# ENCRYPTION METRICS

|  |  |  |  |  |  |  |  |  |  |  |
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| **Encryption Algorithm** | | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | | | | | | | |
| **Video Stream** | | | **Flight Simulator X - Flying PMDG Jetstream 41 1440p** | | | | | | | |
| **Resolution** | | | **1440p** | | | | | | | |
| **Frame Number** | **Correlation Coefficient** | | | | **E(i)** | | | | **Differential Attacks** | |
| **CCh** | **CCv** | | **CCd** | **Red** | **Green** | **Blue** | **Combined** | **NPCR** | **UACI** |
| **1** | 0.0202641318 | 0.0161309349 | | -0.0049935924 | 7.9999435526 | 7.9999484371 | 7.9999546621 | 7.9999823442 | 99.6078373678 | 33.4346865222 |
| **2** | -0.0227126082 | 0.0020913249 | | 0.0253524398 | 7.9999515842 | 7.9999524144 | 7.9999537300 | 7.9999842545 | 99.6068202260 | 33.4246083072 |
| **3** | 0.4421985514 | -0.1881768881 | | -0.1095979635 | 7.3076126618 | 7.1432663574 | 7.1180052739 | 7.2052158008 | 99.6123146078 | 32.6246383627 |
| **4** | -0.0179901353 | -0.0078125017 | | -0.0007600769 | 7.9999561052 | 7.9999545965 | 7.9999501615 | 7.9999861163 | 99.6102984875 | 33.4236185527 |
| **5** | -0.0166925080 | 0.0190402383 | | -0.0286048912 | 7.9999483015 | 7.9999614105 | 7.9999545337 | 7.9999866664 | 99.6096536923 | 33.4280260245 |
| **6** | -0.0081962051 | 0.0402879994 | | 0.0418731707 | 7.9999563685 | 7.9999549523 | 7.9999493677 | 7.9999840499 | 99.6081733878 | 33.4269834898 |
| **7** | -0.0294577508 | -0.0006273997 | | 0.0558713036 | 7.9999613872 | 7.9999507141 | 7.9999543744 | 7.9999844572 | 99.6078192045 | 33.4116918179 |
| **8** | -0.0082437714 | -0.0046948338 | | 0.0426623093 | 7.9999422878 | 7.9999434545 | 7.9999479709 | 7.9999802502 | 99.6081461429 | 33.4254110870 |
| **9** | -0.0025285953 | 0.0083461620 | | -0.0452974223 | 7.9999448635 | 7.9999496746 | 7.9999525147 | 7.9999837739 | 99.6074468580 | 33.4325079300 |
| **10** | 0.0305274377 | -0.0083370295 | | -0.0055571046 | 7.9999489875 | 7.9999453931 | 7.9999490545 | 7.9999828522 | 99.6096900188 | 33.4326638133 |
| **11** | -0.0087826822 | -0.0269255004 | | -0.0045255898 | 7.9999467612 | 7.9999513944 | 7.9999467290 | 7.9999839936 | 99.6059302270 | 33.4226462493 |
| **12** | -0.2264669404 | 0.7202452943 | | -0.2110937041 | 7.9660514232 | 7.9488221316 | 7.9496626224 | 7.9615442574 | 99.8084322504 | 43.3122761843 |
| **13** | 0.0046995167 | -0.0108086571 | | -0.0333947881 | 7.9999495850 | 7.9999496294 | 7.9999484093 | 7.9999816746 | 99.6091542030 | 33.4321312385 |
| **14** | -0.0115564027 | -0.0094574491 | | 0.0162539533 | 7.9999462302 | 7.9999550606 | 7.9999532495 | 7.9999849365 | 99.6102803243 | 33.4218155479 |
| **15** | 0.0239179455 | 0.0052165568 | | 0.0195727628 | 7.9999510364 | 7.9999467123 | 7.9999426483 | 7.9999834449 | 99.6089180809 | 33.4193993733 |
| **16** | 0.0305191113 | -0.0063753572 | | 0.0546148686 | 7.9999447418 | 7.9999557103 | 7.9999444424 | 7.9999817437 | 99.6080644083 | 32.9950693128 |
| **17** | -0.0160670027 | 0.0090161205 | | 0.0284629557 | 7.9999584583 | 7.9999417612 | 7.9999499390 | 7.9999837136 | 99.6078101229 | 33.4348047258 |
| **18** | -0.0842918662 | 0.0617037293 | | -0.1438157846 | 7.9397051089 | 7.9129014429 | 7.8865144402 | 7.9185681075 | 99.6089544073 | 32.3341537921 |
| **19** | 0.0282915414 | -0.0020272477 | | 0.0104954352 | 7.9999555588 | 7.9999530976 | 7.9999355959 | 7.9999827390 | 99.6086910403 | 32.0940048811 |
| **20** | 0.0020703953 | -0.0000626697 | | -0.0171900374 | 7.9999482713 | 7.9999406733 | 7.9999490276 | 7.9999852255 | 99.6114700168 | 33.4371530197 |
| **21** | -0.0224294988 | -0.0160208491 | | 0.0039763178 | 7.9999461165 | 7.9999459826 | 7.9999505891 | 7.9999829305 | 99.6107525686 | 33.4239967756 |
| **22** | -0.0262783944 | 0.7714860297 | | -0.4635653516 | 7.8242529109 | 7.7035661850 | 7.5783547546 | 7.7276241185 | 99.6109886908 | 35.8158750711 |
| **23** | 0.0122806534 | 0.0202470592 | | 0.0574517049 | 7.9999529972 | 7.9999554975 | 7.9999444807 | 7.9999849155 | 99.6092904274 | 32.3135139703 |
| **24** | -0.1169861861 | -0.0601964417 | | -0.1306039766 | 7.6619781481 | 7.5809405709 | 7.5449337978 | 7.6091673542 | 99.6099987940 | 34.3982021037 |
| **25** | 0.4340308246 | 0.9839332439 | | 0.1197970706 | 7.9870864402 | 7.9778295964 | 7.9727533984 | 7.9822417644 | 99.6075285926 | 32.7947428545 |
| **26** | -0.0321701774 | -0.0038531117 | | -0.0249333431 | 7.9999540265 | 7.9999515222 | 7.9999563209 | 7.9999834081 | 99.6072107358 | 33.4317723185 |
| **27** | -0.0643730369 | 0.3744944242 | | -0.0899629893 | 7.9389918711 | 7.8901128947 | 7.8289787172 | 7.8963778670 | 99.6133045046 | 31.8541995048 |
| **28** | -0.0055719241 | 0.0011501955 | | 0.0322662748 | 7.9999503035 | 7.9999568509 | 7.9999554666 | 7.9999839139 | 99.6103075691 | 35.4421285808 |
| **29** | -0.0130928262 | 0.0049947538 | | 0.0287632888 | 7.9999497449 | 7.9999497023 | 7.9999587815 | 7.9999830148 | 99.6065114508 | 33.4187827133 |
| **30** | -0.0009593166 | 0.0268087080 | | 0.0386326519 | 7.9999511756 | 7.9999383163 | 7.9999511683 | 7.9999826756 | 99.6099987940 | 33.4128018771 |
| **31** | 0.0134386267 | -0.0014328326 | | -0.0082123956 | 7.9999483533 | 7.9999563101 | 7.9999578763 | 7.9999853391 | 99.6084730813 | 33.4187769438 |
| **32** | 0.0560934435 | 0.3282132098 | | 0.3376202803 | 7.9414357037 | 7.9044661628 | 7.8418659484 | 7.9045518257 | 99.6096718555 | 32.5375681802 |
| **33** | -0.0080103479 | 0.0188574536 | | 0.0179457048 | 7.9999410907 | 7.9999492514 | 7.9999492754 | 7.9999809481 | 99.6102076713 | 33.4374480834 |
| **34** | 0.0255437612 | 0.0127529044 | | 0.0107500020 | 7.9999540489 | 7.9999406601 | 7.9999460653 | 7.9999814278 | 99.6108433849 | 34.2059427974 |
| **35** | 0.0190509783 | 0.0194154460 | | -0.0310157188 | 7.9999518041 | 7.9999488083 | 7.9999520230 | 7.9999822883 | 99.6076103272 | 33.4370031195 |
| **36** | -0.0042965488 | 0.0159710756 | | -0.0186251837 | 7.9999470595 | 7.9999582716 | 7.9999497121 | 7.9999836064 | 99.6091814479 | 33.4376522597 |
| **37** | -0.0052100611 | -0.0183413934 | | 0.0149574279 | 7.9999506159 | 7.9999501869 | 7.9999523121 | 7.9999835538 | 99.6105164465 | 33.4151983571 |
| **38** | 0.0091074733 | 0.0059954015 | | 0.0156878464 | 7.9999476751 | 7.9999512895 | 7.9999515416 | 7.9999838969 | 99.6098988961 | 33.4297218306 |
| **39** | 0.0114360027 | 0.0067312400 | | -0.0224342405 | 7.9999552215 | 7.9999490845 | 7.9999459224 | 7.9999835921 | 99.6097081820 | 33.4318999955 |
| **40** | 0.0066381811 | 0.0290915749 | | -0.0198409738 | 7.9999408651 | 7.9999436372 | 7.9999461273 | 7.9999802979 | 99.6081552245 | 33.2228062810 |
| **41** | -0.0002540169 | 0.0254181039 | | -0.0041224348 | 7.9999529379 | 7.9999463509 | 7.9999510880 | 7.9999827393 | 99.6098353248 | 33.6608942876 |
| **42** | 0.0068540605 | -0.0119935254 | | 0.0249716601 | 7.9999445453 | 7.9999483856 | 7.9999557493 | 7.9999847748 | 99.6119331796 | 33.4374944175 |
| **43** | -0.0183527050 | -0.0054193510 | | 0.0803109688 | 7.9999470932 | 7.9999571030 | 7.9999510637 | 7.9999823932 | 99.6106072627 | 33.4355064681 |
| **44** | -0.0312092869 | 0.0277519144 | | -0.0145092930 | 7.9999597616 | 7.9999507860 | 7.9999463326 | 7.9999825289 | 99.6077193067 | 33.4305539921 |
| **45** | -0.0390037734 | 0.0063063464 | | -0.0248340452 | 7.9999487907 | 7.9999452103 | 7.9999504404 | 7.9999835558 | 99.6114336904 | 33.1115104248 |
| **46** | 0.0087833904 | -0.0200642635 | | 0.0078927440 | 7.9999450484 | 7.9999468093 | 7.9999441195 | 7.9999822047 | 99.6086547138 | 33.4172662604 |
| **47** | 0.0047771437 | -0.0051987783 | | -0.0503744387 | 7.9999542190 | 7.9999566221 | 7.9999507483 | 7.9999848470 | 99.6098988961 | 34.1453407372 |
| **48** | -0.0090711168 | 0.0033494202 | | 0.0588822310 | 7.9999473683 | 7.9999328049 | 7.9999390499 | 7.9999800669 | 99.6083459386 | 33.4314245102 |
| **49** | 0.0142658027 | -0.0117509625 | | -0.0324315336 | 7.9999530787 | 7.9999495274 | 7.9999481585 | 7.9999844768 | 99.6092631825 | 33.4238975900 |
| **50** | 0.0126355291 | -0.0153818111 | | -0.0081078673 | 7.9999505793 | 7.9999490031 | 7.9999472331 | 7.9999831903 | 99.6100623653 | 33.4311246386 |
| **Total** | 0.3671688167 | 3.1300880110 | | -0.4033393676 | 398.5650128699 | 398.0597884016 | 397.7189570091 | 398.2045899181 | 4980.6638175800 | 1679.9733371763 |
| **Average** | 0.0073432443 | 0.0625201099 | | -0.0080666124 | 7.9713002574 | 7.9611957680 | 7.9543791402 | 7.9640917984 | 99.6132763516 | 33.5994667435 |

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| **Encryption Algorithm** | | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | | | | | | | |
| **Video Stream** | | | **Wreckfest 2016 July - 2 Racing Clips 1440p60** | | | | | | | |
| **Resolution** | | | **1440p** | | | | | | | |
| **Frame Number** | **Correlation Coefficient** | | | | **E(i)** | | | | **Differential Attacks** | |
| **CCh** | **CCv** | | **CCd** | **Red** | **Green** | **Blue** | **Combined** | **NPCR** | **UACI** |
| **1** | 0.0098457846 | 0.0080314717 | | 0.0401789711 | 7.9999532046 | 7.9999474550 | 7.9999492663 | 7.9999828718 | 99.6102933688 | 33.4323616988 |
| **2** | 0.0090001631 | -0.0244060084 | | -0.0085651994 | 7.9999540699 | 7.9999431241 | 7.9999459523 | 7.9999817598 | 99.6093022579 | 33.4304451588 |
| **3** | -0.0003194102 | -0.0118820495 | | 0.0897158331 | 7.9999430989 | 7.9999430493 | 7.9999500083 | 7.9999810756 | 99.6097114321 | 33.4192297555 |
| **4** | -0.0102476103 | 0.0243474682 | | 0.0362450281 | 7.9999443941 | 7.9999483854 | 7.9999433068 | 7.9999814149 | 99.6098660091 | 33.4150421291 |
| **5** | -0.0248624730 | 0.0239395021 | | -0.0050570328 | 7.9999500901 | 7.9999443835 | 7.9999423630 | 7.9999805168 | 99.6115117988 | 33.4202801655 |
| **6** | 0.0048012727 | -0.0130646432 | | 0.0277794474 | 7.9999462114 | 7.9999380518 | 7.9999369768 | 7.9999762910 | 99.6092658869 | 33.4298530952 |
| **7** | 0.0177204022 | 0.0192641669 | | 0.0229360005 | 7.9999560029 | 7.9999407453 | 7.9999163710 | 7.9999760823 | 99.6066108007 | 33.4273065874 |
| **8** | -0.0033957529 | 0.0121585466 | | -0.0097673100 | 7.9999535802 | 7.9999451186 | 7.9999352956 | 7.9999804108 | 99.6045194658 | 33.4208142849 |
| **9** | -0.0141928655 | -0.0024625413 | | 0.0411434012 | 7.9999484959 | 7.9999520378 | 7.9999495811 | 7.9999834625 | 99.6087294140 | 33.4416858792 |
| **10** | -0.0214317263 | 0.0270972002 | | -0.0236069945 | 7.9999495366 | 7.9999416827 | 7.9999397751 | 7.9999756123 | 99.6109389548 | 33.4176308559 |
| **11** | -0.0178567958 | 0.0045314081 | | 0.0127393364 | 7.9999436252 | 7.9999519855 | 7.9999288908 | 7.9999790840 | 99.6096114118 | 33.4323311043 |
| **12** | 0.0148936198 | 0.0251447665 | | -0.0250504129 | 7.9999547444 | 7.9999551251 | 7.9999425244 | 7.9999847946 | 99.6129484550 | 33.4234609914 |
| **13** | -0.0079046008 | 0.0282992793 | | 0.0031992859 | 7.9999504850 | 7.9999489107 | 7.9999462718 | 7.9999824289 | 99.6077928596 | 33.4261440690 |
| **14** | -0.0196903957 | -0.0288534615 | | -0.0153273585 | 7.9999432497 | 7.9999459640 | 7.9999256493 | 7.9999738682 | 99.6095659480 | 33.4346510420 |
| **15** | 0.0937878391 | 0.0618605032 | | 0.0690533736 | 7.9322268641 | 7.9174453089 | 7.9108461689 | 7.9468356581 | 99.6091385882 | 33.2050913898 |
| **16** | 0.0079448647 | 0.0020629113 | | -0.0160140471 | 7.9999467130 | 7.9999470992 | 7.9999493671 | 7.9999828719 | 99.6083475180 | 33.4278595699 |
| **17** | -0.0102276055 | -0.0204355313 | | -0.0210035366 | 7.9999466560 | 7.9999421656 | 7.9999465532 | 7.9999785194 | 99.6087839706 | 33.4282222106 |
| **18** | 0.0065282541 | 0.0136185194 | | -0.0706189157 | 7.9999452329 | 7.9999482531 | 7.9999340443 | 7.9999826221 | 99.6100114932 | 33.4315356839 |
| **19** | 0.0058118082 | -0.0029489166 | | -0.0050760653 | 7.9999586984 | 7.9999443221 | 7.9999379061 | 7.9999834864 | 99.6082020339 | 33.4289653565 |
| **20** | -0.0214553870 | 0.0021239678 | | -0.0074285222 | 7.9999567616 | 7.9999456518 | 7.9999464858 | 7.9999830270 | 99.6096932466 | 33.4323726101 |
| **21** | 0.0232104992 | 0.0015013748 | | 0.0665951603 | 7.9999510411 | 7.9999476855 | 7.9999484820 | 7.9999828490 | 99.6101296991 | 33.4342560952 |
| **22** | -0.0106365246 | 0.0147844867 | | 0.0094192722 | 7.9999438001 | 7.9999561906 | 7.9999340521 | 7.9999815976 | 99.6137395251 | 33.4330545315 |
| **23** | -0.0297119444 | 0.0276008949 | | -0.0372113012 | 7.9999431787 | 7.9999409265 | 7.9999544669 | 7.9999820123 | 99.6090203823 | 33.4224737672 |
| **24** | -0.0024896026 | -0.0342426542 | | 0.0281412029 | 7.9999489907 | 7.9999462287 | 7.9999409956 | 7.9999817295 | 99.6101478847 | 33.4326999495 |
| **25** | 0.0064033765 | -0.0073183809 | | 0.0170302733 | 7.9999409956 | 7.9999470066 | 7.9999453105 | 7.9999827952 | 99.6051104952 | 33.7147632702 |
| **26** | 0.0195451378 | -0.0231477952 | | -0.0347966423 | 7.9999470992 | 7.9999543883 | 7.9999503313 | 7.9999818330 | 99.6095295769 | 33.4268829717 |
| **27** | 0.0015871236 | 0.0046256354 | | -0.0202869264 | 7.9999483704 | 7.9999484483 | 7.9999231810 | 7.9999767533 | 99.6126211156 | 33.4266893494 |
| **28** | -0.0232246751 | 0.0034030328 | | -0.0422909371 | 7.9999458551 | 7.9999483462 | 7.9999502666 | 7.9999809824 | 99.6095659480 | 33.4338157204 |
| **29** | 0.0141845080 | 0.0155602324 | | -0.0167302092 | 7.9999400849 | 7.9999513281 | 7.9999514094 | 7.9999840139 | 99.6088930837 | 33.3531444621 |
| **30** | 0.0260799459 | -0.0331396736 | | -0.0151432683 | 7.9999461730 | 7.9999520149 | 7.9999482089 | 7.9999839761 | 99.6115117988 | 33.5346497298 |
| **31** | 0.0044585332 | -0.0045763291 | | -0.0135931439 | 7.9999495259 | 7.9999419824 | 7.9999429134 | 7.9999803637 | 99.6100024005 | 33.4275594731 |
| **32** | 0.0089357349 | -0.0008413277 | | 0.0289031694 | 7.9999546660 | 7.9999479483 | 7.9999493159 | 7.9999832340 | 99.6082474977 | 33.4354177222 |
| **33** | -0.0290192425 | 0.0063500253 | | -0.0453286142 | 7.9999497986 | 7.9999403809 | 7.9999333724 | 7.9999796024 | 99.6101387919 | 33.4337478278 |
| **34** | -0.0002933480 | 0.0061808492 | | -0.0419033050 | 7.9999544116 | 7.9999482884 | 7.9999420592 | 7.9999820152 | 99.6107843779 | 33.4299852434 |
| **35** | -0.0116182194 | -0.0191633118 | | -0.0227461185 | 7.9999540402 | 7.9999393679 | 7.9999499712 | 7.9999821601 | 99.6088203416 | 33.4211174483 |
| **36** | 0.0261620888 | 0.0082059662 | | -0.0222586929 | 7.9999476882 | 7.9999463663 | 7.9999455091 | 7.9999814740 | 99.6123301472 | 33.4325335341 |
| **37** | 0.0330519741 | 0.0186988272 | | -0.0195965531 | 7.9999458676 | 7.9999477016 | 7.9999463988 | 7.9999838205 | 99.6097841742 | 33.4111747462 |
| **38** | 0.0014319898 | -0.0093975218 | | -0.0105729245 | 7.9999460844 | 7.9999490191 | 7.9999476891 | 7.9999797962 | 99.6075655406 | 33.4200642213 |
| **39** | 0.0222287396 | 0.0162789168 | | -0.0551583947 | 7.9999561711 | 7.9999447005 | 7.9999358697 | 7.9999793746 | 99.6078474162 | 33.4288214413 |
| **40** | -0.0061263375 | -0.0270003643 | | 0.0666256114 | 7.9999503694 | 7.9999532192 | 7.9999503922 | 7.9999849934 | 99.6075382623 | 33.4124945158 |
| **41** | -0.0177863018 | -0.0180549133 | | -0.0440597729 | 7.9999479565 | 7.9999452874 | 7.9999517906 | 7.9999836659 | 99.6065289659 | 33.4314547048 |
| **42** | 0.0277922285 | -0.0053230192 | | -0.0162622573 | 7.9999457510 | 7.9999526265 | 7.9999432390 | 7.9999780564 | 99.6123210545 | 33.4293585204 |
| **43** | 0.1085465817 | -0.0678227575 | | -0.1260030149 | 7.9368146360 | 7.9291255283 | 7.9055421243 | 7.9378454525 | 99.6115663553 | 33.3926659504 |
| **44** | 0.0153846209 | 0.0273943050 | | -0.0048144836 | 7.9999475780 | 7.9999496511 | 7.9999454837 | 7.9999819648 | 99.6072018302 | 33.4429758388 |
| **45** | 0.0019581402 | -0.0045682253 | | -0.0252377259 | 7.9999450613 | 7.9999419961 | 7.9999421782 | 7.9999848320 | 99.6115027060 | 33.4184173619 |
| **46** | -0.0093106971 | -0.0273967614 | | 0.0229639340 | 7.9999457975 | 7.9999500953 | 7.9999495620 | 7.9999816719 | 99.6107480069 | 33.4308762626 |
| **47** | -0.0164180516 | -0.0092219812 | | 0.0434877024 | 7.9999436176 | 7.9999530063 | 7.9999341800 | 7.9999807768 | 99.6125483735 | 33.4275195719 |
| **48** | 0.0047993782 | -0.0107100615 | | -0.0148982384 | 7.9999563983 | 7.9999491484 | 7.9999426470 | 7.9999836816 | 99.6106025227 | 33.4316222612 |
| **49** | 0.0053181999 | -0.0146167373 | | 0.0381246787 | 7.9999508758 | 7.9999466257 | 7.9999405961 | 7.9999841526 | 99.6092840724 | 33.3669945196 |
