# ENCRYPTION METRICS

|  |  |  |  |  |  |  |  |  |  |  |
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| **Encryption Algorithm** | | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | | | | | | | |
| **Video Stream** | | | **VID\_20200717\_171254** | | | | | | | |
| **Resolution** | | | **1080p** | | | | | | | |
| **Frame Number** | **Correlation Coefficient** | | | | **E(i)** | | | | **Differential Attacks** | |
| **CCh** | **CCv** | | **CCd** | **Red** | **Green** | **Blue** | **Combined** | **NPCR** | **UACI** |
| **1** | 0.0101020771 | -0.0265971159 | | -0.0084168880 | 7.9998919664 | 7.9999056280 | 7.9999103444 | 7.9999657731 | 99.6114004630 | 33.4276696018 |
| **2** | 0.0063042587 | 0.0179271698 | | -0.0208156745 | 7.9999003011 | 7.9998989364 | 7.9999172430 | 7.9999687695 | 99.6108056842 | 33.4241157433 |
| **3** | 0.7602341144 | 0.8813139311 | | -0.0425147134 | 7.9257820094 | 7.9282056471 | 7.9222614277 | 7.9459038460 | 99.6063528807 | 33.3670630598 |
| **4** | -0.0051095444 | 0.0229534940 | | -0.0225472743 | 7.9998834920 | 7.9999191846 | 7.9999117426 | 7.9999677229 | 99.6078317901 | 33.4193302797 |
| **5** | 0.0343199917 | 0.0046098365 | | -0.0034005681 | 7.9999058900 | 7.9999072041 | 7.9999097089 | 7.9999721110 | 99.6112718621 | 33.4048451621 |
| **6** | 0.0615802551 | 0.0066491578 | | 0.0487916060 | 7.9999179766 | 7.9999195572 | 7.9999044393 | 7.9999729363 | 99.6132169496 | 33.4186428326 |
| **7** | -0.0027037136 | -0.0133694650 | | -0.0271383333 | 7.9999012311 | 7.9999079573 | 7.9999077995 | 7.9999631247 | 99.6110628858 | 33.4293174574 |
| **8** | -0.0219523417 | 0.0458616451 | | -0.0378080437 | 7.9999058605 | 7.9999096498 | 7.9999026122 | 7.9999658425 | 99.6098894033 | 33.4099398980 |
| **9** | -0.0178855924 | 0.0129011963 | | -0.0008489662 | 7.9998871607 | 7.9999164433 | 7.9999065946 | 7.9999686636 | 99.6073013117 | 33.4166497721 |
| **10** | -0.0295373745 | -0.0256742310 | | 0.0362777575 | 7.9999101705 | 7.9999088561 | 7.9999244058 | 7.9999735430 | 99.6089731224 | 33.4215579738 |
| **11** | 0.0009933084 | -0.0116005627 | | 0.0002060996 | 7.9999051780 | 7.9999155390 | 7.9999083828 | 7.9999721523 | 99.6064332562 | 33.4179064038 |
| **12** | -0.0021100350 | -0.0184877209 | | -0.0281580549 | 7.9998966387 | 7.9999180466 | 7.9999124671 | 7.9999655923 | 99.6091820988 | 33.4234708480 |
| **13** | 0.0192155863 | -0.0121906870 | | 0.0425248820 | 7.9999096211 | 7.9999118345 | 7.9999207840 | 7.9999723723 | 99.6080086163 | 33.4204796811 |
| **14** | -0.0263276684 | 0.0046566216 | | -0.0292147314 | 7.9998914947 | 7.9998972422 | 7.9999172192 | 7.9999663293 | 99.6108539095 | 33.4225968036 |
| **15** | 0.0151301173 | -0.0171796894 | | -0.0447968443 | 7.9998978139 | 7.9999120343 | 7.9999070517 | 7.9999704154 | 99.6099215535 | 33.4324932674 |
| **16** | 0.0160526938 | 0.0148919793 | | -0.0492166408 | 7.9998934411 | 7.9999099981 | 7.9999119030 | 7.9999676953 | 99.6074781379 | 33.4117539261 |
| **17** | -0.0041886959 | 0.0060252233 | | 0.0231875905 | 7.9998995266 | 7.9999057795 | 7.9999087095 | 7.9999703119 | 99.6073013117 | 33.3998645909 |
| **18** | 0.0004456157 | -0.0348646816 | | -0.0228264825 | 7.9998990213 | 7.9999144270 | 7.9999113940 | 7.9999693420 | 99.6083140432 | 33.4123231739 |
| **19** | 0.0170363872 | 0.0016661568 | | -0.0209703476 | 7.9998772928 | 7.9999073133 | 7.9999003191 | 7.9999663999 | 99.6095679012 | 33.0776807598 |
| **20** | 0.0048044857 | 0.0073469074 | | -0.0031107887 | 7.9999078289 | 7.9999113073 | 7.9999229159 | 7.9999710561 | 99.6097125772 | 33.4211546463 |
| **21** | 0.0268878446 | 0.0011707722 | | 0.0032133313 | 7.9998991589 | 7.9999153602 | 7.9999081396 | 7.9999679399 | 99.6095679012 | 33.4205164332 |
| **22** | 0.0201735890 | -0.0067736881 | | -0.0323171960 | 7.9999015311 | 7.9999246473 | 7.9999239709 | 7.9999731444 | 99.6119148663 | 33.4160425114 |
| **23** | -0.0127541451 | 0.0049296098 | | 0.0151216754 | 7.9998889103 | 7.9999102388 | 7.9999218805 | 7.9999662926 | 99.6100823045 | 33.4153148451 |
| **24** | -0.0058565945 | -0.0058996895 | | -0.0253878009 | 7.9998960978 | 7.9999124695 | 7.9999054304 | 7.9999703698 | 99.6103395062 | 33.4227490443 |
| **25** | -0.0106656904 | 0.0076580304 | | 0.0192714801 | 7.9999057528 | 7.9999190116 | 7.9999124383 | 7.9999721459 | 99.6100823045 | 33.4051539301 |
| **26** | 0.0034987559 | -0.0056714368 | | 0.0232304971 | 7.9999122518 | 7.9998980060 | 7.9999013263 | 7.9999699370 | 99.6130883488 | 33.3010505553 |
| **27** | 0.0160072480 | 0.0105300484 | | -0.0256512666 | 7.9998742890 | 7.9999082870 | 7.9999085433 | 7.9999685412 | 99.6113361626 | 33.4572036634 |
| **28** | 0.0279548027 | 0.0056330957 | | 0.0164077578 | 7.9999243977 | 7.9998972568 | 7.9999095995 | 7.9999705881 | 99.6050668724 | 33.4325927439 |
| **29** | -0.0077880186 | 0.0148238116 | | 0.0390107944 | 7.9999153214 | 7.9999203356 | 7.9999052949 | 7.9999728510 | 99.6050186471 | 33.4208142323 |
| **30** | -0.0069506563 | 0.0024973597 | | 0.0248840957 | 7.9999221522 | 7.9999078577 | 7.9999072293 | 7.9999683687 | 99.6105967078 | 33.4179887336 |
| **31** | -0.0032005152 | -0.0027745541 | | -0.0409812283 | 7.9999097226 | 7.9998936493 | 7.9999091019 | 7.9999715312 | 99.6105324074 | 33.4296861131 |
| **32** | 0.0064140249 | -0.0132978880 | | 0.0304236319 | 7.9999103946 | 7.9999258149 | 7.9999104236 | 7.9999724857 | 99.6098251029 | 33.4063680732 |
| **33** | -0.0039587831 | 0.0164658077 | | -0.0016678589 | 7.9999003072 | 7.9998997646 | 7.9999209366 | 7.9999680661 | 99.6132330247 | 33.4174117950 |
| **34** | -0.0011891696 | -0.0353745989 | | 0.0074782468 | 7.9999063085 | 7.9999143364 | 7.9999078802 | 7.9999710224 | 99.6109342850 | 33.4251007373 |
| **35** | 0.0179757602 | -0.0270169170 | | -0.0570113749 | 7.9999107565 | 7.9999063665 | 7.9999067308 | 7.9999705269 | 99.6130079733 | 33.4126741785 |
| **36** | -0.0032113099 | 0.0165416508 | | -0.0296717095 | 7.9999105774 | 7.9999040483 | 7.9999191062 | 7.9999730639 | 99.6103234311 | 33.4177657624 |
| **37** | -0.7782235159 | 0.9122732095 | | 0.0339809508 | 7.8778325446 | 7.8682921541 | 7.8667813765 | 7.8835821710 | 99.6068833591 | 33.5095664513 |
| **38** | -0.5866552449 | 0.9103362020 | | -0.1750509085 | 7.7769541469 | 7.7518092774 | 7.7543657854 | 7.7971594374 | 99.6094553755 | 34.4413297829 |
| **39** | -0.2700314995 | 0.2577893079 | | -0.2158484192 | 7.9134557510 | 7.9274199456 | 7.9249165857 | 7.9365329335 | 99.6116737397 | 33.2104708177 |
| **40** | 0.0040184352 | -0.0080102603 | | 0.0493205417 | 7.9999016639 | 7.9999128051 | 7.9999212562 | 7.9999730759 | 99.6083140432 | 33.4287501639 |
| **41** | -0.0113248143 | 0.0237389823 | | 0.0226102704 | 7.9998991606 | 7.9999112592 | 7.9999031101 | 7.9999719978 | 99.6087802212 | 33.4190439537 |
| **42** | -0.0038611791 | 0.0086725464 | | 0.0050745937 | 7.9998952616 | 7.9999155941 | 7.9999139553 | 7.9999718129 | 99.6077514146 | 33.0298069601 |
| **43** | -0.0260462796 | 0.0090315592 | | 0.0267985928 | 7.9999076117 | 7.9999107213 | 7.9999107426 | 7.9999689633 | 99.6100662294 | 33.4131547925 |
| **44** | 0.0140574737 | -0.0191242078 | | -0.0227511129 | 7.9999019723 | 7.9999052314 | 7.9999112757 | 7.9999684621 | 99.6118827160 | 33.4203652642 |
| **45** | -0.0216994251 | 0.0241766056 | | 0.0246728541 | 7.9999145388 | 7.9999060784 | 7.9999134150 | 7.9999655519 | 99.6118666409 | 34.5844742244 |
| **46** | 0.0557578241 | 0.0326127848 | | 0.0367299507 | 7.9998882039 | 7.9999070447 | 7.9999133341 | 7.9999687219 | 99.6076710391 | 33.4214825784 |
| **47** | -0.0177754444 | 0.0272654398 | | 0.0135346242 | 7.9999205918 | 7.9999108720 | 7.9999052143 | 7.9999715207 | 99.6081854424 | 32.9686445978 |
| **48** | 0.0296660681 | 0.0153204050 | | -0.0270870650 | 7.9999090405 | 7.9999060685 | 7.9999111059 | 7.9999735455 | 99.6070601852 | 32.2871561819 |
| **49** | 0.0188852620 | -0.0127112749 | | 0.0083262874 | 7.9998921251 | 7.9999149189 | 7.9999048489 | 7.9999706292 | 99.6127346965 | 33.4256587640 |
| **50** | -0.0150101110 | 0.0139281950 | | -0.0127098448 | 7.9999091992 | 7.9999009824 | 7.9999047043 | 7.9999654847 | 99.6080086163 | 33.4068896000 |
| **Total** | -0.7085013829 | 3.0455800740 | | -0.4768420252 | 399.4895336571 | 399.4715829891 | 399.4642322065 | 399.5617851819 | 4980.4801633230 | 1670.5640833662 |
| **Average** | -0.0141690793 | 0.0608363812 | | -0.0095365514 | 7.9897906731 | 7.9894316598 | 7.9892846441 | 7.9912357036 | 99.6096032665 | 33.4112816673 |

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| **Encryption Algorithm** | | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | | | | | | | |
| **Video Stream** | | | **VID\_20200717\_171657\_01** | | | | | | | |
| **Resolution** | | | **1080p** | | | | | | | |
| **Frame Number** | **Correlation Coefficient** | | | | **E(i)** | | | | **Differential Attacks** | |
| **CCh** | **CCv** | | **CCd** | **Red** | **Green** | **Blue** | **Combined** | **NPCR** | **UACI** |
| **1** | -0.0139214269 | -0.0192862075 | | 0.0268841239 | 7.9942100546 | 7.9945828744 | 7.9942912650 | 7.9944202558 | 99.6068672840 | 33.4045513344 |
| **2** | -0.0213807250 | 0.0248514230 | | 0.0206541602 | 7.9818189624 | 7.9822662748 | 7.9817281710 | 7.9819963705 | 99.6016107253 | 33.4271294783 |
| **3** | 0.0049174675 | -0.0161800459 | | 0.0212697918 | 7.9963562840 | 7.9964704520 | 7.9962169209 | 7.9964106595 | 99.6088445216 | 33.4113867834 |
| **4** | 0.0836561090 | -0.1510508532 | | -0.2016922909 | 5.9365362821 | 5.8996076380 | 5.9025294787 | 5.9153975202 | 99.6192290381 | 32.9888604580 |
| **5** | 0.8573808765 | 1.0000000000 | | -0.0083861815 | 5.8224311185 | 5.8116798380 | 5.8055059109 | 5.8168696955 | 99.6092142490 | 35.7129683213 |
| **6** | -0.0181991604 | -0.0181923820 | | -0.0113601452 | 7.9954044924 | 7.9953135294 | 7.9951887035 | 7.9953621058 | 99.6024144805 | 33.4047762598 |
| **7** | -0.0030710355 | 0.0142252504 | | 0.0242093763 | 7.9976774607 | 7.9976135064 | 7.9976325112 | 7.9976981097 | 99.6077031893 | 33.4137644487 |
| **8** | -0.0257372215 | 0.0166663585 | | -0.0323272035 | 7.9959171106 | 7.9960872195 | 7.9957861753 | 7.9959894584 | 99.6099858539 | 33.4065031671 |
| **9** | 0.0119902257 | -0.0108933295 | | -0.0561588971 | 7.9962121300 | 7.9962989740 | 7.9961334668 | 7.9962684227 | 99.6032343107 | 33.3537078643 |
| **10** | 0.8697205036 | 0.9917299317 | | 0.2641572652 | 5.7790149042 | 5.7709084489 | 5.7445645908 | 5.7689127851 | 99.6077514146 | 36.8367280799 |
| **11** | -0.0142885556 | -0.0033193792 | | 0.0069634037 | 7.9949526249 | 7.9952549994 | 7.9949327069 | 7.9951004167 | 99.6102430556 | 33.4152964375 |
| **12** | -0.0087108162 | 0.0374328024 | | -0.0327853458 | 7.9962907848 | 7.9963704540 | 7.9962047465 | 7.9963447751 | 99.6028485082 | 33.4261804799 |
| **13** | 0.0480195254 | 0.0052844814 | | -0.0207250667 | 7.9964113709 | 7.9962886247 | 7.9962878156 | 7.9963884060 | 99.6036844136 | 33.4211385712 |
| **14** | -0.0090122157 | 0.0054791285 | | 0.0196699315 | 7.9969784142 | 7.9969933997 | 7.9967906223 | 7.9969867633 | 99.6108217593 | 33.4150278887 |
| **15** | 0.0123013630 | -0.0126584979 | | 0.0190538047 | 7.9959458271 | 7.9959619574 | 7.9959369068 | 7.9960058848 | 99.6055973508 | 33.4256466604 |
| **16** | -0.0024304993 | -0.0062850993 | | 0.0820080765 | 7.9851694288 | 7.9849185007 | 7.9849103102 | 7.9850566204 | 99.6082818930 | 33.4175177015 |
| **17** | 0.0281920625 | -0.0220040474 | | 0.3234634738 | 6.0519947722 | 6.0317651904 | 6.0187475024 | 6.0366501727 | 99.6059831533 | 32.7866246949 |
| **18** | 0.0040507705 | 0.0114740188 | | -0.0222334608 | 7.9949583898 | 7.9951026753 | 7.9948668045 | 7.9950323161 | 99.6071405607 | 33.4089325880 |
| **19** | 0.0054091938 | -0.0251902439 | | 0.0630286712 | 7.9951346733 | 7.9951585372 | 7.9950243056 | 7.9951656765 | 99.6062564300 | 33.4106858458 |
| **20** | 0.8349923948 | 1.0000000000 | | -0.2102002470 | 5.5979243257 | 5.5796669956 | 5.5828181735 | 5.5912116899 | 99.6060635288 | 32.0471148658 |
| **21** | 0.0174291940 | -0.0017023107 | | 0.0180670579 | 7.9949627871 | 7.9950828142 | 7.9947465447 | 7.9949934441 | 99.6076871142 | 33.4163034954 |
| **22** | -0.0063946172 | 0.0227545123 | | -0.0567938425 | 7.9965854366 | 7.9966629429 | 7.9965241409 | 7.9966453915 | 99.6075906636 | 33.4222934570 |
| **23** | 0.0127127324 | 0.0082756657 | | -0.0601861233 | 7.9961117993 | 7.9961612499 | 7.9959476979 | 7.9961338889 | 99.6057581019 | 33.4275053205 |
| **24** | 0.0074151989 | 0.0035808299 | | 0.0131390537 | 7.9813706770 | 7.9817381465 | 7.9808221961 | 7.9813692565 | 99.6062564300 | 33.4266957658 |
| **25** | 0.3005138609 | 1.0000000000 | | 0.0039326258 | 5.4032466664 | 5.3908030533 | 5.3811431135 | 5.3964948347 | 99.5989422582 | 30.5361169738 |
