Table S1: Similarity Values for 117 Randomly Selected Images Out of a Total of 360

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Data Image Name** | **Conventional Method** | | | **Proposed Method** | | | **Difference** | | |
| LPIPS | SSIM | MSE | LPIPS | SSIM | MSE | LPIPS | SSIM | MSE |
| Afghan\_hound\_n02088094\_4406 | 0.335 | 0.676 | 95.74 | 0.226 | 0.810 | 83.99 | 0.109 | 0.133 | 11.76 |
| Afghan\_hound\_n02088094\_4426 | 0.391 | 0.636 | 103.19 | 0.225 | 0.796 | 93.14 | 0.166 | 0.160 | 10.05 |
| African\_hunting\_dog\_n02116738\_4335 | 0.313 | 0.585 | 102.62 | 0.207 | 0.711 | 91.70 | 0.106 | 0.126 | 10.93 |
| Appenzeller\_n02107908\_737 | 0.429 | 0.659 | 107.17 | 0.207 | 0.830 | 97.82 | 0.222 | 0.171 | 9.34 |
| Australian\_terrier\_n02096294\_3800 | 0.484 | 0.635 | 97.76 | 0.281 | 0.789 | 88.97 | 0.203 | 0.154 | 8.79 |
| Australian\_terrier\_n02096294\_7732 | 0.393 | 0.674 | 94.63 | 0.253 | 0.790 | 78.44 | 0.14 | 0.116 | 16.19 |
| Bernese\_mountain\_dog\_n02107683\_5155 | 0.335 | 0.670 | 81.75 | 0.181 | 0.828 | 60.90 | 0.154 | 0.158 | 20.86 |
| Boston\_bull\_n02096585\_1737 | 0.41 | 0.711 | 105.87 | 0.314 | 0.787 | 97.21 | 0.096 | 0.076 | 8.66 |
| Boston\_bull\_n02096585\_3105 | 0.298 | 0.429 | 104.35 | 0.139 | 0.557 | 92.38 | 0.159 | 0.128 | 11.97 |
| Brabancon\_griffon\_n02112706\_1712 | 0.461 | 0.601 | 102.19 | 0.206 | 0.829 | 89.74 | 0.255 | 0.228 | 12.45 |
| Brabancon\_griffon\_n02112706\_204 | 0.397 | 0.646 | 88.62 | 0.22 | 0.840 | 72.87 | 0.177 | 0.195 | 15.75 |
| Brabancon\_griffon\_n02112706\_898 | 0.513 | 0.508 | 99.96 | 0.35 | 0.801 | 90.76 | 0.163 | 0.294 | 9.20 |
| Brittany\_spaniel\_n02101388\_3344 | 0.399 | 0.599 | 85.98 | 0.208 | 0.834 | 67.02 | 0.191 | 0.235 | 18.96 |
| Brittany\_spaniel\_n02101388\_5807 | 0.462 | 0.762 | 104.55 | 0.282 | 0.886 | 96.04 | 0.18 | 0.123 | 8.51 |
| Cardigan\_n02113186\_11371 | 0.479 | 0.665 | 98.44 | 0.267 | 0.838 | 86.44 | 0.212 | 0.173 | 12.00 |
| Cardigan\_n02113186\_12793 | 0.429 | 0.618 | 98.24 | 0.291 | 0.813 | 86.59 | 0.138 | 0.196 | 11.65 |
| Chesapeake\_Bay\_retriever\_n02099849\_4419 | 0.451 | 0.642 | 102.59 | 0.281 | 0.810 | 95.56 | 0.17 | 0.167 | 7.03 |
| Chesapeake\_Bay\_retriever\_n02099849\_544 | 0.363 | 0.681 | 96.50 | 0.226 | 0.829 | 84.44 | 0.137 | 0.147 | 12.05 |
| Chesapeake\_Bay\_retriever\_n02099849\_727 | 0.444 | 0.556 | 102.81 | 0.354 | 0.760 | 96.33 | 0.09 | 0.203 | 6.48 |
| Chihuahua\_n02085620\_11140 | 0.631 | 0.563 | 97.18 | 0.35 | 0.824 | 86.44 | 0.281 | 0.261 | 10.73 |
| Chihuahua\_n02085620\_1271 | 0.476 | 0.639 | 94.33 | 0.323 | 0.797 | 77.36 | 0.153 | 0.158 | 16.96 |
| Chihuahua\_n02085620\_2188 | 0.466 | 0.706 | 94.10 | 0.249 | 0.848 | 80.11 | 0.217 | 0.143 | 14.00 |