| **50** | 0.0027988003 | 0.0039384931 | | -0.0636117669 | 7.9999456935 | 7.9999473642 | 7.9999450913 | 7.9999808679 | 99.6119300658 | 33.4155702937 |
| **Total** | 0.2159920422 | -0.0135922159 | | -0.2357380045 | 399.8665792924 | 399.8440316869 | 399.8136398453 | 399.8837863573 | 4980.4824073266 | 1671.3780849435 |
| **Average** | 0.0043198140 | -0.0002718443 | | -0.0047147252 | 7.9973315858 | 7.9968806337 | 7.9962727969 | 7.9976757271 | 99.6096481465 | 33.4275616989 |

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| **Encryption Algorithm** | | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | | | | | | | |
| **Video Stream** | | | **Forza Motorsport 6: Apex (Beta) - Heavy Rain Gameplay 1440p60** | | | | | | | |
| **Resolution** | | | **1440p** | | | | | | | |
| **Frame Number** | **Correlation Coefficient** | | | | **E(i)** | | | | **Differential Attacks** | |
| **CCh** | **CCv** | | **CCd** | **Red** | **Green** | **Blue** | **Combined** | **NPCR** | **UACI** |
| **1** | -0.0094843623 | -0.0296333836 | | -0.0254989372 | 7.9998598319 | 7.9997877889 | 7.9998636525 | 7.9998748671 | 99.6093840422 | 33.4201623633 |
| **2** | -0.0115761154 | 0.0177121063 | | 0.0297119322 | 7.9998712149 | 7.9998099575 | 7.9998748451 | 7.9998857917 | 99.6078830295 | 33.4179877565 |
| **3** | -0.0128846984 | 0.0098564808 | | 0.0454471511 | 7.9998471731 | 7.9997760383 | 7.9998439989 | 7.9998546191 | 99.6076660156 | 33.4169525790 |
| **4** | -0.0451277603 | 0.0047467959 | | -0.0125139883 | 7.9998526413 | 7.9997725242 | 7.9998507488 | 7.9998653303 | 99.6110478154 | 33.4162012570 |
| **5** | -0.0272320644 | 0.0115988670 | | -0.0147005986 | 7.9998641087 | 7.9997797218 | 7.9998404715 | 7.9998602535 | 99.6071958189 | 33.4204599773 |
| **6** | 0.0026858075 | 0.0359881621 | | -0.0042365394 | 7.9995609923 | 7.9992516031 | 7.9995500086 | 7.9994953374 | 99.6068974248 | 33.4159245998 |
| **7** | 0.0364565185 | 0.0366035899 | | -0.0228797112 | 7.9998642805 | 7.9998067439 | 7.9998633621 | 7.9998809341 | 99.6106680411 | 33.4330535557 |
| **8** | -0.0117928242 | 0.0153260288 | | -0.0197733938 | 7.9996981593 | 7.9995208405 | 7.9996966465 | 7.9996742624 | 99.6063820168 | 33.4232840655 |
| **9** | 0.0352148096 | 0.0065709987 | | 0.0015441375 | 7.9998498491 | 7.9997646091 | 7.9998512411 | 7.9998551442 | 99.6117621528 | 33.4377652038 |
| **10** | -0.0169946082 | -0.0030305210 | | 0.0032286636 | 7.9998762872 | 7.9997735207 | 7.9998474376 | 7.9998694755 | 99.6105595341 | 33.4205794413 |
| **11** | 0.0036916404 | -0.0098765372 | | 0.0871062987 | 7.9998536685 | 7.9997803012 | 7.9998522914 | 7.9998694982 | 99.6076388889 | 33.4395373775 |
| **12** | -0.0041928035 | 0.0125203244 | | -0.0379502842 | 7.9997824476 | 7.9996308620 | 7.9997841375 | 7.9997683068 | 99.6085431134 | 33.4318521072 |
| **13** | 0.0028899691 | 0.0217563464 | | -0.0131451681 | 7.9998772544 | 7.9997990673 | 7.9998673566 | 7.9998850487 | 99.6063006366 | 33.4212576452 |
| **14** | 0.0310879445 | 0.0196326248 | | -0.0794461942 | 7.9998394672 | 7.9997331270 | 7.9998643252 | 7.9998512493 | 99.6106047454 | 33.4192210478 |
| **15** | -0.0057512695 | -0.0145910484 | | 0.0288798727 | 7.9999149005 | 7.9998821183 | 7.9999146369 | 7.9999409916 | 99.6090946904 | 33.4392527772 |
| **16** | -0.0177913310 | -0.0165058526 | | -0.0021723638 | 7.9997133160 | 7.9995164515 | 7.9997158909 | 7.9996894301 | 99.6087691696 | 33.4396967692 |
| **17** | -0.0632990578 | 0.9920599533 | | -0.1419786152 | 7.2765025250 | 7.2670320840 | 7.2763975630 | 7.2891775114 | 99.6110839844 | 32.9233149156 |
| **18** | -0.0005541774 | -0.0087978947 | | -0.0264062185 | 7.9998583037 | 7.9997537367 | 7.9998456536 | 7.9998579414 | 99.6126754196 | 33.4260415249 |
| **19** | -0.0058496064 | 0.0106204510 | | 0.0650561025 | 7.9998322166 | 7.9996834020 | 7.9998614651 | 7.9998340732 | 99.6084074797 | 33.4160650560 |
| **20** | -0.0007965981 | 0.0167207015 | | 0.0126121010 | 7.9997790643 | 7.9996219282 | 7.9997587586 | 7.9997551810 | 99.6088234230 | 33.4276637391 |
| **21** | -0.0163776796 | -0.0241421797 | | 0.0251743152 | 7.9998919519 | 7.9998015169 | 7.9998851966 | 7.9998965032 | 99.6109754774 | 33.4213496988 |
| **22** | -0.0535100738 | 0.0133601332 | | 0.0095059114 | 7.9998623275 | 7.9997756524 | 7.9998706972 | 7.9998724414 | 99.6117802373 | 33.4322575189 |
| **23** | 0.0065248895 | -0.0063369756 | | 0.0219754686 | 7.9998593026 | 7.9997919574 | 7.9998653292 | 7.9998757336 | 99.6090133102 | 33.4217352530 |
| **24** | 0.0056778567 | 0.0078841406 | | 0.0144423800 | 7.9997609913 | 7.9996400909 | 7.9997767999 | 7.9997640074 | 99.6076208044 | 33.4150278927 |
| **25** | 0.0116211507 | 0.0326309468 | | -0.0251220706 | 7.9995371539 | 7.9991892311 | 7.9994930279 | 7.9994486358 | 99.6110478154 | 33.4217907121 |
| **26** | -0.0082094946 | -0.0217391979 | | 0.0147192363 | 7.9998803282 | 7.9997421289 | 7.9997841245 | 7.9998480038 | 99.6116355613 | 33.4319663232 |
| **27** | 0.0045494556 | 0.0171359610 | | 0.0223028258 | 7.9995089074 | 7.9992086643 | 7.9995326912 | 7.9994585547 | 99.6108760127 | 33.4302971247 |
| **28** | 0.3893450113 | -0.0313826114 | | -0.3443646338 | 7.4873826405 | 7.4797575022 | 7.5004339848 | 7.4984824825 | 99.6077021846 | 33.1916647519 |
| **29** | -0.0210492680 | -0.0115873542 | | 0.0165883348 | 7.9995451413 | 7.9991951566 | 7.9995265241 | 7.9994681552 | 99.6060745804 | 33.4306627505 |
| **30** | 0.0142280393 | -0.0266507494 | | 0.0154792819 | 7.9998753786 | 7.9997911955 | 7.9998475817 | 7.9998706312 | 99.6127206308 | 33.4298068222 |
| **31** | 0.0230476966 | 0.0483962416 | | 0.0100061013 | 7.9998699386 | 7.9998077983 | 7.9998683136 | 7.9998844584 | 99.6080457899 | 33.4221300268 |
| **32** | 0.6027488163 | -0.4867152125 | | -0.1103266712 | 7.0892038504 | 7.0743604043 | 7.1054021945 | 7.1033044225 | 99.6098632813 | 31.9460855234 |
| **33** | -0.0173206013 | -0.0227859849 | | -0.0364347932 | 7.9998729027 | 7.9997659092 | 7.9998319048 | 7.9998596006 | 99.6114637587 | 33.4427053902 |
| **34** | 0.0323065830 | -0.0541138812 | | -0.0138089682 | 7.9998659159 | 7.9997998765 | 7.9998707791 | 7.9998815873 | 99.6088595920 | 33.4297429591 |
| **35** | -0.0080922255 | 0.0133576348 | | 0.0245430455 | 7.9995906821 | 7.9993089021 | 7.9995895169 | 7.9995388307 | 99.6078106916 | 32.5155370952 |
| **36** | 0.0331855044 | 0.0385153669 | | -0.0171512816 | 7.9998360244 | 7.9997614596 | 7.9998480794 | 7.9998503885 | 99.6078016493 | 33.4246869965 |
| **37** | 0.0163887262 | 0.0052403603 | | -0.0448609915 | 7.9998326268 | 7.9997534814 | 7.9998253303 | 7.9998401202 | 99.6079463252 | 33.4119179631 |
| **38** | 0.0252161706 | -0.0035808911 | | -0.0060115555 | 7.9998421161 | 7.9997536444 | 7.9998323934 | 7.9998444898 | 99.6100622106 | 33.4294851310 |
| **39** | -0.0063893500 | 0.0200675131 | | -0.0250540149 | 7.9997652671 | 7.9996316245 | 7.9997368625 | 7.9997480737 | 99.6090494792 | 33.4106887851 |
| **40** | -0.0043227754 | -0.0390138847 | | 0.0549537313 | 7.9999324350 | 7.9999017193 | 7.9999161754 | 7.9999504470 | 99.6078559028 | 33.4280255353 |
| **41** | -0.0122018966 | -0.0032784773 | | -0.0253036793 | 7.9998565188 | 7.9997813286 | 7.9998599800 | 7.9998672310 | 99.6089590567 | 33.4371906134 |
| **42** | -0.0014054670 | 0.0369731565 | | 0.0231979719 | 7.9996568877 | 7.9993733214 | 7.9996198395 | 7.9995944966 | 99.6101797598 | 33.4327454810 |
| **43** | -0.0096770205 | -0.0160458435 | | -0.0204943265 | 7.9998481005 | 7.9997439719 | 7.9998517270 | 7.9998530169 | 99.6078739873 | 33.4234242735 |
| **44** | -0.0118921988 | -0.0416409760 | | 0.0253591730 | 7.9996947030 | 7.9994345106 | 7.9996694505 | 7.9996388742 | 99.6088053385 | 33.4320035559 |
| **45** | -0.4184186773 | 0.1789203681 | | -0.3929509467 | 7.1970424275 | 7.1719553972 | 7.2160571348 | 7.2118262697 | 99.6095920139 | 31.1016071439 |
| **46** | 0.0266920122 | -0.0038033919 | | 0.0099390261 | 7.9998539800 | 7.9997648135 | 7.9998415004 | 7.9998529519 | 99.6083080150 | 33.4186689390 |
| **47** | -0.0203941825 | 0.0154418907 | | -0.0194117643 | 7.9998281848 | 7.9997162422 | 7.9998390620 | 7.9998318027 | 99.6109573929 | 33.4224903692 |
| **48** | -0.0124685989 | 0.0223270921 | | -0.0020969374 | 7.9998565680 | 7.9997848012 | 7.9998516485 | 7.9998670242 | 99.6080638744 | 33.4295828937 |
| **49** | 0.0202701844 | -0.0089101452 | | 0.0122620866 | 7.9998475053 | 7.9998277509 | 7.9998613389 | 7.9998768685 | 99.6112105758 | 33.4241392492 |
| **50** | -0.2879066183 | 0.9047239238 | | 0.2724559451 | 7.6542196227 | 7.6499590207 | 7.6566221759 | 7.6591005388 | 99.6105776186 | 29.7819128498 |
| **Total** | 0.1808653812 | 1.6825251664 | | -0.6376035531 | 396.6955180826 | 396.6285554999 | 396.7457558560 | 396.7527418890 | 4980.4641203704 | 1662.1976033810 |
| **Average** | 0.0036172918 | 0.0336378076 | | -0.0127513799 | 7.9339103617 | 7.9325711100 | 7.9349151171 | 7.9350548378 | 99.6092824074 | 33.2439520676 |

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| **Encryption Algorithm** | | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | | | | | | | |
| **Video Stream** | | | **DiRT Rally 2016 - Driving Hard 2 - 1440p60** | | | | | | | |
| **Resolution** | | | **1440p** | | | | | | | |
| **Frame Number** | **Correlation Coefficient** | | | | **E(i)** | | | | **Differential Attacks** | |
| **CCh** | **CCv** | | **CCd** | **Red** | **Green** | **Blue** | **Combined** | **NPCR** | **UACI** |
| **1** | 0.0043660951 | 0.0209160899 | | 0.0515244093 | 7.9999519665 | 7.9999386093 | 7.9999445696 | 7.9999820384 | 99.6114185475 | 33.4206112133 |
| **2** | -0.0054356073 | 0.0080175966 | | -0.0430794838 | 7.9999384259 | 7.9999540235 | 7.9999503468 | 7.9999834860 | 99.6094744647 | 33.4318189878 |
| **3** | 0.3890969500 | 0.3358652556 | | -0.0787722877 | 7.9051195759 | 7.9099008497 | 7.9253894874 | 7.9349591648 | 99.6084798177 | 33.9915013532 |
| **4** | -0.0109829201 | 0.0054605471 | | -0.0327620098 | 7.9999545656 | 7.9999463298 | 7.9999464604 | 7.9999830120 | 99.6099265770 | 33.4417189344 |
| **5** | -0.2086278796 | -0.0864069996 | | -0.2310266511 | 7.7763586666 | 7.7832563015 | 7.8582701535 | 7.8481809247 | 99.6122323495 | 32.4092717766 |
| **6** | 0.0153616702 | -0.0078775680 | | -0.0510946691 | 7.9999500791 | 7.9999473311 | 7.9999464967 | 7.9999819736 | 99.6069064670 | 33.4295126478 |
| **7** | -0.0216803279 | 0.0240054223 | | -0.0190120635 | 7.9999477242 | 7.9999458083 | 7.9999363326 | 7.9999842715 | 99.6092212818 | 33.4131383116 |
| **8** | -0.0221261155 | 0.0260839300 | | 0.0338701797 | 7.9999492348 | 7.9999491279 | 7.9999479932 | 7.9999826732 | 99.6114004630 | 33.4448297505 |
| **9** | 0.0126196309 | -0.0092759273 | | 0.0432748947 | 7.9999491428 | 7.9999557370 | 7.9999522572 | 7.9999837164 | 99.6058937355 | 33.4274785681 |
| **10** | 0.0245148187 | 0.0313870387 | | -0.0300613747 | 7.9999545277 | 7.9999465492 | 7.9999455296 | 7.9999827297 | 99.6121057581 | 33.4270602490 |
| **11** | -0.0306018490 | -0.0046612847 | | -0.0032193850 | 7.9999496855 | 7.9999438017 | 7.9999460089 | 7.9999819894 | 99.6064724392 | 33.4292113460 |
| **12** | 0.0049932091 | 0.0030938367 | | 0.0060048746 | 7.9999494714 | 7.9999447347 | 7.9999517227 | 7.9999837157 | 99.6064091435 | 34.2053281165 |
| **13** | -0.0186448430 | -0.0158912108 | | 0.0089479988 | 7.9999448190 | 7.9999427276 | 7.9999491485 | 7.9999801658 | 99.6098090278 | 32.9428465202 |
| **14** | 0.0110499306 | -0.0238780848 | | 0.0288733468 | 7.9999509452 | 7.9999508267 | 7.9999435804 | 7.9999824292 | 99.6107042101 | 33.4282496057 |
| **15** | 0.0307361505 | -0.0320813588 | | -0.0080383200 | 7.9999499787 | 7.9999514768 | 7.9999436250 | 7.9999819208 | 99.6096553096 | 33.4210663751 |
| **16** | 0.0046178874 | -0.0278283642 | | 0.0613252022 | 7.9999533863 | 7.9999490518 | 7.9999555093 | 7.9999813654 | 99.6102611400 | 33.6253856961 |
| **17** | -0.0376245296 | 0.0063444923 | | -0.0074439388 | 7.9999490758 | 7.9999533716 | 7.9999408540 | 7.9999822166 | 99.6125669126 | 33.4331864235 |
| **18** | 0.0201260229 | 0.0232998417 | | 0.0296626745 | 7.9999462075 | 7.9999538536 | 7.9999534342 | 7.9999830806 | 99.6080638744 | 33.4261030830 |
| **19** | -0.0034031452 | 0.0111240635 | | 0.0301205470 | 7.9999465910 | 7.9999439928 | 7.9999504887 | 7.9999830511 | 99.6085702402 | 33.4367344942 |
| **20** | -0.0128642180 | -0.0085458127 | | -0.0091560902 | 7.9999539548 | 7.9999513325 | 7.9999369806 | 7.9999820033 | 99.6105595341 | 33.4248462109 |
| **21** | 0.0051664697 | 0.0107873891 | | -0.0686878517 | 7.9999473105 | 7.9999424048 | 7.9999441859 | 7.9999810165 | 99.6105866609 | 33.4352286944 |
| **22** | 0.0118390103 | 0.0014606659 | | -0.0095555088 | 7.9999435085 | 7.9999417188 | 7.9999488381 | 7.9999812430 | 99.6089590567 | 33.4225794087 |
| **23** | 0.0121883525 | -0.0321078057 | | -0.0369434992 | 7.9999424386 | 7.9999543431 | 7.9999457726 | 7.9999845026 | 99.6113100405 | 33.4288681662 |
| **24** | 0.0202614650 | 0.0172095678 | | -0.0148853098 | 7.9999533886 | 7.9999490436 | 7.9999412897 | 7.9999845182 | 99.6104148582 | 33.4381935580 |
| **25** | 0.0050217425 | 0.0047950593 | | 0.0731540357 | 7.9999521450 | 7.9999447492 | 7.9999438942 | 7.9999833025 | 99.6077835648 | 33.4219071266 |
| **26** | 0.0117954071 | 0.0038193915 | | 0.0213690281 | 7.9999505434 | 7.9999493042 | 7.9999436191 | 7.9999829799 | 99.6083080150 | 33.4276393073 |
| **27** | -0.1131987000 | -0.0351373432 | | 0.8655561180 | 7.9195249425 | 7.9503376268 | 7.9608885928 | 7.9665558697 | 99.6096191406 | 33.9972167969 |
| **28** | -0.0016737083 | 0.0300351986 | | -0.0034914041 | 7.9999487927 | 7.9999503158 | 7.9999520886 | 7.9999815192 | 99.6105776186 | 33.4291607804 |
| **29** | 0.2138592020 | -0.2632021512 | | 0.3372881504 | 7.9053568847 | 7.8879736708 | 7.8452821615 | 7.8878668615 | 99.6099356192 | 33.2827456938 |
| **30** | 0.0047456781 | -0.0359232914 | | 0.0105144513 | 7.9999502939 | 7.9999353418 | 7.9999295322 | 7.9999818847 | 99.6101526331 | 33.4242979317 |
| **31** | -0.0093341865 | -0.0226420234 | | -0.0007988182 | 7.9999479045 | 7.9999430251 | 7.9999375919 | 7.9999831556 | 99.6079191985 | 33.4171739899 |
| **32** | 0.0045827779 | -0.0011606563 | | -0.0487079437 | 7.9999447715 | 7.9999450039 | 7.9999476817 | 7.9999843293 | 99.6114095052 | 33.4330769237 |
| **33** | 0.0156883819 | -0.0028369997 | | 0.0125446028 | 7.9999522001 | 7.9999534925 | 7.9999390210 | 7.9999848932 | 99.6094744647 | 33.4289540144 |
| **34** | 0.0080838424 | 0.0322154068 | | 0.0437243815 | 7.9999431953 | 7.9999605106 | 7.9999511941 | 7.9999848847 | 99.6119791667 | 33.4153545837 |
| **35** | -0.0126788654 | 0.0363541439 | | 0.0231503577 | 7.9999480231 | 7.9999562161 | 7.9999452116 | 7.9999828520 | 99.6077112269 | 33.4216101864 |
| **36** | -0.0074111367 | -0.0477691537 | | 0.0122493217 | 7.9999486226 | 7.9999515470 | 7.9999455428 | 7.9999817300 | 99.6077745226 | 33.4268635536 |
| **37** | -0.0164297213 | -0.0150706913 | | 0.0305194185 | 7.9999522361 | 7.9999546332 | 7.9999428937 | 7.9999842453 | 99.6098271123 | 33.4253116561 |
| **38** | 0.0018023362 | -0.0411510766 | | -0.0372768959 | 7.9999499585 | 7.9999433711 | 7.9999442879 | 7.9999845340 | 99.6103515625 | 33.4272209173 |
| **39** | -0.0089024688 | -0.0125508788 | | -0.0377144224 | 7.9999532951 | 7.9999375411 | 7.9999400667 | 7.9999835545 | 99.6088776765 | 33.4300221340 |
| **40** | -0.0062494881 | 0.0098396163 | | -0.0366415580 | 7.9999514839 | 7.9999383549 | 7.9999460836 | 7.9999809434 | 99.6085340712 | 33.4259337626 |
| **41** | 0.0052983228 | 0.0012185747 | | -0.0087535164 | 7.9999511090 | 7.9999507357 | 7.9999401117 | 7.9999856131 | 99.6120786314 | 33.4200298855 |
| **42** | -0.0139553165 | 0.0320897451 | | -0.0610305143 | 7.9999498395 | 7.9999474298 | 7.9999474842 | 7.9999827281 | 99.6098813657 | 34.5010440070 |
| **43** | 0.0190761618 | -0.0148475026 | | 0.0103241761 | 7.9999538214 | 7.9999442477 | 7.9999460877 | 7.9999825346 | 99.6093569155 | 33.4339143420 |
| **44** | -0.0299642831 | 0.0012722989 | | -0.0233704355 | 7.9999557231 | 7.9999478679 | 7.9999464696 | 7.9999838620 | 99.6109212240 | 33.4255918593 |
| **45** | 0.0060544978 | -0.0226967568 | | -0.0139088853 | 7.9999443854 | 7.9999450699 | 7.9999346276 | 7.9999823957 | 99.6081995081 | 33.6518135908 |
| **46** | 0.0244764298 | -0.0181271592 | | -0.0015208652 | 7.9999508152 | 7.9999480353 | 7.9999448351 | 7.9999825166 | 99.6086606626 | 32.5674500088 |
| **47** | 0.0101009402 | 0.0223235508 | | 0.0280656353 | 7.9999516155 | 7.9999567743 | 7.9999476306 | 7.9999830268 | 99.6082537616 | 33.4197346828 |