| **26** | -0.0246049031 | -0.0121838676 | | -0.0850307618 | 7.9951150332 | 7.9952108250 | 7.9950290295 | 7.9951796023 | 99.6027359825 | 33.4338586425 |
| **27** | -0.0292716789 | 0.0044417140 | | 0.0700120972 | 7.9961944149 | 7.9962510824 | 7.9960925133 | 7.9962364774 | 99.6088123714 | 33.4285402420 |
| **28** | -0.0195210059 | -0.0054791483 | | 0.0117173463 | 7.9869103373 | 7.9872036378 | 7.9865596776 | 7.9869501396 | 99.5853427212 | 36.9822669551 |
| **29** | -0.0029298573 | -0.0177527802 | | -0.0922590810 | 7.9953019991 | 7.9954386717 | 7.9951567171 | 7.9953662387 | 99.6105002572 | 33.4109874274 |
| **30** | -0.0201509087 | 0.0192924735 | | -0.0249648220 | 7.9952725602 | 7.9953256374 | 7.9951775529 | 7.9953176680 | 99.6035397377 | 33.4063809963 |
| **31** | 0.0049880062 | 0.0346506055 | | 0.0235910462 | 7.9949423314 | 7.9948224687 | 7.9947872979 | 7.9949056769 | 99.6056455761 | 33.4341451575 |
| **32** | 0.0036883868 | 0.0211266030 | | 0.0553396428 | 7.9956850567 | 7.9956282165 | 7.9955569207 | 7.9956787459 | 99.6051633230 | 33.4172324473 |
| **33** | 0.0847845944 | 1.0000000000 | | -0.2255855582 | 5.7890669057 | 5.7663015375 | 5.7667950288 | 5.7779241720 | 99.6003247171 | 32.5254545156 |
| **34** | -0.0373820989 | 0.0104527034 | | 0.0402670279 | 7.9859934053 | 7.9859957525 | 7.9858663639 | 7.9860102319 | 99.6018840021 | 33.4060357914 |
| **35** | 0.7496931831 | 0.9383221629 | | -0.4315979313 | 5.7778056804 | 5.7670274679 | 5.7737595792 | 5.7763391918 | 99.6056295010 | 33.2571428932 |
| **36** | 0.6504206746 | 1.0000000000 | | -0.1917088175 | 4.9540547866 | 4.9473779200 | 4.9439997673 | 4.9557311652 | 99.5905189043 | 35.8425572274 |
| **37** | -0.0116381004 | 0.0012118095 | | 0.0268829974 | 7.9955577602 | 7.9958454580 | 7.9956159853 | 7.9957352548 | 99.6107092335 | 33.4109734326 |
| **38** | -0.0172828115 | -0.0062603508 | | 0.0396817956 | 7.9906286966 | 7.9906473304 | 7.9905037481 | 7.9906568601 | 99.6026716821 | 33.3996111086 |
| **39** | 0.9138788496 | 1.0000000000 | | 0.1896660385 | 6.4506669256 | 6.4445530077 | 6.4505096303 | 6.4502887324 | 99.6014017490 | 34.3768081654 |
| **40** | -0.0287175230 | 0.0270093512 | | 0.0053495848 | 7.9948780413 | 7.9947044362 | 7.9949053795 | 7.9948918322 | 99.6060796039 | 33.4231606300 |
| **41** | -0.0046084678 | -0.0245481300 | | -0.0268179407 | 7.9964998614 | 7.9965969508 | 7.9966060428 | 7.9966268452 | 99.6073334619 | 33.4092174010 |
| **42** | 0.0033319162 | 0.0225482028 | | 0.0391878677 | 7.9953091178 | 7.9952897861 | 7.9951760342 | 7.9953157602 | 99.6055652006 | 33.4244492228 |
| **43** | 0.0030155948 | -0.0226042938 | | 0.0183698971 | 7.9963117694 | 7.9962994889 | 7.9962776739 | 7.9963541264 | 99.6085230195 | 33.4163283961 |
| **44** | -0.0002143762 | 0.0028135960 | | 0.0335384537 | 7.9959776044 | 7.9959910214 | 7.9958507726 | 7.9959978571 | 99.6086676955 | 33.4143437828 |
| **45** | 0.1581242634 | 0.0420210247 | | -0.1160740351 | 6.8861889397 | 6.8711717254 | 6.8787567235 | 6.8795904972 | 99.5971418467 | 33.3896004801 |
| **46** | -0.0156831116 | 0.0081924446 | | 0.0139974847 | 7.9947912684 | 7.9947946765 | 7.9948142516 | 7.9948587084 | 99.6097286523 | 33.4160511478 |
| **47** | 0.0530953578 | -0.0135146294 | | -0.0016308597 | 7.9952702232 | 7.9953577567 | 7.9952112591 | 7.9953383496 | 99.6093910751 | 33.4250562944 |
| **48** | 0.0004754449 | 0.0165486380 | | -0.0391517810 | 7.9972320468 | 7.9972527694 | 7.9971651799 | 7.9972752604 | 99.6054848251 | 33.4109905163 |
| **49** | 0.7412121059 | 0.9999997980 | | -0.1661343561 | 6.3837485574 | 6.3761431994 | 6.3828141031 | 6.3827766054 | 99.7733731996 | 33.6171576191 |
| **50** | -0.0210643229 | -0.0169776602 | | 0.0032230590 | 7.9981664417 | 7.9982665146 | 7.9981390311 | 7.9982534749 | 99.6023823302 | 33.4006217598 |
| **Total** | 6.1091944166 | 8.8843022729 | | -0.6364795937 | 374.6111865425 | 374.4382556357 | 374.4064070450 | 374.5285043944 | 4980.4385609568 | 1677.2424291939 |
| **Average** | 0.1215794736 | 0.1758393759 | | -0.0127289043 | 7.4922237309 | 7.4887651127 | 7.4881281409 | 7.4905700879 | 99.6087712191 | 33.5448485839 |

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| **Encryption Algorithm** | | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | | | | | | | |
| **Video Stream** | | | **VID\_20200717\_171835** | | | | | | | |
| **Resolution** | | | **1080p** | | | | | | | |
| **Frame Number** | **Correlation Coefficient** | | | | **E(i)** | | | | **Differential Attacks** | |
| **CCh** | **CCv** | | **CCd** | **Red** | **Green** | **Blue** | **Combined** | **NPCR** | **UACI** |
| **1** | -0.0148220100 | -0.0211969797 | | -0.0086886183 | 7.9999144603 | 7.9999197320 | 7.9999075196 | 7.9999723839 | 99.6115612140 | 33.7928637260 |
| **2** | -0.0324268783 | 0.0207190336 | | 0.0314285661 | 7.9999098419 | 7.9999237382 | 7.9998884737 | 7.9999716691 | 99.6108539095 | 33.4180629942 |
| **3** | 0.0030235344 | -0.0079812725 | | 0.0109807511 | 7.9999044197 | 7.9999156543 | 7.9999113246 | 7.9999685790 | 99.6077031893 | 33.4265292151 |
| **4** | -0.0165332684 | 0.0042828804 | | -0.0038457139 | 7.9999087834 | 7.9999158971 | 7.9999019471 | 7.9999677207 | 99.6081854424 | 33.4093137255 |
| **5** | 0.4602044906 | -0.0409159901 | | -0.1126371790 | 7.9410967067 | 7.9568492950 | 7.9589285363 | 7.9585962923 | 99.6112718621 | 32.8116180127 |
| **6** | -0.0064203964 | -0.0088229502 | | 0.0276874917 | 7.9999179476 | 7.9999085532 | 7.9999094694 | 7.9999740804 | 99.6096000514 | 33.4128802550 |
| **7** | -0.0014885422 | 0.0007272734 | | -0.0186865861 | 7.9999063764 | 7.9999128516 | 7.9999031926 | 7.9999715509 | 99.6099858539 | 33.4074667277 |
| **8** | -0.0021310308 | -0.0028645946 | | 0.0369817903 | 7.9999078761 | 7.9999051154 | 7.9999039666 | 7.9999677025 | 99.6103234311 | 33.4075484270 |
| **9** | 0.0024102902 | 0.0115977253 | | -0.0433411249 | 7.9999105172 | 7.9999067560 | 7.9999109188 | 7.9999690755 | 99.6098090278 | 33.4209635732 |
| **10** | -0.0162715140 | 0.0258589247 | | 0.0597905490 | 7.9998975526 | 7.9999210624 | 7.9999102064 | 7.9999728892 | 99.6112075617 | 33.4079309514 |
| **11** | -0.0013394504 | 0.0096240914 | | -0.0375757193 | 7.9999099479 | 7.9999060850 | 7.9999192423 | 7.9999733373 | 99.6137152778 | 33.4196966029 |
| **12** | -0.0108257698 | 0.0122991982 | | 0.0054778549 | 7.9999195299 | 7.9999014114 | 7.9999211103 | 7.9999686845 | 99.6099697788 | 33.4145758316 |
| **13** | -0.0101873079 | 0.0290526014 | | 0.0016501360 | 7.9999061826 | 7.9999097503 | 7.9999178816 | 7.9999706539 | 99.6044560185 | 33.4067052091 |
| **14** | 0.0270440113 | -0.0030819068 | | 0.0025248772 | 7.9999130105 | 7.9999190224 | 7.9999104860 | 7.9999733089 | 99.6142136060 | 33.3999616089 |
| **15** | 0.0037553517 | 0.0145352488 | | -0.0639280127 | 7.9999056732 | 7.9999045760 | 7.9999140205 | 7.9999675367 | 99.6032021605 | 33.4000899575 |
| **16** | -0.6895913708 | 0.9916615847 | | -0.0640022163 | 7.8245985531 | 7.8683250521 | 7.8734967736 | 7.8693109592 | 99.6107092335 | 32.2818101070 |
| **17** | -0.0189433903 | -0.0118189808 | | 0.0727498212 | 7.9999122814 | 7.9999163679 | 7.9999014691 | 7.9999699698 | 99.6080889918 | 33.4049326611 |
| **18** | 0.0088971772 | 0.0145940698 | | 0.0341532993 | 7.9999139502 | 7.9999284985 | 7.9999124174 | 7.9999735175 | 99.6050025720 | 33.4161666994 |
| **19** | -0.0034214371 | 0.0114390695 | | -0.0464576195 | 7.9999086583 | 7.9999277258 | 7.9999275596 | 7.9999753458 | 99.6116094393 | 33.4173287718 |
| **20** | 0.0079631010 | 0.0009536415 | | -0.0070318090 | 7.9999173136 | 7.9999196425 | 7.9999035939 | 7.9999702648 | 99.6072691615 | 33.4188182719 |
| **21** | -0.0110949727 | 0.0170525354 | | 0.0172594356 | 7.9999187287 | 7.9999113565 | 7.9999127162 | 7.9999690258 | 99.6080568416 | 33.4207821452 |
| **22** | 0.0103455750 | -0.0126371210 | | -0.0067043845 | 7.9999215087 | 7.9999245675 | 7.9999198928 | 7.9999745335 | 99.6104520319 | 33.4105348660 |
| **23** | -0.0185709544 | 0.0039216791 | | 0.0067892244 | 7.9999145044 | 7.9999194886 | 7.9999095591 | 7.9999737506 | 99.6058224023 | 34.6130062081 |
| **24** | 0.0007171626 | -0.0476536693 | | 0.0009150466 | 7.9999090694 | 7.9999136045 | 7.9999132976 | 7.9999668435 | 99.6042309671 | 33.1918387648 |
| **25** | -0.0020763756 | -0.0056647662 | | -0.0107775147 | 7.9999099427 | 7.9999104633 | 7.9999183931 | 7.9999711471 | 99.6087641461 | 33.4201742541 |
| **26** | -0.7329925048 | 0.6789621687 | | -0.1291671810 | 7.9374403418 | 7.9327660548 | 7.9443030988 | 7.9458539897 | 99.6108860597 | 34.0086080600 |
| **27** | 0.0244244484 | -0.0256212710 | | 0.0386552708 | 7.9999106966 | 7.9999116853 | 7.9999201149 | 7.9999735009 | 99.6097447274 | 33.4263903388 |
| **28** | 0.0338518490 | 0.0070610045 | | -0.0076707176 | 7.9999205557 | 7.9999174985 | 7.9998965830 | 7.9999720381 | 99.6124131944 | 33.4122815047 |
| **29** | 0.0091803077 | 0.0100910276 | | 0.0013381187 | 7.9999137302 | 7.9999169478 | 7.9999172739 | 7.9999708946 | 99.6074620628 | 33.4187427504 |
| **30** | -0.0323468193 | -0.0227942468 | | 0.0251241197 | 7.9999195690 | 7.9999093221 | 7.9999005246 | 7.9999649749 | 99.6103073560 | 33.4277372433 |
| **31** | -0.0122470515 | -0.0372593918 | | -0.0296866443 | 7.9999134297 | 7.9998999178 | 7.9999056028 | 7.9999673812 | 99.6136027521 | 33.4275996909 |
| **32** | 0.0519505824 | 0.0289106202 | | 0.0057665562 | 7.9999147616 | 7.9998930520 | 7.9999128424 | 7.9999658058 | 99.6100823045 | 33.4213563731 |
| **33** | -0.0156950594 | 0.0366975145 | | -0.0405089387 | 7.9999077053 | 7.9998956581 | 7.9999197931 | 7.9999689678 | 99.6082497428 | 33.4102248371 |
| **34** | 0.0149302616 | 0.0025275563 | | 0.0100409741 | 7.9999125307 | 7.9999086756 | 7.9999249818 | 7.9999713303 | 99.6121399177 | 33.4030852220 |
| **35** | 0.0120569874 | -0.0132139792 | | 0.0384211035 | 7.9999116364 | 7.9999179744 | 7.9999185879 | 7.9999722050 | 99.6107092335 | 33.4213356961 |
| **36** | 0.0068921922 | 0.0203141818 | | -0.0526085478 | 7.9999151482 | 7.9999102980 | 7.9999111152 | 7.9999675525 | 99.6101466049 | 35.4237462050 |
| **37** | -0.0177432830 | 0.0042827703 | | 0.0369421454 | 7.9999166237 | 7.9999150585 | 7.9999083025 | 7.9999713254 | 99.6045363940 | 33.4253281212 |
| **38** | -0.0242451650 | 0.0082243607 | | -0.0471173655 | 7.9999018379 | 7.9999146768 | 7.9999158004 | 7.9999717958 | 99.6090213477 | 33.4178640412 |
| **39** | 0.0033951223 | 0.0174047270 | | 0.0109266795 | 7.9999020958 | 7.9999097825 | 7.9999202499 | 7.9999701037 | 99.6107092335 | 33.4246044264 |
| **40** | -0.0283670442 | 0.0073145955 | | 0.0046165506 | 7.9998981760 | 7.9999089387 | 7.9999193683 | 7.9999682003 | 99.6118666409 | 33.4283803105 |
| **41** | -0.0005436043 | 0.0126844827 | | 0.0529650055 | 7.9998923974 | 7.9999162282 | 7.9999144465 | 7.9999684853 | 99.6048900463 | 33.4107305409 |
| **42** | -0.0140219850 | -0.0047611438 | | 0.0106834879 | 7.9998984272 | 7.9999256978 | 7.9999292519 | 7.9999757833 | 99.6090856481 | 33.4077287203 |
| **43** | -0.0407422416 | -0.0100829323 | | 0.0169259784 | 7.9999085110 | 7.9999152941 | 7.9999069961 | 7.9999676760 | 99.6117058899 | 33.4219500171 |
| **44** | 0.0093687911 | 0.0373119347 | | -0.0228265510 | 7.9999258334 | 7.9999204768 | 7.9998951630 | 7.9999687758 | 99.6181520062 | 33.4073765810 |
| **45** | -0.0073713452 | -0.0015827972 | | 0.0439367185 | 7.9999033730 | 7.9999056823 | 7.9999155563 | 7.9999696440 | 99.6100662294 | 33.4147868883 |
| **46** | 0.0114188068 | -0.0020965912 | | -0.0056989763 | 7.9999163014 | 7.9999122677 | 7.9999063217 | 7.9999707307 | 99.6113200874 | 33.3959128893 |
| **47** | -0.0059450292 | 0.0003544441 | | 0.0241776476 | 7.9999097943 | 7.9998995824 | 7.9999162382 | 7.9999680442 | 99.6137152778 | 33.4154134390 |
| **48** | 0.9873778317 | 0.9918076587 | | 0.1141279851 | 7.8812338131 | 7.9023505932 | 7.9458953730 | 7.9175853208 | 99.6101626800 | 33.2833939774 |
| **49** | 0.0025513681 | 0.0148358932 | | -0.0578244596 | 7.9999123425 | 7.9999183913 | 7.9999040877 | 7.9999711363 | 99.6112236368 | 33.8746058763 |
| **50** | -0.0007023693 | 0.0303512229 | | 0.0259099033 | 7.9999186029 | 7.9999101667 | 7.9999042214 | 7.9999712442 | 99.6111914866 | 33.4174631723 |
| **Total** | -0.0973489280 | 2.7974051362 | | -0.0478387914 | 399.5802715713 | 399.6562861890 | 399.7185558632 | 399.6899877290 | 4980.4894547325 | 1673.2982464900 |
| **Average** | -0.0019469761 | 0.0558897997 | | -0.0009567755 | 7.9916054314 | 7.9931257238 | 7.9943711173 | 7.9937997546 | 99.6097890947 | 33.4659649298 |