| Dandie\_Dinmont\_n02096437\_1135 | 0.438 | 0.533 | 90.81 | 0.227 | 0.764 | 77.59 | 0.211 | 0.232 | 13.21 |

(Continued)

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table S1 (continued)** | | | | | | | | | |
| **Data Image Name** | **Conventional Method** | | | **Proposed Method** | | | **Difference** | | |
| LPIPS | SSIM | MSE | LPIPS | SSIM | MSE | LPIPS | SSIM | MSE |
| Dandie\_Dinmont\_n02096437\_2605 | 0.483 | 0.659 | 98.03 | 0.318 | 0.805 | 85.61 | 0.165 | 0.146 | 12.43 |
| Dandie\_Dinmont\_n02096437\_926 | 0.438 | 0.681 | 94.17 | 0.257 | 0.868 | 81.16 | 0.181 | 0.187 | 13.01 |
| Doberman\_n02107142\_12076 | 0.384 | 0.629 | 106.40 | 0.268 | 0.769 | 100.86 | 0.116 | 0.140 | 5.55 |
| Doberman\_n02107142\_3556 | 0.336 | 0.633 | 103.81 | 0.215 | 0.769 | 93.50 | 0.121 | 0.136 | 10.31 |
| English\_setter\_n02100735\_5967 | 0.428 | 0.517 | 99.35 | 0.219 | 0.785 | 87.75 | 0.209 | 0.268 | 11.60 |
| English\_setter\_n02100735\_8318 | 0.461 | 0.467 | 116.11 | 0.306 | 0.706 | 118.36 | 0.155 | 0.239 | -2.25 |
| English\_setter\_n02100735\_8454 | 0.521 | 0.701 | 110.19 | 0.302 | 0.849 | 103.15 | 0.219 | 0.149 | 7.04 |
| English\_springer\_n02102040\_6622 | 0.437 | 0.502 | 110.39 | 0.336 | 0.633 | 107.65 | 0.101 | 0.132 | 2.74 |
| English\_springer\_n02102040\_95 | 0.3 | 0.711 | 99.58 | 0.159 | 0.858 | 87.00 | 0.141 | 0.147 | 12.58 |
| Eskimo\_dog\_n02109961\_15315 | 0.393 | 0.659 | 96.08 | 0.18 | 0.850 | 82.49 | 0.213 | 0.191 | 13.59 |
| French\_bulldog\_n02108915\_4991 | 0.514 | 0.476 | 101.15 | 0.235 | 0.805 | 88.16 | 0.279 | 0.329 | 12.98 |
| German\_shepherd\_n02106662\_22764 | 0.477 | 0.577 | 93.55 | 0.26 | 0.829 | 79.71 | 0.217 | 0.252 | 13.84 |
| German\_shepherd\_n02106662\_9625 | 0.582 | 0.509 | 107.84 | 0.392 | 0.728 | 105.25 | 0.19 | 0.219 | 2.59 |
| German\_short-haired\_pointer\_n02100236\_1941 | 0.319 | 0.586 | 102.10 | 0.197 | 0.739 | 96.74 | 0.122 | 0.152 | 5.36 |
| German\_short-haired\_pointer\_n02100236\_4084 | 0.44 | 0.595 | 100.63 | 0.264 | 0.819 | 90.52 | 0.176 | 0.224 | 10.11 |
| Gordon\_setter\_n02101006\_3467 | 0.437 | 0.560 | 105.60 | 0.286 | 0.765 | 97.36 | 0.151 | 0.206 | 8.24 |
| Gordon\_setter\_n02101006\_3807 | 0.363 | 0.657 | 99.35 | 0.214 | 0.840 | 83.98 | 0.149 | 0.183 | 15.37 |
| Great\_Dane\_n02109047\_13016 | 0.445 | 0.505 | 105.79 | 0.317 | 0.724 | 97.98 | 0.128 | 0.219 | 7.80 |
| Great\_Dane\_n02109047\_25719 | 0.4 | 0.579 | 115.06 | 0.282 | 0.732 | 112.54 | 0.118 | 0.153 | 2.51 |
| Great\_Pyrenees\_n02111500\_4851 | 0.383 | 0.673 | 80.18 | 0.208 | 0.855 | 61.84 | 0.175 | 0.183 | 18.34 |
| Greater\_Swiss\_Mountain\_dog\_n02107574\_2994 | 0.344 | 0.655 | 92.87 | 0.198 | 0.847 | 79.06 | 0.146 | 0.192 | 13.81 |
