0.1255,

0.2555, 0.2283, 0.3579, 0.1471, 0.2554, 0.3262, 0.1888, 0.1662, 0.1831,

0.3881, 0.2004]), 'mar\_100\_per\_class': tensor([0.0000, 0.3129, 0.3206, 0.2426, 0.2973, 0.5198, 0.3386, 0.3860, 0.2532,

0.3215, 0.3412, 0.4611, 0.3238, 0.3924, 0.4386, 0.2833, 0.2041, 0.2481,

0.4495, 0.3058]), 'classes': tensor([ 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17,

18, 19], dtype=torch.int32)}

Noise

0.42913835281349677 0.17475568130356628

0.3000828683565347 0.37936752646409744

0.47587532246699815 0.6961611157088079

0.7685861656756681 0.41427494577188995

0.327923139682544 0.5289136094530968

0.2552348678037881 0.5475147299832739

0.37359311681215024 0.7613685466989843

0.6695011098701126 0.46350716038111167

0.21531291556531568 0.44732261907194537

0.576852543956878 0.30025499506529774

0.5315082633118269 0.6024124758989096

0.5752854620000228 0.6328041581150092

0.7144955204639066 0.8636039444603272

0.8139226019665927 0.36851815891176287

0.37141385149325123 0.3104741211561469

0.24207391263032968 0.6739095417712637

0.24060220536264953 0.34745736500975055

0.5007830100753073 0.5041198895338186

0.22117753414686975 0.5765774131602998

0.2920620402499825 0.5761395849181392

0.5004109126422432 0.43090132236772066

0.49959148964733163 0.633189299708977

0.1035356416676515 0.31916900138029647

0.39763564331950657 0.3864153854794782

0.9149188551255542 0.27612410295492995

0.3589483603252301 0.2296535851852709

0.38374597965403434 0.6010744085060806

0.47614315850885724 0.40714162677287796

0.4039585039526071 0.48381625644584525

0.29446116889089746 0.6459742317919466

0.5357084532574294 0.3691544766680773

0.5264089571236029 0.3399321751197054

0.7240623692019684 0.7159374236055113

0.3978325171682955 0.25645228484665905

0.7984327925195107 0.688115999837716

0.4620599313263935 0.24696367208767583

0.6571721432472336 0.3140160775114561

0.7205110984916381 0.4252751108884926

0.45545475726416773 0.46244386110714186

0.6143735277301092 0.5371242261226664

0.5769856446983044 0.4279536839483448

0.3417061006975518 0.3138743730846596

0.8380472560284177 0.20515000354792234

0.6977023848630383 0.5879139923170914

0.3646055465333235 0.36395501293942645

0.3848700289613064 0.6388492165309461

0.3435977452840864 0.054658623197393896

0.37713866087262093 0.5886288659458501

0.26423228184164027 0.7348913988637993

0.7522352105685335 0.7569954680050173

Running on NVIDIA L4

Epoch 1/10 - Training: 100%|██████████| 803/803 [19:01<00:00, 1.42s/it]

Epoch 1/10 - Training - Loss: 0.5761213341952854

Epoch 1/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 1/10 - Validation - Loss: 0.3375103268082495

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.3.pth

Epoch 2/10 - Training: 100%|██████████| 803/803 [19:03<00:00, 1.42s/it]

Epoch 2/10 - Training - Loss: 0.4943129279619433

Epoch 2/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 2/10 - Validation - Loss: 0.32593737604717415

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.3.pth

Epoch 3/10 - Training: 100%|██████████| 803/803 [19:01<00:00, 1.42s/it]

Epoch 3/10 - Training - Loss: 0.4827787254288663

Epoch 3/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 3/10 - Validation - Loss: 0.30553911515959986

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.3.pth

Epoch 4/10 - Training: 100%|██████████| 803/803 [19:03<00:00, 1.42s/it]

Epoch 4/10 - Training - Loss: 0.4774411472110344

Epoch 4/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 4/10 - Validation - Loss: 0.3038023762680866

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.3.pth

Epoch 5/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 5/10 - Training - Loss: 0.4719890084391365

Epoch 5/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 5/10 - Validation - Loss: 0.2991827113760842

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.3.pth

Epoch 6/10 - Training: 100%|██████████| 803/803 [19:03<00:00, 1.42s/it]

Epoch 6/10 - Training - Loss: 0.46641273572020336

Epoch 6/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 6/10 - Validation - Loss: 0.31297535476861177

Epoch 7/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 7/10 - Training - Loss: 0.46599120205989664

Epoch 7/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 7/10 - Validation - Loss: 0.3083337567470692

Validation loss did not improve for 2 epochs. Reducing learning rate and restoring best model weights.