| **48** | -0.4760448832 | -0.3098860939 | | -0.3874178038 | 7.8448806263 | 7.8845863331 | 7.8924101231 | 7.9168356043 | 99.6088324653 | 33.3099056912 |
| **49** | 0.0263779045 | 0.0360348363 | | 0.0423017709 | 7.9999530598 | 7.9999466374 | 7.9999531913 | 7.9999818502 | 99.6080367477 | 33.4160792399 |
| **50** | -0.0049125843 | 0.0163572291 | | -0.0255129541 | 7.9999544385 | 7.9999471609 | 7.9999485043 | 7.9999840680 | 99.6093297888 | 33.4315820100 |
| **Total** | -0.1488454895 | -0.3401454060 | | 0.4744811158 | 399.3489753974 | 399.4137083433 | 399.4797795945 | 399.5536289472 | 4980.4751880787 | 1672.1464041665 |
| **Average** | -0.0029769010 | -0.0068028032 | | 0.0094893375 | 7.9869795079 | 7.9882741669 | 7.9895955919 | 7.9910725789 | 99.6095037616 | 33.4429280833 |

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| **Encryption Algorithm** | | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | | | | | | | |
| **Video Stream** | | | **Project Cars 2016 - 1440p60 Racing Merc HQ HD** | | | | | | | |
| **Resolution** | | | **1440p** | | | | | | | |
| **Frame Number** | **Correlation Coefficient** | | | | **E(i)** | | | | **Differential Attacks** | |
| **CCh** | **CCv** | | **CCd** | **Red** | **Green** | **Blue** | **Combined** | **NPCR** | **UACI** |
| **1** | -0.0197683930 | 0.0132315559 | | 0.0393155028 | 7.9999062318 | 7.9999442272 | 7.9999561630 | 7.9999811619 | 99.6081542969 | 33.4297494128 |
| **2** | 0.0128316542 | -0.0128597674 | | -0.0403602491 | 7.9999350725 | 7.9999442725 | 7.9999570880 | 7.9999824376 | 99.6095287182 | 33.4363509257 |
| **3** | 0.0110747070 | -0.0039677613 | | 0.0024461652 | 7.9999348141 | 7.9999432564 | 7.9999431052 | 7.9999804128 | 99.6101526331 | 33.4271430476 |
| **4** | 0.0244012748 | 0.0013440790 | | -0.0432597269 | 7.9999457632 | 7.9999431975 | 7.9999532283 | 7.9999843375 | 99.6069788050 | 33.4267784501 |
| **5** | 0.0261711414 | 0.0132359240 | | -0.0311553255 | 7.9999231043 | 7.9999423988 | 7.9999523190 | 7.9999808522 | 99.6050528067 | 33.4116368379 |
| **6** | -0.0166855279 | 0.0137318282 | | 0.0404820436 | 7.9999296043 | 7.9999471830 | 7.9999399752 | 7.9999801845 | 99.6109935619 | 33.4302140424 |
| **7** | -0.0173354826 | -0.0152934505 | | 0.0323092265 | 7.9999284965 | 7.9999400799 | 7.9999508169 | 7.9999798848 | 99.6093207465 | 33.4220602774 |
| **8** | -0.0043028573 | -0.0007837456 | | -0.0049174977 | 7.9999449320 | 7.9999454288 | 7.9999503943 | 7.9999836138 | 99.6074399595 | 33.5197758516 |
| **9** | 0.0040774407 | 0.0023360909 | | 0.0009447070 | 7.9999196892 | 7.9999382403 | 7.9999539940 | 7.9999838816 | 99.6099989149 | 33.4722638520 |
| **10** | 0.0187801531 | 0.0109278660 | | 0.0376665978 | 7.9999276110 | 7.9999419359 | 7.9999462349 | 7.9999809582 | 99.6111382378 | 33.4214678153 |
| **11** | 0.0246870313 | 0.0204209516 | | 0.0109633652 | 7.9999284469 | 7.9999414162 | 7.9999473647 | 7.9999794425 | 99.6089861834 | 33.4332570239 |
| **12** | -0.2365509365 | -0.0255354495 | | -0.0239031696 | 7.9296940331 | 7.9238065808 | 7.9401282904 | 7.9400513408 | 99.6086968316 | 33.6486409328 |
| **13** | 0.0094466734 | -0.0189521042 | | 0.0065109194 | 7.9999262680 | 7.9999559214 | 7.9999392630 | 7.9999809058 | 99.6112919560 | 33.4338970730 |
| **14** | -0.0199016136 | -0.0072925893 | | -0.0578452341 | 7.9999352441 | 7.9999457156 | 7.9999336473 | 7.9999802486 | 99.6115993924 | 33.4168957724 |
| **15** | -0.2125799359 | -0.4776789181 | | -0.1100948321 | 7.7644692268 | 7.7294481607 | 7.7424422295 | 7.7908961232 | 99.6071958189 | 33.4444853296 |
| **16** | 0.0435833031 | -0.0224069874 | | -0.0015092964 | 7.9999326166 | 7.9999438596 | 7.9999498829 | 7.9999828829 | 99.6117621528 | 33.4188807757 |
| **17** | 0.0083382470 | 0.0042158965 | | 0.0157761427 | 7.9999094224 | 7.9999380605 | 7.9999492900 | 7.9999775613 | 99.6120334201 | 33.4354003552 |
| **18** | 0.0072049499 | -0.0074094059 | | -0.0373077458 | 7.9998840667 | 7.9999395154 | 7.9999402060 | 7.9999757532 | 99.6094563802 | 33.4269012828 |
| **19** | 0.0004521010 | 0.0202806040 | | -0.0445798357 | 7.9999399113 | 7.9999531594 | 7.9999532992 | 7.9999828854 | 99.6103696470 | 33.4334057068 |
| **20** | 0.0284677526 | 0.0066339613 | | -0.0578451191 | 7.9999208156 | 7.9999377876 | 7.9999466388 | 7.9999809107 | 99.6127658420 | 33.2071201123 |
| **21** | 0.0282953900 | -0.0182811424 | | -0.0200826177 | 7.9999323688 | 7.9999498126 | 7.9999387064 | 7.9999799974 | 99.6091941551 | 33.3406569493 |
| **22** | 0.0095320386 | -0.0048489166 | | 0.0267220611 | 7.9999024900 | 7.9999430037 | 7.9999441026 | 7.9999787062 | 99.6117350260 | 33.4206857497 |
| **23** | 0.0075056269 | -0.0042448426 | | -0.0462358654 | 7.9999453032 | 7.9999562372 | 7.9999496828 | 7.9999836710 | 99.6090946904 | 33.4165010340 |
| **24** | 0.0231416572 | -0.0019804055 | | 0.0556133203 | 7.9999222710 | 7.9999463481 | 7.9999497090 | 7.9999816848 | 99.6109935619 | 33.4314586809 |
| **25** | 0.0160629191 | 0.0008213578 | | -0.0297888881 | 7.9999304659 | 7.9999536408 | 7.9999412490 | 7.9999779809 | 99.6108127170 | 33.4315893856 |
| **26** | -0.0071443742 | -0.0207416841 | | 0.0311943148 | 7.9999384460 | 7.9999444979 | 7.9999428044 | 7.9999827930 | 99.6133897569 | 33.4269903578 |
| **27** | -0.0248788336 | 0.0083613205 | | -0.0198311717 | 7.9999372188 | 7.9999374861 | 7.9999520794 | 7.9999812189 | 99.6094111690 | 33.1392418911 |
| **28** | -0.0084067327 | -0.0110495893 | | 0.0413037659 | 7.9999435593 | 7.9999461195 | 7.9999427639 | 7.9999793506 | 99.6078016493 | 33.4321393315 |
| **29** | -0.0088885956 | -0.0086888349 | | 0.0199324601 | 7.9999400000 | 7.9999492355 | 7.9999438764 | 7.9999817983 | 99.6093659578 | 33.4171714722 |
| **30** | -0.0162786272 | 0.0124198825 | | 0.0033860621 | 7.9999427822 | 7.9999522705 | 7.9999424793 | 7.9999835859 | 99.6090223524 | 33.4141256539 |
| **31** | -0.0045618540 | -0.0373934778 | | 0.0629344231 | 7.9998902788 | 7.9998733991 | 7.9998778047 | 7.9999444544 | 99.6060384115 | 33.4293309519 |
| **32** | 0.0092246273 | 0.0348580668 | | -0.0187856741 | 7.9998261555 | 7.9999298632 | 7.9999364195 | 7.9999730454 | 99.6119429977 | 33.4244435296 |
| **33** | 0.0090612609 | -0.0212222171 | | -0.0238041235 | 7.9999431885 | 7.9999555434 | 7.9999469923 | 7.9999836000 | 99.6077473958 | 33.4302801394 |
| **34** | -0.0219646800 | 0.0156992187 | | 0.0406392626 | 7.9999363152 | 7.9999533256 | 7.9999473511 | 7.9999834757 | 99.6102520978 | 33.4241626526 |
| **35** | 0.2768826376 | -0.3011765663 | | -0.1547357813 | 7.7648162878 | 7.7516215469 | 7.7664889947 | 7.7965078113 | 99.6095558449 | 33.8826966175 |
| **36** | 0.0168745859 | -0.0009163155 | | -0.0870026831 | 7.9998610325 | 7.9999378643 | 7.9999388897 | 7.9999761585 | 99.6091218171 | 33.2644497564 |
| **37** | 0.0125188837 | 0.0220139302 | | 0.0370778589 | 7.9999388476 | 7.9999391073 | 7.9999491203 | 7.9999810909 | 99.6103334780 | 33.2775090636 |
| **38** | 0.0136923619 | 0.0009957530 | | -0.0454301694 | 7.9999242763 | 7.9999551406 | 7.9999468171 | 7.9999809472 | 99.6092303241 | 33.4261679035 |
| **39** | -0.6721967872 | 0.9998902003 | | -0.4030003360 | 7.7715143650 | 7.7297065703 | 7.7295542398 | 7.7739781152 | 99.6102068866 | 33.5191139593 |
| **40** | -0.0235158705 | 0.0012969687 | | 0.0608730161 | 7.9999382171 | 7.9999530151 | 7.9999455988 | 7.9999808945 | 99.6116536458 | 34.1668544617 |
| **41** | -0.0206883767 | -0.0187273736 | | -0.0036276999 | 7.9999098537 | 7.9999448709 | 7.9999359261 | 7.9999789916 | 99.6110297309 | 33.4407891079 |
| **42** | -0.2828983480 | -0.0744981463 | | -0.1381273678 | 7.8472099334 | 7.8254922820 | 7.8231786648 | 7.8677977144 | 99.6068522135 | 33.3537972821 |
| **43** | -0.0242259490 | -0.0199261492 | | 0.0108624496 | 7.9999329384 | 7.9999456594 | 7.9999469870 | 7.9999802531 | 99.6089500145 | 33.4186528402 |
| **44** | -0.9398728921 | 0.9999754175 | | 0.1356688375 | 7.7912170685 | 7.7515365847 | 7.7430733318 | 7.7943641591 | 99.6039767795 | 33.0367541034 |
| **45** | -0.0056512817 | 0.0120629577 | | 0.0303349706 | 7.9999323654 | 7.9999492665 | 7.9999530353 | 7.9999837846 | 99.6087330006 | 33.4333824806 |
| **46** | 0.8807538964 | 0.0039719459 | | 0.0636682955 | 7.9569532549 | 7.9526126843 | 7.9537311254 | 7.9696212429 | 99.6080638744 | 33.5474899436 |
| **47** | 0.2461229085 | 0.0044977104 | | -0.0541824382 | 7.9708893832 | 7.9675535302 | 7.9624105175 | 7.9741157048 | 99.6100712529 | 33.4333458861 |
| **48** | -0.3214271825 | 0.4062364625 | | -0.0766333870 | 7.7512828547 | 7.6956815067 | 7.6611184306 | 7.7252903837 | 99.6097095631 | 33.4400125386 |
| **49** | -0.0184232987 | 0.0077486163 | | -0.0631681584 | 7.9999385589 | 7.9999478445 | 7.9999531502 | 7.9999817405 | 99.6081452546 | 33.4378267974 |
| **50** | 0.0278758368 | 0.0166891132 | | 0.0732920374 | 7.9999045703 | 7.9999431283 | 7.9999387583 | 7.9999761961 | 99.6087962963 | 33.4208674457 |
| **Total** | -1.1310873703 | 1.5180218390 | | -0.7572965878 | 398.5449300215 | 398.3251517826 | 398.3198530390 | 398.6317963304 | 4980.4741482205 | 1671.7748128448 |
| **Average** | -0.0226178894 | 0.0303511119 | | -0.0151447737 | 7.9708986004 | 7.9665030357 | 7.9663970608 | 7.9726359266 | 99.6094829644 | 33.4354962569 |

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| **Encryption Algorithm** | | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | | | | | | | |
| **Video Stream** | | | **Bears Panasonic G85 - 4K UHD** | | | | | | | |
| **Resolution** | | | **1440p** | | | | | | | |
| **Frame Number** | **Correlation Coefficient** | | | | **E(i)** | | | | **Differential Attacks** | |
| **CCh** | **CCv** | | **CCd** | **Red** | **Green** | **Blue** | **Combined** | **NPCR** | **UACI** |
| **1** | -0.0193055068 | -0.0151339134 | | 0.0054271099 | 7.9999507064 | 7.9999561520 | 7.9999514771 | 7.9999830575 | 99.6110478154 | 33.4272658803 |
| **2** | 0.0146644777 | -0.0229838958 | | 0.0195352278 | 7.9999534765 | 7.9999415899 | 7.9999462811 | 7.9999818052 | 99.6116265191 | 33.4314960555 |
| **3** | 0.0095195280 | -0.0092147576 | | 0.0184743860 | 7.9999500420 | 7.9999397057 | 7.9999486163 | 7.9999816220 | 99.6104239005 | 33.4258415317 |
| **4** | 0.2536180922 | -0.3941162500 | | -0.0276279673 | 7.9572151101 | 7.9508093527 | 7.9436479054 | 7.9548714344 | 99.6094111690 | 32.1890526422 |
| **5** | -0.0089356097 | -0.0045121304 | | 0.0480465444 | 7.9999548008 | 7.9999533434 | 7.9999520390 | 7.9999833541 | 99.6094021267 | 33.4234675699 |
| **6** | -0.0027343355 | -0.0014144984 | | 0.0422609692 | 7.9999557126 | 7.9999521966 | 7.9999570417 | 7.9999848638 | 99.6090494792 | 33.4229654239 |
| **7** | -0.0042940903 | -0.0154824354 | | 0.0057261359 | 7.9999473355 | 7.9999437471 | 7.9999552284 | 7.9999816198 | 99.6092122396 | 33.4123416721 |
| **8** | -0.0029306909 | -0.0072226149 | | 0.0003628846 | 7.9999512593 | 7.9999451263 | 7.9999464441 | 7.9999850126 | 99.6130371094 | 33.4263993850 |
| **9** | -0.0283991586 | -0.0073989140 | | -0.0285401986 | 7.9999507389 | 7.9999419193 | 7.9999475529 | 7.9999819434 | 99.6086606626 | 33.4317492738 |
| **10** | 0.0288099116 | -0.0113354061 | | 0.0559338150 | 7.9999557102 | 7.9999555591 | 7.9999519044 | 7.9999846186 | 99.6109664352 | 33.4274597745 |
| **11** | -0.0004907209 | 0.0048741118 | | 0.0010541038 | 7.9999452755 | 7.9999529007 | 7.9999514904 | 7.9999841065 | 99.6061107494 | 33.4342987260 |
| **12** | -0.0212918696 | -0.0111943666 | | 0.0178956252 | 7.9999521680 | 7.9999461062 | 7.9999481943 | 7.9999829544 | 99.6107042101 | 33.4324604553 |
| **13** | -0.0128465129 | 0.0161544501 | | 0.0062426144 | 7.9999532074 | 7.9999488448 | 7.9999482322 | 7.9999834237 | 99.6071506076 | 33.4175600405 |
| **14** | -0.0060437379 | 0.0126221904 | | -0.0271721658 | 7.9999501916 | 7.9999532409 | 7.9999452779 | 7.9999816110 | 99.6099989149 | 33.4272289667 |
| **15** | -0.0131451594 | 0.0036643709 | | 0.0329205682 | 7.9999446290 | 7.9999534543 | 7.9999561270 | 7.9999834605 | 99.6056134259 | 34.7678576191 |
| **16** | 0.6070237073 | -0.0754291422 | | 0.0783740190 | 7.9700158438 | 7.9670426874 | 7.9736411421 | 7.9742917496 | 99.6100169994 | 33.5563010267 |
| **17** | 0.0283927835 | -0.0086577449 | | 0.0188189475 | 7.9999532630 | 7.9999479222 | 7.9999520292 | 7.9999855397 | 99.6111744068 | 33.4342387281 |
| **18** | -0.0147307223 | 0.0055958458 | | -0.0252809080 | 7.9999493481 | 7.9999479423 | 7.9999524599 | 7.9999820687 | 99.6078468605 | 33.4249245771 |
| **19** | -0.0070731762 | 0.0286022850 | | -0.0112906481 | 7.9999504754 | 7.9999503469 | 7.9999447651 | 7.9999831692 | 99.6103334780 | 33.4171283531 |
| **20** | -0.0033214425 | 0.0040545396 | | -0.0224229763 | 7.9999489682 | 7.9999563183 | 7.9999423309 | 7.9999836331 | 99.6083803530 | 33.4115682942 |
| **21** | 0.0083135486 | 0.0128224349 | | 0.0089253770 | 7.9999456559 | 7.9999503882 | 7.9999557829 | 7.9999823976 | 99.6069245515 | 32.0530950010 |
| **22** | 0.0112972041 | -0.0071997018 | | 0.0267745976 | 7.9999434648 | 7.9999481132 | 7.9999433920 | 7.9999811730 | 99.6098180700 | 33.4269828403 |
| **23** | 0.0079716473 | 0.0063833535 | | -0.0717042852 | 7.9999527738 | 7.9999528867 | 7.9999558307 | 7.9999843515 | 99.6101616753 | 33.4296767912 |
| **24** | 0.0165018574 | -0.0323630274 | | -0.0137838818 | 7.9999469828 | 7.9999524027 | 7.9999505698 | 7.9999827092 | 99.6096733941 | 33.4405151456 |
| **25** | 0.0133013283 | 0.0109530329 | | 0.0264503527 | 7.9999554075 | 7.9999577015 | 7.9999499618 | 7.9999845128 | 99.6105776186 | 34.7692138495 |
| **26** | 0.6401255950 | 0.0215829812 | | -0.0355329498 | 7.9906885410 | 7.9893650856 | 7.9910570701 | 7.9914618968 | 99.6086697049 | 33.9504578922 |
| **27** | 0.0294121298 | -0.0112548833 | | -0.0115161522 | 7.9999446958 | 7.9999489834 | 7.9999562594 | 7.9999826645 | 99.6110568576 | 33.4226858944 |
| **28** | -0.0011992603 | 0.0056480749 | | -0.0162289467 | 7.9999469189 | 7.9999489435 | 7.9999567323 | 7.9999850290 | 99.6050347222 | 33.4327564381 |
| **29** | 0.0110693447 | -0.0004117478 | | 0.0545219575 | 7.9999577093 | 7.9999491599 | 7.9999536762 | 7.9999831282 | 99.6106228299 | 33.4255075714 |
| **30** | 0.0195826681 | -0.0196716477 | | 0.0106137543 | 7.9999485450 | 7.9999512406 | 7.9999476939 | 7.9999814658 | 99.6081542969 | 33.4235893743 |
| **31** | -0.0203515241 | 0.0135780170 | | -0.0183871880 | 7.9999440735 | 7.9999524604 | 7.9999469241 | 7.9999815657 | 99.6110568576 | 32.6063356000 |
| **32** | -0.0142200075 | 0.0055847873 | | 0.0371959948 | 7.9999460589 | 7.9999561193 | 7.9999495762 | 7.9999853772 | 99.6051884404 | 33.4306237448 |
| **33** | -0.0025670568 | -0.0039360846 | | -0.0064920744 | 7.9999438347 | 7.9999481258 | 7.9999468857 | 7.9999816193 | 99.6125307436 | 33.4220295692 |
| **34** | 0.0326391152 | 0.0041428937 | | -0.0286343657 | 7.9999531177 | 7.9999496384 | 7.9999584775 | 7.9999862380 | 99.6094111690 | 34.4073878691 |
| **35** | 0.0210344983 | 0.0197717405 | | -0.0452366770 | 7.9999519966 | 7.9999469926 | 7.9999415645 | 7.9999804922 | 99.6101435909 | 33.4417369835 |
| **36** | 0.0219782409 | -0.0052079145 | | 0.0157806679 | 7.9999563306 | 7.9999478428 | 7.9999512864 | 7.9999827988 | 99.6081995081 | 33.4277429563 |
| **37** | 0.0254145765 | 0.0216411655 | | 0.0165398509 | 7.9999500849 | 7.9999522229 | 7.9999550465 | 7.9999853232 | 99.6096100984 | 33.4275749124 |
| **38** | -0.0000877743 | 0.0383777966 | | -0.0039969972 | 7.9999598310 | 7.9999459639 | 7.9999425749 | 7.9999837467 | 99.6102973090 | 33.4156877639 |
| **39** | -0.0000231051 | -0.0305488984 | | -0.0327739842 | 7.9999444913 | 7.9999455531 | 7.9999557162 | 7.9999834907 | 99.6079463252 | 35.6575758060 |
| **40** | -0.0092107896 | -0.0173665152 | | 0.0519809863 | 7.9999503372 | 7.9999504768 | 7.9999438834 | 7.9999835820 | 99.6087510851 | 33.4261344650 |
| **41** | -0.0187507698 | -0.0001623829 | | 0.0049274689 | 7.9999522822 | 7.9999436624 | 7.9999469914 | 7.9999815208 | 99.6106589988 | 33.4306831044 |
| **42** | -0.0594696921 | -0.0156034921 | | 0.0039829752 | 7.9999564402 | 7.9999471781 | 7.9999511690 | 7.9999849522 | 99.6100531684 | 33.4290158562 |
| **43** | -0.5803303341 | 0.2324840633 | | -0.0047014279 | 7.9909543017 | 7.9899382419 | 7.9906750986 | 7.9916616226 | 99.6084436487 | 33.3908617296 |
| **44** | -0.0238222861 | 0.0101449639 | | 0.0220870771 | 7.9999547328 | 7.9999454019 | 7.9999551102 | 7.9999833286 | 99.6128924334 | 33.4304921180 |
| **45** | -0.0086446338 | 0.0068613925 | | 0.0337298024 | 7.9999505204 | 7.9999545102 | 7.9999510191 | 7.9999854617 | 99.6113009983 | 33.4289859991 |