| Irish\_setter\_n02100877\_2199 | 0.352 | 0.687 | 101.62 | 0.254 | 0.806 | 89.70 | 0.098 | 0.120 | 11.92 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table S1 (continued)** | | | | | | | | | |
| **Data Image Name** | **Conventional Method** | | | **Proposed Method** | | | **Difference** | | |
| LPIPS | SSIM | MSE | LPIPS | SSIM | MSE | LPIPS | SSIM | MSE |
| Irish\_terrier\_n02093991\_3403 | 0.332 | 0.652 | 96.10 | 0.191 | 0.823 | 81.99 | 0.141 | 0.171 | 14.11 |
| Irish\_water\_spaniel\_n02102973\_4510 | 0.361 | 0.671 | 95.23 | 0.234 | 0.807 | 82.98 | 0.127 | 0.136 | 12.25 |
| Labrador\_retriever\_n02099712\_4759 | 0.446 | 0.792 | 109.09 | 0.393 | 0.836 | 105.28 | 0.053 | 0.044 | 3.81 |
| Labrador\_retriever\_n02099712\_5941 | 0.493 | 0.699 | 101.52 | 0.324 | 0.834 | 97.17 | 0.169 | 0.136 | 4.35 |
| Pembroke\_n02113023\_4544 | 0.494 | 0.476 | 97.51 | 0.307 | 0.756 | 87.37 | 0.187 | 0.280 | 10.13 |
| Pembroke\_n02113023\_5739 | 0.418 | 0.610 | 102.54 | 0.254 | 0.789 | 91.71 | 0.164 | 0.179 | 10.84 |
| Rhodesian\_ridgeback\_n02087394\_3015 | 0.461 | 0.559 | 97.54 | 0.289 | 0.767 | 84.58 | 0.172 | 0.208 | 12.96 |
| Rottweiler\_n02106550\_10222 | 0.335 | 0.626 | 92.81 | 0.214 | 0.790 | 78.51 | 0.121 | 0.164 | 14.30 |
| Saint\_Bernard\_n02109525\_499 | 0.41 | 0.633 | 94.43 | 0.256 | 0.784 | 81.27 | 0.154 | 0.151 | 13.17 |
| Samoyed\_n02111889\_5769 | 0.43 | 0.737 | 100.45 | 0.278 | 0.853 | 83.57 | 0.152 | 0.116 | 16.88 |
| Scotch\_terrier\_n02097298\_16738 | 0.544 | 0.503 | 104.33 | 0.259 | 0.825 | 96.63 | 0.285 | 0.323 | 7.70 |
| Sealyham\_terrier\_n02095889\_4774 | 0.428 | 0.692 | 94.25 | 0.243 | 0.828 | 81.02 | 0.185 | 0.136 | 13.24 |
| Shetland\_sheepdog\_n02105855\_1816 | 0.443 | 0.657 | 95.55 | 0.261 | 0.799 | 76.38 | 0.182 | 0.143 | 19.17 |
| Siberian\_husky\_n02110185\_7117 | 0.476 | 0.521 | 98.95 | 0.248 | 0.794 | 88.11 | 0.228 | 0.273 | 10.84 |
| Sussex\_spaniel\_n02102480\_4743 | 0.443 | 0.673 | 83.66 | 0.274 | 0.847 | 76.38 | 0.169 | 0.174 | 7.28 |
| Welsh\_springer\_spaniel\_n02102177\_656 | 0.548 | 0.451 | 95.12 | 0.269 | 0.770 | 82.17 | 0.279 | 0.319 | 12.95 |
| Welsh\_springer\_spaniel\_n02102177\_716 | 0.372 | 0.664 | 95.93 | 0.217 | 0.836 | 83.45 | 0.155 | 0.172 | 12.48 |
| West\_Highland\_white\_terrier\_n02098286\_4011 | 0.36 | 0.540 | 99.69 | 0.227 | 0.762 | 87.87 | 0.133 | 0.222 | 11.82 |
| West\_Highland\_white\_terrier\_n02098286\_733 | 0.371 | 0.560 | 101.12 | 0.198 | 0.820 | 89.67 | 0.173 | 0.260 | 11.45 |
| affenpinscher\_n02110627\_8099 | 0.396 | 0.529 | 98.17 | 0.246 | 0.747 | 87.43 | 0.15 | 0.218 | 10.74 |