Model loaded from /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.3.pth

Epoch 8/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 8/10 - Training - Loss: 0.45331881541392277

Epoch 8/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 8/10 - Validation - Loss: 0.3009319308179396

Epoch 9/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 9/10 - Training - Loss: 0.4514948245819895

Epoch 9/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 9/10 - Validation - Loss: 0.2969792614242545

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.3.pth

Epoch 10/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 10/10 - Training - Loss: 0.4500909821776346

Epoch 10/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 10/10 - Validation - Loss: 0.29486774694588447

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.3.pth

Training completed in 12281.55s

Losses saved to /content/experiment/Research/logs/exp1/noise\_0.3.csv

Evaluation: 100%|██████████| 2569/2569 [01:42<00:00, 25.18it/s]

{'map': tensor(0.2520), 'map\_50': tensor(0.4239), 'map\_75': tensor(0.2679), 'map\_small': tensor(0.1092), 'map\_medium': tensor(0.2400), 'map\_large': tensor(0.3562), 'mar\_1': tensor(0.2647), 'mar\_10': tensor(0.3479), 'mar\_100': tensor(0.3511), 'mar\_small': tensor(0.1681), 'mar\_medium': tensor(0.3416), 'mar\_large': tensor(0.4372), 'map\_per\_class': tensor([0.0000, 0.2279, 0.3254, 0.2248, 0.1791, 0.4393, 0.3004, 0.3325, 0.1465,

0.1939, 0.2172, 0.4044, 0.2120, 0.2386, 0.3487, 0.1958, 0.2228, 0.1965,

0.3669, 0.2666]), 'mar\_100\_per\_class': tensor([0.0000, 0.3784, 0.4111, 0.3147, 0.2653, 0.5571, 0.4197, 0.4259, 0.2576,

0.3243, 0.3202, 0.5097, 0.3343, 0.3657, 0.4734, 0.3216, 0.3041, 0.2511,

0.4140, 0.3732]), 'classes': tensor([ 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17,

18, 19], dtype=torch.int32)}

Noise

0.5796802290490425 0.48158835960019053

0.27784543920762134 0.8087386555575891

0.6700619804275764 0.5349653119750446

0.36314076953863716 0.21458310627883748

0.42545601162627805 0.36536277024846403

0.4858084150946387 0.4443599851649548

0.35234756144622137 0.4372299770386651

0.4635908959919356 0.9007167394056922

0.767471560557712 0.46489560357996135

0.32631167392935 0.5231622444395443

0.4981443327671078 0.34968472342213586

0.6341917715439345 0.4679301495296877

0.5877413510454764 0.44299452002522266

0.6499620049447445 0.6532965895556777

0.4987910825561196 0.423829875283564

0.5800781928451761 0.39121408320822926

0.31417119698029994 0.680583131635721

0.2562956954510971 0.24313678411157197

0.5841630546008784 0.3822762200879745

0.39456214234924314 -0.19117769582926492

0.6091772536264836 0.6337288490617077

0.26710740898029156 0.3547074247239822

0.6052250053379135 0.6806891646119624

0.4982345622485293 0.7208418831680435

0.30519954810036587 0.2826878164118508

0.5812985626822053 0.6333184800053748

0.6568715328384332 0.31173799718981343

0.6603729186659134 0.40790656294564376

0.8281341800406531 0.8009578080874229

0.5787860937784773 0.41694794618125264

0.5260928089540411 0.7536034775847176

0.4047664554614474 0.13431477639470873

0.6639173601036369 0.4802072087017448

0.4801543185728355 0.5576196194219043

0.6180068140015499 0.953667789188784

0.6568606184174359 0.535131966402953

0.4963758064683659 0.6359450311743369

0.6584196068460044 0.5793805506378964

0.4679265969526934 0.55249020421469

0.2385971398857618 0.35630031639738524

0.28527239440979646 0.6187320910636293

0.545814566002485 0.11753888155123998

0.7489283025817012 0.3923144831941653

0.3649536431919946 0.16607433055149357

0.45288488667813964 0.5870875832669931

0.5863434991195838 0.6735656475842102

Running on NVIDIA L4

Epoch 1/10 - Training: 100%|██████████| 803/803 [19:01<00:00, 1.42s/it]

Epoch 1/10 - Training - Loss: 0.6327695656906475

Epoch 1/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 1/10 - Validation - Loss: 0.3433345281691463

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.4.pth

Epoch 2/10 - Training: 100%|██████████| 803/803 [19:01<00:00, 1.42s/it]

Epoch 2/10 - Training - Loss: 0.5599549613883754

Epoch 2/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 2/10 - Validation - Loss: 0.3330210341071641

