Dimensione Batch: 64,32,16

Ottimizzatore: Adam, SGD

Learning rate: 0,01, 0.001, 0.0001

Image size, 256, 128, 64

Epoche: 10, 25, 50

RGB:

**Risultati con batch size: 32,16,16, Adam, con image 256, lr = 0.001, 10 epoche**

train\_loss: 0.46818 valid\_loss: 0.41068 score: 0.47379 IoU: 0.56548 BIoU: 0.38209

train\_loss: 0.30974 valid\_loss: 0.43310 score: 0.54288 IoU: 0.63498 BIoU: 0.45078

train\_loss: 0.26374 valid\_loss: 0.50307 score: 0.48483 IoU: 0.57198 BIoU: 0.39768

train\_loss: 0.23844 valid\_loss: 0.32605 score: 0.63362 IoU: 0.70939 BIoU: 0.55785

train\_loss: 0.21741 valid\_loss: 0.26530 score: 0.66853 IoU: 0.73863 BIoU: 0.59842

train\_loss: 0.21478 valid\_loss: 0.25374 score: 0.66203 IoU: 0.72892 BIoU: 0.59514

train\_loss: 0.20081 valid\_loss: 0.32822 score: 0.60276 IoU: 0.67738 BIoU: 0.52813

train\_loss: 0.19009 valid\_loss: 0.23951 score: 0.66652 IoU: 0.74300 BIoU: 0.59004

train\_loss: 0.18670 valid\_loss: 0.25280 score: 0.51902 IoU: 0.59581 BIoU: 0.44224

train\_loss: 0.17509 valid\_loss: 0.21535 score: 0.59515 IoU: 0.66641 BIoU: 0.52389

**Risultati con batch size: 16,8,8, Adam, con image 128, lr = 0.001, 20 epoche:**

train\_loss: 0.40895 valid\_loss: 0.26933 score: 0.50158 IoU: 0.60106 BIoU: 0.40210

train\_loss: 0.25761 valid\_loss: 0.36365 score: 0.56904 IoU: 0.64831 BIoU: 0.48978

train\_loss: 0.22545 valid\_loss: 0.29974 score: 0.70058 IoU: 0.76611 BIoU: 0.63506

train\_loss: 0.20992 valid\_loss: 0.27734 score: 0.61218 IoU: 0.70741 BIoU: 0.51696

train\_loss: 0.20775 valid\_loss: 0.20365 score: 0.63806 IoU: 0.72291 BIoU: 0.55321

train\_loss: 0.20456 valid\_loss: 0.18270 score: 0.75758 IoU: 0.82201 BIoU: 0.69315

train\_loss: 0.18836 valid\_loss: 0.17137 score: 0.75641 IoU: 0.82257 BIoU: 0.69025

train\_loss: 0.20745 valid\_loss: 0.21327 score: 0.69706 IoU: 0.77392 BIoU: 0.62020

train\_loss: 0.18856 valid\_loss: 0.17260 score: 0.77292 IoU: 0.83457 BIoU: 0.71127

train\_loss: 0.19856 valid\_loss: 0.33372 score: 0.66615 IoU: 0.73199 BIoU: 0.60031

train\_loss: 0.19571 valid\_loss: 0.54944 score: 0.56105 IoU: 0.63475 BIoU: 0.48734

train\_loss: 0.18148 valid\_loss: 0.16538 score: 0.77874 IoU: 0.83779 BIoU: 0.71969

train\_loss: 0.17613 valid\_loss: 0.17819 score: 0.75305 IoU: 0.81611 BIoU: 0.68998

train\_loss: 0.18001 valid\_loss: 0.15188 score: 0.77427 IoU: 0.83536 BIoU: 0.71319

train\_loss: 0.17751 valid\_loss: 0.15377 score: 0.78974 IoU: 0.84724 BIoU: 0.73224

train\_loss: 0.17810 valid\_loss: 0.15941 score: 0.77485 IoU: 0.83608 BIoU: 0.71362

train\_loss: 0.17099 valid\_loss: 0.17071 score: 0.74411 IoU: 0.80670 BIoU: 0.68151