| **46** | -0.0023844586 | -0.0370720352 | | 0.0016899740 | 7.9999479904 | 7.9999534287 | 7.9999547850 | 7.9999847784 | 99.6115541811 | 33.4273973652 |
| **47** | -0.0087474213 | 0.0000997785 | | -0.1072512181 | 7.9999425243 | 7.9999530171 | 7.9999477369 | 7.9999838455 | 99.6067889178 | 33.4160539571 |
| **48** | -0.0050147976 | -0.0268195644 | | 0.0134036987 | 7.9999544999 | 7.9999514985 | 7.9999420196 | 7.9999830009 | 99.6092755353 | 33.4224992696 |
| **49** | -0.0160113318 | -0.0066380027 | | 0.0001626864 | 7.9999528506 | 7.9999542785 | 7.9999524247 | 7.9999853217 | 99.6072681568 | 33.4128102377 |
| **50** | 0.0113588619 | 0.0112267033 | | 0.0031770516 | 7.9999533278 | 7.9999412845 | 7.9999495299 | 7.9999802984 | 99.6065266927 | 33.4324027977 |
| **Total** | 0.8956511401 | -0.3014809944 | | 0.1444422119 | 399.9065985837 | 399.8948412595 | 399.8967313283 | 399.9115187407 | 4980.4687590422 | 1674.4001188982 |
| **Average** | 0.0179111071 | -0.0060295468 | | 0.0028888362 | 7.9981319717 | 7.9978968252 | 7.9979346266 | 7.9982303748 | 99.6093751808 | 33.4880023780 |

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| **Encryption Algorithm** | | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | | | | | | | |
| **Video Stream** | | | **Jackdaw Bird Panasonic G85 Clip High Quality - 4K UHD** | | | | | | | |
| **Resolution** | | | **1440p** | | | | | | | |
| **Frame Number** | **Correlation Coefficient** | | | | **E(i)** | | | | **Differential Attacks** | |
| **CCh** | **CCv** | | **CCd** | **Red** | **Green** | **Blue** | **Combined** | **NPCR** | **UACI** |
| **1** | 0.0121181486 | -0.0042397307 | | 0.0100562396 | 7.9999273671 | 7.9999469640 | 7.9998709885 | 7.9999580910 | 99.6117078993 | 33.4502321907 |
| **2** | 0.0057042300 | -0.0185256611 | | 0.0242819261 | 7.9999405414 | 7.9999451585 | 7.9999200539 | 7.9999762731 | 99.6094202112 | 33.4249331583 |
| **3** | 0.0158646789 | 0.0244370065 | | -0.0095192049 | 7.9999494570 | 7.9999495683 | 7.9999352381 | 7.9999790850 | 99.6067617911 | 33.4262830415 |
| **4** | 0.7601882422 | -0.2535791707 | | -0.1546855442 | 7.9678977922 | 7.9571816129 | 7.9166654324 | 7.9606645100 | 99.6097095631 | 33.3715406142 |
| **5** | 0.0090549257 | -0.0125004718 | | 0.0119108457 | 7.9999409276 | 7.9999515926 | 7.9999247198 | 7.9999751224 | 99.6103063513 | 33.4282846754 |
| **6** | -0.0051495720 | -0.0056059899 | | -0.0164639254 | 7.9999236565 | 7.9999466019 | 7.9998244098 | 7.9999488403 | 99.6101797598 | 33.8424213928 |
| **7** | -0.0101581180 | -0.0141269778 | | -0.0255685891 | 7.9999300044 | 7.9999565375 | 7.9998703036 | 7.9999590407 | 99.6106318721 | 33.4226624555 |
| **8** | -0.0185773493 | 0.0099513716 | | -0.0449893767 | 7.9999466747 | 7.9999587391 | 7.9999240757 | 7.9999782239 | 99.6060474537 | 33.4253191026 |
| **9** | -0.1037475245 | -0.0829581048 | | 0.1474486745 | 7.9680695653 | 7.9709194835 | 7.9364453094 | 7.9708712179 | 99.6088505498 | 33.8995970705 |
| **10** | 0.0237496297 | 0.0394530997 | | -0.0300168804 | 7.9999267498 | 7.9999464264 | 7.9998422821 | 7.9999487888 | 99.6066623264 | 33.0876230809 |
| **11** | -0.0083952841 | -0.0023269579 | | -0.0185182210 | 7.9999389003 | 7.9999406255 | 7.9999400029 | 7.9999775495 | 99.6106047454 | 33.4352459987 |
| **12** | 0.0379991224 | 0.0096723389 | | 0.0375127933 | 7.9999421212 | 7.9999560202 | 7.9999274935 | 7.9999760414 | 99.6079011140 | 33.4235780272 |
| **13** | -0.0037392676 | 0.0009842331 | | -0.0089855241 | 7.9999448423 | 7.9999530269 | 7.9999289983 | 7.9999765072 | 99.6106137876 | 32.9089744108 |
| **14** | -0.0190506180 | 0.0044026790 | | 0.0352848319 | 7.9999507483 | 7.9999382902 | 7.9999176358 | 7.9999747747 | 99.6064181858 | 33.4242921518 |
| **15** | 0.0260047044 | 0.0043276523 | | 0.0238290537 | 7.9999478038 | 7.9999514684 | 7.9999304274 | 7.9999772201 | 99.6081542969 | 33.4417404231 |
| **16** | -0.7999950214 | 0.0280074766 | | -0.0805604925 | 7.9829677583 | 7.9840423887 | 7.9765518562 | 7.9862935160 | 99.6117983218 | 32.6899381085 |
| **17** | -0.0070372594 | -0.0237331467 | | 0.0097192182 | 7.9999454362 | 7.9999476900 | 7.9999402585 | 7.9999786130 | 99.6134440104 | 33.4304919053 |
| **18** | -0.0028692150 | 0.0394461126 | | 0.0075135521 | 7.9999453919 | 7.9999496805 | 7.9999376793 | 7.9999795989 | 99.6085431134 | 33.4231857001 |
| **19** | -0.0181470431 | -0.0032353830 | | 0.0465153704 | 7.9999487948 | 7.9999595258 | 7.9999353519 | 7.9999801710 | 99.6082175926 | 33.4350915005 |
| **20** | -0.0041235228 | -0.0208681991 | | -0.0334897698 | 7.9999563633 | 7.9999499151 | 7.9999309643 | 7.9999809607 | 99.6102068866 | 33.4263269052 |
| **21** | -0.1098462672 | -0.3106301302 | | -0.1680236842 | 7.9558884785 | 7.9503888822 | 7.9339559113 | 7.9643898598 | 99.6103786892 | 32.5719561320 |
| **22** | -0.0025292358 | -0.0160332126 | | -0.0233086899 | 7.9999439900 | 7.9999485795 | 7.9999241108 | 7.9999794331 | 99.6092574508 | 33.4236445497 |
| **23** | -0.0242160048 | 0.0325587481 | | 0.0060326856 | 7.9999485166 | 7.9999534988 | 7.9999261332 | 7.9999806778 | 99.6085431134 | 33.4200453815 |
| **24** | 0.0135293272 | 0.0324194204 | | -0.0155285688 | 7.9999466718 | 7.9999453622 | 7.9999068313 | 7.9999773026 | 99.6117983218 | 33.4321561394 |
| **25** | 0.0418899117 | 0.0144063980 | | -0.0503162069 | 7.9999445147 | 7.9999527431 | 7.9999470777 | 7.9999812410 | 99.6108669705 | 33.4212267242 |
| **26** | 0.0317525826 | -0.0217290675 | | 0.0213656539 | 7.9999404569 | 7.9999550393 | 7.9999465656 | 7.9999812872 | 99.6092845775 | 33.4477438002 |
| **27** | -0.3233509523 | -0.2379916803 | | 0.1153688820 | 7.9601770030 | 7.9788754365 | 7.9573474786 | 7.9740534016 | 99.6116084346 | 33.6876301020 |
| **28** | -0.2863711679 | 0.0911008357 | | 0.0013743263 | 7.9941860141 | 7.9934653975 | 7.9916110860 | 7.9952195668 | 99.6068160446 | 33.1922446257 |
| **29** | -0.0160362394 | 0.0389512233 | | 0.0210029188 | 7.9999454550 | 7.9999514820 | 7.9996766592 | 7.9999352751 | 99.6145200376 | 33.4390180689 |
| **30** | 0.2264396933 | 0.0332494550 | | -0.0146184652 | 7.9736835828 | 7.9689213825 | 7.9527005217 | 7.9736583931 | 99.6126121238 | 32.7715586633 |
| **31** | -0.0071281376 | 0.0025506401 | | -0.0031510092 | 7.9999472494 | 7.9999491484 | 7.9999202663 | 7.9999779265 | 99.6116536458 | 33.4185432695 |
| **32** | -0.0112456865 | -0.0044406951 | | 0.0087865485 | 7.9999499757 | 7.9999515709 | 7.9999403863 | 7.9999815157 | 99.6083713108 | 33.4208257095 |
| **33** | -0.0150545807 | 0.0444732239 | | 0.0366312527 | 7.9999478099 | 7.9999569852 | 7.9999274663 | 7.9999801457 | 99.6073766638 | 33.4324215204 |
| **34** | 0.0117241964 | 0.0031258851 | | 0.0456673412 | 7.9999510001 | 7.9999538954 | 7.9999301705 | 7.9999792960 | 99.6087330006 | 33.4322724120 |
| **35** | -0.0151138715 | 0.0010461409 | | 0.0192598051 | 7.9999480144 | 7.9999473011 | 7.9998881946 | 7.9999696519 | 99.6105776186 | 33.4188960589 |
| **36** | -0.0307069868 | -0.0182098722 | | -0.1018379094 | 7.9999484899 | 7.9999487386 | 7.9999148842 | 7.9999782902 | 99.6093930845 | 33.4244348774 |
| **37** | -0.0223531422 | 0.0098844599 | | -0.0247452802 | 7.9999416492 | 7.9999535067 | 7.9999054495 | 7.9999691932 | 99.6129738137 | 33.4452761183 |
| **38** | -0.4000160367 | -0.2193366526 | | 0.1660802850 | 7.8498512790 | 7.8945511435 | 7.7827681851 | 7.8785033347 | 99.6104329427 | 32.8464133845 |
| **39** | 0.9186485965 | 0.9787360949 | | -0.1902858430 | 7.9497648631 | 7.9695727524 | 7.8853178373 | 7.9544294177 | 99.6087510851 | 33.9836024731 |
| **40** | -0.0002727399 | 0.0318037794 | | 0.0325199736 | 7.9999521216 | 7.9999578187 | 7.9999241623 | 7.9999791279 | 99.6103696470 | 33.4305716543 |
| **41** | -0.5242666835 | -0.2492980412 | | 0.0869442425 | 7.8951496665 | 7.9146339556 | 7.7865853110 | 7.8983037407 | 99.6095920139 | 33.1959426559 |
| **42** | 0.0169714133 | -0.0246304723 | | -0.0679126827 | 7.9999472445 | 7.9999512551 | 7.9998866668 | 7.9999764344 | 99.6119158709 | 33.4220039318 |
| **43** | 0.0228967020 | -0.0168430279 | | -0.0354933792 | 7.9999469411 | 7.9999525356 | 7.9999099890 | 7.9999781234 | 99.6062554253 | 34.4662261852 |
| **44** | -0.0189226566 | 0.0035001361 | | -0.0224404745 | 7.9999489515 | 7.9999443890 | 7.9998822307 | 7.9999709610 | 99.6078287760 | 33.4349085280 |
| **45** | -0.0344565743 | 0.0011366310 | | -0.0227550665 | 7.9999471938 | 7.9999481447 | 7.9998748759 | 7.9999695850 | 99.6069155093 | 33.4337684604 |
| **46** | -0.0333396165 | 0.2610676093 | | -0.0973082973 | 7.8139365780 | 7.7568947346 | 7.5680885496 | 7.7611645686 | 99.6096914786 | 33.8881723176 |
| **47** | 0.0117137216 | -0.0171142083 | | 0.0087047683 | 7.9999439347 | 7.9999429806 | 7.9998157321 | 7.9999586981 | 99.6103696470 | 33.4330377406 |
| **48** | -0.0244869121 | -0.0022903164 | | 0.0396847838 | 7.9999283441 | 7.9999559385 | 7.9994685360 | 7.9998972632 | 99.6097547743 | 33.4270529798 |
| **49** | -0.0103922135 | -0.0051467460 | | -0.0045440910 | 7.9999443360 | 7.9999461910 | 7.9998886587 | 7.9999719981 | 99.6115451389 | 32.7395431929 |
| **50** | -0.0347785215 | -0.0054765347 | | -0.0213746396 | 7.9999441130 | 7.9999492827 | 7.9997033435 | 7.9999440655 | 99.6065266927 | 33.4162940198 |
| **Total** | -0.7596241960 | 0.1498222006 | | -0.3229458427 | 399.3093853352 | 399.3375113879 | 398.6836467525 | 399.3163939212 | 4980.4808937355 | 1669.7351935907 |
| **Average** | -0.0151913152 | 0.0029964350 | | -0.0064588270 | 7.9861877067 | 7.9867502278 | 7.9736729351 | 7.9863278784 | 99.6096178747 | 33.3947038718 |

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| **Encryption Algorithm** | | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | | | | | | | |
| **Video Stream** | | | **Drifting in Real World by Drift Mechaniks 4K UHD** | | | | | | | |
| **Resolution** | | | **1440p** | | | | | | | |
| **Frame Number** | **Correlation Coefficient** | | | | **E(i)** | | | | **Differential Attacks** | |
| **CCh** | **CCv** | | **CCd** | **Red** | **Green** | **Blue** | **Combined** | **NPCR** | **UACI** |
| **1** | 0.0177543322 | 0.0244220843 | | -0.0078722650 | 7.9995922690 | 7.9995240862 | 7.9996005115 | 7.9996051852 | 99.6077473958 | 33.5905371661 |
| **2** | -0.0211213726 | 0.0364455927 | | -0.0233892846 | 7.9995180910 | 7.9994499925 | 7.9995349608 | 7.9995356844 | 99.6101797598 | 33.4249803199 |
| **3** | -0.0038988980 | -0.0205306187 | | -0.0339264272 | 7.9995148814 | 7.9994419920 | 7.9995037007 | 7.9995192332 | 99.6048086661 | 33.4320321011 |
| **4** | 0.0462206040 | -0.0031492292 | | -0.0279626392 | 7.9998744620 | 7.9998586222 | 7.9998703247 | 7.9998997745 | 99.6097728588 | 34.2742882867 |
| **5** | -0.0032969837 | -0.0081450523 | | -0.0152991297 | 7.9995289889 | 7.9994248622 | 7.9995133878 | 7.9995212176 | 99.6112105758 | 33.4232192096 |
| **6** | 0.0152320314 | -0.0000743102 | | 0.0551737187 | 7.9995404137 | 7.9994143918 | 7.9995695907 | 7.9995420997 | 99.6089861834 | 33.4311289403 |
| **7** | -0.9908381668 | 0.9196037199 | | -0.0138008297 | 7.6483394960 | 7.6447472142 | 7.6507860695 | 7.6530494852 | 99.6075755932 | 33.5672413280 |
| **8** | -0.0126566614 | 0.0178385360 | | -0.0459821999 | 7.9992814661 | 7.9991998497 | 7.9993282846 | 7.9993058141 | 99.6072229456 | 33.4210186107 |
| **9** | -0.3835550021 | 0.7457031504 | | -0.5074620609 | 7.3215606076 | 7.3125136597 | 7.3079786596 | 7.3291723538 | 99.6117078993 | 32.6561641874 |
| **10** | 0.0124534113 | -0.0163485966 | | 0.0387189669 | 7.9994001310 | 7.9993164780 | 7.9993928160 | 7.9994046884 | 99.6103425203 | 33.4307791650 |
| **11** | 0.0042917483 | -0.0159832898 | | -0.0019145801 | 7.9995490097 | 7.9994996814 | 7.9995075455 | 7.9995538157 | 99.6101978443 | 33.4298827416 |
| **12** | 0.0067637593 | -0.0193261254 | | -0.0336384009 | 7.9984160373 | 7.9982430392 | 7.9984029244 | 7.9983861438 | 99.6106137876 | 33.4250392895 |
| **13** | -0.0232005804 | 0.0022707646 | | -0.0446474629 | 7.9994409804 | 7.9993874817 | 7.9994077433 | 7.9994429816 | 99.6111020689 | 33.4364093634 |
| **14** | -0.0025740263 | 0.0174181057 | | -0.0093552605 | 7.9994292307 | 7.9993350929 | 7.9994109319 | 7.9994250242 | 99.6086606626 | 33.4334096428 |
| **15** | 0.0082649384 | -0.0106950806 | | 0.0480090727 | 7.9998508798 | 7.9998421427 | 7.9998486579 | 7.9998801490 | 99.6097728588 | 33.4339595886 |
| **16** | 0.0030082101 | -0.0257044019 | | -0.0054811668 | 7.9997438075 | 7.9997252790 | 7.9997517993 | 7.9997723075 | 99.6069516782 | 33.4225763237 |
| **17** | 0.0186417730 | -0.0292767722 | | -0.0184456761 | 7.9977418117 | 7.9976362768 | 7.9977300278 | 7.9977334099 | 99.6099627459 | 33.4193318597 |
| **18** | 0.0034510376 | 0.0247479699 | | 0.0092093856 | 7.9994584259 | 7.9994451460 | 7.9994575487 | 7.9994904375 | 99.6089500145 | 33.4306814378 |
| **19** | 0.0176294166 | -0.0055361083 | | -0.0194472020 | 7.9988801568 | 7.9987684756 | 7.9988851305 | 7.9988777796 | 99.6103063513 | 33.4380514352 |
| **20** | 0.0030683893 | 0.0216704947 | | -0.0503562060 | 7.9979488472 | 7.9978366190 | 7.9980582887 | 7.9979814994 | 99.6105233652 | 33.4323400338 |
| **21** | 0.0388219104 | -0.0039969847 | | -0.0575705285 | 7.9994434513 | 7.9993611758 | 7.9994635605 | 7.9994561893 | 99.6091399016 | 34.2774986384 |
| **22** | -0.0076227406 | 0.0248179640 | | 0.0322316021 | 7.9995381681 | 7.9995168720 | 7.9995656520 | 7.9995773728 | 99.6097638166 | 33.4209679033 |
| **23** | -0.0032237913 | 0.0100954539 | | 0.0242712401 | 7.9994911180 | 7.9993902217 | 7.9994801433 | 7.9994882310 | 99.6063458478 | 33.4314079379 |
| **24** | 0.0203066302 | 0.0298651166 | | 0.0448207624 | 7.9995093230 | 7.9994680780 | 7.9995262538 | 7.9995327186 | 99.6089500145 | 33.4314289656 |
| **25** | 0.0089782171 | 0.0088604391 | | 0.0121990523 | 7.9995194308 | 7.9995147379 | 7.9995561215 | 7.9995669959 | 99.6119339554 | 33.4313652089 |
| **26** | 0.0102334110 | 0.0124910769 | | 0.0151151825 | 7.9982216021 | 7.9981003030 | 7.9982034970 | 7.9982068259 | 99.6105052807 | 33.4293179381 |
| **27** | 0.0787723645 | -0.2223169769 | | 0.2399848664 | 7.5223679164 | 7.5133299256 | 7.4923110191 | 7.5263436254 | 99.6115180122 | 33.4464379936 |
| **28** | -0.0144539815 | -0.0138517532 | | -0.0508848747 | 7.9995392661 | 7.9995293869 | 7.9995542855 | 7.9995739925 | 99.6095829716 | 32.4960801335 |
| **29** | 0.0136170362 | 0.0143869952 | | -0.0259848527 | 7.9976300199 | 7.9976162277 | 7.9975665315 | 7.9976375527 | 99.6109845197 | 33.4299236267 |
| **30** | -0.0090963710 | 0.0243019313 | | -0.0053856922 | 7.9995604642 | 7.9995466773 | 7.9995803945 | 7.9995953982 | 99.6083532263 | 33.4215708614 |
| **31** | 0.0358004000 | 0.0148331977 | | -0.0447075106 | 7.9993542505 | 7.9993931920 | 7.9994186032 | 7.9994235769 | 99.6060293692 | 33.4238551808 |
| **32** | 0.0058686343 | -0.0222280353 | | 0.0172065119 | 7.9994621335 | 7.9994791179 | 7.9995394697 | 7.9995266955 | 99.6090042679 | 33.4170720784 |
| **33** | 0.0377587345 | -0.0266972691 | | 0.0034024718 | 7.9993969595 | 7.9993545526 | 7.9994319684 | 7.9994243126 | 99.6100079572 | 33.4263286782 |
| **34** | -0.1844003794 | -0.3354539479 | | 0.1761954517 | 7.5780791573 | 7.5694792314 | 7.5713730859 | 7.5835560981 | 99.6127567998 | 33.0373261052 |
| **35** | 0.0088515162 | 0.0179204999 | | -0.0210771474 | 7.9994492580 | 7.9993851334 | 7.9994627979 | 7.9994642777 | 99.6102430556 | 33.1998368850 |
| **36** | 0.0176421559 | 0.0407384831 | | 0.0282462331 | 7.9994708967 | 7.9994324985 | 7.9995038117 | 7.9995017715 | 99.6079463252 | 33.4212155189 |
| **37** | 0.0092563964 | 0.0065407941 | | 0.0378618268 | 7.9981995846 | 7.9982200651 | 7.9981607613 | 7.9982273499 | 99.6078559028 | 33.4293127256 |
| **38** | 0.0025316987 | -0.0071318239 | | 0.0440737830 | 7.9981834828 | 7.9980694156 | 7.9981179942 | 7.9981565134 | 99.6109573929 | 33.4223432820 |
| **39** | 0.0067621816 | 0.0059251489 | | -0.0027758086 | 7.9976815877 | 7.9975822215 | 7.9975236216 | 7.9976302162 | 99.6067798756 | 33.4203507257 |
| **40** | -0.0155173182 | 0.0067263097 | | -0.0184731741 | 7.9993015092 | 7.9993357656 | 7.9993094687 | 7.9993491968 | 99.6068612558 | 33.4220984676 |
| **41** | -0.0109030212 | -0.0142038760 | | -0.0145304933 | 7.9995129360 | 7.9995052029 | 7.9994828603 | 7.9995326042 | 99.6106951678 | 33.4401507609 |
| **42** | 0.0091949243 | -0.0225693741 | | 0.0632898028 | 7.9994885911 | 7.9994432304 | 7.9995301268 | 7.9995212371 | 99.6096553096 | 33.4191284623 |
| **43** | -0.0069023781 | 0.0257050719 | | 0.0683035188 | 7.9994351010 | 7.9994242035 | 7.9994642227 | 7.9994731775 | 99.6106951678 | 33.4248680542 |