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| **Encryption Algorithm** | | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | | | | | | | |
| **Video Stream** | | | **VID\_20200717\_171931** | | | | | | | |
| **Resolution** | | | **1080p** | | | | | | | |
| **Frame Number** | **Correlation Coefficient** | | | | **E(i)** | | | | **Differential Attacks** | |
| **CCh** | **CCv** | | **CCd** | **Red** | **Green** | **Blue** | **Combined** | **NPCR** | **UACI** |
| **1** | 0.0069886083 | 0.0301577196 | | -0.0350802756 | 7.9999068680 | 7.9999054217 | 7.9998954836 | 7.9999621710 | 99.6102752058 | 33.4221918371 |
| **2** | 0.0406825831 | 0.0206543178 | | -0.0126775043 | 7.9999047213 | 7.9999176084 | 7.9999113714 | 7.9999674583 | 99.6109182099 | 33.4298112468 |
| **3** | 0.0307430406 | -0.0352076743 | | 0.0260818557 | 7.9999189283 | 7.9998984522 | 7.9999093534 | 7.9999706852 | 99.6089731224 | 33.4258635167 |
| **4** | -0.0380237647 | 0.0185664480 | | 0.0254113182 | 7.9999039316 | 7.9999166750 | 7.9999041988 | 7.9999692450 | 99.6066100823 | 33.4048555636 |
| **5** | -0.0001805271 | -0.0118879823 | | 0.0421607685 | 7.9999144996 | 7.9998937147 | 7.9999117522 | 7.9999690641 | 99.6109342850 | 33.9645014449 |
| **6** | 0.0041847681 | -0.0234382478 | | 0.0182357360 | 7.9999184398 | 7.9999219835 | 7.9999227169 | 7.9999718411 | 99.6057581019 | 33.3653428977 |
| **7** | 0.0220747938 | -0.0110877717 | | 0.0234895256 | 7.9999170808 | 7.9999186201 | 7.9999087074 | 7.9999713350 | 99.6068029835 | 33.4154717507 |
| **8** | 0.0039614805 | 0.0135632947 | | -0.0816625454 | 7.9999147761 | 7.9998870012 | 7.9999177932 | 7.9999703258 | 99.6137474280 | 33.4139521807 |
| **9** | 0.0016695729 | -0.0138092062 | | -0.0106084177 | 7.9999169515 | 7.9999100015 | 7.9998946883 | 7.9999724499 | 99.6079443158 | 33.3948138566 |
| **10** | 0.0085098431 | -0.0182785090 | | 0.0382240146 | 7.9999250198 | 7.9999118387 | 7.9999112108 | 7.9999691531 | 99.6098090278 | 33.4174037259 |
| **11** | -0.0047207685 | 0.0141956996 | | 0.0057612879 | 7.9998944137 | 7.9999105862 | 7.9999096150 | 7.9999685705 | 99.6098251029 | 33.4104631269 |
| **12** | -0.0058422083 | 0.0154648627 | | -0.0098578942 | 7.9999159906 | 7.9999095103 | 7.9999020038 | 7.9999665077 | 99.6077353395 | 33.4211941721 |
| **13** | -0.0043637362 | -0.0142405358 | | -0.0164846310 | 7.9999041463 | 7.9999147576 | 7.9999071039 | 7.9999674002 | 99.6103555813 | 33.4293424842 |
| **14** | 0.0084339550 | -0.0070281107 | | -0.0443134443 | 7.9999086510 | 7.9999055208 | 7.9999278371 | 7.9999764198 | 99.6099054784 | 33.4024847696 |
| **15** | -0.3808263253 | 0.9539112971 | | 0.0246158685 | 7.9717531904 | 7.9811709288 | 7.9816911366 | 7.9837713649 | 99.6132973251 | 33.4720595170 |
| **16** | -0.0282701370 | -0.0225957560 | | 0.0523954370 | 7.9999141778 | 7.9999068303 | 7.9999074860 | 7.9999683760 | 99.6124774949 | 33.6420579536 |
| **17** | -0.0008175278 | -0.0324657750 | | 0.0119093574 | 7.9999241786 | 7.9999137346 | 7.9999092138 | 7.9999745898 | 99.6102912809 | 33.4250371934 |
| **18** | 0.0236849948 | -0.0475693145 | | 0.0107059746 | 7.9999125785 | 7.9999177390 | 7.9999072466 | 7.9999717893 | 99.6101626800 | 33.4148852931 |
| **19** | -0.0107576807 | 0.0002613324 | | 0.0565940267 | 7.9999030883 | 7.9999101050 | 7.9999054880 | 7.9999665235 | 99.6128632973 | 33.4170857541 |
| **20** | -0.4262619320 | 0.2591274907 | | -0.0510141249 | 7.9736291610 | 7.9762315839 | 7.9776617889 | 7.9805437587 | 99.6135545267 | 33.1242111852 |
| **21** | -0.0224069752 | -0.0076452597 | | 0.0124548924 | 7.9999273120 | 7.9999257348 | 7.9999051780 | 7.9999722112 | 99.6080246914 | 33.4336537007 |
| **22** | -0.0283397735 | 0.0007233502 | | -0.0558054332 | 7.9906875576 | 7.9872448015 | 7.9878049571 | 7.9899887296 | 99.6084426440 | 33.3133347076 |
| **23** | 0.0344004839 | 0.2857516821 | | -0.0424305511 | 7.9812254548 | 7.9834887189 | 7.9891295647 | 7.9877699432 | 99.6173321759 | 33.4137164125 |
| **24** | 0.0070085028 | -0.0131278933 | | 0.0296365537 | 7.9999105799 | 7.9999185031 | 7.9999103439 | 7.9999727962 | 99.6081050669 | 33.4034130911 |
| **25** | 0.0091836734 | 0.0180453225 | | 0.0136855207 | 7.9999099970 | 7.9999246052 | 7.9999242072 | 7.9999710781 | 99.6097447274 | 33.4118887679 |
| **26** | 0.0110464843 | 0.0035324558 | | 0.0346446866 | 7.9999101798 | 7.9999105920 | 7.9999234151 | 7.9999738168 | 99.6077353395 | 33.2506208772 |
| **27** | -0.0051844983 | -0.0094470847 | | -0.0363118613 | 7.9998951333 | 7.9999256282 | 7.9999289116 | 7.9999714187 | 99.6115933642 | 33.4015772513 |
| **28** | 0.9061976317 | 0.9111215638 | | -0.0068404471 | 7.9105328574 | 7.8308006367 | 7.8407411814 | 7.8760608239 | 99.6106770833 | 34.3148209927 |
| **29** | -0.0181825236 | 0.0175516774 | | 0.0972705995 | 7.9999044652 | 7.9999151830 | 7.9999121394 | 7.9999694728 | 99.6076871142 | 33.4138529563 |
| **30** | -0.0383630362 | -0.0014700823 | | 0.0050167042 | 7.9998989320 | 7.9999250619 | 7.9999113096 | 7.9999682614 | 99.6124453447 | 33.4137311638 |
| **31** | -0.0206302441 | -0.0308943017 | | -0.0241648125 | 7.9999006537 | 7.9999115066 | 7.9998895517 | 7.9999653367 | 99.6128632973 | 33.4101177958 |
| **32** | 0.0346738371 | 0.0067610803 | | 0.0053747536 | 7.9999097880 | 7.9999117858 | 7.9999126626 | 7.9999698081 | 99.6117219650 | 33.4194066837 |
| **33** | -0.0067551059 | -0.0077528871 | | -0.0486219228 | 7.9999030030 | 7.9999047624 | 7.9999234555 | 7.9999691379 | 99.6086033951 | 33.4093965596 |
| **34** | 0.0420082008 | 0.0122531900 | | 0.0219365037 | 7.9999260860 | 7.9999095820 | 7.9999141950 | 7.9999749972 | 99.6078317901 | 33.4242382923 |
| **35** | -0.0161095373 | 0.0148491326 | | -0.0050522240 | 7.9999160797 | 7.9999108664 | 7.9999178525 | 7.9999716318 | 99.6070280350 | 33.4246346224 |
| **36** | 0.0042987619 | -0.0018613317 | | 0.0341151919 | 7.9999157009 | 7.9999140923 | 7.9999045472 | 7.9999703159 | 99.6060474537 | 33.4125881924 |
| **37** | 0.0078323585 | 0.0322436648 | | -0.0394319110 | 7.9999030219 | 7.9999129445 | 7.9999184426 | 7.9999728218 | 99.6089570473 | 33.4305351307 |
| **38** | -0.0025662906 | 0.0079364565 | | -0.0054558298 | 7.9999112907 | 7.9999166547 | 7.9999090513 | 7.9999699030 | 99.6091820988 | 33.5025790139 |
| **39** | 0.0066026272 | 0.0385948511 | | 0.0125949147 | 7.9999098697 | 7.9999072909 | 7.9999111996 | 7.9999711189 | 99.6085712449 | 33.4257392656 |
| **40** | 0.0131143525 | 0.0353679430 | | 0.0250577395 | 7.9999054624 | 7.9998989502 | 7.9999060016 | 7.9999668230 | 99.6052919239 | 33.3470961430 |
| **41** | 0.0159277167 | -0.0004651653 | | 0.0254081710 | 7.9999055093 | 7.9999070270 | 7.9999127106 | 7.9999693333 | 99.6110146605 | 33.7975180672 |
| **42** | 0.0060604293 | 0.0301971310 | | 0.0033747584 | 7.9999125528 | 7.9999194040 | 7.9999036744 | 7.9999683551 | 99.6145511831 | 33.4141593919 |
| **43** | 0.0044765724 | -0.0150071234 | | -0.0243831400 | 7.9998985780 | 7.9999189989 | 7.9999065967 | 7.9999702356 | 99.6089088220 | 33.4215502829 |
| **44** | -0.0148612530 | 0.0087070574 | | 0.0081866809 | 7.9999078535 | 7.9999156431 | 7.9999023599 | 7.9999652233 | 99.6081050669 | 33.4061833671 |
| **45** | 0.0138554995 | -0.0041990692 | | 0.0334426879 | 7.9999174573 | 7.9999230253 | 7.9999051345 | 7.9999702587 | 99.6111593364 | 33.4153722742 |
| **46** | 0.0103021912 | -0.0028261650 | | -0.0113854237 | 7.9999110415 | 7.9999017325 | 7.9999140504 | 7.9999669062 | 99.6060796039 | 33.4144490589 |
| **47** | 0.0231953974 | -0.0117654478 | | 0.0480283332 | 7.9999181477 | 7.9999064614 | 7.9999117526 | 7.9999697930 | 99.6107574588 | 33.4072338593 |
| **48** | 0.0011098943 | 0.0120289113 | | -0.0065285139 | 7.9999114968 | 7.9999076480 | 7.9999004380 | 7.9999687114 | 99.6061439043 | 33.4122006879 |
| **49** | -0.0141396644 | 0.0044595153 | | 0.0354406001 | 7.9999042723 | 7.9999141737 | 7.9999067474 | 7.9999697634 | 99.6092142490 | 33.4126883624 |
| **50** | 0.0038125372 | 0.0046071882 | | 0.0241522370 | 7.9999125155 | 7.9999194867 | 7.9999052625 | 7.9999731713 | 99.6115451389 | 33.1534907559 |
| **Total** | 0.2184372825 | 2.4265639414 | | 0.2372957920 | 399.8238036428 | 399.7549841155 | 399.7729830906 | 399.8167812263 | 4980.4876060957 | 1672.0448171978 |
| **Average** | 0.0043687179 | 0.0484932130 | | 0.0047458802 | 7.9964760729 | 7.9950996823 | 7.9954596618 | 7.9963356245 | 99.6097521219 | 33.4408963440 |

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| **Encryption Algorithm** | | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | | | | | | | |
| **Video Stream** | | | **VID\_20200717\_172041** | | | | | | | |
| **Resolution** | | | **1080p** | | | | | | | |
| **Frame Number** | **Correlation Coefficient** | | | | **E(i)** | | | | **Differential Attacks** | |
| **CCh** | **CCv** | | **CCd** | **Red** | **Green** | **Blue** | **Combined** | **NPCR** | **UACI** |
| **1** | -0.0183680247 | -0.0054201685 | | -0.0510128325 | 7.9999164489 | 7.9999245299 | 7.9999124802 | 7.9999731061 | 99.6098251029 | 33.4124418775 |
| **2** | -0.0298520182 | 0.0315764743 | | 0.0431320930 | 7.9999114937 | 7.9999162074 | 7.9999103927 | 7.9999717076 | 99.6114165381 | 33.4188160655 |
| **3** | 0.1502815479 | 0.6289472888 | | -0.0628976126 | 7.9916580238 | 7.9856931893 | 7.9914344700 | 7.9928104980 | 99.6067065329 | 33.0846072380 |
| **4** | 0.0046910222 | 0.0326835423 | | 0.0133963557 | 7.9999020189 | 7.9999065072 | 7.9999010014 | 7.9999719806 | 99.6116898148 | 33.4101634365 |
| **5** | -0.0025528050 | 0.0092349441 | | -0.0135037799 | 7.9999225650 | 7.9999220855 | 7.9999079010 | 7.9999722648 | 99.6038451646 | 33.4322658835 |
| **6** | -0.0019461706 | 0.0078703969 | | -0.0457877498 | 7.9999040551 | 7.9998964833 | 7.9999158563 | 7.9999674533 | 99.6115933642 | 33.4234660569 |
| **7** | -0.0074052210 | -0.0012370144 | | -0.0503021163 | 7.9999264986 | 7.9999095875 | 7.9999085566 | 7.9999726819 | 99.6097125772 | 33.4141598332 |
| **8** | 0.0236218420 | -0.0012262021 | | 0.0335913323 | 7.9999155414 | 7.9999000461 | 7.9999076623 | 7.9999687661 | 99.6090534979 | 32.8651489248 |
| **9** | -0.0162727590 | 0.0255218458 | | -0.0147000075 | 7.9999147926 | 7.9999186376 | 7.9999259720 | 7.9999733273 | 99.6092142490 | 33.9138361247 |
| **10** | -0.0172012922 | -0.0165651380 | | -0.0255918473 | 7.9999154766 | 7.9999218617 | 7.9999125660 | 7.9999711158 | 99.6097608025 | 33.4153662854 |
| **11** | 0.0323448941 | -0.0196490147 | | -0.0247599848 | 7.9999057308 | 7.9999301189 | 7.9999064932 | 7.9999712653 | 99.6102430556 | 33.4197393438 |
| **12** | -0.8790357454 | 0.5108013199 | | -0.1063611914 | 7.9633033543 | 7.9397117594 | 7.9725435296 | 7.9737122461 | 99.6111432613 | 34.3970646232 |
| **13** | -0.0059560563 | -0.0011910754 | | -0.0158214213 | 7.9999224154 | 7.9999205227 | 7.9999206739 | 7.9999749044 | 99.6088123714 | 33.4045033613 |
| **14** | -0.0202201044 | 0.0458732015 | | 0.0939857620 | 7.9999121460 | 7.9999091020 | 7.9998926563 | 7.9999677394 | 99.6094553755 | 33.4308588392 |
| **15** | 0.0190581987 | 0.0082962239 | | 0.0112043082 | 7.9999072797 | 7.9999113829 | 7.9999065034 | 7.9999704348 | 99.6052758488 | 33.3961459468 |
| **16** | -0.0370942229 | 0.0192343684 | | 0.0208341407 | 7.9999053303 | 7.9999173893 | 7.9999118479 | 7.9999713202 | 99.6057259516 | 33.4252147129 |
| **17** | -0.0024275821 | 0.0037860556 | | 0.0029794763 | 7.9999162441 | 7.9999210772 | 7.9999096207 | 7.9999760741 | 99.6088766718 | 33.4156315561 |
| **18** | -0.0006428775 | 0.0024268145 | | -0.0302993993 | 7.9999122843 | 7.9999340491 | 7.9999177509 | 7.9999727070 | 99.6067547582 | 33.4283340394 |
| **19** | -0.1141678153 | 0.0746774141 | | -0.0291522631 | 7.9988824645 | 7.9987813720 | 7.9992098705 | 7.9993698774 | 99.6137152778 | 33.5177598367 |
| **20** | 0.0068883148 | 0.0343864110 | | -0.0043639882 | 7.9999158606 | 7.9999164335 | 7.9999179783 | 7.9999726421 | 99.6111271862 | 33.4187883911 |
| **21** | 0.0157810492 | 0.0257063404 | | 0.0010742243 | 7.9999029698 | 7.9999164516 | 7.9999164351 | 7.9999712716 | 99.6101466049 | 33.4174599572 |
| **22** | 0.0152420052 | -0.0071197093 | | 0.0556382589 | 7.9999143731 | 7.9999261783 | 7.9999109112 | 7.9999718466 | 99.6100823045 | 33.4021367909 |
| **23** | -0.0069501724 | 0.0316274725 | | -0.0330766585 | 7.9999214218 | 7.9999301135 | 7.9999176947 | 7.9999737973 | 99.6104520319 | 33.4270780380 |
| **24** | 0.0041341908 | 0.0197204314 | | 0.0025873473 | 7.9999186852 | 7.9999075016 | 7.9998997176 | 7.9999690912 | 99.6093428498 | 33.4313874894 |
| **25** | 0.0210755346 | -0.0128157783 | | 0.0246522534 | 7.9999258638 | 7.9999164621 | 7.9999099304 | 7.9999760478 | 99.6092142490 | 33.4146686890 |