Early Stopping Triggered With Patience 3

**Risultati con batch size: 16,8,8, SGD, con image 256, lr = 0.001, 20 epoche**

train\_loss: 0.71512 valid\_loss: 0.57345 score: 0.43478 IoU: 0.52548 BIoU: 0.34408

train\_loss: 0.61605 valid\_loss: 0.51635 score: 0.43262 IoU: 0.52362 BIoU: 0.34163

train\_loss: 0.55469 valid\_loss: 0.54878 score: 0.43055 IoU: 0.52339 BIoU: 0.33771

train\_loss: 0.51412 valid\_loss: 0.45663 score: 0.42815 IoU: 0.52142 BIoU: 0.33487

train\_loss: 0.47733 valid\_loss: 0.48028 score: 0.42933 IoU: 0.52266 BIoU: 0.33601

train\_loss: 0.45899 valid\_loss: 0.43461 score: 0.43231 IoU: 0.52497 BIoU: 0.33965

train\_loss: 0.43873 valid\_loss: 0.40820 score: 0.43073 IoU: 0.52386 BIoU: 0.33760

train\_loss: 0.41945 valid\_loss: 0.39673 score: 0.42886 IoU: 0.52226 BIoU: 0.33546

train\_loss: 0.40376 valid\_loss: 0.41849 score: 0.43774 IoU: 0.52999 BIoU: 0.34549

train\_loss: 0.39546 valid\_loss: 0.37628 score: 0.42999 IoU: 0.52305 BIoU: 0.33694

train\_loss: 0.38081 valid\_loss: 0.39627 score: 0.43583 IoU: 0.52855 BIoU: 0.34311

train\_loss: 0.36783 valid\_loss: 0.37849 score: 0.42984 IoU: 0.52341 BIoU: 0.33628

train\_loss: 0.35846 valid\_loss: 0.36315 score: 0.44249 IoU: 0.53517 BIoU: 0.34981

train\_loss: 0.34488 valid\_loss: 0.43778 score: 0.43510 IoU: 0.52787 BIoU: 0.34233

train\_loss: 0.33192 valid\_loss: 0.38379 score: 0.45803 IoU: 0.54935 BIoU: 0.36670

train\_loss: 0.32305 valid\_loss: 0.36950 score: 0.46174 IoU: 0.55693 BIoU: 0.36655

train\_loss: 0.31668 valid\_loss: 0.32336 score: 0.43898 IoU: 0.53263 BIoU: 0.34532

train\_loss: 0.31339 valid\_loss: 0.32406 score: 0.43955 IoU: 0.53268 BIoU: 0.34641

train\_loss: 0.31545 valid\_loss: 0.31725 score: 0.44200 IoU: 0.53555 BIoU: 0.34846

train\_loss: 0.31500 valid\_loss: 0.31546 score: 0.43728 IoU: 0.53142 BIoU: 0.34313

modello: unet\_rgb6

**Risultati con batch size: 8,4,4, Adam, con image 256, lr = 0.0001, 20 epoche**

train\_loss: 0.52894 valid\_loss: 0.44273 score: 0.47395 IoU: 0.56729 BIoU: 0.38060

train\_loss: 0.37974 valid\_loss: 0.42144 score: 0.45615 IoU: 0.54659 BIoU: 0.36572

train\_loss: 0.30756 valid\_loss: 0.30386 score: 0.50529 IoU: 0.59191 BIoU: 0.41868

train\_loss: 0.26835 valid\_loss: 0.30230 score: 0.52718 IoU: 0.62094 BIoU: 0.43343

train\_loss: 0.23947 valid\_loss: 0.24693 score: 0.47747 IoU: 0.56790 BIoU: 0.38704

train\_loss: 0.22029 valid\_loss: 0.25066 score: 0.47965 IoU: 0.57003 BIoU: 0.38926

train\_loss: 0.20392 valid\_loss: 0.23181 score: 0.52077 IoU: 0.60436 BIoU: 0.43718

train\_loss: 0.18506 valid\_loss: 0.22319 score: 0.45197 IoU: 0.53843 BIoU: 0.36550

train\_loss: 0.18010 valid\_loss: 0.32097 score: 0.57152 IoU: 0.65925 BIoU: 0.48379

train\_loss: 0.17226 valid\_loss: 0.19963 score: 0.47554 IoU: 0.56123 BIoU: 0.38985

train\_loss: 0.15899 valid\_loss: 0.19901 score: 0.48442 IoU: 0.56656 BIoU: 0.40228

train\_loss: 0.15560 valid\_loss: 0.20885 score: 0.57805 IoU: 0.65820 BIoU: 0.49790

train\_loss: 0.15358 valid\_loss: 0.21650 score: 0.48678 IoU: 0.56846 BIoU: 0.40510

train\_loss: 0.14553 valid\_loss: 0.18459 score: 0.49843 IoU: 0.57239 BIoU: 0.42448