| **44** | 0.0063959451 | -0.0203820256 | | 0.0003678030 | 7.9988025385 | 7.9987695506 | 7.9989551776 | 7.9988754297 | 99.6099898727 | 33.4177360984 |
| **45** | 0.0076715952 | 0.0019544753 | | -0.0106586443 | 7.9995091425 | 7.9994765741 | 7.9995295834 | 7.9995383024 | 99.6123860677 | 33.4353264215 |
| **46** | -0.0291631695 | 0.0037532425 | | 0.0205251759 | 7.9994909682 | 7.9994293143 | 7.9994500000 | 7.9994897982 | 99.6096281829 | 33.4341971692 |
| **47** | 0.0141728999 | -0.0049461650 | | 0.0215326078 | 7.9993800539 | 7.9993598361 | 7.9993315626 | 7.9993921523 | 99.6094744647 | 33.4191408023 |
| **48** | 0.0310131642 | 0.0063658069 | | -0.0409074882 | 7.9995621078 | 7.9995578926 | 7.9995999190 | 7.9996053362 | 99.6102973090 | 33.4297950141 |
| **49** | 0.0031536668 | 0.0346636555 | | -0.0110959591 | 7.9993701026 | 7.9993813453 | 7.9994182960 | 7.9994261927 | 99.6103153935 | 33.5242143176 |
| **50** | 0.0053711751 | 0.0264779778 | | 0.0128923662 | 7.9992889329 | 7.9992993494 | 7.9993685348 | 7.9993513117 | 99.6088776765 | 33.4313443940 |
| **Total** | -1.1934705330 | 1.2779962416 | | -0.1494015630 | 398.0338500480 | 398.0013616819 | 397.9863182281 | 398.0565435368 | 4980.4741301360 | 1671.1647113802 |
| **Average** | -0.0238648785 | 0.0255543601 | | -0.0029880224 | 7.9606770010 | 7.9600272336 | 7.9597263646 | 7.9611308707 | 99.6094826027 | 33.4232942276 |

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| **Encryption Algorithm** | | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | | | | | | | |
| **Video Stream** | | | **ARTE Carnival Ultra -HD Demo Video 4K UHD** | | | | | | | |
| **Resolution** | | | **1440p** | | | | | | | |
| **Frame Number** | **Correlation Coefficient** | | | | **E(i)** | | | | **Differential Attacks** | |
| **CCh** | **CCv** | | **CCd** | **Red** | **Green** | **Blue** | **Combined** | **NPCR** | **UACI** |
| **1** | -0.0161862317 | 0.0007446533 | | -0.0152536760 | 7.9981830463 | 7.9980905309 | 7.9986500630 | 7.9983495695 | 99.6045193142 | 33.4169412318 |
| **2** | 0.0175207503 | -0.0211068016 | | -0.0201888115 | 7.9951681899 | 7.9957013081 | 7.9962303127 | 7.9957442713 | 99.6104510272 | 33.4322951063 |
| **3** | -0.0039918701 | -0.0213206280 | | -0.0003899377 | 7.9960940857 | 7.9968396357 | 7.9971185960 | 7.9967287358 | 99.6075755932 | 33.4293006692 |
| **4** | 0.1282240327 | -0.0082967515 | | 0.2688541409 | 6.6439934047 | 6.8899117044 | 6.8476826414 | 6.8011915637 | 99.6096281829 | 33.1868862621 |
| **5** | 0.0215324660 | -0.0143961008 | | -0.0392044663 | 7.9801261012 | 7.9869541974 | 7.9857500824 | 7.9844456011 | 99.6051703559 | 33.4244696280 |
| **6** | -0.0204351036 | -0.0006546553 | | -0.0050957913 | 7.9950225854 | 7.9969030961 | 7.9965283085 | 7.9962254224 | 99.6106228299 | 33.4226729870 |
| **7** | 0.0113842294 | -0.0142946735 | | -0.0235451202 | 7.9921995521 | 7.9947448519 | 7.9942595678 | 7.9938152324 | 99.6054958767 | 33.4280514564 |
| **8** | 0.0226148073 | -0.0015959390 | | -0.0211801237 | 7.9773047759 | 7.9857040266 | 7.9844849480 | 7.9827175241 | 99.6065628617 | 33.4318988786 |
| **9** | 0.0023708078 | 0.0132311982 | | 0.0224454300 | 7.9867633431 | 7.9909645214 | 7.9897091448 | 7.9892462543 | 99.6101978443 | 33.4276050887 |
| **10** | -0.0022444353 | 0.0166473733 | | -0.0500465980 | 7.9934999991 | 7.9956578641 | 7.9950263920 | 7.9948035455 | 99.6078739873 | 33.4213076789 |
| **11** | 0.0061703279 | -0.0148936361 | | 0.0098823267 | 7.9931090126 | 7.9953609189 | 7.9948431934 | 7.9945130184 | 99.6040581597 | 33.4173842664 |
| **12** | -0.0104051802 | 0.0186403300 | | 0.0460774319 | 7.9964989629 | 7.9975925537 | 7.9971764238 | 7.9971371473 | 99.6051793981 | 33.4195579158 |
| **13** | 0.0018402102 | -0.0132442241 | | 0.0008467248 | 7.9946032355 | 7.9964947307 | 7.9959957323 | 7.9957684715 | 99.6066171152 | 33.4270548592 |
| **14** | 0.0076638550 | 0.0224490452 | | -0.0393861792 | 7.9947086929 | 7.9963424818 | 7.9958035941 | 7.9956784930 | 99.6017071759 | 33.4274661572 |
| **15** | -0.0010338564 | 0.0013737994 | | -0.0163168520 | 7.9955878285 | 7.9970419531 | 7.9965698484 | 7.9964610147 | 99.6079644097 | 33.4282210961 |
| **16** | -0.0075905735 | -0.0071397663 | | 0.0128612240 | 7.9935665712 | 7.9955592286 | 7.9948785082 | 7.9947317646 | 99.6070240162 | 33.4103315987 |
| **17** | -0.0119714055 | -0.0082465824 | | -0.0180927097 | 7.9950297077 | 7.9965114882 | 7.9957863689 | 7.9958323518 | 99.6099627459 | 33.4283585382 |
| **18** | 0.0043534775 | -0.0397313091 | | 0.0524442419 | 7.9946248817 | 7.9969209902 | 7.9962977704 | 7.9960379742 | 99.6166720920 | 30.5943810778 |
| **19** | -0.0103537642 | -0.0140088868 | | -0.0008644307 | 7.9951910952 | 7.9966374983 | 7.9962191556 | 7.9960702136 | 99.6085702402 | 33.4214017183 |
| **20** | 0.0009407714 | 0.0237891919 | | 0.0191295759 | 7.9896142861 | 7.9932297297 | 7.9916928576 | 7.9916068053 | 99.6053602431 | 33.4292429762 |
| **21** | -0.0211141343 | -0.0016468567 | | -0.0110915787 | 7.9934887477 | 7.9958317505 | 7.9947841019 | 7.9947779412 | 99.6041576244 | 33.4206175960 |
| **22** | -0.0153036478 | -0.0309075521 | | -0.0212187485 | 7.9942850696 | 7.9958342239 | 7.9951409480 | 7.9951388409 | 99.6076479311 | 33.4187004273 |
| **23** | -0.0103871647 | -0.0024932668 | | -0.0416808283 | 7.9948504996 | 7.9966491528 | 7.9956613496 | 7.9957868845 | 99.6076750579 | 33.4235949769 |
| **24** | 0.0084038694 | -0.0022125115 | | -0.0488738597 | 7.9930488305 | 7.9950504524 | 7.9939736328 | 7.9940815618 | 99.6048900463 | 33.4180387476 |
| **25** | 0.0142776079 | 0.0123505654 | | -0.0185969195 | 7.9925260822 | 7.9951569693 | 7.9940737569 | 7.9939981126 | 99.6056767216 | 33.4271205661 |
| **26** | -0.0118082375 | -0.0003318571 | | 0.0287254813 | 7.9947255874 | 7.9964513886 | 7.9957024531 | 7.9956884985 | 99.6048629196 | 33.4187594678 |
| **27** | 0.0267210029 | -0.0144694486 | | -0.0102620162 | 7.9928915241 | 7.9950523227 | 7.9942988540 | 7.9941436882 | 99.6085521557 | 33.4335456666 |
| **28** | -0.0146517837 | 0.0022107266 | | -0.0090381032 | 7.9934544408 | 7.9956615643 | 7.9948301679 | 7.9947213292 | 99.6195746528 | 40.0595989995 |
| **29** | -0.0007971966 | 0.0034718180 | | 0.0320584360 | 7.9951794357 | 7.9965492521 | 7.9961256503 | 7.9960057517 | 99.6086064091 | 33.4400986704 |
| **30** | 0.0228431900 | 0.0135453647 | | 0.0054416838 | 7.9945785721 | 7.9964385987 | 7.9957261178 | 7.9956463343 | 99.6093750000 | 33.4551108544 |
| **31** | -0.0145722558 | 0.0131114979 | | 0.0583110655 | 7.9987181816 | 7.9991829592 | 7.9990055342 | 7.9990141275 | 99.6038773148 | 33.4221449908 |
| **32** | 0.0188349141 | 0.0152532284 | | -0.0225081734 | 7.9949728982 | 7.9964649363 | 7.9959732501 | 7.9958579497 | 99.6071958189 | 33.4202905150 |
| **33** | -0.0015080209 | 0.0006462555 | | 0.0045724858 | 7.9892545649 | 7.9927121380 | 7.9911904155 | 7.9911419675 | 99.6017614294 | 33.4366561635 |
| **34** | 0.0369699805 | -0.0112357032 | | -0.0151658181 | 7.9938685799 | 7.9961615536 | 7.9952353002 | 7.9951710024 | 99.5844003183 | 34.3959671941 |
| **35** | -0.0074937734 | 0.0110195630 | | 0.0186862278 | 7.9772641713 | 7.9843945059 | 7.9813910011 | 7.9811655877 | 99.6002423322 | 33.4312320928 |
| **36** | -0.0041101357 | 0.0022681626 | | -0.0177877298 | 7.9785928397 | 7.9854096966 | 7.9830226116 | 7.9824851898 | 99.6015715422 | 33.4197190805 |
| **37** | 0.0097758847 | -0.0109541388 | | 0.0364467566 | 7.9948469501 | 7.9962889940 | 7.9956972244 | 7.9956649426 | 99.6087058738 | 33.4211410534 |
| **38** | -0.0401551043 | -0.0067956116 | | -0.0379782510 | 7.9792712011 | 7.9868002797 | 7.9842368017 | 7.9836145454 | 99.6093930845 | 33.4276213647 |
| **39** | 0.0032804738 | 0.0060541088 | | -0.0012741127 | 7.9742490759 | 7.9828648114 | 7.9795712303 | 7.9790783622 | 99.6020869502 | 33.4303212373 |
| **40** | 0.0007459512 | -0.0240097037 | | -0.0255987903 | 7.9941724724 | 7.9956290329 | 7.9950378008 | 7.9949958002 | 99.6117983218 | 33.4272882909 |
| **41** | 0.0095515530 | -0.0117751553 | | -0.0110809681 | 7.9935917441 | 7.9960495539 | 7.9952812287 | 7.9950585849 | 99.6059118200 | 33.4087466881 |
| **42** | 0.0143782946 | -0.0008851758 | | 0.0503022776 | 7.9948650150 | 7.9966268588 | 7.9959227911 | 7.9958672875 | 99.6050437645 | 33.4279958910 |
| **43** | 0.0023741867 | -0.0018061052 | | -0.0358688322 | 7.9958440073 | 7.9970990884 | 7.9966995188 | 7.9965998594 | 99.6084165220 | 33.4274810503 |
| **44** | -0.0108273592 | -0.0005077628 | | 0.0186949045 | 7.9982402032 | 7.9987266436 | 7.9985251346 | 7.9985394484 | 99.6074942130 | 33.4224177830 |
| **45** | 0.5948491252 | 0.0049211722 | | -0.2265621661 | 5.1537818004 | 5.9901152647 | 5.8148062939 | 5.6814642228 | 99.5986689815 | 34.3056295956 |
| **46** | -0.0233914981 | -0.0067352755 | | -0.0208190604 | 7.9807650891 | 7.9893119187 | 7.9874566604 | 7.9861068456 | 99.6051522714 | 33.4241346749 |
| **47** | 0.0295676782 | -0.0083217323 | | 0.0239104494 | 7.9975072961 | 7.9986593703 | 7.9985154188 | 7.9982945084 | 99.6091218171 | 33.4351163932 |
| **48** | 0.0242077702 | -0.0082626328 | | 0.0104991218 | 7.9937606652 | 7.9965079291 | 7.9960333482 | 7.9955402450 | 99.6061197917 | 33.4270267395 |
| **49** | 0.0099776869 | 0.0308713670 | | -0.0248986918 | 7.9754455006 | 7.9853801283 | 7.9832614580 | 7.9816319178 | 99.6040943287 | 33.4250881531 |
| **50** | -0.0198901019 | 0.0323354820 | | -0.0427008206 | 7.9797288978 | 7.9889216078 | 7.9867769260 | 7.9854251541 | 99.6071325231 | 33.4201322934 |
| **Total** | 0.7711520704 | -0.0773455408 | | -0.1723801786 | 395.3786593013 | 396.6051462564 | 396.3446604900 | 396.1498114661 | 4980.3204210069 | 1676.6961664086 |
| **Average** | 0.0154218186 | -0.0015469096 | | -0.0034475899 | 7.9075731860 | 7.9321029251 | 7.9268932098 | 7.9229962293 | 99.6064084201 | 33.5339233282 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Encryption Algorithm** | | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | | | | | | | |
| **Video Stream** | | | **Max Payne 3 - Part 1 of Part 1 in 4K UHD** | | | | | | | |
| **Resolution** | | | **1440p** | | | | | | | |
| **Frame Number** | **Correlation Coefficient** | | | | **E(i)** | | | | **Differential Attacks** | |
| **CCh** | **CCv** | | **CCd** | **Red** | **Green** | **Blue** | **Combined** | **NPCR** | **UACI** |
| **1** | -0.0158926209 | 0.0114044219 | | -0.0218292020 | 7.9998524255 | 7.9998110624 | 7.9998217804 | 7.9998590289 | 99.6074851707 | 33.4153652571 |
| **2** | 0.0251087668 | 0.0020217842 | | 0.0374247048 | 7.9997397656 | 7.9997131200 | 7.9997015201 | 7.9997504720 | 99.6124493634 | 33.4215451176 |
| **3** | -0.0182352321 | -0.0349469536 | | -0.0089527052 | 7.9998064957 | 7.9998204011 | 7.9998182406 | 7.9998520205 | 99.6079463252 | 33.4191111579 |
| **4** | 0.0021820059 | -0.0016700452 | | 0.0057235894 | 7.9997727657 | 7.9998048071 | 7.9997981520 | 7.9998253250 | 99.6044650608 | 33.4327198081 |
| **5** | 0.0021820059 | -0.0016700452 | | 0.0057235894 | 7.9997727657 | 7.9998048071 | 7.9997981520 | 7.9998253250 | 99.6044650608 | 33.4327198081 |
| **6** | 0.0021820059 | -0.0016700452 | | 0.0057235894 | 7.9997727657 | 7.9998048071 | 7.9997981520 | 7.9998253250 | 99.6044650608 | 33.4327198081 |
| **7** | 0.0021820059 | -0.0016700452 | | 0.0057235894 | 7.9997727657 | 7.9998048071 | 7.9997981520 | 7.9998253250 | 99.6044650608 | 33.4327198081 |
| **8** | 0.0021820059 | -0.0016700452 | | 0.0057235894 | 7.9997727657 | 7.9998048071 | 7.9997981520 | 7.9998253250 | 99.6044650608 | 33.4327198081 |
| **9** | 0.0021820059 | -0.0016700452 | | 0.0057235894 | 7.9997727657 | 7.9998048071 | 7.9997981520 | 7.9998253250 | 99.6044650608 | 33.4327198081 |
| **10** | 0.0021820059 | -0.0016700452 | | 0.0057235894 | 7.9997727657 | 7.9998048071 | 7.9997981520 | 7.9998253250 | 99.6044650608 | 33.4327198081 |
| **11** | 0.0021820059 | -0.0016700452 | | 0.0057235894 | 7.9997727657 | 7.9998048071 | 7.9997981520 | 7.9998253250 | 99.6044650608 | 33.4327198081 |
| **12** | 0.0021820059 | -0.0016700452 | | 0.0057235894 | 7.9997727657 | 7.9998048071 | 7.9997981520 | 7.9998253250 | 99.6044650608 | 33.4327198081 |
| **13** | 0.0021820059 | -0.0016700452 | | 0.0057235894 | 7.9997727657 | 7.9998048071 | 7.9997981520 | 7.9998253250 | 99.6044650608 | 33.4327198081 |
| **14** | 0.0021820059 | -0.0016700452 | | 0.0057235894 | 7.9997727657 | 7.9998048071 | 7.9997981520 | 7.9998253250 | 99.6044650608 | 33.4327198081 |
| **15** | 0.0021820059 | -0.0016700452 | | 0.0057235894 | 7.9997727657 | 7.9998048071 | 7.9997981520 | 7.9998253250 | 99.6044650608 | 33.4327198081 |
| **16** | 0.0021820059 | -0.0016700452 | | 0.0057235894 | 7.9997727657 | 7.9998048071 | 7.9997981520 | 7.9998253250 | 99.6044650608 | 33.4327198081 |
| **17** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **18** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **19** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **20** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **21** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **22** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **23** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **24** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **25** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **26** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **27** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **28** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **29** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **30** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **31** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **32** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **33** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **34** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **35** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **36** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **37** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **38** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **39** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **40** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **41** | 0.0227961947 | 0.0077922381 | | 0.0843966780 | 7.9997844278 | 7.9997942557 | 7.9997839101 | 7.9998200684 | 99.6121961806 | 33.4299587674 |
| **42** | -0.0136356551 | 0.0106017518 | | 0.0014075728 | 7.9992411792 | 7.9992724211 | 7.9991933644 | 7.9992687361 | 99.6116446036 | 33.4146903865 |
| **43** | -0.0136356551 | 0.0106017518 | | 0.0014075728 | 7.9992411792 | 7.9992724211 | 7.9991933644 | 7.9992687361 | 99.6116446036 | 33.4146903865 |
| **44** | -0.0136356551 | 0.0106017518 | | 0.0014075728 | 7.9992411792 | 7.9992724211 | 7.9991933644 | 7.9992687361 | 99.6116446036 | 33.4146903865 |
| **45** | 0.0102145104 | -0.0249406115 | | 0.0079594214 | 7.9993534183 | 7.9993580916 | 7.9993340442 | 7.9993825017 | 99.6084526910 | 33.4198758837 |
| **46** | -0.0537025919 | 0.0062604438 | | 0.0239521901 | 7.9998226474 | 7.9998272530 | 7.9998300532 | 7.9998633637 | 99.6106409144 | 33.4300351832 |
| **47** | 0.6348907796 | 0.0355666745 | | 0.0819164436 | 7.8645528868 | 7.8632780361 | 7.8635969952 | 7.8644892772 | 99.6084255642 | 33.3880935259 |
| **48** | 0.6348907796 | 0.0355666745 | | 0.0819164436 | 7.8645528868 | 7.8632780361 | 7.8635969952 | 7.8644892772 | 99.6084255642 | 33.3880935259 |
| **49** | -0.0209573052 | 0.0035701508 | | -0.0063147651 | 7.9994250102 | 7.9993639554 | 7.9993046812 | 7.9993965519 | 99.6092303241 | 33.4292458129 |
| **50** | -0.0209573052 | 0.0035701508 | | -0.0063147651 | 7.9994250102 | 7.9993639554 | 7.9993046812 | 7.9993965519 | 99.6092303241 | 33.4292458129 |
| **Total** | 1.7327237591 | 0.2429733557 | | 2.3783040981 | 399.7159107322 | 399.7139500589 | 399.7138628133 | 399.7175161867 | 4980.4801703559 | 1671.3590091274 |
| **Average** | 0.0346406093 | 0.0048594289 | | 0.0475302411 | 7.9943182146 | 7.9942790012 | 7.9942772563 | 7.9943503237 | 99.6096034071 | 33.4271801825 |

# DECRYPTION METRICS

|  |  |  |  |
| --- | --- | --- | --- |
| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **Flight Simulator X - Flying PMDG Jetstream 41 1440p** | |
| **Resolution** | | **1440p** | |
| **Frame Number** | **Mean Square Error** | | **Peak Signal-to-Noise Ratio** |
| **1** | 0.0004692063 | | 33.2863612815 |
| **2** | 0.0002203202 | | 36.5694564847 |
| **3** | 0.0002110958 | | 36.7552039611 |
| **4** | 0.0002121728 | | 36.7331028932 |