| **26** | -0.0111981005 | 0.0012010432 | | 0.0105333413 | 7.9999006501 | 7.9999249246 | 7.9999006346 | 7.9999680982 | 99.6089570473 | 33.4049917292 |
| **27** | -0.1906958674 | 0.0426108403 | | 0.0331933280 | 7.9769881328 | 7.9678105556 | 7.9856414169 | 7.9874639176 | 99.6093589249 | 32.7656062142 |
| **28** | 0.0210418141 | -0.0047758367 | | 0.0053481201 | 7.9999119709 | 7.9999166453 | 7.9999149507 | 7.9999703143 | 99.6088123714 | 33.4180742783 |
| **29** | -0.0071502811 | -0.0175092377 | | -0.0149330768 | 7.9999036106 | 7.9999015430 | 7.9999134753 | 7.9999712061 | 99.6093106996 | 33.4178876180 |
| **30** | -0.0060923667 | 0.0086543896 | | -0.0858640926 | 7.9999085872 | 7.9999138072 | 7.9999032414 | 7.9999668331 | 99.6088927469 | 33.4066773456 |
| **31** | -0.0190162317 | 0.0332366020 | | 0.0236452022 | 7.9999034061 | 7.9999132840 | 7.9999106649 | 7.9999662787 | 99.6049864969 | 33.4197122367 |
| **32** | -0.0165572633 | -0.0073234401 | | 0.0255435371 | 7.9999271121 | 7.9999077600 | 7.9999046983 | 7.9999721371 | 99.6087802212 | 33.4340589824 |
| **33** | -0.0170119164 | 0.0124455887 | | -0.0403677449 | 7.9999236362 | 7.9998984246 | 7.9999118149 | 7.9999722080 | 99.6084587191 | 33.4273284944 |
| **34** | -0.0207824853 | -0.0054360825 | | -0.0499339255 | 7.9999103109 | 7.9998977760 | 7.9999191070 | 7.9999667243 | 99.6091177984 | 33.4047976933 |
| **35** | -0.0327886803 | -0.0112054543 | | 0.0119936746 | 7.9999004993 | 7.9999166262 | 7.9998925237 | 7.9999670728 | 99.6088927469 | 33.4061439043 |
| **36** | -0.0380671990 | -0.0128568498 | | 0.0047714121 | 7.9999094648 | 7.9999193248 | 7.9999104605 | 7.9999712713 | 99.6097286523 | 33.4223268680 |
| **37** | -0.0020028178 | 0.0111327386 | | -0.0215428602 | 7.9999076270 | 7.9999104193 | 7.9999071366 | 7.9999674310 | 99.6105484825 | 33.4094254947 |
| **38** | 0.0006604960 | -0.0021889533 | | -0.0234922161 | 7.9999268704 | 7.9999298521 | 7.9998904137 | 7.9999727443 | 99.6062725051 | 33.4019898456 |
| **39** | 0.0286688424 | -0.0095075920 | | 0.0031187309 | 7.9999038021 | 7.9999043990 | 7.9999095534 | 7.9999679265 | 99.6089409722 | 33.4273036568 |
| **40** | -0.0147909659 | 0.0031703318 | | 0.0083107967 | 7.9999170530 | 7.9999164455 | 7.9999041722 | 7.9999705625 | 99.6057902521 | 31.6935137275 |
| **41** | -0.0324103768 | -0.0139470758 | | -0.0337898346 | 7.9999182452 | 7.9999098837 | 7.9999184161 | 7.9999717222 | 99.6057741770 | 33.4186981814 |
| **42** | 0.0050128654 | -0.0095469027 | | 0.0020184880 | 7.9998951471 | 7.9999233447 | 7.9999165062 | 7.9999694345 | 99.6092303241 | 33.4196496384 |
| **43** | 0.0055581542 | -0.0308040156 | | 0.0349123281 | 7.9999166817 | 7.9999022211 | 7.9999316305 | 7.9999721460 | 99.6111271862 | 33.4027614505 |
| **44** | 0.0105912067 | -0.0025535992 | | -0.0283206698 | 7.9999168786 | 7.9999084053 | 7.9999151172 | 7.9999711243 | 99.6081854424 | 33.4351887784 |
| **45** | -0.0073695389 | 0.0102077330 | | -0.0316765617 | 7.9999160271 | 7.9999132994 | 7.9999101200 | 7.9999748245 | 99.6130079733 | 33.4170572601 |
| **46** | 0.0265552979 | -0.0164112096 | | 0.0106632145 | 7.9999131489 | 7.9998932693 | 7.9999198151 | 7.9999652419 | 99.6111271862 | 35.1178824488 |
| **47** | 0.0131595393 | 0.0419041445 | | -0.0154500775 | 7.9999173199 | 7.9999117576 | 7.9999208894 | 7.9999726524 | 99.6120113169 | 34.4418967613 |
| **48** | 0.0066922112 | 0.0242666762 | | 0.0267437662 | 7.9999065908 | 7.9999134312 | 7.9999209449 | 7.9999678319 | 99.6083461934 | 33.4067447349 |
| **49** | -0.0189306762 | 0.0353682851 | | 0.0120916649 | 7.9999107491 | 7.9999079671 | 7.9999140168 | 7.9999730514 | 99.6096643519 | 33.4219191277 |
| **50** | 0.0098198779 | 0.0126605163 | | -0.0006345498 | 7.9999245509 | 7.9999116719 | 7.9999126473 | 7.9999731434 | 99.6050186471 | 33.4091952110 |
| **Total** | -1.1740787296 | 1.5399390850 | | -0.3376733051 | 399.9268314110 | 399.8880360878 | 399.9447428398 | 399.9520200651 | 4980.4535268776 | 1671.8878750227 |
| **Average** | -0.0234772598 | 0.0307890472 | | -0.0067533634 | 7.9985366282 | 7.9977607218 | 7.9988948568 | 7.9990404013 | 99.6090705376 | 33.4377575005 |

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| **Encryption Algorithm** | | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | | | | | | | |
| **Video Stream** | | | **Star Citizen: 325a Dream Weapons Combat Test AC - ULTRA 1080p60** | | | | | | | |
| **Resolution** | | | **1080p** | | | | | | | |
| **Frame Number** | **Correlation Coefficient** | | | | **E(i)** | | | | **Differential Attacks** | |
| **CCh** | **CCv** | | **CCd** | **Red** | **Green** | **Blue** | **Combined** | **NPCR** | **UACI** |
| **1** | -0.0217752264 | -0.0182775186 | | -0.0457647057 | 7.9997162776 | 7.9998975113 | 7.9999079595 | 7.9999332444 | 99.6063951078 | 33.4034024628 |
| **2** | -0.0018262738 | -0.0185203234 | | -0.0123400600 | 7.9996695702 | 7.9998990467 | 7.9999248813 | 7.9999382110 | 99.6159825871 | 33.4209264772 |
| **3** | -0.0081528780 | 0.0062982972 | | -0.0153963884 | 7.9997084958 | 7.9999054501 | 7.9999161664 | 7.9999404298 | 99.6125330379 | 33.4107559755 |
| **4** | -0.0144258812 | 0.0023477464 | | -0.0222832414 | 7.9996881799 | 7.9999047909 | 7.9998933576 | 7.9999283133 | 99.6095693408 | 33.3986674064 |
| **5** | 0.0183540679 | -0.0146521823 | | 0.0124969515 | 7.9996420492 | 7.9998851766 | 7.9999185744 | 7.9999235625 | 99.6082737355 | 33.4088513722 |
| **6** | 0.0162409504 | 0.0169057526 | | 0.0014291985 | 7.9998729451 | 7.9999013421 | 7.9999242007 | 7.9999615337 | 99.6107191905 | 33.4260635522 |
| **7** | -0.0044386705 | -0.0095874087 | | 0.0153082465 | 7.9997121585 | 7.9998913082 | 7.9999167034 | 7.9999367201 | 99.6068323746 | 33.4170766876 |
| **8** | -0.0116651189 | 0.0142104746 | | -0.0035846953 | 7.9997686754 | 7.9998894430 | 7.9999114582 | 7.9999415307 | 99.6116746994 | 33.4114625250 |
| **9** | -0.0145863241 | 0.0015065747 | | -0.0025184885 | 7.9996236359 | 7.9999047516 | 7.9999213525 | 7.9999186815 | 99.6122739169 | 33.4274185395 |
| **10** | -0.0311979872 | -0.0181742485 | | 0.0265760391 | 7.9997638816 | 7.9998974400 | 7.9999125204 | 7.9999384287 | 99.6110107017 | 33.4164177707 |
| **11** | -0.0197476326 | 0.0010696799 | | 0.0199447154 | 7.9997238836 | 7.9998751128 | 7.9999022783 | 7.9999232234 | 99.6074315920 | 33.4222155410 |
| **12** | 0.0108265749 | -0.0366689383 | | -0.0542411254 | 7.9995922055 | 7.9998993246 | 7.9999177697 | 7.9999273766 | 99.6094721704 | 33.4082582517 |
| **13** | -0.0015448110 | -0.0330362563 | | 0.0669798133 | 7.9996251459 | 7.9998857419 | 7.9999200624 | 7.9999258942 | 99.6111240672 | 33.4156557135 |
| **14** | 0.0330758476 | -0.0306071401 | | -0.0211267728 | 7.9991837911 | 7.9998364140 | 7.9998984019 | 7.9998365923 | 99.6092292444 | 33.4123021280 |
| **15** | 0.0063928587 | -0.0099297604 | | 0.0221792132 | 7.9997363925 | 7.9998980163 | 7.9999288334 | 7.9999421480 | 99.6088567579 | 33.3963859344 |
| **16** | 0.0047104265 | -0.0273857726 | | 0.0507817081 | 7.9998250976 | 7.9999021943 | 7.9998964848 | 7.9999551036 | 99.6102657286 | 33.4038201685 |
| **17** | -0.0012538540 | 0.0478532869 | | -0.0235308014 | 7.9997535034 | 7.9998960922 | 7.9999184303 | 7.9999430620 | 99.6096665112 | 33.4113538593 |
| **18** | -0.0231190220 | -0.0042456984 | | 0.0320599608 | 7.9997135154 | 7.9998950639 | 7.9999178297 | 7.9999387569 | 99.6068971549 | 33.4197528747 |
| **19** | 0.0018659275 | -0.0124470230 | | -0.0101344444 | 7.9997894815 | 7.9999099432 | 7.9999014721 | 7.9999557404 | 99.6133589863 | 34.4430757391 |
| **20** | 0.0258045265 | -0.0256310318 | | -0.0094345489 | 7.9998191209 | 7.9998974505 | 7.9999124708 | 7.9999578176 | 99.6147517620 | 33.4055666952 |
| **21** | -0.0279901901 | 0.0210387815 | | -0.0032362028 | 7.9998950490 | 7.9999056799 | 7.9999136599 | 7.9999692236 | 99.6097798767 | 33.4138992156 |
| **22** | -0.0132351839 | -0.0156770241 | | -0.0133175415 | 7.9987759141 | 7.9998950709 | 7.9998907087 | 7.9998392886 | 99.6078526638 | 33.4016469811 |
| **23** | -0.0023919994 | 0.0002365904 | | 0.0103710209 | 7.9997228222 | 7.9999147186 | 7.9999040714 | 7.9999526830 | 99.6106058250 | 33.4066657369 |
| **24** | 0.0138192249 | -0.0090409847 | | 0.0112838666 | 7.9997391275 | 7.9999056600 | 7.9998960568 | 7.9999481434 | 99.6119662106 | 33.4052191046 |
| **25** | 0.0130004570 | 0.0193113779 | | 0.0406549243 | 7.9997417549 | 7.9999065713 | 7.9999133170 | 7.9999527539 | 99.6097798767 | 33.4119479959 |
| **26** | 0.0081746603 | 0.0175377813 | | 0.0400393545 | 7.9996827426 | 7.9999142786 | 7.9999201080 | 7.9999480488 | 99.6066380338 | 33.4134000900 |
| **27** | -0.0131145448 | 0.0148481778 | | 0.0386980858 | 7.9997124855 | 7.9999160171 | 7.9999042766 | 7.9999499681 | 99.6123872823 | 33.4321930355 |
| **28** | 0.0101865669 | -0.0285051483 | | 0.0342728632 | 7.9997577512 | 7.9999083118 | 7.9999073331 | 7.9999547661 | 99.6086462220 | 33.4257296798 |
| **29** | 0.0095658049 | -0.0049451206 | | 0.0230464686 | 7.9998179286 | 7.9999173243 | 7.9999133650 | 7.9999623409 | 99.6062655473 | 33.4165405357 |
| **30** | -0.0085770728 | 0.0051080814 | | 0.0271058930 | 7.9997331681 | 7.9999027196 | 7.9998997189 | 7.9999492542 | 99.6094397803 | 33.4178512564 |
| **31** | 0.0375571519 | 0.0058905093 | | -0.0432344214 | 7.9992944678 | 7.9999053289 | 7.9998956197 | 7.9999157608 | 99.6072858364 | 33.4122626248 |
| **32** | -0.0016130785 | 0.0084808125 | | -0.0139662857 | 7.9996899343 | 7.9999071346 | 7.9999234196 | 7.9999460918 | 99.6110916770 | 33.4119720027 |
| **33** | -0.0240110589 | 0.0424222364 | | -0.0796741077 | 7.9997131950 | 7.9999093646 | 7.9998965927 | 7.9999486267 | 99.6130350850 | 33.4167346859 |
| **34** | -0.0520262651 | -0.0314810638 | | -0.0201411149 | 7.9994927636 | 7.9999151244 | 7.9999175611 | 7.9999342591 | 99.6111888474 | 33.4058121616 |
| **35** | -0.0123281889 | 0.0308208670 | | 0.0416820634 | 7.9993668635 | 7.9998926066 | 7.9999117380 | 7.9999257383 | 99.6099418273 | 33.4028644055 |
| **36** | -0.0020251948 | -0.0160751042 | | -0.0742494397 | 7.9996797947 | 7.9998994120 | 7.9999062674 | 7.9999560165 | 99.6096503161 | 33.4309093701 |
| **37** | -0.0144505080 | -0.0040930041 | | 0.0494462883 | 7.9996815000 | 7.9999122123 | 7.9999073778 | 7.9999528663 | 99.6083871010 | 32.9922153809 |
| **38** | -0.0120571472 | 0.0045711451 | | -0.0188225544 | 7.9996482096 | 7.9999106719 | 7.9999037806 | 7.9999511028 | 99.6078364687 | 34.7204240618 |
| **39** | -0.0600876834 | -0.0197921085 | | 0.0360322083 | 7.9995598060 | 7.9999128348 | 7.9998954027 | 7.9999461809 | 99.6125654281 | 33.4200680117 |
| **40** | 0.0048624645 | 0.0159858074 | | -0.0256685065 | 7.9989313314 | 7.9999172594 | 7.9998718974 | 7.9998956448 | 99.6111402622 | 33.4341094517 |
| **41** | 0.0089825972 | -0.0080529790 | | -0.0547758774 | 7.9997026957 | 7.9999001057 | 7.9999031506 | 7.9999522046 | 99.6058444755 | 33.4159803769 |
| **42** | 0.0445732269 | 0.9949896741 | | -0.4087581812 | 5.8878612745 | 6.8575448069 | 7.0441399144 | 6.8505045813 | 99.6074963723 | 35.1358377384 |
| **43** | 0.2047232320 | 0.9989686021 | | 0.1410536136 | 7.3506102939 | 7.7363930686 | 7.7875510144 | 7.7446888364 | 99.6139096186 | 35.4554481346 |
| **44** | 0.0308262309 | -0.0150532748 | | -0.0082230414 | 7.9996867024 | 7.9999016418 | 7.9999165895 | 7.9999424221 | 99.6102657286 | 33.4255092364 |
| **45** | -0.0114617808 | -0.0024216850 | | -0.0171884798 | 7.9992923722 | 7.9999053911 | 7.9998976570 | 7.9999051351 | 99.6107515806 | 34.9507067908 |
| **46** | 0.0216620925 | 0.0142271381 | | -0.0432598327 | 7.9995012317 | 7.9999073719 | 7.9999045154 | 7.9999276952 | 99.6107353856 | 33.4270406546 |
| **47** | -0.0127097083 | -0.0246353212 | | -0.0134600103 | 7.9986406286 | 7.9999142198 | 7.9999165499 | 7.9998459285 | 99.6054395989 | 33.4128618422 |
| **48** | 0.0027728517 | 0.9962285500 | | -0.1434914432 | 7.3529450952 | 7.7727844356 | 7.8245810819 | 7.7727759134 | 99.6097474865 | 32.8518119675 |
| **49** | 0.0415151352 | -0.0096009304 | | -0.0129957987 | 7.9997415111 | 7.9999058001 | 7.9999103424 | 7.9999469997 | 99.6124034774 | 33.0419988243 |
| **50** | 0.0302314429 | 0.0052439150 | | 0.0368464333 | 7.9997781894 | 7.9999083680 | 7.9999014122 | 7.9999540452 | 99.6096179260 | 33.4249513005 |
| **Total** | 0.1779110353 | 2.8375648084 | | -0.4365291817 | 396.5733246106 | 398.3621051251 | 398.6519757077 | 398.3649088907 | 4980.4980144849 | 1677.0140423292 |
| **Average** | 0.0035582057 | 0.0566904481 | | -0.0087303618 | 7.9314664922 | 7.9672421025 | 7.9730395142 | 7.9672981778 | 99.6099602897 | 33.5402808466 |

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| **Encryption Algorithm** | | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | | | | | | | |
| **Video Stream** | | | **Wreckfest 2016 - Racing 2 1080p60 HD HQ** | | | | | | | |
| **Resolution** | | | **1080p** | | | | | | | |
| **Frame Number** | **Correlation Coefficient** | | | | **E(i)** | | | | **Differential Attacks** | |
| **CCh** | **CCv** | | **CCd** | **Red** | **Green** | **Blue** | **Combined** | **NPCR** | **UACI** |
| **1** | -0.0045247323 | 0.0149195897 | | 0.0063376515 | 7.9999012799 | 7.9999001951 | 7.9998763102 | 7.9999610481 | 99.6087319959 | 32.7161712383 |
| **2** | -0.0112335197 | 0.0078986832 | | 0.0255881973 | 7.9998786884 | 7.9999130966 | 7.9998749044 | 7.9999530976 | 99.6094393004 | 33.4319376362 |
| **3** | -0.0180181985 | 0.0176097971 | | 0.0231558584 | 7.9999040441 | 7.9999117611 | 7.9999003548 | 7.9999668454 | 99.6096482767 | 33.4230530214 |
| **4** | 0.0093903695 | -0.0353532144 | | 0.0377898910 | 7.9998808935 | 7.9999044815 | 7.9999014851 | 7.9999574907 | 99.6095518261 | 33.5049849209 |
| **5** | -0.0046898567 | 0.0187763042 | | 0.0266628133 | 7.9998920973 | 7.9999088071 | 7.9998626177 | 7.9999531270 | 99.6133937757 | 33.4235521691 |
| **6** | 0.0049159062 | -0.0062238558 | | -0.0179813885 | 7.9998817812 | 7.9998980520 | 7.9998632816 | 7.9999441489 | 99.6101948302 | 33.4201021368 |
| **7** | -0.0123032843 | -0.0170358151 | | -0.0031390768 | 7.9999146849 | 7.9999192871 | 7.9998979228 | 7.9999677044 | 99.6155960648 | 33.4212889207 |
| **8** | 0.0186030790 | 0.0151627808 | | -0.0065859375 | 7.9999006741 | 7.9999078278 | 7.9999046955 | 7.9999632890 | 99.6093750000 | 33.4109044672 |
| **9** | -0.0070127124 | -0.0048670710 | | 0.0046598688 | 7.9998989606 | 7.9999068662 | 7.9999042424 | 7.9999663876 | 99.6137795782 | 33.4164889580 |
| **10** | 0.0115792474 | -0.0320497507 | | -0.0102528668 | 7.9998807777 | 7.9999074556 | 7.9998939260 | 7.9999566905 | 99.6133616255 | 33.4319786750 |
| **11** | -0.0301248327 | -0.0180857615 | | 0.0005610800 | 7.9999047048 | 7.9999026626 | 7.9998972734 | 7.9999663924 | 99.6088445216 | 33.4169025609 |
| **12** | 0.5439576820 | 0.6178936138 | | -0.0162476332 | 7.9546985409 | 7.9484202411 | 7.9525069403 | 7.9606236542 | 99.6068512088 | 33.3426030572 |
| **13** | 0.0177035112 | -0.0004256338 | | -0.0123159045 | 7.9998693612 | 7.9999099898 | 7.9998921980 | 7.9999523357 | 99.6097125772 | 33.3986670903 |
| **14** | -0.0077717717 | 0.0113843540 | | -0.0293674658 | 7.9998683699 | 7.9999017707 | 7.9999008220 | 7.9999549991 | 99.6080729167 | 33.4108678412 |
| **15** | -0.0016356843 | -0.0114313429 | | 0.0576221672 | 7.9998984495 | 7.9999118527 | 7.9998794781 | 7.9999613235 | 99.6090856481 | 33.4142385066 |
| **16** | 0.0067217524 | -0.0083120404 | | -0.0143729624 | 7.9999058404 | 7.9999166978 | 7.9999050545 | 7.9999702619 | 99.6136027521 | 33.4090297320 |
| **17** | 0.0216091762 | 0.0135911047 | | 0.0742281541 | 7.9999186350 | 7.9999133853 | 7.9999110239 | 7.9999710310 | 99.6101144547 | 33.4095602104 |
| **18** | 0.0103532299 | 0.0162976950 | | 0.0663118921 | 7.9998918822 | 7.9999102258 | 7.9999027227 | 7.9999638260 | 99.6060474537 | 33.4163126362 |
| **19** | -0.0195677594 | 0.0053305183 | | -0.0097618486 | 7.9998715553 | 7.9999131402 | 7.9998674781 | 7.9999433650 | 99.6087962963 | 33.4268798414 |
| **20** | 0.0018853049 | -0.0120603651 | | -0.0080956095 | 7.9998042618 | 7.9999221219 | 7.9998312753 | 7.9999271341 | 99.6059027778 | 32.9391226398 |
| **21** | 0.0333160188 | -0.0091690067 | | 0.0504580631 | 7.9998916345 | 7.9999176683 | 7.9998694410 | 7.9999500470 | 99.6086998457 | 33.4395045969 |
| **22** | 0.0021561884 | 0.0382646335 | | -0.0150967027 | 7.9998911196 | 7.9998963556 | 7.9998841571 | 7.9999567411 | 99.6109342850 | 33.4053006233 |
| **23** | 0.0091264698 | -0.0265187909 | | -0.0096615375 | 7.9998979812 | 7.9999134300 | 7.9999068674 | 7.9999698359 | 99.6127829218 | 33.4245853884 |
| **24** | -0.0189740087 | -0.0018584250 | | -0.0047340889 | 7.9999110508 | 7.9999210102 | 7.9998920994 | 7.9999649644 | 99.6099537037 | 33.5231078658 |
| **25** | -0.8258153298 | 0.9975980685 | | -0.2110560821 | 7.9581004811 | 7.9447325722 | 7.9470072700 | 7.9539543838 | 99.6101466049 | 33.2547425336 |
| **26** | 0.0023318921 | -0.0120579699 | | -0.0185340382 | 7.9998557123 | 7.9999141084 | 7.9998761625 | 7.9999489861 | 99.6092303241 | 33.4054991351 |
| **27** | 0.8487842302 | 0.9978795873 | | 0.0154370021 | 7.9926218134 | 7.9920875274 | 7.9916885979 | 7.9937526650 | 99.6145672582 | 33.2648209297 |
| **28** | 0.0119887105 | 0.0079390639 | | 0.0294335278 | 7.9998746780 | 7.9999059631 | 7.9998905052 | 7.9999558112 | 99.6089891975 | 33.4194400947 |
| **29** | -0.0097232106 | -0.0138361900 | | 0.0148566494 | 7.9999007184 | 7.9999156243 | 7.9999095972 | 7.9999677975 | 99.6067547582 | 33.4223237790 |
| **30** | -0.0088540194 | -0.0279385921 | | -0.0347455254 | 7.9998944232 | 7.9999233890 | 7.9999095163 | 7.9999677141 | 99.6087480710 | 33.4218968117 |
| **31** | 0.0189277082 | -0.0009600622 | | 0.0239777975 | 7.9999053261 | 7.9999091732 | 7.9999153006 | 7.9999685135 | 99.6054848251 | 33.4137948338 |
| **32** | 0.0125741034 | -0.0129108933 | | -0.0091237403 | 7.9998720324 | 7.9999055818 | 7.9998932805 | 7.9999575876 | 99.6149530607 | 33.4215809832 |
| **33** | -0.0111937850 | -0.0249415479 | | 0.0205260700 | 7.9998975526 | 7.9999141138 | 7.9999055979 | 7.9999658765 | 99.6101626800 | 33.2719170474 |
| **34** | 0.0276397798 | -0.0145959846 | | -0.0055579287 | 7.9999037502 | 7.9999030492 | 7.9999055085 | 7.9999637381 | 99.6085069444 | 33.4319104661 |
| **35** | -0.0323268719 | -0.0179718990 | | -0.0013454538 | 7.9998938954 | 7.9999151155 | 7.9998995585 | 7.9999625436 | 99.6092624743 | 33.4228963679 |
| **36** | 0.0182916586 | 0.0085303749 | | -0.0558231997 | 7.9999052026 | 7.9999209505 | 7.9998918785 | 7.9999608654 | 99.6061760545 | 33.4150343188 |
| **37** | 0.0219422682 | -0.0109107098 | | 0.0294919524 | 7.9998937253 | 7.9999144122 | 7.9999017225 | 7.9999671964 | 99.6091820988 | 33.4063833288 |
| **38** | -0.0043617608 | -0.0314552657 | | -0.0739715838 | 7.9998987615 | 7.9998950350 | 7.9998924605 | 7.9999629453 | 99.6139242541 | 33.4080938458 |
| **39** | 0.0275985553 | 0.0289443302 | | 0.0226604750 | 7.9999110519 | 7.9999041290 | 7.9998799899 | 7.9999657888 | 99.6050347222 | 33.4069001276 |
| **40** | 0.0379428957 | 0.0295399470 | | -0.0569800483 | 7.9999045238 | 7.9999173197 | 7.9998895765 | 7.9999663449 | 99.6087802212 | 33.3126261423 |
| **41** | 0.0134150725 | -0.0169991887 | | -0.0714386695 | 7.9999087456 | 7.9999135051 | 7.9999149020 | 7.9999698031 | 99.6112236368 | 33.3904527127 |
| **42** | -0.0124277628 | -0.0015907869 | | -0.0227023312 | 7.9999283350 | 7.9999163753 | 7.9999145456 | 7.9999732803 | 99.6153870885 | 33.4197335441 |
| **43** | 0.0284199160 | 0.0040728877 | | -0.0129943066 | 7.9998943941 | 7.9999051532 | 7.9999013254 | 7.9999646311 | 99.6083461934 | 33.4216118726 |
| **44** | -0.0031578376 | 0.0021507165 | | 0.0717257119 | 7.9998899101 | 7.9999080524 | 7.9999003905 | 7.9999639736 | 99.6093910751 | 33.4131991094 |
| **45** | -0.0297830378 | 0.0384554404 | | 0.0006024887 | 7.9999024205 | 7.9999169673 | 7.9998981723 | 7.9999636245 | 99.6081050669 | 33.4205974391 |
| **46** | -0.0053672485 | -0.0126923575 | | -0.0358643941 | 7.9998980148 | 7.9999147360 | 7.9998967388 | 7.9999647547 | 99.6113843879 | 33.4119480881 |
| **47** | 0.2403096496 | 0.5963550081 | | 0.0746836235 | 7.9806769461 | 7.9791749848 | 7.9772878308 | 7.9830418290 | 99.6103716564 | 33.5841677257 |
| **48** | 0.0185167985 | -0.0034011449 | | -0.0786420960 | 7.9999078951 | 7.9999082884 | 7.9998989234 | 7.9999677962 | 99.6127989969 | 33.4262606663 |
| **49** | 0.0092366719 | 0.0139917018 | | 0.0330943671 | 7.9998813929 | 7.9998996877 | 7.9998739705 | 7.9999516212 | 99.6034432870 | 33.4235070327 |
| **50** | 0.0271680884 | -0.0378672031 | | -0.0516364462 | 7.9999042736 | 7.9999080742 | 7.9998988762 | 7.9999633933 | 99.6138760288 | 33.4157778711 |
| **Total** | 0.9775387100 | 3.0790653315 | | -0.1881635644 | 399.8811832449 | 399.8602922705 | 399.8635687703 | 399.8895792056 | 4980.4967046039 | 1669.4042615414 |
| **Average** | 0.0195482836 | 0.0615035805 | | -0.0037632535 | 7.9976236649 | 7.9972058454 | 7.9972713754 | 7.9977915841 | 99.6099340921 | 33.3880852308 |

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| **Encryption Algorithm** | | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | | | | | | | |
| **Video Stream** | | | **Wreckfest 2016 - New Update Racing New Track 1080p60** | | | | | | | |
| **Resolution** | | | **1080p** | | | | | | | |
| **Frame Number** | **Correlation Coefficient** | | | | **E(i)** | | | | **Differential Attacks** | |
| **CCh** | **CCv** | | **CCd** | **Red** | **Green** | **Blue** | **Combined** | **NPCR** | **UACI** |
| **1** | -0.0061294284 | 0.0016709381 | | -0.0192966234 | 7.9999170133 | 7.9999092985 | 7.9999122582 | 7.9999700724 | 99.6086033951 | 33.4209775680 |
| **2** | 0.0030204501 | -0.0028575845 | | -0.0410917615 | 7.9999002769 | 7.9998979300 | 7.9999095840 | 7.9999686686 | 99.6116094393 | 33.4356323252 |
| **3** | -0.0039511325 | -0.0020934919 | | 0.0097564481 | 7.9999142578 | 7.9999233198 | 7.9999104970 | 7.9999688898 | 99.6100180041 | 33.4088375872 |
| **4** | -0.0180853579 | 0.0063074971 | | 0.0056671774 | 7.9999165226 | 7.9999027449 | 7.9998923280 | 7.9999686690 | 99.6080246914 | 33.4187885172 |
| **5** | 0.0150212734 | 0.0054487534 | | 0.0126389706 | 7.9999025960 | 7.9998984469 | 7.9998910647 | 7.9999648177 | 99.6064814815 | 33.4219065198 |
| **6** | 0.0175511512 | 0.0123737541 | | -0.0008325696 | 7.9999171669 | 7.9999090680 | 7.9999025354 | 7.9999701290 | 99.6032503858 | 33.4079298167 |
| **7** | 0.0122072877 | 0.0254053035 | | 0.0046443207 | 7.9999025171 | 7.9999208677 | 7.9999014581 | 7.9999687755 | 99.6088766718 | 33.4079975213 |
| **8** | 0.0339815534 | -0.0065950857 | | 0.0274250608 | 7.9999125414 | 7.9999203689 | 7.9999013716 | 7.9999677708 | 99.6058706276 | 33.4150710078 |
| **9** | -0.0010155099 | 0.0227001405 | | 0.0082224033 | 7.9999059870 | 7.9999071865 | 7.9998948711 | 7.9999647577 | 99.6112718621 | 33.4138037224 |
| **10** | -0.0157028823 | 0.0222896371 | | 0.0102357447 | 7.9999241166 | 7.9998972742 | 7.9998752623 | 7.9999633365 | 99.6088123714 | 33.4243380840 |
| **11** | -0.0243228409 | -0.0101348885 | | -0.0039720135 | 7.9999085162 | 7.9998957730 | 7.9998752240 | 7.9999625765 | 99.6072852366 | 33.4189696300 |
| **12** | 0.0158691860 | 0.0114355813 | | -0.0217945229 | 7.9999073686 | 7.9999121489 | 7.9999024575 | 7.9999683501 | 99.6085230195 | 33.4301436547 |
| **13** | 0.0020651993 | 0.0156540690 | | 0.0217901483 | 7.9999145177 | 7.9999268529 | 7.9999048183 | 7.9999699279 | 99.6090052726 | 33.4106279124 |
| **14** | -0.0058768398 | -0.0001320853 | | -0.0291813660 | 7.9999023983 | 7.9999103970 | 7.9999075063 | 7.9999684987 | 99.6094875257 | 33.4083431045 |
| **15** | 0.0021163584 | 0.0300795854 | | 0.0143444587 | 7.9999145022 | 7.9999087903 | 7.9998744087 | 7.9999645222 | 99.6052115484 | 33.4005137729 |
| **16** | 0.0068154338 | 0.0241199068 | | -0.0533210546 | 7.9999161184 | 7.9999200956 | 7.9998871583 | 7.9999715394 | 99.6064654064 | 33.4061240468 |
| **17** | 0.0006425249 | 0.0000412999 | | -0.0287583012 | 7.9999191773 | 7.9999052211 | 7.9999059597 | 7.9999694598 | 99.6086033951 | 33.4181694681 |
| **18** | -0.0423087703 | 0.0134080164 | | 0.0121804250 | 7.9999122714 | 7.9999113309 | 7.9999106407 | 7.9999702839 | 99.6113200874 | 33.4245637658 |
| **19** | 0.0426611396 | -0.0051206418 | | -0.0400452726 | 7.9998934816 | 7.9998980986 | 7.9998849972 | 7.9999682385 | 99.6063689558 | 33.4041287168 |
| **20** | -0.0270597612 | -0.0187634722 | | -0.0222742481 | 7.9999083211 | 7.9999154906 | 7.9999195291 | 7.9999699596 | 99.6079925412 | 33.4144347490 |
| **21** | -0.0050175584 | 0.0127252588 | | 0.0435044817 | 7.9999251334 | 7.9999127246 | 7.9999023313 | 7.9999703107 | 99.6077192644 | 32.8428555308 |
| **22** | 0.0210625663 | 0.0106346409 | | 0.0357839200 | 7.9999094531 | 7.9999159520 | 7.9999173425 | 7.9999692331 | 99.6037487140 | 33.4126045197 |
| **23** | -0.0114150181 | -0.0067961485 | | -0.0015050980 | 7.9999027195 | 7.9999102419 | 7.9998869689 | 7.9999666375 | 99.6100019290 | 33.4088648204 |
| **24** | -0.0100011335 | -0.0013455376 | | 0.0529785998 | 7.9999130654 | 7.9999081918 | 7.9998798522 | 7.9999622166 | 99.6114808385 | 33.3925940425 |
| **25** | -0.0266273877 | 0.0018625893 | | -0.0197325000 | 7.9999181900 | 7.9999122761 | 7.9999030104 | 7.9999694783 | 99.6117058899 | 33.4179649676 |
| **26** | -0.0096744714 | -0.0102856165 | | 0.0089404234 | 7.9999168751 | 7.9999233039 | 7.9999209594 | 7.9999747685 | 99.6088766718 | 33.4089176476 |