train\_loss: 0.14243 valid\_loss: 0.20677 score: 0.47829 IoU: 0.55683 BIoU: 0.39974

train\_loss: 0.13430 valid\_loss: 0.20753 score: 0.46645 IoU: 0.54505 BIoU: 0.38784

train\_loss: 0.13881 valid\_loss: 0.20208 score: 0.57908 IoU: 0.65731 BIoU: 0.50086

train\_loss: 0.12253 valid\_loss: 0.17495 score: 0.56810 IoU: 0.64051 BIoU: 0.49569

train\_loss: 0.11534 valid\_loss: 0.17227 score: 0.51190 IoU: 0.58391 BIoU: 0.43989

train\_loss: 0.11778 valid\_loss: 0.16610 score: 0.51565 IoU: 0.58791 BIoU: 0.44339

modello: unet\_rgb\_7

**Risultati con batch size: 8,4,4, Adam, con image 64, lr = 0.001, 20 epoche**

train\_loss: 0.47414 valid\_loss: 0.34460 score: 0.56159 IoU: 0.64515 BIoU: 0.47803

train\_loss: 0.30851 valid\_loss: 0.27635 score: 0.51294 IoU: 0.59849 BIoU: 0.42739

train\_loss: 0.26318 valid\_loss: 0.27849 score: 0.60271 IoU: 0.67958 BIoU: 0.52584

train\_loss: 0.23986 valid\_loss: 0.42078 score: 0.56169 IoU: 0.65283 BIoU: 0.47054

train\_loss: 0.23461 valid\_loss: 0.29819 score: 0.63136 IoU: 0.70886 BIoU: 0.55385

train\_loss: 0.20218 valid\_loss: 0.22481 score: 0.67177 IoU: 0.74966 BIoU: 0.59388

train\_loss: 0.18543 valid\_loss: 0.21963 score: 0.68225 IoU: 0.76002 BIoU: 0.60448

train\_loss: 0.17792 valid\_loss: 0.20548 score: 0.64549 IoU: 0.72275 BIoU: 0.56823

train\_loss: 0.17571 valid\_loss: 0.20838 score: 0.68344 IoU: 0.76194 BIoU: 0.60495

train\_loss: 0.16849 valid\_loss: 0.21585 score: 0.69488 IoU: 0.77343 BIoU: 0.61633

train\_loss: 0.16873 valid\_loss: 0.20995 score: 0.69756 IoU: 0.77520 BIoU: 0.61993

train\_loss: 0.16337 valid\_loss: 0.20632 score: 0.67484 IoU: 0.75096 BIoU: 0.59873

train\_loss: 0.16433 valid\_loss: 0.20993 score: 0.67683 IoU: 0.75351 BIoU: 0.60015

train\_loss: 0.15884 valid\_loss: 0.20681 score: 0.67823 IoU: 0.75463 BIoU: 0.60183

train\_loss: 0.15837 valid\_loss: 0.20328 score: 0.68049 IoU: 0.75699 BIoU: 0.60399

train\_loss: 0.16291 valid\_loss: 0.20932 score: 0.67584 IoU: 0.75191 BIoU: 0.59977

train\_loss: 0.15772 valid\_loss: 0.20812 score: 0.67966 IoU: 0.75663 BIoU: 0.60270

train\_loss: 0.15835 valid\_loss: 0.20609 score: 0.68624 IoU: 0.76399 BIoU: 0.60849

train\_loss: 0.15688 valid\_loss: 0.20813 score: 0.68006 IoU: 0.75661 BIoU: 0.60352

train\_loss: 0.15956 valid\_loss: 0.20557 score: 0.68953 IoU: 0.76705 BIoU: 0.61200

modello: unet\_rgb8

LiDAR:

**Risultati con batch size: 32,16,16, Adam, con image 256, lr = 0.001, 10 epoche**

train\_loss: 0.32377 valid\_loss: 0.14647 score: 0.69853 IoU: 0.78736 BIoU: 0.60970

train\_loss: 0.20451 valid\_loss: 0.22119 score: 0.59668 IoU: 0.67884 BIoU: 0.51452

train\_loss: 0.16115 valid\_loss: 0.10870 score: 0.82567 IoU: 0.88071 BIoU: 0.77063

train\_loss: 0.13402 valid\_loss: 0.09533 score: 0.75177 IoU: 0.81848 BIoU: 0.68506

train\_loss: 0.13403 valid\_loss: 0.09067 score: 0.70359 IoU: 0.78038 BIoU: 0.62681

train\_loss: 0.11022 valid\_loss: 0.08542 score: 0.86249 IoU: 0.90660 BIoU: 0.81837

train\_loss: 0.13093 valid\_loss: 0.99494 score: 0.50697 IoU: 0.58935 BIoU: 0.42460

train\_loss: 0.12239 valid\_loss: 0.08706 score: 0.82400 IoU: 0.87733 BIoU: 0.77067

train\_loss: 0.10983 valid\_loss: 0.19892 score: 0.64293 IoU: 0.73218 BIoU: 0.55368

train\_loss: 0.10767 valid\_loss: 0.07442 score: 0.81280 IoU: 0.86792 BIoU: 0.75768