| **5** | 0.0002107349 | | 36.7626349238 |
| **6** | 0.0002108794 | | 36.7596582055 |
| **7** | 0.0002104932 | | 36.7676191110 |
| **8** | 0.0002106415 | | 36.7645605939 |
| **9** | 0.0002104132 | | 36.7692709399 |
| **10** | 0.0002105357 | | 36.7667429713 |
| **11** | 0.0002103715 | | 36.7701307805 |
| **12** | 0.0002099113 | | 36.7796409067 |
| **13** | 0.0001690452 | | 37.7199721846 |
| **14** | 0.0001712310 | | 37.6641769586 |
| **15** | 0.0001691027 | | 37.7184945332 |
| **16** | 0.0001694940 | | 37.7084566371 |
| **17** | 0.0001692126 | | 37.7156742603 |
| **18** | 0.0001693767 | | 37.7114643101 |
| **19** | 0.0001692390 | | 37.7149942883 |
| **20** | 0.0001693657 | | 37.7117442162 |
| **21** | 0.0001692440 | | 37.7148674527 |
| **22** | 0.0001693501 | | 37.7121459502 |
| **23** | 0.0001692507 | | 37.7146951788 |
| **24** | 0.0001693532 | | 37.7120661878 |
| **25** | 0.0001689625 | | 37.7220969317 |
| **26** | 0.0001711772 | | 37.6655407095 |
| **27** | 0.0001691034 | | 37.7184773162 |
| **28** | 0.0001695038 | | 37.7082062855 |
| **29** | 0.0001692360 | | 37.7150725992 |
| **30** | 0.0001693970 | | 37.7109434734 |
| **31** | 0.0001692481 | | 37.7147623745 |
| **32** | 0.0001693681 | | 37.7116848026 |
| **33** | 0.0001692304 | | 37.7152168240 |
| **34** | 0.0001693401 | | 37.7124030838 |
| **35** | 0.0001692079 | | 37.7157938426 |
| **36** | 0.0001692987 | | 37.7134631908 |
| **37** | 0.0001689401 | | 37.7226734291 |
| **38** | 0.0001711584 | | 37.6660184938 |
| **39** | 0.0001690640 | | 37.7194889661 |
| **40** | 0.0001694520 | | 37.7095326404 |
| **41** | 0.0001691850 | | 37.7163803310 |
| **42** | 0.0001693323 | | 37.7126031707 |
| **43** | 0.0001692042 | | 37.7158879049 |
| **44** | 0.0001693101 | | 37.7131711726 |
| **45** | 0.0001692209 | | 37.7154605546 |
| **46** | 0.0001693075 | | 37.7132369117 |
| **47** | 0.0001692151 | | 37.7156083768 |
| **48** | 0.0001693077 | | 37.7132322544 |
| **49** | 0.0001689848 | | 37.7215238489 |
| **50** | 0.0001712283 | | 37.6642440857 |
| **Total** | 0.0092360242 | | 1870.4458587855 |
| **Average** | 0.0001847205 | | 37.4089171757 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **Wreckfest 2016 July - 2 Racing Clips 1440p60** | |
| **Resolution** | | **1440p** | |
| **Frame Number** | **Mean Square Error** | | **Peak Signal-to-Noise Ratio** |
| **1** | 0.0008306366 | | 30.8058895630 |
| **2** | 0.0002296661 | | 36.3890319541 |
| **3** | 0.0002263779 | | 36.4516594933 |
| **4** | 0.0002256062 | | 36.4664901470 |
| **5** | 0.0002266236 | | 36.4469494192 |
| **6** | 0.0002266027 | | 36.4473486134 |
| **7** | 0.0002281676 | | 36.4174603135 |
| **8** | 0.0002310568 | | 36.3628116107 |
| **9** | 0.0002300760 | | 36.3812862348 |
| **10** | 0.0002358530 | | 36.2735856736 |
| **11** | 0.0002347575 | | 36.2938053693 |
| **12** | 0.0002392263 | | 36.2119104367 |
| **13** | 0.0001693444 | | 37.7122915203 |
| **14** | 0.0001917494 | | 37.1726599783 |
| **15** | 0.0002055027 | | 36.8718244129 |
| **16** | 0.0002058001 | | 36.8655433742 |
| **17** | 0.0002111666 | | 36.7537485927 |
| **18** | 0.0002104271 | | 36.7689842519 |
| **19** | 0.0002143288 | | 36.6891951900 |
| **20** | 0.0002180519 | | 36.6144015038 |
| **21** | 0.0002170709 | | 36.6339837722 |
| **22** | 0.0002202002 | | 36.5718232007 |
| **23** | 0.0002186817 | | 36.6018760768 |
| **24** | 0.0002261162 | | 36.4566827006 |
| **25** | 0.0001693564 | | 37.7119843412 |
| **26** | 0.0001838251 | | 37.3559521611 |
| **27** | 0.0001857571 | | 37.3105466288 |
| **28** | 0.0001849476 | | 37.3295129955 |
| **29** | 0.0001947863 | | 37.1044170076 |
| **30** | 0.0001964457 | | 37.0675750261 |
| **31** | 0.0002002294 | | 36.9847211603 |
| **32** | 0.0002029956 | | 36.9251335531 |
| **33** | 0.0002023864 | | 36.9381876007 |
| **34** | 0.0002066399 | | 36.8478580270 |
| **35** | 0.0002063962 | | 36.8529836496 |
| **36** | 0.0002102228 | | 36.7732016370 |
| **37** | 0.0001700117 | | 37.6952125960 |
| **38** | 0.0001719653 | | 37.6455915423 |
| **39** | 0.0001940963 | | 37.1198281436 |
| **40** | 0.0001942797 | | 37.1157261150 |
| **41** | 0.0002029318 | | 36.9264995232 |
| **42** | 0.0002018668 | | 36.9493516533 |
| **43** | 0.0002008913 | | 36.9703883330 |
| **44** | 0.0002064326 | | 36.8522179345 |
| **45** | 0.0002056146 | | 36.8694609514 |
| **46** | 0.0002082115 | | 36.8149531744 |
| **47** | 0.0002075126 | | 36.8295547110 |
| **48** | 0.0002115811 | | 36.7452306401 |
| **49** | 0.0001704438 | | 37.6841887698 |
| **50** | 0.0001786615 | | 37.4796892992 |
| **Total** | 0.0109415790 | | 1837.5612105780 |
| **Average** | 0.0002188316 | | 36.7512242116 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **Forza Motorsport 6: Apex (Beta) - Heavy Rain Gameplay 1440p60** | |
| **Resolution** | | **1440p** | |
| **Frame Number** | **Mean Square Error** | | **Peak Signal-to-Noise Ratio** |
| **1** | 0.0002951309 | | 35.2998526867 |
| **2** | 0.0001906205 | | 37.1983044296 |
| **3** | 0.0001859632 | | 37.3057306228 |
| **4** | 0.0001839939 | | 37.3519663629 |
| **5** | 0.0001821845 | | 37.3948869040 |
| **6** | 0.0001825448 | | 37.3863042599 |
| **7** | 0.0001815030 | | 37.4111631036 |
| **8** | 0.0001817718 | | 37.4047346276 |
| **9** | 0.0001818643 | | 37.4025257511 |
| **10** | 0.0001825163 | | 37.3869824241 |
| **11** | 0.0001823396 | | 37.3911898580 |
| **12** | 0.0001823096 | | 37.3919056880 |
| **13** | 0.0001515625 | | 38.1940835926 |
| **14** | 0.0001582901 | | 38.0054624979 |
| **15** | 0.0001603075 | | 37.9504622865 |
| **16** | 0.0001643341 | | 37.8427219985 |
| **17** | 0.0001667154 | | 37.7802417015 |
| **18** | 0.0001684668 | | 37.7348568398 |
| **19** | 0.0001675107 | | 37.7595733487 |
| **20** | 0.0001676587 | | 37.7557397570 |
| **21** | 0.0001674749 | | 37.7605023454 |
| **22** | 0.0001689562 | | 37.7222590776 |
| **23** | 0.0001685243 | | 37.7333734486 |
| **24** | 0.0001703775 | | 37.6858780498 |
| **25** | 0.0001529158 | | 38.1554763554 |
| **26** | 0.0001627813 | | 37.8839556806 |
| **27** | 0.0001619533 | | 37.9061021187 |
| **28** | 0.0001636422 | | 37.8610473102 |
| **29** | 0.0001642341 | | 37.8453671937 |
| **30** | 0.0001639466 | | 37.8529747305 |
| **31** | 0.0001637969 | | 37.8569419484 |
| **32** | 0.0001638450 | | 37.8556669828 |
| **33** | 0.0001640177 | | 37.8510919123 |
| **34** | 0.0001641209 | | 37.8483603974 |
| **35** | 0.0001640732 | | 37.8496225819 |
| **36** | 0.0001641013 | | 37.8488809268 |
| **37** | 0.0001531284 | | 38.1494423172 |
| **38** | 0.0001542981 | | 38.1163931186 |
| **39** | 0.0001568314 | | 38.0456698827 |
| **40** | 0.0001603899 | | 37.9482307163 |
| **41** | 0.0001605516 | | 37.9438533897 |
| **42** | 0.0001610662 | | 37.9299558486 |
| **43** | 0.0001602904 | | 37.9509237260 |
| **44** | 0.0001611790 | | 37.9269152267 |
| **45** | 0.0001605555 | | 37.9437476165 |
| **46** | 0.0001606307 | | 37.9417134884 |
| **47** | 0.0001605190 | | 37.9447366136 |
| **48** | 0.0001605860 | | 37.9429220196 |
| **49** | 0.0001488216 | | 38.2733408626 |
| **50** | 0.0001496063 | | 38.2505011244 |
| **Total** | 0.0084548037 | | 1887.1745357515 |
| **Average** | 0.0001690961 | | 37.7434907150 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **DiRT Rally 2016 - Driving Hard 2 - 1440p60** | |
| **Resolution** | | **1440p** | |
| **Frame Number** | **Mean Square Error** | | **Peak Signal-to-Noise Ratio** |
| **1** | 0.0004732668 | | 33.2489396493 |
| **2** | 0.0002312564 | | 36.3590616467 |
| **3** | 0.0002232982 | | 36.5111470191 |
| **4** | 0.0002153715 | | 36.6681181752 |
| **5** | 0.0002127620 | | 36.7210590357 |
| **6** | 0.0002136887 | | 36.7021839855 |
| **7** | 0.0002119115 | | 36.7384538958 |
| **8** | 0.0002128598 | | 36.7190637858 |
| **9** | 0.0002119938 | | 36.7367681807 |
| **10** | 0.0002135779 | | 36.7044359547 |
| **11** | 0.0002129261 | | 36.7177108044 |
| **12** | 0.0002132188 | | 36.7117447596 |
| **13** | 0.0001630308 | | 37.8773031913 |
| **14** | 0.0001657133 | | 37.8064254551 |
| **15** | 0.0001723461 | | 37.6359849259 |
| **16** | 0.0001733239 | | 37.6114151064 |
| **17** | 0.0001793162 | | 37.4638046328 |
| **18** | 0.0001880893 | | 37.2563584580 |
| **19** | 0.0001891941 | | 37.2309243919 |
| **20** | 0.0001970435 | | 37.0543789756 |
| **21** | 0.0001977658 | | 37.0384878236 |
| **22** | 0.0001971721 | | 37.0515453462 |
| **23** | 0.0001973836 | | 37.0468903139 |
| **24** | 0.0001970206 | | 37.0548829378 |
| **25** | 0.0001628225 | | 37.8828565419 |
| **26** | 0.0001765141 | | 37.5322064650 |
| **27** | 0.0001743758 | | 37.5851390294 |
| **28** | 0.0001791728 | | 37.4672788779 |
| **29** | 0.0001781461 | | 37.4922370297 |
| **30** | 0.0001859227 | | 37.3066757571 |
| **31** | 0.0001891217 | | 37.2325873648 |
| **32** | 0.0001909193 | | 37.1915024361 |
| **33** | 0.0001936074 | | 37.1307812476 |
| **34** | 0.0001956536 | | 37.0851211771 |
| **35** | 0.0001953628 | | 37.0915806388 |
| **36** | 0.0002020413 | | 36.9455986908 |
| **37** | 0.0001627338 | | 37.8852218339 |
| **38** | 0.0001776362 | | 37.5046854269 |
| **39** | 0.0001812228 | | 37.4178712983 |
| **40** | 0.0001895614 | | 37.2225015048 |
| **41** | 0.0001862811 | | 37.2983115164 |
| **42** | 0.0001864564 | | 37.2942276570 |
| **43** | 0.0001899551 | | 37.2134905934 |
| **44** | 0.0001899316 | | 37.2140280846 |
| **45** | 0.0001897098 | | 37.2191014237 |
| **46** | 0.0001894812 | | 37.2243391628 |
| **47** | 0.0001918854 | | 37.1695816733 |
| **48** | 0.0001955666 | | 37.0870537486 |
| **49** | 0.0001641517 | | 37.8475458545 |
| **50** | 0.0001791921 | | 37.4668105573 |
| **Total** | 0.0098609562 | | 1855.6754240428 |
| **Average** | 0.0001972191 | | 37.1135084809 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **Project Cars 2016 - 1440p60 Racing Merc HQ HD** | |
| **Resolution** | | **1440p** | |
| **Frame Number** | **Mean Square Error** | | **Peak Signal-to-Noise Ratio** |
| **1** | 0.0003139667 | | 35.0311640570 |
| **2** | 0.0001613296 | | 37.9228605794 |
| **3** | 0.0001549457 | | 38.0982051819 |
| **4** | 0.0001550980 | | 38.0939371518 |
| **5** | 0.0001536056 | | 38.1359281815 |
| **6** | 0.0001536937 | | 38.1334393843 |
| **7** | 0.0001528084 | | 38.1585264192 |
| **8** | 0.0001527331 | | 38.1606690498 |
| **9** | 0.0001523989 | | 38.1701830128 |
| **10** | 0.0001524528 | | 38.1686452164 |
| **11** | 0.0001498796 | | 38.2425744808 |
| **12** | 0.0001493775 | | 38.2571478903 |
| **13** | 0.0001221351 | | 39.1315958816 |
| **14** | 0.0001315537 | | 38.8089694695 |
| **15** | 0.0001309348 | | 38.8294493372 |
| **16** | 0.0001347755 | | 38.7038896925 |
| **17** | 0.0001345353 | | 38.7116390406 |
| **18** | 0.0001372207 | | 38.6258041591 |
| **19** | 0.0001364559 | | 38.6500766027 |
| **20** | 0.0001332174 | | 38.7543918045 |
| **21** | 0.0001327111 | | 38.7709279103 |
| **22** | 0.0001279548 | | 38.9294328558 |
| **23** | 0.0001273049 | | 38.9515476613 |
| **24** | 0.0001284055 | | 38.9141629101 |
| **25** | 0.0001248005 | | 39.0378378438 |
| **26** | 0.0001263904 | | 38.9828582415 |
| **27** | 0.0001288291 | | 38.8998600630 |
| **28** | 0.0001293060 | | 38.8838122935 |
| **29** | 0.0001317350 | | 38.8029874800 |
| **30** | 0.0001320751 | | 38.7917919635 |
| **31** | 0.0001317793 | | 38.8015290265 |
| **32** | 0.0001312642 | | 38.8185354552 |
| **33** | 0.0001304993 | | 38.8439186996 |
| **34** | 0.0001292167 | | 38.8868145344 |
| **35** | 0.0001331516 | | 38.7565345231 |
| **36** | 0.0001396840 | | 38.5485331477 |
| **37** | 0.0001267774 | | 38.9695832040 |
| **38** | 0.0001332427 | | 38.7535667675 |
| **39** | 0.0001324027 | | 38.7810310283 |
| **40** | 0.0001324078 | | 38.7808645004 |
| **41** | 0.0001317763 | | 38.8016260459 |
| **42** | 0.0001314218 | | 38.8133247666 |
| **43** | 0.0001301198 | | 38.8565674526 |
| **44** | 0.0001300495 | | 38.8589143422 |
| **45** | 0.0001275506 | | 38.9431746523 |
| **46** | 0.0001280868 | | 38.9249551316 |
| **47** | 0.0001278966 | | 38.9314084467 |
| **48** | 0.0001340869 | | 38.7261356070 |
| **49** | 0.0001275547 | | 38.9430341744 |
| **50** | 0.0001396830 | | 38.5485660063 |
| **Total** | 0.0069812822 | | 1930.0429333277 |
| **Average** | 0.0001396256 | | 38.6008586666 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **Bears Panasonic G85 - 4K UHD** | |
| **Resolution** | | **1440p** | |
| **Frame Number** | **Mean Square Error** | | **Peak Signal-to-Noise Ratio** |
| **1** | 0.0001932732 | | 37.1382826414 |
| **2** | 0.0001582126 | | 38.0075899997 |
| **3** | 0.0001366314 | | 38.6444955887 |
| **4** | 0.0001466439 | | 38.3373608155 |
| **5** | 0.0001352316 | | 38.6892192980 |
| **6** | 0.0001394180 | | 38.5568115925 |
| **7** | 0.0001291231 | | 38.8899593966 |
| **8** | 0.0001398060 | | 38.5447406901 |
| **9** | 0.0001491974 | | 38.2623886120 |
| **10** | 0.0001595856 | | 37.9700641129 |
| **11** | 0.0001437632 | | 38.4235222876 |
| **12** | 0.0001568617 | | 38.0448308816 |
| **13** | 0.0001364185 | | 38.6512684907 |
| **14** | 0.0001638037 | | 37.8567623209 |
| **15** | 0.0001452895 | | 38.3776582958 |
| **16** | 0.0001574280 | | 38.0291789007 |
| **17** | 0.0001617209 | | 37.9123397783 |
| **18** | 0.0001729639 | | 37.6204445622 |
| **19** | 0.0001624290 | | 37.8933644119 |
| **20** | 0.0001587512 | | 37.9928293431 |
| **21** | 0.0001698712 | | 37.6988015770 |
| **22** | 0.0001899127 | | 37.2144605740 |
| **23** | 0.0001543592 | | 38.1146734568 |
| **24** | 0.0001635429 | | 37.8636822392 |
| **25** | 0.0001390081 | | 38.5695994319 |
| **26** | 0.0001613855 | | 37.9213543091 |
| **27** | 0.0001538760 | | 38.1282898407 |
| **28** | 0.0001665696 | | 37.7840417735 |
| **29** | 0.0001573129 | | 38.0323556074 |
| **30** | 0.0001669748 | | 37.7734896036 |
| **31** | 0.0001568890 | | 38.0440744180 |
| **32** | 0.0001628768 | | 37.8814077954 |
| **33** | 0.0001502927 | | 38.2306206412 |
| **34** | 0.0001627384 | | 37.8850983675 |
| **35** | 0.0001418188 | | 38.4826610773 |
| **36** | 0.0001486712 | | 38.2777323598 |
| **37** | 0.0001230317 | | 39.0998311390 |
| **38** | 0.0001421840 | | 38.4714938707 |
| **39** | 0.0001388753 | | 38.5737496334 |
| **40** | 0.0001440826 | | 38.4138832823 |
| **41** | 0.0001441934 | | 38.4105452462 |
| **42** | 0.0001535159 | | 38.1384654160 |
| **43** | 0.0001374421 | | 38.6188016373 |
| **44** | 0.0001602087 | | 37.9531386998 |
| **45** | 0.0001831115 | | 37.3728438705 |
| **46** | 0.0001875062 | | 37.2698443054 |
| **47** | 0.0001685776 | | 37.7320023708 |
| **48** | 0.0001733088 | | 37.6117929657 |
| **49** | 0.0001478087 | | 38.3030014375 |
| **50** | 0.0001659289 | | 37.8007805662 |
| **Total** | 0.0077624278 | | 1905.5156295335 |
| **Average** | 0.0001552486 | | 38.1103125907 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **Jackdaw Bird Panasonic G85 Clip High Quality - 4K UHD** | |
| **Resolution** | | **1440p** | |
| **Frame Number** | **Mean Square Error** | | **Peak Signal-to-Noise Ratio** |
| **1** | 0.0003404546 | | 34.6794082758 |
| **2** | 0.0001944360 | | 37.1122333560 |
| **3** | 0.0001960418 | | 37.0765126153 |
| **4** | 0.0001957857 | | 37.0821895071 |
| **5** | 0.0001747802 | | 37.5750770735 |
| **6** | 0.0001823082 | | 37.3919375223 |
| **7** | 0.0001777782 | | 37.5012142274 |
| **8** | 0.0001886844 | | 37.2426407856 |
| **9** | 0.0001762951 | | 37.5375982392 |
| **10** | 0.0001835383 | | 37.3627322791 |
| **11** | 0.0001836391 | | 37.3603489135 |
| **12** | 0.0001935607 | | 37.1318279954 |
| **13** | 0.0001506962 | | 38.2189776482 |
| **14** | 0.0001780106 | | 37.4955401439 |
| **15** | 0.0001754231 | | 37.5591317580 |
| **16** | 0.0001825742 | | 37.3856049654 |
| **17** | 0.0001703875 | | 37.6856237317 |
| **18** | 0.0001831708 | | 37.3714369285 |
| **19** | 0.0001716062 | | 37.6546695981 |
| **20** | 0.0001723363 | | 37.6362315878 |
| **21** | 0.0001543069 | | 38.1161471705 |
| **22** | 0.0001683253 | | 37.7385052689 |
| **23** | 0.0001719541 | | 37.6458755852 |
| **24** | 0.0001798378 | | 37.4511906058 |
| **25** | 0.0001483623 | | 38.2867648265 |
| **26** | 0.0001728277 | | 37.6238669817 |
| **27** | 0.0001600824 | | 37.9565642328 |
| **28** | 0.0001626555 | | 37.8873116849 |
| **29** | 0.0001612110 | | 37.9260533760 |
| **30** | 0.0001742755 | | 37.5876367061 |
| **31** | 0.0001670580 | | 37.7713272360 |
| **32** | 0.0001790069 | | 37.4713029545 |
| **33** | 0.0001674566 | | 37.7609767458 |
| **34** | 0.0001740601 | | 37.5930072586 |
| **35** | 0.0001690137 | | 37.7207799466 |
| **36** | 0.0001855404 | | 37.3156152665 |