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.4.pth

Epoch 3/10 - Training: 100%|██████████| 803/803 [19:01<00:00, 1.42s/it]

Epoch 3/10 - Training - Loss: 0.5443397338779302

Epoch 3/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 3/10 - Validation - Loss: 0.322305285130386

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.4.pth

Epoch 4/10 - Training: 100%|██████████| 803/803 [19:01<00:00, 1.42s/it]

Epoch 4/10 - Training - Loss: 0.5419771498345201

Epoch 4/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.26it/s]

Epoch 4/10 - Validation - Loss: 0.31382674958418916

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.4.pth

Epoch 5/10 - Training: 100%|██████████| 803/803 [19:01<00:00, 1.42s/it]

Epoch 5/10 - Training - Loss: 0.5366757231883955

Epoch 5/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 5/10 - Validation - Loss: 0.32429702517886955

Epoch 6/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 6/10 - Training - Loss: 0.5313503584855818

Epoch 6/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 6/10 - Validation - Loss: 0.3179282312867818

Validation loss did not improve for 2 epochs. Reducing learning rate and restoring best model weights.

Model loaded from /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.4.pth

Epoch 7/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 7/10 - Training - Loss: 0.5280735692749284

Epoch 7/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 7/10 - Validation - Loss: 0.31299181737833554

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.4.pth

Epoch 8/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 8/10 - Training - Loss: 0.5236367315684873

Epoch 8/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 8/10 - Validation - Loss: 0.3136569491967007

Epoch 9/10 - Training: 100%|██████████| 803/803 [19:01<00:00, 1.42s/it]

Epoch 9/10 - Training - Loss: 0.5215282656373004

Epoch 9/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 9/10 - Validation - Loss: 0.30529344123270774

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.4.pth

Epoch 10/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 10/10 - Training - Loss: 0.5175338576398186

Epoch 10/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.26it/s]

Epoch 10/10 - Validation - Loss: 0.309198801578195

Training completed in 12273.27s

Losses saved to /content/experiment/Research/logs/exp1/noise\_0.4.csv

Evaluation: 100%|██████████| 2569/2569 [01:42<00:00, 25.03it/s]

{'map': tensor(0.2386), 'map\_50': tensor(0.4063), 'map\_75': tensor(0.2537), 'map\_small': tensor(0.1228), 'map\_medium': tensor(0.2228), 'map\_large': tensor(0.3490), 'mar\_1': tensor(0.2548), 'mar\_10': tensor(0.3364), 'mar\_100': tensor(0.3403), 'mar\_small': tensor(0.1668), 'mar\_medium': tensor(0.3285), 'mar\_large': tensor(0.4277), 'map\_per\_class': tensor([0.0000, 0.1916, 0.3144, 0.1598, 0.2046, 0.3731, 0.2765, 0.3106, 0.1372,

0.2342, 0.2167, 0.3442, 0.1951, 0.2264, 0.3453, 0.1799, 0.2909, 0.1758,

0.3290, 0.2671]), 'mar\_100\_per\_class': tensor([0.0000, 0.3457, 0.4090, 0.2566, 0.2973, 0.4670, 0.3850, 0.4399, 0.2254,

0.3243, 0.3184, 0.4866, 0.3381, 0.3724, 0.4676, 0.3099, 0.3578, 0.2237,

0.3935, 0.3877]), 'classes': tensor([ 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17,

18, 19], dtype=torch.int32)}

Noise

0.32785472943485783 0.6193529573542675

0.319809196478383 0.4314491254566012

0.3162028276440305 0.6448344292143223

0.41930668014938155 0.5368328022119381

0.533563495654381 0.5321103024916585

0.3838095613462155 0.34820185111464524

0.5911117098761813 0.39124400034241597

0.6398492377212439 0.7102333675421564

0.4885231827582903 0.3712896304088125

0.4322627288370645 0.22143537089673665

0.5189814623286698 0.6302362602208709

0.35985462761979664 0.5988342425643147

0.19937436477511233 0.31870798433302805

0.2543318528729976 0.5158573072688898

0.498670884506687 0.31313977237738816

0.2997077758644643 0.628612519528079

0.827472968016134 0.31093440916773385

0.6652966087048162 0.6081968358343491

0.587055758544916 0.5069701611653535

0.73372307855696 0.3006973542739915

0.3833779429817351 0.4554932429689407

0.44332088222242483 0.17837716101746004

0.5109093217719046 0.4502035187852225

0.5701978253252828 0.7581856061779351

0.3219623475881773 0.5200449368884449

0.4862003970855108 0.599736912061768

0.3646020123127158 0.12491306887935999

0.1551895385233104 0.5558589918839609

0.5676290341629083 0.7188577089007095

0.7155289604568214 0.3663874211349173

0.6337419169005583 0.6571869339629985

0.3185023676808198 0.5769430089156066

0.6618682706457567 0.4633026834347606

0.4302221012517653 0.5834901922900688

0.5529488316777014 0.6582090620803727

Running on NVIDIA L4

Epoch 1/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 1/10 - Training - Loss: 0.6928017978947308