**Risultati con batch size: 16,8,8, Adam, con image 128, lr = 0.001, 20 epoche**

train\_loss: 0.37348 valid\_loss: 0.37905 score: 0.50415 IoU: 0.58675 BIoU: 0.42155

train\_loss: 0.21447 valid\_loss: 0.68008 score: 0.50659 IoU: 0.58904 BIoU: 0.42415

train\_loss: 0.19270 valid\_loss: 0.13423 score: 0.66022 IoU: 0.75456 BIoU: 0.56587

train\_loss: 0.16810 valid\_loss: 0.11217 score: 0.74444 IoU: 0.81718 BIoU: 0.67170

train\_loss: 0.15344 valid\_loss: 0.41126 score: 0.51192 IoU: 0.59328 BIoU: 0.43056

train\_loss: 0.13137 valid\_loss: 0.58263 score: 0.51079 IoU: 0.59277 BIoU: 0.42881

train\_loss: 0.12700 valid\_loss: 0.10471 score: 0.84473 IoU: 0.89246 BIoU: 0.79700

train\_loss: 0.11424 valid\_loss: 0.15807 score: 0.51425 IoU: 0.60189 BIoU: 0.42660

train\_loss: 0.10901 valid\_loss: 0.08120 score: 0.77647 IoU: 0.83888 BIoU: 0.71407

train\_loss: 0.10633 valid\_loss: 0.08986 score: 0.83943 IoU: 0.88906 BIoU: 0.78980

train\_loss: 0.09655 valid\_loss: 0.07911 score: 0.83557 IoU: 0.87623 BIoU: 0.79491

train\_loss: 0.10070 valid\_loss: 0.09521 score: 0.76318 IoU: 0.82173 BIoU: 0.70463

train\_loss: 0.09933 valid\_loss: 0.10780 score: 0.62740 IoU: 0.68160 BIoU: 0.57320

train\_loss: 0.09736 valid\_loss: 0.07600 score: 0.73686 IoU: 0.79686 BIoU: 0.67685

train\_loss: 0.09138 valid\_loss: 0.99940 score: 0.50681 IoU: 0.58934 BIoU: 0.42427

train\_loss: 0.09242 valid\_loss: 0.11135 score: 0.84573 IoU: 0.89621 BIoU: 0.79526

train\_loss: 0.09087 valid\_loss: 0.07897 score: 0.72789 IoU: 0.79073 BIoU: 0.66505

train\_loss: 0.08901 valid\_loss: 0.07226 score: 0.71484 IoU: 0.75052 BIoU: 0.67916

train\_loss: 0.09360 valid\_loss: 0.07362 score: 0.87078 IoU: 0.91060 BIoU: 0.83096

train\_loss: 0.09131 valid\_loss: 0.08543 score: 0.61714 IoU: 0.66107 BIoU: 0.57321

modello: unet\_lidar2

**Risultati con batch size: 16,8,8, SGD, con image 256, lr = 0.001, 20 epoche**

train\_loss: 0.70278 valid\_loss: 0.57979 score: 0.50712 IoU: 0.58960 BIoU: 0.42464

train\_loss: 0.61587 valid\_loss: 0.54257 score: 0.50515 IoU: 0.58775 BIoU: 0.42255

train\_loss: 0.58142 valid\_loss: 0.52853 score: 0.51136 IoU: 0.59304 BIoU: 0.42969

train\_loss: 0.55673 valid\_loss: 0.47815 score: 0.50892 IoU: 0.59100 BIoU: 0.42685

train\_loss: 0.53616 valid\_loss: 0.44402 score: 0.50502 IoU: 0.58755 BIoU: 0.42248

train\_loss: 0.51828 valid\_loss: 0.43017 score: 0.50658 IoU: 0.58912 BIoU: 0.42404

train\_loss: 0.49598 valid\_loss: 0.36500 score: 0.50713 IoU: 0.58952 BIoU: 0.42474