| **37** | 0.0001509516 | | 38.2116241879 |
| **38** | 0.0001670838 | | 37.7706568788 |
| **39** | 0.0001566023 | | 38.0520198548 |
| **40** | 0.0001647821 | | 37.8308984205 |
| **41** | 0.0001450156 | | 38.3858542586 |
| **42** | 0.0001493171 | | 38.2589057837 |
| **43** | 0.0001437590 | | 38.4236502880 |
| **44** | 0.0001464054 | | 38.3444284323 |
| **45** | 0.0001364536 | | 38.6501496283 |
| **46** | 0.0001394050 | | 38.5572149387 |
| **47** | 0.0001285990 | | 38.9076256821 |
| **48** | 0.0001319259 | | 38.7966981186 |
| **49** | 0.0001120195 | | 39.5070628220 |
| **50** | 0.0001190523 | | 39.2426213045 |
| **Total** | 0.0084588537 | | 1888.8532735972 |
| **Average** | 0.0001691771 | | 37.7770654719 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **Drifting in Real World by Drift Mechaniks 4K UHD** | |
| **Resolution** | | **1440p** | |
| **Frame Number** | **Mean Square Error** | | **Peak Signal-to-Noise Ratio** |
| **1** | 0.0001066587 | | 39.7200389616 |
| **2** | 0.0000840811 | | 40.7530159596 |
| **3** | 0.0000741489 | | 41.2989529676 |
| **4** | 0.0000791621 | | 41.0148278495 |
| **5** | 0.0000729101 | | 41.3721256909 |
| **6** | 0.0000812505 | | 40.9017412548 |
| **7** | 0.0000742676 | | 41.2920034386 |
| **8** | 0.0000769167 | | 41.1397932455 |
| **9** | 0.0000719266 | | 41.4311073569 |
| **10** | 0.0000786637 | | 41.0422574802 |
| **11** | 0.0000726988 | | 41.3847255627 |
| **12** | 0.0000769277 | | 41.1391712843 |
| **13** | 0.0000625702 | | 42.0363234621 |
| **14** | 0.0000720442 | | 41.4240120199 |
| **15** | 0.0000656824 | | 41.8255071772 |
| **16** | 0.0000731224 | | 41.3594985081 |
| **17** | 0.0000688584 | | 41.6204281053 |
| **18** | 0.0000699184 | | 41.5540874352 |
| **19** | 0.0000687387 | | 41.6279854408 |
| **20** | 0.0000757763 | | 41.2046687788 |
| **21** | 0.0000705584 | | 41.5145154734 |
| **22** | 0.0000762583 | | 41.1771302572 |
| **23** | 0.0000712387 | | 41.4728378626 |
| **24** | 0.0000762647 | | 41.1767666919 |
| **25** | 0.0000609268 | | 42.1519130785 |
| **26** | 0.0000710723 | | 41.4829987450 |
| **27** | 0.0000660023 | | 41.8044094546 |
| **28** | 0.0000677882 | | 41.6884589856 |
| **29** | 0.0000652486 | | 41.8542869627 |
| **30** | 0.0000718250 | | 41.4372453162 |
| **31** | 0.0000665802 | | 41.7665466608 |
| **32** | 0.0000732609 | | 41.3512786264 |
| **33** | 0.0000687528 | | 41.6270990492 |
| **34** | 0.0000743578 | | 41.2867341329 |
| **35** | 0.0000688612 | | 41.6202571721 |
| **36** | 0.0000752598 | | 41.2343670373 |
| **37** | 0.0000604568 | | 42.1855458282 |
| **38** | 0.0000614132 | | 42.1173848423 |
| **39** | 0.0000609922 | | 42.1472552413 |
| **40** | 0.0000694201 | | 41.5851468950 |
| **41** | 0.0000651137 | | 41.8632754833 |
| **42** | 0.0000725912 | | 41.3911579923 |
| **43** | 0.0000680311 | | 41.6729241285 |
| **44** | 0.0000750349 | | 41.2473661501 |
| **45** | 0.0000698442 | | 41.5586937608 |
| **46** | 0.0000770289 | | 41.1334619937 |
| **47** | 0.0000702641 | | 41.5326681622 |
| **48** | 0.0000720799 | | 41.4218582125 |
| **49** | 0.0000633701 | | 41.9811529505 |
| **50** | 0.0000726561 | | 41.3872806010 |
| **Total** | 0.0035888759 | | 2073.0142897272 |
| **Average** | 0.0000717775 | | 41.4602857945 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **ARTE Carnival Ultra -HD Demo Video 4K UHD** | |
| **Resolution** | | **1440p** | |
| **Frame Number** | **Mean Square Error** | | **Peak Signal-to-Noise Ratio** |
| **1** | 0.0000806578 | | 40.9335350419 |
| **2** | 0.0000514895 | | 42.8828164113 |
| **3** | 0.0000504176 | | 42.9741765655 |
| **4** | 0.0000452422 | | 43.4445659907 |
| **5** | 0.0000453814 | | 43.4312206619 |
| **6** | 0.0000448567 | | 43.4817233037 |
| **7** | 0.0000426194 | | 43.7039258166 |
| **8** | 0.0000453398 | | 43.4351996169 |
| **9** | 0.0000418340 | | 43.7847093269 |
| **10** | 0.0000442132 | | 43.5444818041 |
| **11** | 0.0000430956 | | 43.6556719372 |
| **12** | 0.0000430221 | | 43.6630817408 |
| **13** | 0.0000352447 | | 44.5290574585 |
| **14** | 0.0000397504 | | 44.0065814323 |
| **15** | 0.0000417995 | | 43.7882898110 |
| **16** | 0.0000409349 | | 43.8790676305 |
| **17** | 0.0000391797 | | 44.0693937757 |
| **18** | 0.0000427304 | | 43.6926348947 |
| **19** | 0.0000401059 | | 43.9679193641 |
| **20** | 0.0000425833 | | 43.7076038052 |
| **21** | 0.0000409521 | | 43.8772366985 |
| **22** | 0.0000395971 | | 44.0233706112 |
| **23** | 0.0000415416 | | 43.8151654047 |
| **24** | 0.0000399998 | | 43.9794212542 |
| **25** | 0.0000332767 | | 44.7785999509 |
| **26** | 0.0000385704 | | 44.1374623053 |
| **27** | 0.0000380034 | | 44.2017778975 |
| **28** | 0.0000409088 | | 43.8818353322 |
| **29** | 0.0000377949 | | 44.2256670048 |
| **30** | 0.0000391161 | | 44.0764443795 |
| **31** | 0.0000388335 | | 44.1079333316 |
| **32** | 0.0000385625 | | 44.1383454863 |
| **33** | 0.0000400844 | | 43.9702500905 |
| **34** | 0.0000394369 | | 44.0409744833 |
| **35** | 0.0000407858 | | 43.8949058853 |
| **36** | 0.0000408522 | | 43.8878477354 |
| **37** | 0.0000319663 | | 44.9530755094 |
| **38** | 0.0000405119 | | 43.9241686658 |
| **39** | 0.0000379840 | | 44.2039984725 |
| **40** | 0.0000407408 | | 43.8997048606 |
| **41** | 0.0000413589 | | 43.8343118773 |
| **42** | 0.0000405732 | | 43.9176063927 |
| **43** | 0.0000415391 | | 43.8154279641 |
| **44** | 0.0000391791 | | 44.0694515791 |
| **45** | 0.0000401506 | | 43.9630844689 |
| **46** | 0.0000394015 | | 44.0448758468 |
| **47** | 0.0000362904 | | 44.4020846171 |
| **48** | 0.0000405525 | | 43.9198268685 |
| **49** | 0.0000306325 | | 45.1381731401 |
| **50** | 0.0000370056 | | 44.3173305343 |
| **Total** | 0.0020667005 | | 2194.0160150379 |
| **Average** | 0.0000413340 | | 43.8803203008 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **Max Payne 3 - Part 1 of Part 1 in 4K UHD** | |
| **Resolution** | | **1440p** | |
| **Frame Number** | **Mean Square Error** | | **Peak Signal-to-Noise Ratio** |
| **1** | 0.0002421064 | | 36.1599377988 |
| **2** | 0.0001667839 | | 37.7784591617 |
| **3** | 0.0001579387 | | 38.0151137412 |
| **4** | 0.0001601513 | | 37.9546955179 |
| **5** | 0.0001590173 | | 37.9855558371 |
| **6** | 0.0001593785 | | 37.9757038210 |
| **7** | 0.0001590951 | | 37.9834321527 |
| **8** | 0.0001592851 | | 37.9782482364 |
| **9** | 0.0001591105 | | 37.9830126796 |
| **10** | 0.0001592707 | | 37.9786404415 |
| **11** | 0.0001591212 | | 37.9827201998 |
| **12** | 0.0001592614 | | 37.9788957123 |
| **13** | 0.0001363457 | | 38.6535871180 |
| **14** | 0.0001389333 | | 38.5719350569 |
| **15** | 0.0001373371 | | 38.6221227522 |
| **16** | 0.0001376187 | | 38.6132262831 |
| **17** | 0.0001373815 | | 38.6207165707 |
| **18** | 0.0001374988 | | 38.6170103518 |
| **19** | 0.0001373907 | | 38.6204270636 |
| **20** | 0.0001374792 | | 38.6176289921 |
| **21** | 0.0001373942 | | 38.6203144925 |
| **22** | 0.0001374777 | | 38.6176780162 |
| **23** | 0.0001373944 | | 38.6203111959 |
| **24** | 0.0001374775 | | 38.6176846934 |
| **25** | 0.0001363505 | | 38.6534311638 |
| **26** | 0.0001389374 | | 38.5718079137 |
| **27** | 0.0001373450 | | 38.6218727253 |
| **28** | 0.0001376312 | | 38.6128294613 |
| **29** | 0.0001373977 | | 38.6202047814 |
| **30** | 0.0001375120 | | 38.6165925866 |
| **31** | 0.0001374044 | | 38.6199925755 |
| **32** | 0.0001374930 | | 38.6171947838 |
| **33** | 0.0001374080 | | 38.6198800157 |
| **34** | 0.0001374914 | | 38.6172438031 |
| **35** | 0.0001374081 | | 38.6198767194 |
| **36** | 0.0001374912 | | 38.6172504796 |
| **37** | 0.0001363505 | | 38.6534311638 |
| **38** | 0.0001389374 | | 38.5718079137 |
| **39** | 0.0001373450 | | 38.6218727253 |
| **40** | 0.0001376312 | | 38.6128294613 |
| **41** | 0.0001373977 | | 38.6202047814 |
| **42** | 0.0001375206 | | 38.6163235552 |
| **43** | 0.0001374130 | | 38.6197233334 |
| **44** | 0.0001375015 | | 38.6169257151 |
| **45** | 0.0001374177 | | 38.6195724139 |
| **46** | 0.0001375150 | | 38.6165005800 |
| **47** | 0.0001374297 | | 38.6191943032 |
| **48** | 0.0001375128 | | 38.6165684759 |
| **49** | 0.0001363408 | | 38.6537426349 |
| **50** | 0.0001389210 | | 38.5723224646 |
| **Total** | 0.0072253526 | | 1921.2062544169 |
| **Average** | 0.0001445071 | | 38.4241250883 |

# PROCESSING TIME

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **Flight Simulator X - Flying PMDG Jetstream 41 1440p** | |
| **Resolution** | | **1440p** | |
| **Frame Number** | **Encryption (In seconds)** | | **Decryption (In seconds)** |
| **1** | 1.4609956741 | | 1.4347672462 |
| **2** | 1.2947673798 | | 1.3257389069 |
| **3** | 1.2796323299 | | 1.2569487095 |
| **4** | 1.2884969711 | | 1.2639610767 |
| **5** | 1.2839188576 | | 1.2464065552 |
| **6** | 1.2785460949 | | 1.2471272945 |
| **7** | 1.2877469063 | | 1.2458872795 |
| **8** | 1.2772157192 | | 1.2540287971 |
| **9** | 1.2859010696 | | 1.2492930889 |
| **10** | 1.2808110714 | | 1.2552180290 |
| **11** | 1.3037052155 | | 1.2530355453 |
| **12** | 1.3103575706 | | 1.2481505871 |
| **13** | 1.3121922016 | | 1.2568101883 |
| **14** | 1.3493258953 | | 1.2578237057 |
| **15** | 1.3108017445 | | 1.2585844994 |
| **16** | 1.2721440792 | | 1.2529273033 |
| **17** | 1.2786002159 | | 1.2512745857 |
| **18** | 1.2798116207 | | 1.2531213760 |
| **19** | 1.2774672508 | | 1.2517135143 |
| **20** | 1.2741916180 | | 1.2482683659 |
| **21** | 1.2733190060 | | 1.2482414246 |
| **22** | 1.2767865658 | | 1.2516155243 |
| **23** | 1.2757461071 | | 1.2511785030 |
| **24** | 1.2758522034 | | 1.2526216507 |
| **25** | 1.2846102715 | | 1.2557709217 |
| **26** | 1.2790842056 | | 1.2533857822 |
| **27** | 1.2803800106 | | 1.2527866364 |
| **28** | 1.3164424896 | | 1.2514102459 |
| **29** | 1.2774281502 | | 1.2542204857 |
| **30** | 1.2770569324 | | 1.2532563210 |
| **31** | 1.2782802582 | | 1.2559261322 |
| **32** | 1.2783911228 | | 1.2485680580 |
| **33** | 1.2806441784 | | 1.2500071526 |
| **34** | 1.2792248726 | | 1.2530848980 |
| **35** | 1.2789719105 | | 1.2549800873 |
| **36** | 1.2754285336 | | 1.2445809841 |
| **37** | 1.2789058685 | | 1.2620067596 |
| **38** | 1.2757596970 | | 1.2610251904 |
| **39** | 1.2775633335 | | 1.2510874271 |
| **40** | 1.2742259502 | | 1.2528173923 |
| **41** | 1.2753360271 | | 1.2494134903 |
| **42** | 1.2709865570 | | 1.2504076958 |
| **43** | 1.2752513885 | | 1.2514708042 |
| **44** | 1.2714238167 | | 1.2486102581 |
| **45** | 1.2763466835 | | 1.2469644547 |
| **46** | 1.2706978321 | | 1.2560951710 |
| **47** | 1.2714009285 | | 1.2530336380 |
| **48** | 1.2737472057 | | 1.2486209869 |
| **49** | 1.2787394524 | | 1.2598121166 |
| **50** | 1.2678604126 | | 1.2481257915 |
| **Total** | 64.3125214577 | | 62.8822126389 |
| **Average** | 1.2862504292 | | 1.2576442528 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **Wreckfest 2016 July - 2 Racing Clips 1440p60** | |
| **Resolution** | | **1440p** | |
| **Frame Number** | **Encryption (In seconds)** | | **Decryption (In seconds)** |
| **1** | 1.3605344296 | | 1.4382946491 |
| **2** | 1.2834041119 | | 1.2798933983 |
| **3** | 1.3416280746 | | 1.3220841885 |
| **4** | 1.3241648674 | | 1.2583427429 |
| **5** | 1.2724261284 | | 1.2562427521 |
| **6** | 1.2703728676 | | 1.2533550262 |
| **7** | 1.2708694935 | | 1.2576622963 |
| **8** | 1.2719171047 | | 1.2567796707 |
| **9** | 1.2775533199 | | 1.2448143959 |
| **10** | 1.2726075649 | | 1.2522263527 |
| **11** | 1.2710292339 | | 1.2811479568 |
| **12** | 1.2695569992 | | 1.2571408749 |
| **13** | 1.2709763050 | | 1.2592222691 |
| **14** | 1.2719821930 | | 1.2506606579 |
| **15** | 1.2671036720 | | 1.2619316578 |
| **16** | 1.2717859745 | | 1.2488775253 |
| **17** | 1.2726848125 | | 1.2530400753 |
| **18** | 1.2701251507 | | 1.2520966530 |
| **19** | 1.2710871696 | | 1.2514462471 |
| **20** | 1.2638559341 | | 1.2479670048 |
| **21** | 1.3123652935 | | 1.2460217476 |
| **22** | 1.3073000908 | | 1.2571289539 |
| **23** | 1.2679615021 | | 1.2501201630 |
| **24** | 1.3159716129 | | 1.2544496059 |
| **25** | 1.2711424828 | | 1.2731897831 |
| **26** | 1.2765228748 | | 1.2523722649 |
| **27** | 1.2714886665 | | 1.3176653385 |
| **28** | 1.2938773632 | | 1.2793009281 |
| **29** | 1.2707588673 | | 1.2565500736 |
| **30** | 1.2740728855 | | 1.2506983280 |
| **31** | 1.2759182453 | | 1.2587149143 |
| **32** | 1.2676305771 | | 1.2570917606 |
| **33** | 1.2721176147 | | 1.2506327629 |
| **34** | 1.2666943073 | | 1.2510762215 |
| **35** | 1.2673010826 | | 1.2500522137 |
| **36** | 1.2769594193 | | 1.2538621426 |
| **37** | 1.2686409950 | | 1.2642264366 |
| **38** | 1.2641806602 | | 1.2525510788 |
| **39** | 1.2669270039 | | 1.2460949421 |
| **40** | 1.2638955116 | | 1.2449588776 |
| **41** | 1.2706031799 | | 1.2500092983 |
| **42** | 1.2675647736 | | 1.3174941540 |
| **43** | 1.2696344852 | | 1.3195166588 |
| **44** | 1.2674727440 | | 1.2697920799 |
| **45** | 1.2665543556 | | 1.2436690331 |
| **46** | 1.2654232979 | | 1.2472183704 |
| **47** | 1.2679302692 | | 1.2508318424 |
| **48** | 1.2683842182 | | 1.2512738705 |
| **49** | 1.2684793472 | | 1.2557685375 |
| **50** | 1.2679808140 | | 1.2482874393 |
| **Total** | 63.8774199486 | | 63.2038462162 |
| **Average** | 1.2775483990 | | 1.2640769243 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **Forza Motorsport 6: Apex (Beta) - Heavy Rain Gameplay 1440p60** | |
| **Resolution** | | **1440p** | |
| **Frame Number** | **Encryption (In seconds)** | | **Decryption (In seconds)** |
| **1** | 1.3836593628 | | 1.4393169880 |
| **2** | 1.3409171104 | | 1.3149333000 |
| **3** | 1.2880494595 | | 1.2612051964 |
| **4** | 1.2968909740 | | 1.2636280060 |
| **5** | 1.2863087654 | | 1.2551157475 |
| **6** | 1.2886202335 | | 1.2500863075 |
| **7** | 1.2846779823 | | 1.2512211800 |
| **8** | 1.2823266983 | | 1.2525382042 |
| **9** | 1.2829959393 | | 1.2536177635 |
| **10** | 1.2826497555 | | 1.2977337837 |
| **11** | 1.2878589630 | | 1.2560968399 |
| **12** | 1.2847082615 | | 1.2541918755 |
| **13** | 1.2879281044 | | 1.3306195736 |
| **14** | 1.2846379280 | | 1.2521958351 |
| **15** | 1.2845358849 | | 1.2560739517 |
| **16** | 1.2887699604 | | 1.2526214123 |
| **17** | 1.2811450958 | | 1.2603297234 |
| **18** | 1.2843391895 | | 1.2478265762 |
| **19** | 1.2820298672 | | 1.2543656826 |
| **20** | 1.2864429951 | | 1.2567820549 |
| **21** | 1.2843594551 | | 1.2492620945 |
| **22** | 1.2815253735 | | 1.2547938824 |
| **23** | 1.2854459286 | | 1.2539589405 |
| **24** | 1.3268072605 | | 1.2533166409 |
| **25** | 1.2860627174 | | 1.2610979080 |
| **26** | 1.2840783596 | | 1.2571229935 |
| **27** | 1.2908902168 | | 1.2562608719 |
| **28** | 1.3075022697 | | 1.2549970150 |
| **29** | 1.2795073986 | | 1.2544591427 |
| **30** | 1.2816557884 | | 1.2601191998 |
| **31** | 1.2866165638 | | 1.2655389309 |
| **32** | 1.2811238766 | | 1.2581770420 |
| **33** | 1.2845487595 | | 1.2511129379 |
| **34** | 1.2841963768 | | 1.2573018074 |
| **35** | 1.2830896378 | | 1.2502915859 |
| **36** | 1.2871506214 | | 1.2517991066 |
| **37** | 1.2823102474 | | 1.2621784210 |
| **38** | 1.2852392197 | | 1.2668387890 |
| **39** | 1.2879481316 | | 1.2521207333 |
| **40** | 1.2894489765 | | 1.2457098961 |
| **41** | 1.2875728607 | | 1.2498893738 |
| **42** | 1.2854559422 | | 1.2502276897 |
| **43** | 1.2833557129 | | 1.2461485863 |
| **44** | 1.2858183384 | | 1.2502505779 |
| **45** | 1.2891659737 | | 1.2479779720 |
| **46** | 1.2922077179 | | 1.2478091717 |
| **47** | 1.2854645252 | | 1.2482008934 |
| **48** | 1.2879533768 | | 1.2516415119 |
| **49** | 1.2815852165 | | 1.2543358803 |
| **50** | 1.2819108963 | | 1.2462241650 |
| **Total** | 64.4894902706 | | 63.0696637630 |
| **Average** | 1.2897898054 | | 1.2613932753 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **DiRT Rally 2016 - Driving Hard 2 - 1440p60** | |
| **Resolution** | | **1440p** | |
| **Frame Number** | **Encryption (In seconds)** | | **Decryption (In seconds)** |
| **1** | 1.3803348541 | | 1.4480292797 |
| **2** | 1.3027822971 | | 1.2725777626 |
| **3** | 1.2962262630 | | 1.2668256760 |
| **4** | 1.2810645103 | | 1.2804963589 |
| **5** | 1.3054213524 | | 1.2612383366 |
| **6** | 1.3552882671 | | 1.2630765438 |
| **7** | 1.3564617634 | | 1.2650907040 |
| **8** | 1.2813777924 | | 1.2622132301 |
| **9** | 1.2835054398 | | 1.2650363445 |
| **10** | 1.2855122089 | | 1.2631580830 |
| **11** | 1.3237802982 | | 1.2635109425 |
| **12** | 1.3545322418 | | 1.2615392208 |
| **13** | 1.2849943638 | | 1.2716267109 |