| **27** | 0.0256815916 | -0.0204278800 | | 0.0036393677 | 7.9999002191 | 7.9999100547 | 7.9999024772 | 7.9999713055 | 99.6085873200 | 33.4289829692 |
| **28** | -0.0176214329 | 0.0033771638 | | -0.0331401516 | 7.9998998013 | 7.9999150449 | 7.9999156276 | 7.9999689952 | 99.6119470165 | 33.4073387573 |
| **29** | -0.0070990872 | -0.0002200160 | | 0.0288688060 | 7.9998984178 | 7.9999039316 | 7.9998977163 | 7.9999661250 | 99.6073495370 | 33.4237453225 |
| **30** | 0.0261485495 | -0.0007888347 | | -0.0145494302 | 7.9998918035 | 7.9999152161 | 7.9998890435 | 7.9999648025 | 99.6094393004 | 33.4302878893 |
| **31** | -0.0290077123 | 0.0011866762 | | -0.0057165823 | 7.9999050614 | 7.9999090717 | 7.9999039316 | 7.9999652901 | 99.6063207305 | 33.4132352941 |
| **32** | 0.0180954395 | 0.0030013981 | | 0.0057089810 | 7.9999149069 | 7.9999032824 | 7.9998980415 | 7.9999687369 | 99.6081050669 | 33.7065573812 |
| **33** | -0.0050572154 | -0.0315725028 | | -0.0268594672 | 7.9999055758 | 7.9999084087 | 7.9998998994 | 7.9999695808 | 99.6137152778 | 33.4173496379 |
| **34** | 0.0229532664 | 0.0204876784 | | -0.0163088975 | 7.9999151367 | 7.9999071964 | 7.9998768112 | 7.9999624610 | 99.6071244856 | 33.4031659127 |
| **35** | 0.0005026591 | -0.0054688971 | | -0.0060608373 | 7.9999073454 | 7.9999178953 | 7.9999039954 | 7.9999697472 | 99.6127829218 | 33.4210672103 |
| **36** | -0.0041935984 | -0.0165761642 | | -0.0433351439 | 7.9999258544 | 7.9999152314 | 7.9999163657 | 7.9999764722 | 99.6126703961 | 33.4276537788 |
| **37** | -0.0076196567 | -0.0175205597 | | -0.0061010322 | 7.9999145758 | 7.9999177757 | 7.9999277764 | 7.9999709630 | 99.6108699846 | 33.4119811839 |
| **38** | -0.0039761130 | 0.0209182882 | | 0.0086328243 | 7.9999093212 | 7.9999184909 | 7.9999198913 | 7.9999718069 | 99.6099697788 | 33.5583270924 |
| **39** | -0.0034101547 | -0.0279678336 | | -0.0355099617 | 7.9998976765 | 7.9999021626 | 7.9998810224 | 7.9999630917 | 99.6076871142 | 33.7065024737 |
| **40** | -0.9654443411 | 0.7936546236 | | -0.2775937982 | 7.8371243302 | 7.8822626906 | 7.8911547254 | 7.9189939929 | 99.6077192644 | 34.0709531086 |
| **41** | 0.0170851891 | -0.0237085687 | | 0.0323645295 | 7.9999088804 | 7.9999178724 | 7.9998845739 | 7.9999643448 | 99.6088927469 | 33.4161840353 |
| **42** | 0.0010194677 | 0.0052878586 | | 0.0065617664 | 7.9998973002 | 7.9999055265 | 7.9999063825 | 7.9999698050 | 99.6045524691 | 33.3997022639 |
| **43** | -0.0269545237 | -0.0088543034 | | -0.0317475316 | 7.9999113664 | 7.9999234836 | 7.9999182540 | 7.9999698277 | 99.6128954475 | 33.4268222232 |
| **44** | -0.0033295535 | -0.0066718681 | | -0.0380056854 | 7.9999028892 | 7.9999194797 | 7.9999045680 | 7.9999697103 | 99.6125900206 | 33.4356479590 |
| **45** | 0.0036074624 | 0.0059322858 | | 0.0387558245 | 7.9999112078 | 7.9999230065 | 7.9999165526 | 7.9999728820 | 99.6127346965 | 33.4139480201 |
| **46** | -0.0344366334 | -0.0204496087 | | -0.0315607710 | 7.9999087436 | 7.9999007279 | 7.9999053356 | 7.9999666911 | 99.6079282407 | 33.4192470674 |
| **47** | 0.0164164332 | -0.0193858950 | | 0.0204977112 | 7.9999172946 | 7.9998973351 | 7.9999091324 | 7.9999690579 | 99.6055169753 | 33.4128095245 |
| **48** | -0.0226195134 | -0.0155748547 | | -0.0091730655 | 7.9999229489 | 7.9999098594 | 7.9999213488 | 7.9999707456 | 99.6058706276 | 33.4134460986 |
| **49** | 0.0338547572 | 0.0245984388 | | 0.0098992415 | 7.9999092542 | 7.9999027928 | 7.9999201523 | 7.9999724878 | 99.6077031893 | 33.4055169123 |
| **50** | 0.0125132618 | 0.0118029527 | | -0.0029867190 | 7.9999031520 | 7.9999163849 | 7.9998951174 | 7.9999710380 | 99.6114326132 | 33.4185836384 |
| **Total** | -0.9870654262 | 0.8270919963 | | -0.4374127716 | 399.8326981683 | 399.8778963162 | 399.8863431375 | 399.9174518493 | 4980.4410204475 | 1671.5841587742 |
| **Average** | -0.0197387444 | 0.0165403313 | | -0.0087480323 | 7.9966539634 | 7.9975579263 | 7.9977268627 | 7.9983490370 | 99.6088204090 | 33.4316831755 |

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| **Encryption Algorithm** | | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | | | | | | | |
| **Video Stream** | | | **DiRT Rally 2016 - Driving Rally With A BMW 1080p60** | | | | | | | |
| **Resolution** | | | **1080p** | | | | | | | |
| **Frame Number** | **Correlation Coefficient** | | | | **E(i)** | | | | **Differential Attacks** | |
| **CCh** | **CCv** | | **CCd** | **Red** | **Green** | **Blue** | **Combined** | **NPCR** | **UACI** |
| **1** | 0.0262668224 | 0.0231721111 | | 0.0240970180 | 7.9999086935 | 7.9999176164 | 7.9999068621 | 7.9999731037 | 99.6082015175 | 33.3971366144 |
| **2** | 0.0099965453 | 0.0022230556 | | 0.0487698332 | 7.9999015166 | 7.9999193259 | 7.9999107408 | 7.9999727884 | 99.6071405607 | 33.4075218243 |
| **3** | -0.0069676600 | -0.0096709328 | | -0.0094463637 | 7.9999121698 | 7.9999039134 | 7.9998876689 | 7.9999634207 | 99.6086355453 | 33.4188124092 |
| **4** | -0.0148895549 | 0.0031052922 | | -0.0032614203 | 7.9999119742 | 7.9999019585 | 7.9998853196 | 7.9999649330 | 99.6067226080 | 33.4120346415 |
| **5** | -0.0394160137 | -0.0057476639 | | 0.0265826287 | 7.9998966133 | 7.9999125550 | 7.9999114942 | 7.9999690085 | 99.6085390947 | 33.4093454975 |
| **6** | 0.0261561506 | 0.0174505146 | | 0.0146995646 | 7.9999046103 | 7.9999011350 | 7.9998805407 | 7.9999588383 | 99.6082979681 | 33.4208864757 |
| **7** | -0.0285618874 | -0.0121071554 | | -0.0135191889 | 7.9999043675 | 7.9999164049 | 7.9999142784 | 7.9999723271 | 99.6099697788 | 33.4052375207 |
| **8** | 0.0229502646 | -0.0199986234 | | -0.0029498912 | 7.9999046002 | 7.9999072024 | 7.9999051074 | 7.9999711590 | 99.6103555813 | 32.3477725581 |
| **9** | 0.0100801963 | 0.0113859879 | | -0.0073718660 | 7.9999147972 | 7.9999091208 | 7.9998987337 | 7.9999674379 | 99.6100501543 | 33.4186754872 |
| **10** | -0.0191100597 | -0.0119114810 | | 0.0138818640 | 7.9999193384 | 7.9999065996 | 7.9998912782 | 7.9999666331 | 99.6043595679 | 33.4070919572 |
| **11** | 0.0275233568 | 0.0119361809 | | -0.0186434284 | 7.9999149268 | 7.9999075223 | 7.9999122880 | 7.9999709502 | 99.6066743827 | 33.4159274011 |
| **12** | -0.0112041500 | 0.0088368858 | | -0.0335627699 | 7.9999193035 | 7.9999182923 | 7.9998764321 | 7.9999646615 | 99.6066743827 | 33.4194784858 |
| **13** | -0.1523131997 | -0.0822226812 | | 0.1014566456 | 7.8885367010 | 7.8525754830 | 7.7046559844 | 7.8418435430 | 99.6079443158 | 32.1536897089 |
| **14** | 0.0095227981 | 0.0292961874 | | -0.0152765774 | 7.9999007804 | 7.9999054531 | 7.9998965880 | 7.9999635899 | 99.6083140432 | 33.4029778025 |
| **15** | 0.0250467628 | 0.0114849868 | | 0.0435254016 | 7.9999134391 | 7.9999078136 | 7.9999052589 | 7.9999693925 | 99.6093910751 | 33.4121621076 |
| **16** | -0.0201210154 | 0.0030688126 | | 0.0046133968 | 7.9999016751 | 7.9999103986 | 7.9999051888 | 7.9999670264 | 99.6093428498 | 33.4237980236 |
| **17** | 0.0065481201 | -0.0062641648 | | 0.0449771624 | 7.9998976542 | 7.9999204579 | 7.9999177251 | 7.9999746529 | 99.6073334619 | 33.4200152052 |
| **18** | -0.0024318287 | -0.0118325529 | | 0.0153334003 | 7.9999141441 | 7.9999050504 | 7.9998963426 | 7.9999623145 | 99.6090213477 | 33.4262868277 |
| **19** | 0.5794258293 | 0.7669412024 | | -0.1394653653 | 7.8765362178 | 7.8155081849 | 7.6523790500 | 7.8113696595 | 99.6079443158 | 32.1401680888 |
| **20** | 0.0157578830 | -0.0252275912 | | 0.0332314126 | 7.9999110055 | 7.9999159522 | 7.9999036127 | 7.9999666627 | 99.6122685185 | 33.4162797295 |
| **21** | -0.0152480427 | -0.0556210830 | | 0.0186502980 | 7.9999096579 | 7.9999175219 | 7.9998943998 | 7.9999728145 | 99.6039898405 | 33.4073472046 |
| **22** | 0.0136312611 | 0.0053092177 | | -0.0283162027 | 7.9999086497 | 7.9999175016 | 7.9998957106 | 7.9999711438 | 99.6100019290 | 33.4034387482 |
| **23** | -0.0317457890 | 0.0151853203 | | 0.0554722551 | 7.9999091465 | 7.9999091867 | 7.9999051877 | 7.9999708206 | 99.6100340792 | 33.4037186441 |
| **24** | 0.0213259421 | -0.0153206686 | | -0.0008750686 | 7.9999134737 | 7.9999154570 | 7.9999117141 | 7.9999697274 | 99.6085873200 | 33.4138182845 |
| **25** | 0.0298160797 | 0.0123905163 | | 0.0305115402 | 7.9999129683 | 7.9999134864 | 7.9999098172 | 7.9999683480 | 99.6094553755 | 33.2471204763 |
| **26** | -0.0067390379 | -0.0039882632 | | -0.0241927266 | 7.9998978183 | 7.9999145195 | 7.9999140993 | 7.9999668928 | 99.6063528807 | 33.4035274449 |
| **27** | -0.0265144107 | -0.0096815937 | | -0.0089373995 | 7.9999026419 | 7.9999121742 | 7.9999059993 | 7.9999643619 | 99.6107574588 | 33.4197420545 |
| **28** | 0.0169685246 | 0.0145982856 | | 0.0336219973 | 7.9999175449 | 7.9998969924 | 7.9999015182 | 7.9999666938 | 99.6147440844 | 33.4185640962 |
| **29** | 0.0710970478 | -0.0094262184 | | 0.0003489567 | 7.9999023799 | 7.9999217757 | 7.9998971011 | 7.9999664703 | 99.6072691615 | 33.4241858433 |
| **30** | -0.0439657120 | 0.8318503704 | | -0.1571558789 | 7.9339716257 | 7.9138465368 | 7.8003222162 | 7.9071583507 | 99.6077192644 | 32.9852858595 |
| **31** | -0.0070977704 | 0.0160241326 | | 0.0168749781 | 7.9999154231 | 7.9999080831 | 7.9999054510 | 7.9999691170 | 99.6070762603 | 33.4136751215 |
| **32** | 0.0018052089 | 0.0150121664 | | 0.0391002762 | 7.9999092247 | 7.9999151575 | 7.9999093093 | 7.9999691248 | 99.6127668467 | 33.4217827730 |
| **33** | -0.0159057695 | -0.0014589142 | | -0.0043447640 | 7.9999093471 | 7.9999044849 | 7.9999165026 | 7.9999711513 | 99.6095036008 | 33.4112103985 |
| **34** | 0.0235375394 | 0.0270687982 | | 0.0350329002 | 7.9999049487 | 7.9999123918 | 7.9999107920 | 7.9999693283 | 99.6075745885 | 32.8822296987 |
| **35** | -0.0221442702 | -0.0043778366 | | -0.0450188078 | 7.9999047802 | 7.9999148338 | 7.9999168448 | 7.9999701880 | 99.6078800154 | 33.4168881879 |
| **36** | 0.0093179283 | 0.0040288663 | | -0.0152124279 | 7.9999157529 | 7.9999093893 | 7.9999107957 | 7.9999674588 | 99.6134741512 | 33.4077874102 |
| **37** | 0.0196040327 | -0.0105972047 | | -0.0003406914 | 7.9999244481 | 7.9999102332 | 7.9999029637 | 7.9999727234 | 99.6105806327 | 33.4255014171 |
| **38** | -0.0190542653 | 0.2521775082 | | -0.0600825389 | 7.9814733248 | 7.9746326179 | 7.9573365696 | 7.9762530632 | 99.6064654064 | 33.3305198121 |
| **39** | 0.0244419558 | -0.0142415692 | | 0.0118425506 | 7.9999060378 | 7.9999117346 | 7.9998986620 | 7.9999679677 | 99.6117541152 | 33.4271105665 |
| **40** | -0.0402014390 | 0.0230336695 | | 0.0314689263 | 7.9999177019 | 7.9999039209 | 7.9999008559 | 7.9999708614 | 99.6114165381 | 33.4104108040 |
| **41** | -0.1785336055 | 0.8263852833 | | -0.0394525439 | 7.7450887466 | 7.6087366197 | 7.4372768389 | 7.6294576820 | 99.6106449331 | 32.9394053094 |
| **42** | 0.0081217273 | -0.0135437550 | | 0.0040626189 | 7.9998969992 | 7.9999126860 | 7.9999155526 | 7.9999645820 | 99.6067226080 | 33.4164831583 |
| **43** | -0.0378058736 | 0.0047558480 | | -0.0711491858 | 7.9999074890 | 7.9999063441 | 7.9998948645 | 7.9999622207 | 99.6083461934 | 33.4274540063 |
| **44** | -0.0070681721 | 0.0254992060 | | -0.0058809263 | 7.9999112384 | 7.9999157644 | 7.9999057361 | 7.9999702715 | 99.6108539095 | 33.4041676753 |
| **45** | -0.0571305507 | 0.6594212248 | | -0.1210247691 | 7.9819222607 | 7.9758413778 | 7.9611047012 | 7.9767650107 | 99.6080086163 | 33.2482078467 |
| **46** | -0.0092420609 | -0.0007562571 | | -0.0103953635 | 7.9999138764 | 7.9999121334 | 7.9998938961 | 7.9999646845 | 99.6085069444 | 33.4119087514 |
| **47** | 0.2117439128 | 0.8713353744 | | -0.1120967540 | 7.9597538467 | 7.9475513634 | 7.8817704453 | 7.9425240847 | 99.6111754115 | 33.3366327640 |
| **48** | 0.0047605417 | -0.0299862353 | | 0.0625733840 | 7.9999052026 | 7.9999053686 | 7.9999080396 | 7.9999685466 | 99.6086194702 | 33.3935765780 |
| **49** | 0.0062190663 | -0.0308080660 | | 0.0466041397 | 7.9999071838 | 7.9999129093 | 7.9999221020 | 7.9999720726 | 99.6084265689 | 33.4255068385 |
| **50** | -0.0074109137 | 0.0121771085 | | -0.0048444356 | 7.9999106843 | 7.9999169530 | 7.9999063571 | 7.9999722011 | 99.6065618570 | 33.4185741825 |
| **Total** | 0.4008424450 | 4.1203636020 | | -0.1954842064 | 399.3633689525 | 399.0848699591 | 398.3907055381 | 399.0840100671 | 4980.4424511317 | 1665.1710803226 |
| **Average** | 0.0080166772 | 0.0822212359 | | -0.0039096642 | 7.9872673790 | 7.9816973992 | 7.9678141108 | 7.9816802013 | 99.6088490226 | 33.3034216065 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Encryption Algorithm** | | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | | | | | | | |
| **Video Stream** | | | **FlatOut: Ultimate Carnage 1080p60 Action** | | | | | | | |
| **Resolution** | | | **1080p** | | | | | | | |
| **Frame Number** | **Correlation Coefficient** | | | | **E(i)** | | | | **Differential Attacks** | |
| **CCh** | **CCv** | | **CCd** | **Red** | **Green** | **Blue** | **Combined** | **NPCR** | **UACI** |
| **1** | -0.4759494783 | 0.9780104009 | | 0.0584702513 | 7.9678975732 | 7.9541386454 | 7.9551873522 | 7.9741472994 | 99.6126382459 | 33.9588225208 |
| **2** | -0.0232684905 | 0.0053486216 | | 0.0007402188 | 7.9999069535 | 7.9999007399 | 7.9998774229 | 7.9999573992 | 99.6038130144 | 33.4190265548 |
| **3** | 0.0249700866 | 0.0271382398 | | 0.0342984631 | 7.9999164603 | 7.9999120392 | 7.9998861683 | 7.9999649694 | 99.6136188272 | 33.4204047270 |
| **4** | -0.0147315639 | -0.0245523157 | | 0.0095754080 | 7.9998910920 | 7.9999171284 | 7.9999039746 | 7.9999651043 | 99.6124614198 | 33.4069177156 |
| **5** | 0.0209633863 | -0.0095447585 | | 0.0130102394 | 7.9999045590 | 7.9999102785 | 7.9998899071 | 7.9999642991 | 99.6063850309 | 33.4198480871 |
| **6** | 0.8832623125 | 0.9814031306 | | -0.0055724850 | 7.9619608173 | 7.9366948648 | 7.8894944489 | 7.9506178689 | 99.5940232767 | 33.1759981063 |
| **7** | 0.0016394093 | 0.0088929787 | | -0.0162934116 | 7.9999138323 | 7.9999055754 | 7.9998703713 | 7.9999633737 | 99.6091499486 | 33.4177091528 |
| **8** | 0.0081173669 | 0.0033793348 | | -0.0430685338 | 7.9999207155 | 7.9999122520 | 7.9998713827 | 7.9999617106 | 99.6066743827 | 33.4195724779 |
| **9** | -0.0094862987 | -0.0060153920 | | -0.0247961903 | 7.9999018096 | 7.9999027821 | 7.9998980300 | 7.9999649927 | 99.6086998457 | 33.3920773698 |
| **10** | -0.0474702461 | 0.0184539111 | | -0.0316304896 | 7.9999091514 | 7.9999015850 | 7.9998805197 | 7.9999623219 | 99.6077192644 | 33.4104635681 |
| **11** | 0.0709272551 | -0.0091561176 | | -0.0159617499 | 7.9999087305 | 7.9999017528 | 7.9998832070 | 7.9999596169 | 99.6096000514 | 33.4197634249 |
| **12** | 0.0034271468 | -0.0693224719 | | -0.0494129389 | 7.9999070671 | 7.9999030189 | 7.9998655624 | 7.9999531714 | 99.6109825103 | 33.4226097898 |
| **13** | -0.0003973648 | 0.0036426240 | | -0.0053596332 | 7.9999040231 | 7.9999017873 | 7.9998840710 | 7.9999630925 | 99.6088927469 | 33.4147883382 |
| **14** | 0.7598799998 | 0.9843380491 | | -0.0209134140 | 7.9793319058 | 7.9664419660 | 7.9320592872 | 7.9698305569 | 99.6086516204 | 33.0207088301 |
| **15** | 0.0166963986 | -0.0062046016 | | -0.0134170338 | 7.9999014891 | 7.9999142609 | 7.9998966354 | 7.9999622790 | 99.6098894033 | 33.4092936789 |
| **16** | -0.0016217341 | -0.0041704373 | | -0.0351263148 | 7.9999102388 | 7.9999034581 | 7.9998947835 | 7.9999623273 | 99.6108378344 | 33.4215968062 |
| **17** | -0.0065793847 | 0.0083102364 | | 0.0025508004 | 7.9999042203 | 7.9998897286 | 7.9998853747 | 7.9999617698 | 99.6146797840 | 33.4085454617 |
| **18** | -0.0026502883 | 0.0159709898 | | -0.0525158714 | 7.9999029113 | 7.9999003949 | 7.9998482820 | 7.9999486026 | 99.6122845936 | 33.4139954889 |
| **19** | 0.0179601189 | -0.0013181744 | | -0.0062497472 | 7.9999099852 | 7.9999130788 | 7.9998841927 | 7.9999656787 | 99.6106127829 | 33.4272761085 |
| **20** | 0.0389755692 | 0.0096823374 | | -0.0011137105 | 7.9999129048 | 7.9999129185 | 7.9998959600 | 7.9999688348 | 99.6080246914 | 33.4092064951 |
| **21** | 0.0197645062 | -0.0099245918 | | -0.0228168072 | 7.9999086171 | 7.9999077061 | 7.9998866364 | 7.9999650815 | 99.6088445216 | 33.3934823968 |
| **22** | -0.0105573562 | -0.0057390626 | | -0.0547090737 | 7.9999049407 | 7.9999121409 | 7.9998834972 | 7.9999630570 | 99.6094071502 | 33.4175756980 |
| **23** | 0.0258158590 | -0.0042570925 | | 0.0218133473 | 7.9998965501 | 7.9999089167 | 7.9999052123 | 7.9999676302 | 99.6071566358 | 33.4153398718 |
| **24** | 0.0138388909 | -0.0063305589 | | -0.0351880118 | 7.9998898209 | 7.9998997651 | 7.9998905861 | 7.9999623115 | 99.6067065329 | 34.2770433662 |
| **25** | 0.2408694062 | 0.9803020682 | | 0.0378098152 | 7.9615671013 | 7.9557349600 | 7.9029071565 | 7.9537514401 | 99.6117862654 | 33.2939826792 |
| **26** | -0.0104507709 | 0.0172711598 | | 0.0040331356 | 7.9999220446 | 7.9999047221 | 7.9999015387 | 7.9999700755 | 99.6066100823 | 33.3993549786 |
| **27** | -0.0103517890 | -0.0175629040 | | -0.0318344136 | 7.9999102497 | 7.9999109008 | 7.9999204165 | 7.9999733228 | 99.6119952418 | 33.4082523274 |
| **28** | -0.0203137444 | -0.0158275682 | | -0.0149911548 | 7.9999149866 | 7.9999152545 | 7.9998517795 | 7.9999571035 | 99.6067065329 | 33.4084181216 |
| **29** | 0.0130939246 | 0.0388608323 | | -0.0420946954 | 7.9999155391 | 7.9998899945 | 7.9999030308 | 7.9999715397 | 99.6099697788 | 33.4181089501 |
| **30** | 0.0007690426 | 0.0299470628 | | -0.0095436445 | 7.9999073964 | 7.9999223260 | 7.9999050119 | 7.9999673483 | 99.6073816872 | 33.4133304209 |
| **31** | 0.9029802201 | 0.9787009253 | | -0.0809280446 | 7.9662994141 | 7.9254195406 | 7.8653571350 | 7.9376277494 | 99.6120434671 | 33.6664727568 |
| **32** | -0.1793265237 | -0.0239225102 | | -0.0609029721 | 7.9978902358 | 7.9981638475 | 7.9953727465 | 7.9980064678 | 99.6081854424 | 33.3292426925 |
| **33** | -0.0029846130 | 0.0084883036 | | -0.0251718608 | 7.9999039319 | 7.9998970817 | 7.9998897839 | 7.9999593984 | 99.6111432613 | 33.4043015715 |
| **34** | -0.0030240231 | 0.0217150574 | | 0.0343507382 | 7.9998882029 | 7.9999046722 | 7.9998088927 | 7.9999387807 | 99.6085390947 | 33.4061831150 |
| **35** | -0.0024183568 | -0.0005198088 | | 0.0356042705 | 7.9999027282 | 7.9999075825 | 7.9999049643 | 7.9999660617 | 99.6097286523 | 33.4143408199 |
| **36** | -0.0249300902 | -0.0364935244 | | -0.0519407624 | 7.9999050222 | 7.9998918589 | 7.9998359340 | 7.9999444734 | 99.6060796039 | 33.4140193179 |
| **37** | 0.0033312950 | -0.0219502272 | | -0.0391704729 | 7.9999185678 | 7.9999156932 | 7.9998990236 | 7.9999682214 | 99.6113040123 | 33.4186897341 |
| **38** | -0.0071015446 | -0.0069295417 | | 0.0499175869 | 7.9999089318 | 7.9999010276 | 7.9998133833 | 7.9999456276 | 99.6084104938 | 33.4042684757 |
| **39** | 0.0069614545 | -0.0062863465 | | -0.0209046756 | 7.9999216106 | 7.9999141600 | 7.9998971501 | 7.9999689248 | 99.6112718621 | 33.4057113895 |
| **40** | -0.0151361151 | 0.0041999284 | | 0.0292370314 | 7.9999072139 | 7.9999131792 | 7.9998937713 | 7.9999666903 | 99.6086676955 | 33.4186981184 |
| **41** | -0.0114977922 | -0.0033718718 | | 0.0427539295 | 7.9999100528 | 7.9999084924 | 7.9998831804 | 7.9999612829 | 99.6103716564 | 33.4013179063 |
| **42** | -0.0045965267 | 0.0237603013 | | -0.0278045334 | 7.9999000792 | 7.9998966937 | 7.9999108414 | 7.9999673818 | 99.6087802212 | 33.4237090116 |
| **43** | 0.0072161156 | 0.0166514275 | | 0.0384083816 | 7.9999020192 | 7.9999191265 | 7.9999013865 | 7.9999654813 | 99.6061439043 | 33.4344888496 |
| **44** | 0.0181951364 | 0.0072443049 | | -0.0017612725 | 7.9999153356 | 7.9999131198 | 7.9998916487 | 7.9999694330 | 99.6122685185 | 33.4220865610 |
| **45** | 0.0024889589 | 0.0125053778 | | -0.0462703292 | 7.9999007029 | 7.9999112846 | 7.9998857093 | 7.9999686658 | 99.6067708333 | 33.4197838498 |
| **46** | -0.0152514069 | -0.0147864143 | | -0.0009807813 | 7.9998907717 | 7.9999064380 | 7.9998624757 | 7.9999567673 | 99.6090052726 | 33.4269361989 |
| **47** | -0.0178529927 | -0.0048344219 | | 0.0061068031 | 7.9999097734 | 7.9999102935 | 7.9999044611 | 7.9999678652 | 99.6097929527 | 33.4184008866 |
| **48** | -0.0067491975 | 0.0126152937 | | 0.0315973944 | 7.9999110129 | 7.9999094482 | 7.9998776226 | 7.9999566164 | 99.6085712449 | 33.4262183037 |
| **49** | -0.0186627688 | 0.0078694236 | | 0.0429798436 | 7.9999191105 | 7.9999151628 | 7.9998666966 | 7.9999627522 | 99.6111111111 | 33.4139769552 |
| **50** | -0.0049610621 | 0.0005411545 | | -0.0341242219 | 7.9999184849 | 7.9999067330 | 7.9997881420 | 7.9999431747 | 99.6169624486 | 33.4013606471 |
| **Total** | 2.1538223367 | 4.8962227616 | | -0.4293115936 | 399.8308768891 | 399.7325103783 | 399.5351567485 | 399.7823059954 | 4980.4613554527 | 1671.5237206740 |
| **Average** | 0.0430498226 | 0.0976126455 | | -0.0085860209 | 7.9966175378 | 7.9946502076 | 7.9907031350 | 7.9956461199 | 99.6092271091 | 33.4304744135 |

# DECRYPTION METRICS

|  |  |  |  |
| --- | --- | --- | --- |
| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **VID\_20200717\_171254** | |
| **Resolution** | | **1080p** | |
| **Frame Number** | **Mean Square Error** | | **Peak Signal-to-Noise Ratio** |
| **1** | 0.0002624626 | | 35.8093252182 |
| **2** | 0.0001784177 | | 37.4856195124 |
| **3** | 0.0001673568 | | 37.7635673382 |
| **4** | 0.0001727198 | | 37.6265775516 |
| **5** | 0.0001680262 | | 37.7462300361 |
| **6** | 0.0001725949 | | 37.6297199139 |
| **7** | 0.0001677138 | | 37.7543119002 |
| **8** | 0.0001727715 | | 37.6252795207 |
| **9** | 0.0001683035 | | 37.7390688046 |
| **10** | 0.0001722541 | | 37.6383030630 |
| **11** | 0.0001689735 | | 37.7218139654 |
| **12** | 0.0001748311 | | 37.5738125270 |
| **13** | 0.0001515808 | | 38.1935576614 |
| **14** | 0.0001730285 | | 37.6188247146 |
| **15** | 0.0001661350 | | 37.7953882436 |
| **16** | 0.0001744670 | | 37.5828673430 |
| **17** | 0.0001658045 | | 37.8040360317 |
| **18** | 0.0001712655 | | 37.6633012992 |
| **19** | 0.0001650397 | | 37.8241161837 |
| **20** | 0.0001711453 | | 37.6663512249 |
| **21** | 0.0001674980 | | 37.7599048698 |
| **22** | 0.0001738419 | | 37.5984561936 |
| **23** | 0.0001670089 | | 37.7726046773 |
| **24** | 0.0001739618 | | 37.5954605973 |
| **25** | 0.0001530624 | | 38.1513143798 |
| **26** | 0.0001749670 | | 37.5704389293 |
| **27** | 0.0001672311 | | 37.7668305325 |
| **28** | 0.0001756147 | | 37.5543916916 |
| **29** | 0.0001654128 | | 37.8143101343 |
| **30** | 0.0001741495 | | 37.5907766548 |
| **31** | 0.0001698495 | | 37.6993577162 |
| **32** | 0.0001774214 | | 37.5099402542 |
| **33** | 0.0001699657 | | 37.6963881883 |
| **34** | 0.0001750901 | | 37.5673831191 |
| **35** | 0.0001715570 | | 37.6559164200 |
| **36** | 0.0001774197 | | 37.5099825533 |
| **37** | 0.0001503883 | | 38.2278589475 |
| **38** | 0.0001705998 | | 37.6802159565 |
| **39** | 0.0001674547 | | 37.7610259699 |
| **40** | 0.0001766889 | | 37.5279080441 |
| **41** | 0.0001690775 | | 37.7191427258 |
| **42** | 0.0001757718 | | 37.5505072595 |
| **43** | 0.0001736270 | | 37.6038264076 |
| **44** | 0.0001804024 | | 37.4375775708 |
| **45** | 0.0001694150 | | 37.7104814939 |
| **46** | 0.0001745849 | | 37.5799342562 |
| **47** | 0.0001684199 | | 37.7360647416 |
| **48** | 0.0001738227 | | 37.5989347938 |
| **49** | 0.0001501047 | | 38.2360579452 |
| **50** | 0.0001696365 | | 37.7048061383 |
| **Total** | 0.0085889372 | | 1883.1498712159 |
| **Average** | 0.0001717787 | | 37.6629974243 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **VID\_20200717\_171657\_01** | |
| **Resolution** | | **1080p** | |
| **Frame Number** | **Mean Square Error** | | **Peak Signal-to-Noise Ratio** |
| **1** | 0.0001372562 | | 38.6246817024 |
| **2** | 0.0000819017 | | 40.8670720887 |
| **3** | 0.0000774863 | | 41.1077511856 |
| **4** | 0.0000775216 | | 41.1057755152 |
| **5** | 0.0000759530 | | 41.1945480850 |
| **6** | 0.0000761517 | | 41.1832030278 |
| **7** | 0.0000760321 | | 41.1900301716 |
| **8** | 0.0000782184 | | 41.0669079753 |
| **9** | 0.0000757940 | | 41.2036535634 |
| **10** | 0.0000770019 | | 41.1349873434 |
| **11** | 0.0000750537 | | 41.2462816559 |
| **12** | 0.0000766773 | | 41.1533309660 |
| **13** | 0.0000583684 | | 42.3382213291 |
| **14** | 0.0000724266 | | 41.4010171432 |
| **15** | 0.0000734825 | | 41.3381601587 |
| **16** | 0.0000742069 | | 41.2955571197 |
| **17** | 0.0000740831 | | 41.3028089721 |
| **18** | 0.0000747204 | | 41.2656053451 |
| **19** | 0.0000742119 | | 41.2952635705 |
| **20** | 0.0000756906 | | 41.2095799384 |
| **21** | 0.0000735127 | | 41.3363746488 |
| **22** | 0.0000758091 | | 41.2027841897 |
| **23** | 0.0000738265 | | 41.3178800281 |
| **24** | 0.0000759618 | | 41.1940491289 |
| **25** | 0.0000598871 | | 42.2266684777 |
| **26** | 0.0000751825 | | 41.2388346013 |
| **27** | 0.0000749345 | | 41.2531831165 |
| **28** | 0.0000755833 | | 41.2157399762 |
| **29** | 0.0000745896 | | 41.2732170907 |
| **30** | 0.0000788320 | | 41.0329735724 |
| **31** | 0.0000767941 | | 41.1467210226 |
| **32** | 0.0000777836 | | 41.0911175539 |
| **33** | 0.0000759020 | | 41.1974673489 |
| **34** | 0.0000776070 | | 41.1009924425 |
| **35** | 0.0000757390 | | 41.2068026398 |
| **36** | 0.0000771320 | | 41.1276547747 |
| **37** | 0.0000591405 | | 42.2811511676 |
| **38** | 0.0000688318 | | 41.6221060358 |