train\_loss: 0.45327 valid\_loss: 0.42189 score: 0.50671 IoU: 0.58928 BIoU: 0.42415

train\_loss: 0.40943 valid\_loss: 0.33611 score: 0.50707 IoU: 0.58959 BIoU: 0.42455

train\_loss: 0.36370 valid\_loss: 0.28752 score: 0.50679 IoU: 0.58929 BIoU: 0.42429

train\_loss: 0.35185 valid\_loss: 0.26777 score: 0.50492 IoU: 0.58766 BIoU: 0.42217

train\_loss: 0.30907 valid\_loss: 0.34654 score: 0.51135 IoU: 0.59278 BIoU: 0.42992

train\_loss: 0.30439 valid\_loss: 0.20779 score: 0.50677 IoU: 0.58914 BIoU: 0.42439

train\_loss: 0.27650 valid\_loss: 0.19385 score: 0.50912 IoU: 0.59129 BIoU: 0.42695

train\_loss: 0.27454 valid\_loss: 0.18708 score: 0.50459 IoU: 0.58734 BIoU: 0.42184

train\_loss: 0.26215 valid\_loss: 0.20040 score: 0.50493 IoU: 0.58736 BIoU: 0.42251

train\_loss: 0.27011 valid\_loss: 0.20663 score: 0.50900 IoU: 0.59107 BIoU: 0.42693

train\_loss: 0.25808 valid\_loss: 0.17047 score: 0.50692 IoU: 0.58943 BIoU: 0.42441

train\_loss: 0.25116 valid\_loss: 0.43196 score: 0.50677 IoU: 0.58934 BIoU: 0.42421

train\_loss: 0.23936 valid\_loss: 0.80859 score: 0.50898 IoU: 0.59117 BIoU: 0.42679

modello: unet\_lidar1

**Risultati con batch size: 8,4,4, Adam, con image 256, lr = 0.0001, 20 epoche**

train\_loss: 0.46257 valid\_loss: 0.30597 score: 0.56369 IoU: 0.63658 BIoU: 0.49080

train\_loss: 0.31428 valid\_loss: 0.27454 score: 0.59224 IoU: 0.65685 BIoU: 0.52763

train\_loss: 0.26200 valid\_loss: 0.31165 score: 0.54754 IoU: 0.61333 BIoU: 0.48176

train\_loss: 0.22290 valid\_loss: 0.60588 score: 0.51739 IoU: 0.59480 BIoU: 0.43997

train\_loss: 0.20893 valid\_loss: 0.21030 score: 0.53133 IoU: 0.60113 BIoU: 0.46152

train\_loss: 0.17327 valid\_loss: 0.15968 score: 0.64610 IoU: 0.71169 BIoU: 0.58052

train\_loss: 0.16821 valid\_loss: 0.15519 score: 0.55166 IoU: 0.61526 BIoU: 0.48806

train\_loss: 0.14838 valid\_loss: 0.20354 score: 0.54472 IoU: 0.60807 BIoU: 0.48137

train\_loss: 0.13489 valid\_loss: 0.10529 score: 0.54220 IoU: 0.60805 BIoU: 0.47636

train\_loss: 0.14032 valid\_loss: 0.11968 score: 0.77330 IoU: 0.82446 BIoU: 0.72214

train\_loss: 0.11821 valid\_loss: 0.10137 score: 0.56502 IoU: 0.62322 BIoU: 0.50683

train\_loss: 0.11732 valid\_loss: 0.11025 score: 0.54662 IoU: 0.61024 BIoU: 0.48300

train\_loss: 0.10682 valid\_loss: 0.38291 score: 0.50891 IoU: 0.59014 BIoU: 0.42768

train\_loss: 0.11952 valid\_loss: 0.12399 score: 0.61466 IoU: 0.66344 BIoU: 0.56588

train\_loss: 0.09749 valid\_loss: 0.11331 score: 0.57016 IoU: 0.62595 BIoU: 0.51436

train\_loss: 0.09693 valid\_loss: 0.08813 score: 0.63040 IoU: 0.67395 BIoU: 0.58685

train\_loss: 0.09474 valid\_loss: 0.08824 score: 0.58305 IoU: 0.63571 BIoU: 0.53039

train\_loss: 0.09591 valid\_loss: 0.08752 score: 0.55177 IoU: 0.61205 BIoU: 0.49150

train\_loss: 0.09018 valid\_loss: 0.09703 score: 0.59707 IoU: 0.64590 BIoU: 0.54823