Epoch 1/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 1/10 - Validation - Loss: 0.35157865113406267

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.5.pth

Epoch 2/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 2/10 - Training - Loss: 0.6152053155088484

Epoch 2/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 2/10 - Validation - Loss: 0.34150361807809937

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.5.pth

Epoch 3/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 3/10 - Training - Loss: 0.6082301912539329

Epoch 3/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 3/10 - Validation - Loss: 0.3324684554504024

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.5.pth

Epoch 4/10 - Training: 100%|██████████| 803/803 [19:00<00:00, 1.42s/it]

Epoch 4/10 - Training - Loss: 0.5989043496985216

Epoch 4/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 4/10 - Validation - Loss: 0.3419494404009095

Epoch 5/10 - Training: 100%|██████████| 803/803 [19:03<00:00, 1.42s/it]

Epoch 5/10 - Training - Loss: 0.5958013513762211

Epoch 5/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.28it/s]

Epoch 5/10 - Validation - Loss: 0.3300559729061745

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.5.pth

Epoch 6/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 6/10 - Training - Loss: 0.5943824273637341

Epoch 6/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 6/10 - Validation - Loss: 0.33057693309254116

Epoch 7/10 - Training: 100%|██████████| 803/803 [19:03<00:00, 1.42s/it]

Epoch 7/10 - Training - Loss: 0.5875682609612737

Epoch 7/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.26it/s]

Epoch 7/10 - Validation - Loss: 0.33133973788332055

Validation loss did not improve for 2 epochs. Reducing learning rate and restoring best model weights.

Model loaded from /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.5.pth

Epoch 8/10 - Training: 100%|██████████| 803/803 [19:03<00:00, 1.42s/it]

Epoch 8/10 - Training - Loss: 0.5789574651537025

Epoch 8/10 - Validation: 100%|██████████| 108/108 [01:25<00:00, 1.27it/s]

Epoch 8/10 - Validation - Loss: 0.3174492160755175

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.5.pth

Epoch 9/10 - Training: 100%|██████████| 803/803 [19:02<00:00, 1.42s/it]

Epoch 9/10 - Training - Loss: 0.5775300355287151

Epoch 9/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 9/10 - Validation - Loss: 0.31221684951473166

Model saved to /content/experiment/Research/FCNN-models/exp1/run\_0\_noise0.5.pth

Epoch 10/10 - Training: 100%|██████████| 803/803 [19:04<00:00, 1.42s/it]

Epoch 10/10 - Training - Loss: 0.5802991390228271

Epoch 10/10 - Validation: 100%|██████████| 108/108 [01:24<00:00, 1.27it/s]

Epoch 10/10 - Validation - Loss: 0.3250575623026601

Training completed in 12272.79s

Losses saved to /content/experiment/Research/logs/exp1/noise\_0.5.csv

Evaluation: 100%|██████████| 2569/2569 [01:41<00:00, 25.21it/s]

{'map': tensor(0.2352), 'map\_50': tensor(0.4080), 'map\_75': tensor(0.2404), 'map\_small': tensor(0.1119), 'map\_medium': tensor(0.2368), 'map\_large': tensor(0.3256), 'mar\_1': tensor(0.2527), 'mar\_10': tensor(0.3357), 'mar\_100': tensor(0.3389), 'mar\_small': tensor(0.1672), 'mar\_medium': tensor(0.3397), 'mar\_large': tensor(0.4115), 'map\_per\_class': tensor([0.0000, 0.1544, 0.2214, 0.1766, 0.2063, 0.4805, 0.2773, 0.3846, 0.1091,

0.1776, 0.1738, 0.3338, 0.1566, 0.2785, 0.3370, 0.1775, 0.2671, 0.1902,

0.3331, 0.2681]), 'mar\_100\_per\_class': tensor([0.0000, 0.2905, 0.3196, 0.2765, 0.2907, 0.5879, 0.3983, 0.4798, 0.2057,

0.3178, 0.2579, 0.4478, 0.3162, 0.4114, 0.4651, 0.3142, 0.3500, 0.2603,

0.4118, 0.3775]), 'classes': tensor([ 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17,

18, 19], dtype=torch.int32)}