| basenji\_n02110806\_1841 | 0.512 | 0.547 | 99.31 | 0.33 | 0.807 | 89.71 | 0.182 | 0.260 | 9.60 |
| beagle\_n02088364\_11130 | 0.428 | 0.455 | 107.57 | 0.271 | 0.721 | 99.75 | 0.157 | 0.266 | 7.82 |
| beagle\_n02088364\_13236 | 0.301 | 0.688 | 91.78 | 0.162 | 0.812 | 75.30 | 0.139 | 0.124 | 16.48 |

(Continued)

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table S1 (continued)** | | | | | | | | | |
| **Data Image Name** | **Conventional Method** | | | **Proposed Method** | | | **Difference** | | |
| LPIPS | SSIM | MSE | LPIPS | SSIM | MSE | LPIPS | SSIM | MSE |
| beagle\_n02088364\_8713 | 0.346 | 0.607 | 96.09 | 0.216 | 0.790 | 81.81 | 0.13 | 0.183 | 14.27 |
| bluetick\_n02088632\_190 | 0.368 | 0.601 | 96.55 | 0.203 | 0.836 | 83.65 | 0.165 | 0.235 | 12.90 |
| boxer\_n02108089\_14719 | 0.428 | 0.543 | 99.47 | 0.239 | 0.770 | 88.01 | 0.189 | 0.227 | 11.46 |
| briard\_n02105251\_6138 | 0.46 | 0.509 | 116.81 | 0.236 | 0.805 | 112.63 | 0.224 | 0.296 | 4.18 |
| briard\_n02105251\_6301 | 0.35 | 0.734 | 106.53 | 0.233 | 0.870 | 101.51 | 0.117 | 0.136 | 5.02 |
| bull\_mastiff\_n02108422\_1096 | 0.356 | 0.539 | 97.07 | 0.18 | 0.809 | 86.01 | 0.176 | 0.270 | 11.07 |
| cairn\_n02096177\_7574 | 0.38 | 0.630 | 94.04 | 0.207 | 0.777 | 81.36 | 0.173 | 0.147 | 12.68 |
| clumber\_n02101556\_651 | 0.472 | 0.670 | 89.22 | 0.28 | 0.833 | 77.71 | 0.192 | 0.163 | 11.51 |
| clumber\_n02101556\_7440 | 0.473 | 0.652 | 103.20 | 0.335 | 0.786 | 92.57 | 0.138 | 0.134 | 10.63 |
| dhole\_n02115913\_253 | 0.424 | 0.644 | 80.77 | 0.23 | 0.846 | 59.45 | 0.194 | 0.203 | 21.32 |
| dingo\_n02115641\_13295 | 0.509 | 0.629 | 105.63 | 0.239 | 0.868 | 99.42 | 0.27 | 0.239 | 6.21 |
| dingo\_n02115641\_7071 | 0.449 | 0.502 | 99.35 | 0.29 | 0.785 | 89.16 | 0.159 | 0.283 | 10.19 |
| giant\_schnauzer\_n02097130\_1193 | 0.499 | 0.447 | 94.49 | 0.24 | 0.809 | 79.01 | 0.259 | 0.362 | 15.48 |
| golden\_retriever\_n02099601\_1162 | 0.475 | 0.554 | 100.45 | 0.208 | 0.852 | 88.46 | 0.267 | 0.298 | 11.99 |
| golden\_retriever\_n02099601\_280 | 0.5 | 0.745 | 92.39 | 0.328 | 0.857 | 79.48 | 0.172 | 0.112 | 12.91 |
| groenendael\_n02105056\_1050 | 0.47 | 0.607 | 101.83 | 0.309 | 0.774 | 87.65 | 0.161 | 0.167 | 14.18 |
| keeshond\_n02112350\_6701 | 0.454 | 0.636 | 99.19 | 0.285 | 0.812 | 87.99 | 0.169 | 0.177 | 11.20 |
| kelpie\_n02105412\_1222 | 0.41 | 0.604 | 100.52 | 0.216 | 0.811 | 86.03 | 0.194 | 0.207 | 14.49 |
| komondor\_n02105505\_561 | 0.46 | 0.544 | 111.58 | 0.335 | 0.675 | 112.31 | 0.125 | 0.132 | -0.73 |
| malinois\_n02105162\_5667 | 0.397 | 0.798 | 75.48 | 0.226 | 0.905 | 63.61 | 0.171 | 0.106 | 11.86 |
| miniature\_pinscher\_n02107312\_843 | 0.334 | 0.683 | 83.62 | 0.177 | 0.846 | 65.06 | 0.157 | 0.163 | 18.57 |