train\_loss: 0.09310 valid\_loss: 0.08328 score: 0.64452 IoU: 0.68661 BIoU: 0.60242

modello: unet\_lidar\_3

**Risultati con batch size: 8,4,4, Adam, con image 64, lr = 0.001, 20 epoche**

train\_loss: 0.38139 valid\_loss: 0.17918 score: 0.60055 IoU: 0.67985 BIoU: 0.52124

train\_loss: 0.21956 valid\_loss: 0.14412 score: 0.63194 IoU: 0.71659 BIoU: 0.54729

train\_loss: 0.18349 valid\_loss: 0.15327 score: 0.57322 IoU: 0.63724 BIoU: 0.50919

train\_loss: 0.18916 valid\_loss: 0.11719 score: 0.50798 IoU: 0.58995 BIoU: 0.42601

train\_loss: 0.16176 valid\_loss: 0.13510 score: 0.59851 IoU: 0.67203 BIoU: 0.52498

train\_loss: 0.14581 valid\_loss: 0.99823 score: 0.50729 IoU: 0.58960 BIoU: 0.42498

train\_loss: 0.15689 valid\_loss: 0.15039 score: 0.79517 IoU: 0.85650 BIoU: 0.73384

train\_loss: 0.11230 valid\_loss: 0.08459 score: 0.74693 IoU: 0.81721 BIoU: 0.67665

train\_loss: 0.10333 valid\_loss: 0.08495 score: 0.75486 IoU: 0.82179 BIoU: 0.68793

train\_loss: 0.10019 valid\_loss: 0.12582 score: 0.51247 IoU: 0.59551 BIoU: 0.42943

train\_loss: 0.10826 valid\_loss: 0.10849 score: 0.62237 IoU: 0.69480 BIoU: 0.54995

train\_loss: 0.09745 valid\_loss: 0.08073 score: 0.66531 IoU: 0.73874 BIoU: 0.59189

train\_loss: 0.10026 valid\_loss: 0.09203 score: 0.60276 IoU: 0.69002 BIoU: 0.51551

train\_loss: 0.09533 valid\_loss: 0.07938 score: 0.67169 IoU: 0.74876 BIoU: 0.59461

train\_loss: 0.09543 valid\_loss: 0.07519 score: 0.74449 IoU: 0.80850 BIoU: 0.68048

train\_loss: 0.09762 valid\_loss: 0.08441 score: 0.66739 IoU: 0.74177 BIoU: 0.59301

train\_loss: 0.09603 valid\_loss: 0.09274 score: 0.66951 IoU: 0.74373 BIoU: 0.59529

train\_loss: 0.09914 valid\_loss: 0.08616 score: 0.72910 IoU: 0.79297 BIoU: 0.66522

train\_loss: 0.09844 valid\_loss: 0.08078 score: 0.69302 IoU: 0.76278 BIoU: 0.62326

train\_loss: 0.09717 valid\_loss: 0.09542 score: 0.68626 IoU: 0.75632 BIoU: 0.61621

modello: unet\_lidar4

RGB + LiDAR:

**Risultati con batch size: 32,16,16, Adam, con image 256, lr = 0.001, 10 epoche**

**Risultati con batch size: 16,8,8, Adam, con image 128, lr = 0.001, 20 epoche**

train\_loss: 0.40895 valid\_loss: 0.26933 score: 0.50158 IoU: 0.60106 BIoU: 0.40210

train\_loss: 0.25761 valid\_loss: 0.36365 score: 0.56904 IoU: 0.64831 BIoU: 0.48978

train\_loss: 0.22545 valid\_loss: 0.29974 score: 0.70058 IoU: 0.76611 BIoU: 0.63506

train\_loss: 0.20992 valid\_loss: 0.27734 score: 0.61218 IoU: 0.70741 BIoU: 0.51696

train\_loss: 0.20775 valid\_loss: 0.20365 score: 0.63806 IoU: 0.72291 BIoU: 0.55321

train\_loss: 0.20456 valid\_loss: 0.18270 score: 0.75758 IoU: 0.82201 BIoU: 0.69315

train\_loss: 0.18836 valid\_loss: 0.17137 score: 0.75641 IoU: 0.82257 BIoU: 0.69025

train\_loss: 0.20745 valid\_loss: 0.21327 score: 0.69706 IoU: 0.77392 BIoU: 0.62020

train\_loss: 0.18856 valid\_loss: 0.17260 score: 0.77292 IoU: 0.83457 BIoU: 0.71127