| **14** | 1.2922253609 | | 1.2607378960 |
| **15** | 1.2825551033 | | 1.2674798965 |
| **16** | 1.2825472355 | | 1.2613072395 |
| **17** | 1.2869184017 | | 1.2647480965 |
| **18** | 1.2771809101 | | 1.2534105778 |
| **19** | 1.3172783852 | | 1.2566611767 |
| **20** | 1.2993745804 | | 1.2658324242 |
| **21** | 1.2832064629 | | 1.2683231831 |
| **22** | 1.3398654461 | | 1.2561774254 |
| **23** | 1.2803497314 | | 1.2565262318 |
| **24** | 1.2823190689 | | 1.2573819160 |
| **25** | 1.2850620747 | | 1.2679958344 |
| **26** | 1.3033742905 | | 1.2565863132 |
| **27** | 1.2835545540 | | 1.2644207478 |
| **28** | 1.2810642719 | | 1.2572445869 |
| **29** | 1.2823741436 | | 1.2562520504 |
| **30** | 1.2880003452 | | 1.2599606514 |
| **31** | 1.2856724262 | | 1.2785968781 |
| **32** | 1.2853007317 | | 1.2626252174 |
| **33** | 1.2883319855 | | 1.2677500248 |
| **34** | 1.2807097435 | | 1.2612974644 |
| **35** | 1.2942941189 | | 1.2665731907 |
| **36** | 1.2855579853 | | 1.2556302547 |
| **37** | 1.3352277279 | | 1.2731363773 |
| **38** | 1.3176407814 | | 1.2734746933 |
| **39** | 1.3241364956 | | 1.2713742256 |
| **40** | 1.3140769005 | | 1.2587873936 |
| **41** | 1.3124613762 | | 1.2514975071 |
| **42** | 1.3201754093 | | 1.2535405159 |
| **43** | 1.3117663860 | | 1.2519845963 |
| **44** | 1.3148696423 | | 1.2561769485 |
| **45** | 1.3173615932 | | 1.2567589283 |
| **46** | 1.3133056164 | | 1.2570707798 |
| **47** | 1.3105676174 | | 1.2585318089 |
| **48** | 1.3170821667 | | 1.2639362812 |
| **49** | 1.3145754337 | | 1.2698085308 |
| **50** | 1.3620045185 | | 1.2579202652 |
| **Total** | 65.2436506748 | | 63.3219373226 |
| **Average** | 1.3048730135 | | 1.2664387465 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **Project Cars 2016 - 1440p60 Racing Merc HQ HD** | |
| **Resolution** | | **1440p** | |
| **Frame Number** | **Encryption (In seconds)** | | **Decryption (In seconds)** |
| **1** | 1.4125595093 | | 1.4370195866 |
| **2** | 1.2945897579 | | 1.3199741840 |
| **3** | 1.2827417850 | | 1.2685513496 |
| **4** | 1.2878654003 | | 1.2655344009 |
| **5** | 1.2882511616 | | 1.2627711296 |
| **6** | 1.2849817276 | | 1.2617723942 |
| **7** | 1.2834715843 | | 1.2605764866 |
| **8** | 1.2871346474 | | 1.2591526508 |
| **9** | 1.2935712337 | | 1.2582490444 |
| **10** | 1.2940180302 | | 1.2561476231 |
| **11** | 1.2925083637 | | 1.2645230293 |
| **12** | 1.2856647968 | | 1.2579343319 |
| **13** | 1.3663611412 | | 1.2637979984 |
| **14** | 1.3299121857 | | 1.2722578049 |
| **15** | 1.2885940075 | | 1.2584939003 |
| **16** | 1.2890257835 | | 1.2585570812 |
| **17** | 1.2784547806 | | 1.2609698772 |
| **18** | 1.2873473167 | | 1.2608585358 |
| **19** | 1.2864251137 | | 1.2650606632 |
| **20** | 1.2866048813 | | 1.2598514557 |
| **21** | 1.2809264660 | | 1.2655291557 |
| **22** | 1.2828230858 | | 1.2671649456 |
| **23** | 1.3135762215 | | 1.2612311840 |
| **24** | 1.3654901981 | | 1.2565064430 |
| **25** | 1.2777183056 | | 1.2661552429 |
| **26** | 1.2761693001 | | 1.2573950291 |
| **27** | 1.2781195641 | | 1.2643184662 |
| **28** | 1.3005361557 | | 1.2534649372 |
| **29** | 1.2816092968 | | 1.2572100163 |
| **30** | 1.2853288651 | | 1.2621555328 |
| **31** | 1.2760202885 | | 1.2559616566 |
| **32** | 1.2783460617 | | 1.2586429119 |
| **33** | 1.2738921642 | | 1.2559914589 |
| **34** | 1.2787003517 | | 1.2620995045 |
| **35** | 1.3588888645 | | 1.2546443939 |
| **36** | 1.2990200520 | | 1.2565178871 |
| **37** | 1.3532128334 | | 1.2700271606 |
| **38** | 1.3509116173 | | 1.2642955780 |
| **39** | 1.3387303352 | | 1.2642157078 |
| **40** | 1.3541367054 | | 1.2515044212 |
| **41** | 1.3197121620 | | 1.2507026196 |
| **42** | 1.2792310715 | | 1.2532606125 |
| **43** | 1.2832877636 | | 1.2595016956 |
| **44** | 1.2813956738 | | 1.2510814667 |
| **45** | 1.2819075584 | | 1.2514567375 |
| **46** | 1.2960066795 | | 1.2620091438 |
| **47** | 1.2851543427 | | 1.2503511906 |
| **48** | 1.2832589149 | | 1.2566747665 |
| **49** | 1.2821586132 | | 1.2566463947 |
| **50** | 1.2870688438 | | 1.2557160854 |
| **Total** | 64.9834215641 | | 63.2244858742 |
| **Average** | 1.2996684313 | | 1.2644897175 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **Bears Panasonic G85 - 4K UHD** | |
| **Resolution** | | **1440p** | |
| **Frame Number** | **Encryption (In seconds)** | | **Decryption (In seconds)** |
| **1** | 1.3371119499 | | 1.5259673595 |
| **2** | 1.2824406624 | | 1.2971899509 |
| **3** | 1.2829856873 | | 1.2700517178 |
| **4** | 1.2819168568 | | 1.2666814327 |
| **5** | 1.2736294270 | | 1.3026490211 |
| **6** | 1.2711868286 | | 1.2539246082 |
| **7** | 1.2738924026 | | 1.2572133541 |
| **8** | 1.2716119289 | | 1.2584865093 |
| **9** | 1.2752320766 | | 1.2653682232 |
| **10** | 1.2787747383 | | 1.2665784359 |
| **11** | 1.2730581760 | | 1.2682573795 |
| **12** | 1.2751944065 | | 1.2664220333 |
| **13** | 1.2775163651 | | 1.2666285038 |
| **14** | 1.2743999958 | | 1.2618868351 |
| **15** | 1.2743151188 | | 1.2934589386 |
| **16** | 1.2721865177 | | 1.2685225010 |
| **17** | 1.2731082439 | | 1.2616670132 |
| **18** | 1.2767665386 | | 1.2706685066 |
| **19** | 1.2771131992 | | 1.2632412910 |
| **20** | 1.3303947449 | | 1.2680716515 |
| **21** | 1.3073580265 | | 1.2614493370 |
| **22** | 1.2721600533 | | 1.2647242546 |
| **23** | 1.3017632961 | | 1.2609825134 |
| **24** | 1.2821393013 | | 1.2673320770 |
| **25** | 1.2741549015 | | 1.2605247498 |
| **26** | 1.2747006416 | | 1.2670793533 |
| **27** | 1.2730834484 | | 1.2669436932 |
| **28** | 1.2811560631 | | 1.2770555019 |
| **29** | 1.2770698071 | | 1.2703840733 |
| **30** | 1.2733876705 | | 1.2694020271 |
| **31** | 1.2805840969 | | 1.2625403404 |
| **32** | 1.2785191536 | | 1.2624216080 |
| **33** | 1.2772722244 | | 1.2625963688 |
| **34** | 1.2738239765 | | 1.2560732365 |
| **35** | 1.2978324890 | | 1.2589862347 |
| **36** | 1.2757620811 | | 1.2634525299 |
| **37** | 1.2828226089 | | 1.2590768337 |
| **38** | 1.2883076668 | | 1.2661759853 |
| **39** | 1.2871699333 | | 1.2624599934 |
| **40** | 1.2789986134 | | 1.2553422451 |
| **41** | 1.2790694237 | | 1.2639682293 |
| **42** | 1.2771627903 | | 1.2570664883 |
| **43** | 1.2784709930 | | 1.2545883656 |
| **44** | 1.2778882980 | | 1.2632606030 |
| **45** | 1.2806596756 | | 1.2572174072 |
| **46** | 1.2778501511 | | 1.2639603615 |
| **47** | 1.3119087219 | | 1.2560296059 |
| **48** | 1.3340790272 | | 1.2640929222 |
| **49** | 1.2838461399 | | 1.2569558620 |
| **50** | 1.2991726398 | | 1.2586872578 |
| **Total** | 64.1710097790 | | 63.5237653255 |
| **Average** | 1.2834201956 | | 1.2704753065 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **Jackdaw Bird Panasonic G85 Clip High Quality - 4K UHD** | |
| **Resolution** | | **1440p** | |
| **Frame Number** | **Encryption (In seconds)** | | **Decryption (In seconds)** |
| **1** | 1.3764927387 | | 1.4658122063 |
| **2** | 1.2905268669 | | 1.2707953453 |
| **3** | 1.2695276737 | | 1.2706930637 |
| **4** | 1.2716376781 | | 1.2648389339 |
| **5** | 1.3522334099 | | 1.2672908306 |
| **6** | 1.3017170429 | | 1.2602887154 |
| **7** | 1.3047406673 | | 1.2643854618 |
| **8** | 1.3112714291 | | 1.2566065788 |
| **9** | 1.2857282162 | | 1.2597882748 |
| **10** | 1.3397605419 | | 1.2631285191 |
| **11** | 1.2730655670 | | 1.2657461166 |
| **12** | 1.2711515427 | | 1.2630696297 |
| **13** | 1.2935421467 | | 1.2674436569 |
| **14** | 1.2731673717 | | 1.2561526299 |
| **15** | 1.2743167877 | | 1.2649664879 |
| **16** | 1.2767937183 | | 1.2596368790 |
| **17** | 1.2702209949 | | 1.2613387108 |
| **18** | 1.2703151703 | | 1.2633659840 |
| **19** | 1.2692179680 | | 1.2584125996 |
| **20** | 1.2736396790 | | 1.2621734142 |
| **21** | 1.2915053368 | | 1.2612717152 |
| **22** | 1.2795178890 | | 1.2593007088 |
| **23** | 1.2724390030 | | 1.2654526234 |
| **24** | 1.2846810818 | | 1.2591853142 |
| **25** | 1.2735543251 | | 1.2713556290 |
| **26** | 1.2892899513 | | 1.2669894695 |
| **27** | 1.2825353146 | | 1.2704367638 |
| **28** | 1.3284304142 | | 1.2697782516 |
| **29** | 1.2752103806 | | 1.2715811729 |
| **30** | 1.2845120430 | | 1.2781944275 |
| **31** | 1.2739045620 | | 1.2692399025 |
| **32** | 1.2722246647 | | 1.2749135494 |
| **33** | 1.2689063549 | | 1.2695496082 |
| **34** | 1.2711334229 | | 1.2696566582 |
| **35** | 1.2696158886 | | 1.2602412701 |
| **36** | 1.2714736462 | | 1.2633416653 |
| **37** | 1.2717919350 | | 1.2783560753 |
| **38** | 1.2751150131 | | 1.2657003403 |
| **39** | 1.2787325382 | | 1.2659511566 |
| **40** | 1.2717933655 | | 1.2617461681 |
| **41** | 1.2798035145 | | 1.2681818008 |
| **42** | 1.2774863243 | | 1.2675323486 |
| **43** | 1.2730891705 | | 1.2643933296 |
| **44** | 1.2710995674 | | 1.2626607418 |
| **45** | 1.2695355415 | | 1.2663359642 |
| **46** | 1.3224165440 | | 1.2550883293 |
| **47** | 1.2736718655 | | 1.2662324905 |
| **48** | 1.2723193169 | | 1.2611145973 |
| **49** | 1.2707903385 | | 1.2649254799 |
| **50** | 1.2891921997 | | 1.2598140240 |
| **Total** | 64.2348387241 | | 63.4544556141 |
| **Average** | 1.2846967745 | | 1.2690891123 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **Drifting in Real World by Drift Mechaniks 4K UHD** | |
| **Resolution** | | **1440p** | |
| **Frame Number** | **Encryption (In seconds)** | | **Decryption (In seconds)** |
| **1** | 1.3437550068 | | 1.5437829494 |
| **2** | 1.2803149223 | | 1.3291561604 |
| **3** | 1.2710301876 | | 1.3040904999 |
| **4** | 1.2739748955 | | 1.2912504673 |
| **5** | 1.3027594090 | | 1.2709188461 |
| **6** | 1.3419785500 | | 1.2717542648 |
| **7** | 1.2674484253 | | 1.2564668655 |
| **8** | 1.2749226093 | | 1.2643468380 |
| **9** | 1.2687127590 | | 1.2749116421 |
| **10** | 1.2749931812 | | 1.2701427937 |
| **11** | 1.2718305588 | | 1.2758705616 |
| **12** | 1.2709562778 | | 1.2606542110 |
| **13** | 1.3333899975 | | 1.2584264278 |
| **14** | 1.2690026760 | | 1.2557103634 |
| **15** | 1.2700083256 | | 1.2536509037 |
| **16** | 1.2720212936 | | 1.2607371807 |
| **17** | 1.2700376511 | | 1.2570624352 |
| **18** | 1.2717583179 | | 1.2525506020 |
| **19** | 1.2717883587 | | 1.2612798214 |
| **20** | 1.2661089897 | | 1.2582838535 |
| **21** | 1.2737333775 | | 1.2564034462 |
| **22** | 1.2726738453 | | 1.2550032139 |
| **23** | 1.2762136459 | | 1.2560887337 |
| **24** | 1.2761232853 | | 1.2568747997 |
| **25** | 1.2999324799 | | 1.2577016354 |
| **26** | 1.2749598026 | | 1.2559785843 |
| **27** | 1.2668046951 | | 1.2581388950 |
| **28** | 1.3536310196 | | 1.2572338581 |
| **29** | 1.3007266521 | | 1.2592842579 |
| **30** | 1.2756662369 | | 1.2546594143 |
| **31** | 1.2833466530 | | 1.2530651093 |
| **32** | 1.2769434452 | | 1.2511010170 |
| **33** | 1.2809534073 | | 1.2525999546 |
| **34** | 1.2848320007 | | 1.2653949261 |
| **35** | 1.2796795368 | | 1.2528011799 |
| **36** | 1.2797138691 | | 1.2670836449 |
| **37** | 1.2788538933 | | 1.2561323643 |
| **38** | 1.2791314125 | | 1.2509143353 |
| **39** | 1.2836618423 | | 1.2542052269 |
| **40** | 1.2765393257 | | 1.2565128803 |
| **41** | 1.2813494205 | | 1.2574703693 |
| **42** | 1.2704005241 | | 1.2494728565 |
| **43** | 1.2783324718 | | 1.2478449345 |
| **44** | 1.2701494694 | | 1.2467188835 |
| **45** | 1.2696952820 | | 1.2498970032 |
| **46** | 1.2755560875 | | 1.2517476082 |
| **47** | 1.2822794914 | | 1.2535922527 |
| **48** | 1.2716779709 | | 1.2507104874 |
| **49** | 1.2764496803 | | 1.2496898174 |
| **50** | 1.2771468163 | | 1.2512259483 |
| **Total** | 64.0939500332 | | 63.3065953255 |
| **Average** | 1.2818790007 | | 1.2661319065 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **ARTE Carnival Ultra -HD Demo Video 4K UHD** | |
| **Resolution** | | **1440p** | |
| **Frame Number** | **Encryption (In seconds)** | | **Decryption (In seconds)** |
| **1** | 1.3848526478 | | 1.5756821632 |
| **2** | 1.3608930111 | | 1.3288261890 |
| **3** | 1.3511095047 | | 1.3022687435 |
| **4** | 1.2897541523 | | 1.2862317562 |
| **5** | 1.2782101631 | | 1.3030261993 |
| **6** | 1.2749254704 | | 1.2737030983 |
| **7** | 1.2874243259 | | 1.2742140293 |
| **8** | 1.2755348682 | | 1.2598652840 |
| **9** | 1.2794039249 | | 1.2537384033 |
| **10** | 1.3057930470 | | 1.2522256374 |
| **11** | 1.2804956436 | | 1.2526662350 |
| **12** | 1.2866690159 | | 1.2587788105 |
| **13** | 1.2804884911 | | 1.2568140030 |
| **14** | 1.2812187672 | | 1.2590794563 |
| **15** | 1.2869524956 | | 1.2761774063 |
| **16** | 1.2827174664 | | 1.2784993649 |
| **17** | 1.2733311653 | | 1.2633316517 |
| **18** | 1.2764089108 | | 1.3489031792 |
| **19** | 1.2748689651 | | 1.2602543831 |
| **20** | 1.2754116058 | | 1.2587425709 |
| **21** | 1.2752852440 | | 1.2686750889 |
| **22** | 1.2761178017 | | 1.2638061047 |
| **23** | 1.2742252350 | | 1.2646212578 |
| **24** | 1.2784337997 | | 1.2603967190 |
| **25** | 1.2789621353 | | 1.2661972046 |
| **26** | 1.2799010277 | | 1.2556071281 |
| **27** | 1.2978112698 | | 1.2607097626 |
| **28** | 1.2836327553 | | 1.2547564507 |
| **29** | 1.3404366970 | | 1.2660090923 |
| **30** | 1.2759518623 | | 1.2613265514 |
| **31** | 1.2796554565 | | 1.2588598728 |
| **32** | 1.3182098866 | | 1.2524802685 |
| **33** | 1.2811934948 | | 1.2486202717 |
| **34** | 1.2812073231 | | 1.2522678375 |
| **35** | 1.2872223854 | | 1.2490124702 |
| **36** | 1.2813086510 | | 1.2571806908 |
| **37** | 1.2851657867 | | 1.2581202984 |
| **38** | 1.2811017036 | | 1.2503089905 |
| **39** | 1.2862079144 | | 1.2539265156 |
| **40** | 1.2828748226 | | 1.2501041889 |
| **41** | 1.2851424217 | | 1.2514595985 |
| **42** | 1.2986078262 | | 1.2522878647 |
| **43** | 1.2791182995 | | 1.2512347698 |
| **44** | 1.3262612820 | | 1.2490708828 |
| **45** | 1.2858004570 | | 1.2617769241 |
| **46** | 1.2778182030 | | 1.2466413975 |
| **47** | 1.2751836777 | | 1.2513694763 |
| **48** | 1.2789120674 | | 1.2505657673 |
| **49** | 1.2804908752 | | 1.2539260387 |
| **50** | 1.2812550068 | | 1.2529125214 |
| **Total** | 64.4799590111 | | 63.4972605705 |
| **Average** | 1.2895991802 | | 1.2699452114 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **Max Payne 3 - Part 1 of Part 1 in 4K UHD** | |
| **Resolution** | | **1440p** | |
| **Frame Number** | **Encryption (In seconds)** | | **Decryption (In seconds)** |
| **1** | 1.3537194729 | | 1.3956575394 |
| **2** | 1.2800645828 | | 1.2711629868 |
| **3** | 1.2724556923 | | 1.2596175671 |
| **4** | 1.2823767662 | | 1.2606012821 |
| **5** | 1.2728173733 | | 1.2503385544 |
| **6** | 1.2790827751 | | 1.2519989014 |
| **7** | 1.2759847641 | | 1.2596011162 |
| **8** | 1.3088674545 | | 1.2506275177 |
| **9** | 1.2759318352 | | 1.2517004013 |
| **10** | 1.2790915966 | | 1.2494444847 |
| **11** | 1.2694950104 | | 1.2555935383 |
| **12** | 1.2728953362 | | 1.2509124279 |
| **13** | 1.2745611668 | | 1.2585778236 |
| **14** | 1.2712197304 | | 1.2555499077 |
| **15** | 1.2718787193 | | 1.2537620068 |
| **16** | 1.2739198208 | | 1.2517027855 |
| **17** | 1.2747430801 | | 1.2540433407 |
| **18** | 1.2761065960 | | 1.2566781044 |
| **19** | 1.2718334198 | | 1.2571780682 |
| **20** | 1.2773203850 | | 1.2494919300 |
| **21** | 1.2767233849 | | 1.2489676476 |
| **22** | 1.2759983540 | | 1.2508556843 |
| **23** | 1.2741606236 | | 1.2633426189 |
| **24** | 1.3460412025 | | 1.2497384548 |
| **25** | 1.3541612625 | | 1.2541091442 |
| **26** | 1.2811312675 | | 1.2535855770 |
| **27** | 1.2778794765 | | 1.2534484863 |
| **28** | 1.2724330425 | | 1.2513916492 |
| **29** | 1.3169951439 | | 1.2459037304 |
| **30** | 1.2759079933 | | 1.2536232471 |
| **31** | 1.2768275738 | | 1.2588155270 |
| **32** | 1.2767765522 | | 1.2513444424 |
| **33** | 1.2747724056 | | 1.2568650246 |
| **34** | 1.2750034332 | | 1.2509746552 |
| **35** | 1.2758417130 | | 1.2544400692 |
| **36** | 1.2738556862 | | 1.2515940666 |
| **37** | 1.2733294964 | | 1.2621192932 |
| **38** | 1.2790811062 | | 1.2542166710 |
| **39** | 1.2796351910 | | 1.2522883415 |
| **40** | 1.2808682919 | | 1.2500820160 |
| **41** | 1.2789916992 | | 1.2442286015 |
| **42** | 1.2773327827 | | 1.2536821365 |
| **43** | 1.2750291824 | | 1.2494926453 |
| **44** | 1.2765541077 | | 1.2503464222 |
| **45** | 1.2787103653 | | 1.2493839264 |
| **46** | 1.2802689075 | | 1.2482371330 |
| **47** | 1.2693932056 | | 1.2468354702 |
| **48** | 1.2689862251 | | 1.2431790829 |
| **49** | 1.2749392986 | | 1.2530138493 |
| **50** | 1.2762258053 | | 1.2483584881 |
| **Total** | 64.0882203579 | | 62.7987043858 |
| **Average** | 1.2817644072 | | 1.2559740877 |