| miniature\_schnauzer\_n02097047\_5253 | 0.392 | 0.572 | 99.15 | 0.273 | 0.748 | 86.02 | 0.119 | 0.176 | 13.13 |
| papillon\_n02086910\_6483 | 0.503 | 0.746 | 94.80 | 0.32 | 0.873 | 83.16 | 0.183 | 0.127 | 11.64 |
| papillon\_n02086910\_695 | 0.381 | 0.605 | 97.53 | 0.225 | 0.820 | 85.72 | 0.156 | 0.215 | 11.81 |
| p | 0.423 | 0.568 | 97.19 | 0.269 | 0.775 | 87.61 | 0.154 | 0.206 | 9.58 |

(Continued)

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table S1 (continued)** | | | | | | | | | |
| **Data Image Name** | **Conventional Method** | | | **Proposed Method** | | | **Difference** | | |
| LPIPS | SSIM | MSE | LPIPS | SSIM | MSE | LPIPS | SSIM | MSE |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| schipperke\_n02104365\_3649 | 0.275 | 0.898 | 77.23 | 0.174 | 0.950 | 50.82 | 0.101 | 0.052 | 26.41 |
| schipperke\_n02104365\_6527 | 0.324 | 0.503 | 106.54 | 0.185 | 0.698 | 82.89 | 0.139 | 0.195 | 23.65 |
| schipperke\_n02104365\_8161 | 0.282 | 0.633 | 96.75 | 0.173 | 0.797 | 84.83 | 0.109 | 0.164 | 11.92 |
| silky\_terrier\_n02097658\_4231 | 0.29 | 0.619 | 101.13 | 0.133 | 0.819 | 86.76 | 0.157 | 0.200 | 14.38 |
| silky\_terrier\_n02097658\_758 | 0.361 | 0.503 | 98.25 | 0.217 | 0.786 | 85.61 | 0.144 | 0.283 | 12.65 |
| silky\_terrier\_n02097658\_9978 | 0.345 | 0.667 | 108.44 | 0.183 | 0.848 | 99.30 | 0.162 | 0.181 | 9.14 |
| soft-coated\_wheaten\_terrier\_n02098105\_1139 | 0.537 | 0.644 | 95.33 | 0.326 | 0.837 | 85.55 | 0.211 | 0.193 | 9.78 |
| standard\_schnauzer\_n02097209\_1 | 0.409 | 0.567 | 102.51 | 0.25 | 0.796 | 90.61 | 0.159 | 0.229 | 11.90 |
| standard\_schnauzer\_n02097209\_991 | 0.28 | 0.666 | 90.72 | 0.148 | 0.865 | 74.17 | 0.132 | 0.198 | 16.54 |
| toy\_poodle\_n02113624\_629 | 0.454 | 0.572 | 92.44 | 0.282 | 0.784 | 75.79 | 0.172 | 0.212 | 16.65 |
| toy\_poodle\_n02113624\_764 | 0.43 | 0.753 | 97.57 | 0.289 | 0.858 | 84.39 | 0.141 | 0.105 | 13.18 |
| toy\_terrier\_n02087046\_4906 | 0.451 | 0.517 | 98.38 | 0.242 | 0.768 | 85.27 | 0.209 | 0.251 | 13.11 |
| toy\_terrier\_n02087046\_505 | 0.343 | 0.673 | 103.85 | 0.222 | 0.801 | 91.81 | 0.121 | 0.128 | 12.05 |
| toy\_terrier\_n02087046\_5756 | 0.345 | 0.743 | 110.96 | 0.279 | 0.780 | 85.85 | 0.066 | 0.037 | 25.10 |
| vizsla\_n02100583\_12047 | 0.275 | 0.653 | 98.52 | 0.165 | 0.834 | 86.55 | 0.11 | 0.181 | 11.97 |
| vizsla\_n02100583\_2251 | 0.557 | 0.507 | 102.36 | 0.29 | 0.799 | 90.52 | 0.267 | 0.292 | 11.84 |
| wire-haired\_fox\_terrier\_n02095314\_157 | 0.411 | 0.569 | 107.82 | 0.193 | 0.843 | 102.35 | 0.218 | 0.274 | 5.48 |
| **Average** | **0.416** | **0.619** | **98.74** | **0.249** | **0.806** | **87.08** | **0.167** | **0.187** | **11.66** |