train\_loss: 0.19856 valid\_loss: 0.33372 score: 0.66615 IoU: 0.73199 BIoU: 0.60031

train\_loss: 0.19571 valid\_loss: 0.54944 score: 0.56105 IoU: 0.63475 BIoU: 0.48734

train\_loss: 0.18148 valid\_loss: 0.16538 score: 0.77874 IoU: 0.83779 BIoU: 0.71969

train\_loss: 0.17613 valid\_loss: 0.17819 score: 0.75305 IoU: 0.81611 BIoU: 0.68998

train\_loss: 0.18001 valid\_loss: 0.15188 score: 0.77427 IoU: 0.83536 BIoU: 0.71319

train\_loss: 0.17751 valid\_loss: 0.15377 score: 0.78974 IoU: 0.84724 BIoU: 0.73224

train\_loss: 0.17810 valid\_loss: 0.15941 score: 0.77485 IoU: 0.83608 BIoU: 0.71362

train\_loss: 0.17099 valid\_loss: 0.17071 score: 0.74411 IoU: 0.80670 BIoU: 0.68151

Early Stopping Triggered With Patience 3

**Risultati con batch size: 16,8,8, SGD, con image 256, lr = 0.001, 20 epoche**

train\_loss: 0.66384 valid\_loss: 0.53692 score: 0.43685 IoU: 0.52741 BIoU: 0.34629

train\_loss: 0.54092 valid\_loss: 0.45631 score: 0.43163 IoU: 0.52273 BIoU: 0.34053

train\_loss: 0.46937 valid\_loss: 0.43129 score: 0.43000 IoU: 0.52164 BIoU: 0.33836

train\_loss: 0.42154 valid\_loss: 0.38291 score: 0.43218 IoU: 0.52347 BIoU: 0.34090

train\_loss: 0.37881 valid\_loss: 0.34132 score: 0.43011 IoU: 0.52183 BIoU: 0.33838

train\_loss: 0.35036 valid\_loss: 0.30511 score: 0.42947 IoU: 0.52152 BIoU: 0.33742

train\_loss: 0.32134 valid\_loss: 0.26757 score: 0.43186 IoU: 0.52336 BIoU: 0.34036

train\_loss: 0.29699 valid\_loss: 0.24528 score: 0.42978 IoU: 0.52140 BIoU: 0.33815

train\_loss: 0.27309 valid\_loss: 0.27335 score: 0.43030 IoU: 0.52196 BIoU: 0.33863

train\_loss: 0.26359 valid\_loss: 0.23636 score: 0.43279 IoU: 0.52355 BIoU: 0.34204

train\_loss: 0.25319 valid\_loss: 0.54865 score: 0.42978 IoU: 0.52153 BIoU: 0.33802

train\_loss: 0.25190 valid\_loss: 0.22012 score: 0.43010 IoU: 0.52185 BIoU: 0.33835

train\_loss: 0.23703 valid\_loss: 0.26912 score: 0.42947 IoU: 0.52104 BIoU: 0.33789

train\_loss: 0.25815 valid\_loss: 0.34746 score: 0.43218 IoU: 0.52353 BIoU: 0.34083

train\_loss: 0.25044 valid\_loss: 0.21060 score: 0.42936 IoU: 0.52136 BIoU: 0.33737

train\_loss: 0.23294 valid\_loss: 0.19900 score: 0.43202 IoU: 0.52350 BIoU: 0.34054

train\_loss: 0.23132 valid\_loss: 0.20044 score: 0.43215 IoU: 0.52328 BIoU: 0.34102

train\_loss: 0.20400 valid\_loss: 0.19458 score: 0.43218 IoU: 0.52332 BIoU: 0.34104

train\_loss: 0.21792 valid\_loss: 0.25717 score: 0.43215 IoU: 0.52338 BIoU: 0.34091

train\_loss: 0.23883 valid\_loss: 0.16736 score: 0.43518 IoU: 0.52578 BIoU: 0.34458

**Risultati con batch size: 8,4,4, Adam, con image 256, lr = 0.0001, 20 epoche**

train\_loss: 0.51320 valid\_loss: 0.40321 score: 0.48845 IoU: 0.57698 BIoU: 0.39991

train\_loss: 0.38491 valid\_loss: 0.43429 score: 0.44371 IoU: 0.53009 BIoU: 0.35733

train\_loss: 0.32345 valid\_loss: 0.25577 score: 0.67116 IoU: 0.75390 BIoU: 0.58841

train\_loss: 0.28238 valid\_loss: 0.20060 score: 0.59115 IoU: 0.67912 BIoU: 0.50318

train\_loss: 0.26598 valid\_loss: 0.23749 score: 0.53234 IoU: 0.59324 BIoU: 0.47143

train\_loss: 0.23734 valid\_loss: 0.59250 score: 0.43401 IoU: 0.52383 BIoU: 0.34419

train\_loss: 0.21839 valid\_loss: 0.41881 score: 0.53823 IoU: 0.60836 BIoU: 0.46810

train\_loss: 0.19848 valid\_loss: 0.19721 score: 0.54633 IoU: 0.60268 BIoU: 0.48997

train\_loss: 0.20027 valid\_loss: 0.21633 score: 0.56978 IoU: 0.62594 BIoU: 0.51361

train\_loss: 0.19177 valid\_loss: 0.18229 score: 0.47668 IoU: 0.54739 BIoU: 0.40597

train\_loss: 0.19137 valid\_loss: 0.20126 score: 0.52747 IoU: 0.58839 BIoU: 0.46656

train\_loss: 0.18800 valid\_loss: 0.15545 score: 0.50910 IoU: 0.57208 BIoU: 0.44612

train\_loss: 0.18416 valid\_loss: 0.15518 score: 0.52913 IoU: 0.58921 BIoU: 0.46905

train\_loss: 0.18905 valid\_loss: 0.19169 score: 0.53833 IoU: 0.60010 BIoU: 0.47657

train\_loss: 0.18866 valid\_loss: 0.18950 score: 0.49496 IoU: 0.56243 BIoU: 0.42749

train\_loss: 0.18041 valid\_loss: 0.19646 score: 0.49727 IoU: 0.56345 BIoU: 0.43110

train\_loss: 0.18342 valid\_loss: 0.17966 score: 0.51806 IoU: 0.58170 BIoU: 0.45443

train\_loss: 0.18498 valid\_loss: 0.18113 score: 0.51742 IoU: 0.57997 BIoU: 0.45487

train\_loss: 0.17929 valid\_loss: 0.19332 score: 0.49832 IoU: 0.56605 BIoU: 0.43058

train\_loss: 0.17535 valid\_loss: 0.18668 score: 0.48369 IoU: 0.55564 BIoU: 0.41173

**Risultati con batch size: 8,4,4, Adam, con image 64, lr = 0.001, 20 epoche**

train\_loss: 0.33447 valid\_loss: 0.87209 score: 0.43611 IoU: 0.52744 BIoU: 0.34479

train\_loss: 0.23684 valid\_loss: 0.34217 score: 0.50698 IoU: 0.59246 BIoU: 0.42150

train\_loss: 0.23560 valid\_loss: 0.31043 score: 0.73248 IoU: 0.81915 BIoU: 0.64580

train\_loss: 0.21073 valid\_loss: 0.22179 score: 0.69305 IoU: 0.76714 BIoU: 0.61895

train\_loss: 0.20585 valid\_loss: 0.20776 score: 0.49420 IoU: 0.56926 BIoU: 0.41913

train\_loss: 0.21210 valid\_loss: 0.22614 score: 0.63405 IoU: 0.69581 BIoU: 0.57229

train\_loss: 0.19916 valid\_loss: 0.25353 score: 0.61166 IoU: 0.67300 BIoU: 0.55032

train\_loss: 0.19577 valid\_loss: 0.27683 score: 0.74367 IoU: 0.82797 BIoU: 0.65937

train\_loss: 0.16748 valid\_loss: 0.21610 score: 0.63905 IoU: 0.70309 BIoU: 0.57501

train\_loss: 0.16252 valid\_loss: 0.16340 score: 0.63475 IoU: 0.69190 BIoU: 0.57760

train\_loss: 0.17192 valid\_loss: 0.15747 score: 0.66683 IoU: 0.72015 BIoU: 0.61351

train\_loss: 0.17874 valid\_loss: 0.19243 score: 0.62353 IoU: 0.67934 BIoU: 0.56772

train\_loss: 0.16358 valid\_loss: 0.14912 score: 0.67359 IoU: 0.73259 BIoU: 0.61458

train\_loss: 0.17396 valid\_loss: 0.15356 score: 0.70327 IoU: 0.76119 BIoU: 0.64535

train\_loss: 0.15615 valid\_loss: 0.16302 score: 0.64834 IoU: 0.70538 BIoU: 0.59130

train\_loss: 0.16925 valid\_loss: 0.16987 score: 0.67581 IoU: 0.73409 BIoU: 0.61753

Early Stopping Triggered With Patience 3