| **39** | 0.0000716794 | | 41.4460565855 |
| **40** | 0.0000757062 | | 41.2086841343 |
| **41** | 0.0000743850 | | 41.2851437105 |
| **42** | 0.0000770792 | | 41.1306296915 |
| **43** | 0.0000752879 | | 41.2327506906 |
| **44** | 0.0000765962 | | 41.1579298444 |
| **45** | 0.0000756418 | | 41.2123831435 |
| **46** | 0.0000763178 | | 41.1737403098 |
| **47** | 0.0000762228 | | 41.1791521152 |
| **48** | 0.0000771766 | | 41.1251423385 |
| **49** | 0.0000613143 | | 42.1243840823 |
| **50** | 0.0000749878 | | 41.2500967406 |
| **Total** | 0.0037816823 | | 2062.1162480599 |
| **Average** | 0.0000756336 | | 41.2423249612 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **VID\_20200717\_171835** | |
| **Resolution** | | **1080p** | |
| **Frame Number** | **Mean Square Error** | | **Peak Signal-to-Noise Ratio** |
| **1** | 0.0001666599 | | 37.7816888846 |
| **2** | 0.0001321452 | | 38.7894851100 |
| **3** | 0.0001252204 | | 39.0232489145 |
| **4** | 0.0001286033 | | 38.9074786165 |
| **5** | 0.0001254363 | | 39.0157690722 |
| **6** | 0.0001283824 | | 38.9149466231 |
| **7** | 0.0001246987 | | 39.0413817640 |
| **8** | 0.0001302907 | | 38.8508656561 |
| **9** | 0.0001267832 | | 38.9693825538 |
| **10** | 0.0001303422 | | 38.8491492887 |
| **11** | 0.0001276080 | | 38.9412217043 |
| **12** | 0.0001312947 | | 38.8175271884 |
| **13** | 0.0001119364 | | 39.5102879468 |
| **14** | 0.0001246104 | | 39.0444560538 |
| **15** | 0.0001250121 | | 39.0304803985 |
| **16** | 0.0001296771 | | 38.8713686032 |
| **17** | 0.0001267556 | | 38.9703297511 |
| **18** | 0.0001311484 | | 38.8223695458 |
| **19** | 0.0001275450 | | 38.9433665142 |
| **20** | 0.0001324560 | | 38.7792835668 |
| **21** | 0.0001283027 | | 38.9176421250 |
| **22** | 0.0001318134 | | 38.8004049086 |
| **23** | 0.0001284210 | | 38.9136399629 |
| **24** | 0.0001340878 | | 38.7261081029 |
| **25** | 0.0001152947 | | 39.3819059276 |
| **26** | 0.0001274971 | | 38.9449964060 |
| **27** | 0.0001275049 | | 38.9447323353 |
| **28** | 0.0001318136 | | 38.8003965191 |
| **29** | 0.0001292035 | | 38.8872566638 |
| **30** | 0.0001345759 | | 38.7103262380 |
| **31** | 0.0001296274 | | 38.8730324853 |
| **32** | 0.0001358599 | | 38.6690863209 |
| **33** | 0.0001330606 | | 38.7595063000 |
| **34** | 0.0001371119 | | 38.6292473846 |
| **35** | 0.0001314769 | | 38.8115064039 |
| **36** | 0.0001356862 | | 38.6746443296 |
| **37** | 0.0001154923 | | 39.3744704270 |
| **38** | 0.0001281705 | | 38.9221175471 |
| **39** | 0.0001271579 | | 38.9565669337 |
| **40** | 0.0001284090 | | 38.9140442857 |
| **41** | 0.0001265544 | | 38.9772276347 |
| **42** | 0.0001315191 | | 38.8101108171 |
| **43** | 0.0001274203 | | 38.9476121286 |
| **44** | 0.0001319015 | | 38.7975010807 |
| **45** | 0.0001290935 | | 38.8909563714 |
| **46** | 0.0001333799 | | 38.7490964929 |
| **47** | 0.0001292604 | | 38.8853443668 |
| **48** | 0.0001340157 | | 38.7284425235 |
| **49** | 0.0001123716 | | 39.4934357140 |
| **50** | 0.0001259775 | | 38.9970711752 |
| **Total** | 0.0064586670 | | 1944.7625176682 |
| **Average** | 0.0001291733 | | 38.8952503534 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **VID\_20200717\_171931** | |
| **Resolution** | | **1080p** | |
| **Frame Number** | **Mean Square Error** | | **Peak Signal-to-Noise Ratio** |
| **1** | 0.0006566062 | | 31.8269504460 |
| **2** | 0.0002253862 | | 36.4707265381 |
| **3** | 0.0002206672 | | 36.5626221960 |
| **4** | 0.0002251881 | | 36.4745448645 |
| **5** | 0.0002311920 | | 36.3602720526 |
| **6** | 0.0002330154 | | 36.3261530902 |
| **7** | 0.0002301152 | | 36.3805478158 |
| **8** | 0.0002322298 | | 36.3408209099 |
| **9** | 0.0002300773 | | 36.3812624661 |
| **10** | 0.0002330493 | | 36.3255216210 |
| **11** | 0.0002215182 | | 36.5459058969 |
| **12** | 0.0002235704 | | 36.5058561957 |
| **13** | 0.0001770481 | | 37.5190877108 |
| **14** | 0.0001963011 | | 37.0707728938 |
| **15** | 0.0001972637 | | 37.0495283652 |
| **16** | 0.0002014285 | | 36.9587911330 |
| **17** | 0.0002081403 | | 36.8164386283 |
| **18** | 0.0002119446 | | 36.7377773790 |
| **19** | 0.0002108613 | | 36.7600309243 |
| **20** | 0.0002146813 | | 36.6820587480 |
| **21** | 0.0002211907 | | 36.5523322193 |
| **22** | 0.0002223323 | | 36.5299752758 |
| **23** | 0.0002175711 | | 36.6239885217 |
| **24** | 0.0002211564 | | 36.5530045367 |
| **25** | 0.0001749604 | | 37.5706022174 |
| **26** | 0.0002041434 | | 36.9006469031 |
| **27** | 0.0002078600 | | 36.8222898463 |
| **28** | 0.0002123430 | | 36.7296198201 |
| **29** | 0.0002054870 | | 36.8721565226 |
| **30** | 0.0002102297 | | 36.7730589664 |
| **31** | 0.0002053567 | | 36.8749108888 |
| **32** | 0.0002084860 | | 36.8092305563 |
| **33** | 0.0002163462 | | 36.6485070285 |
| **34** | 0.0002198368 | | 36.5789963447 |
| **35** | 0.0002215024 | | 36.5462161952 |
| **36** | 0.0002241934 | | 36.4937715387 |
| **37** | 0.0001706005 | | 37.6801977689 |
| **38** | 0.0001921234 | | 37.1641962489 |
| **39** | 0.0001983889 | | 37.0248255447 |
| **40** | 0.0002042364 | | 36.8986685149 |
| **41** | 0.0002078482 | | 36.8225378860 |
| **42** | 0.0002102675 | | 36.7722782824 |
| **43** | 0.0002107968 | | 36.7613588838 |
| **44** | 0.0002130911 | | 36.7143461010 |
| **45** | 0.0002113836 | | 36.7492877001 |
| **46** | 0.0002151666 | | 36.6722523625 |
| **47** | 0.0002143695 | | 36.6883702408 |
| **48** | 0.0002171001 | | 36.6333990748 |
| **49** | 0.0001743511 | | 37.5857527175 |
| **50** | 0.0002011400 | | 36.9650153591 |
| **Total** | 0.0110141434 | | 1833.1074639425 |
| **Average** | 0.0002202829 | | 36.6621492789 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **VID\_20200717\_172041** | |
| **Resolution** | | **1080p** | |
| **Frame Number** | **Mean Square Error** | | **Peak Signal-to-Noise Ratio** |
| **1** | 0.0006450458 | | 31.9040946291 |
| **2** | 0.0002484050 | | 36.0483969054 |
| **3** | 0.0002440280 | | 36.1256038384 |
| **4** | 0.0002489140 | | 36.0395069695 |
| **5** | 0.0002468475 | | 36.0757126267 |
| **6** | 0.0002525719 | | 35.9761492575 |
| **7** | 0.0002440118 | | 36.1258918931 |
| **8** | 0.0002496183 | | 36.0272356801 |
| **9** | 0.0002422442 | | 36.1574654401 |
| **10** | 0.0002457048 | | 36.0958637364 |
| **11** | 0.0002370602 | | 36.2514143321 |
| **12** | 0.0002417468 | | 36.1663920172 |
| **13** | 0.0001958634 | | 37.0804671189 |
| **14** | 0.0002317489 | | 36.3498238714 |
| **15** | 0.0002260278 | | 36.4583820776 |
| **16** | 0.0002344407 | | 36.2996700038 |
| **17** | 0.0002322407 | | 36.3406158310 |
| **18** | 0.0002376508 | | 36.2406074080 |
| **19** | 0.0002300648 | | 36.3814975201 |
| **20** | 0.0002340266 | | 36.3073471990 |
| **21** | 0.0002300648 | | 36.3814985934 |
| **22** | 0.0002323196 | | 36.3391410827 |
| **23** | 0.0002282963 | | 36.4150109009 |
| **24** | 0.0002309620 | | 36.3645951408 |
| **25** | 0.0001948461 | | 37.1030838002 |
| **26** | 0.0002167685 | | 36.6400377487 |
| **27** | 0.0002219723 | | 36.5370116270 |
| **28** | 0.0002280753 | | 36.4192173569 |
| **29** | 0.0002351204 | | 36.2870969222 |
| **30** | 0.0002468414 | | 36.0758205801 |
| **31** | 0.0002434757 | | 36.1354439270 |
| **32** | 0.0002473276 | | 36.0672743892 |
| **33** | 0.0002433937 | | 36.1369067152 |
| **34** | 0.0002467668 | | 36.0771329803 |
| **35** | 0.0002420608 | | 36.1607553970 |
| **36** | 0.0002455796 | | 36.0980772966 |
| **37** | 0.0001930243 | | 37.1438800211 |
| **38** | 0.0002247484 | | 36.4830340047 |
| **39** | 0.0002265210 | | 36.4489152477 |
| **40** | 0.0002328948 | | 36.3284015729 |
| **41** | 0.0002286629 | | 36.4080428631 |
| **42** | 0.0002337354 | | 36.3127544294 |
| **43** | 0.0002268432 | | 36.4427429766 |
| **44** | 0.0002324296 | | 36.3370860247 |
| **45** | 0.0002270492 | | 36.4387998998 |
| **46** | 0.0002312747 | | 36.3587189849 |
| **47** | 0.0002279389 | | 36.4218159029 |
| **48** | 0.0002334786 | | 36.3175289402 |
| **49** | 0.0001942948 | | 37.1153872685 |
| **50** | 0.0002233024 | | 36.5110653726 |
| **Total** | 0.0120383311 | | 1812.7584163224 |
| **Average** | 0.0002407666 | | 36.2551683264 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **Star Citizen: 325a Dream Weapons Combat Test AC - ULTRA 1080p60** | |
| **Resolution** | | **1080p** | |
| **Frame Number** | **Mean Square Error** | | **Peak Signal-to-Noise Ratio** |
| **1** | 0.0003493878 | | 34.5669230927 |
| **2** | 0.0001455505 | | 38.3698627051 |
| **3** | 0.0001360975 | | 38.6614983795 |
| **4** | 0.0001356572 | | 38.6755719753 |
| **5** | 0.0001311897 | | 38.8210020893 |
| **6** | 0.0001332322 | | 38.7539069713 |
| **7** | 0.0001285868 | | 38.9080368082 |
| **8** | 0.0001285915 | | 38.9078781640 |
| **9** | 0.0001277568 | | 38.9361595773 |
| **10** | 0.0001340312 | | 38.7279397030 |
| **11** | 0.0001308529 | | 38.8321663734 |
| **12** | 0.0001334547 | | 38.7466596838 |
| **13** | 0.0001056933 | | 39.7595268884 |
| **14** | 0.0001302096 | | 38.8535684223 |
| **15** | 0.0001246534 | | 39.0429584730 |
| **16** | 0.0001243039 | | 39.0551528945 |
| **17** | 0.0001241682 | | 39.0598967564 |
| **18** | 0.0001236774 | | 39.0770953370 |
| **19** | 0.0001270409 | | 38.9605654161 |
| **20** | 0.0001331914 | | 38.7552375586 |
| **21** | 0.0001299055 | | 38.8637236155 |
| **22** | 0.0001304280 | | 38.8462916205 |
| **23** | 0.0001280585 | | 38.9259154653 |
| **24** | 0.0001287123 | | 38.9038008277 |
| **25** | 0.0001027537 | | 39.8820257410 |
| **26** | 0.0001050652 | | 39.7854122341 |
| **27** | 0.0001184910 | | 39.2631460615 |
| **28** | 0.0001181062 | | 39.2772718723 |
| **29** | 0.0001206968 | | 39.1830437081 |
| **30** | 0.0001201966 | | 39.2010770236 |
| **31** | 0.0001267316 | | 38.9711513106 |
| **32** | 0.0001338295 | | 38.7344803838 |
| **33** | 0.0001308847 | | 38.8311097572 |
| **34** | 0.0001363663 | | 38.6529292225 |
| **35** | 0.0001344072 | | 38.7157757767 |
| **36** | 0.0001361745 | | 38.6590428651 |
| **37** | 0.0001086535 | | 39.6395627635 |
| **38** | 0.0001316302 | | 38.8064436307 |
| **39** | 0.0001284670 | | 38.9120854568 |
| **40** | 0.0001357974 | | 38.6710860627 |
| **41** | 0.0001314378 | | 38.8127986353 |
| **42** | 0.0001312716 | | 38.8182913434 |
| **43** | 0.0001324302 | | 38.7801306537 |
| **44** | 0.0001321374 | | 38.7897409394 |
| **45** | 0.0001319736 | | 38.7951294688 |
| **46** | 0.0001314614 | | 38.8120171624 |
| **47** | 0.0001274090 | | 38.9480003220 |
| **48** | 0.0001269231 | | 38.9645931317 |
| **49** | 0.0001082505 | | 39.6557013588 |
| **50** | 0.0001102790 | | 39.5750704432 |
| **Total** | 0.0065762562 | | 1944.1484561267 |
| **Average** | 0.0001315251 | | 38.8829691225 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **Wreckfest 2016 - Racing 2 1080p60 HD HQ** | |
| **Resolution** | | **1080p** | |
| **Frame Number** | **Mean Square Error** | | **Peak Signal-to-Noise Ratio** |
| **1** | 0.0004172486 | | 33.7960513863 |
| **2** | 0.0002154539 | | 36.6664567889 |
| **3** | 0.0002097718 | | 36.7825286749 |
| **4** | 0.0002099207 | | 36.7794476353 |
| **5** | 0.0002087886 | | 36.8029312930 |
| **6** | 0.0002085168 | | 36.8085889013 |
| **7** | 0.0002084050 | | 36.8109191061 |
| **8** | 0.0002086847 | | 36.8050934157 |
| **9** | 0.0002084703 | | 36.8095573162 |
| **10** | 0.0002082297 | | 36.8145739637 |
| **11** | 0.0002081889 | | 36.8154233474 |
| **12** | 0.0002079562 | | 36.8202817730 |
| **13** | 0.0001594853 | | 37.9727942233 |
| **14** | 0.0001612101 | | 37.9260775096 |
| **15** | 0.0001620528 | | 37.9034355501 |
| **16** | 0.0001624513 | | 37.8927687819 |
| **17** | 0.0001643741 | | 37.8416657642 |
| **18** | 0.0001656910 | | 37.8070101288 |
| **19** | 0.0001657155 | | 37.8063685506 |
| **20** | 0.0001667449 | | 37.7794747240 |
| **21** | 0.0001667292 | | 37.7798833497 |
| **22** | 0.0001671794 | | 37.7681731155 |
| **23** | 0.0001678018 | | 37.7520342942 |
| **24** | 0.0001683835 | | 37.7370049937 |
| **25** | 0.0001600541 | | 37.9573319672 |
| **26** | 0.0001613843 | | 37.9213871025 |
| **27** | 0.0001621556 | | 37.9006792011 |
| **28** | 0.0001624661 | | 37.8923732524 |
| **29** | 0.0001659313 | | 37.8007165616 |
| **30** | 0.0001675707 | | 37.7580193717 |
| **31** | 0.0001676878 | | 37.7549864898 |
| **32** | 0.0001701777 | | 37.6909735269 |
| **33** | 0.0001705256 | | 37.6821042349 |
| **34** | 0.0001712654 | | 37.6633045591 |
| **35** | 0.0001719756 | | 37.6453318202 |
| **36** | 0.0001724062 | | 37.6344723486 |
| **37** | 0.0001606288 | | 37.9417654183 |
| **38** | 0.0001627706 | | 37.8842393494 |
| **39** | 0.0001638658 | | 37.8551167331 |
| **40** | 0.0001652151 | | 37.8195023882 |
| **41** | 0.0001661687 | | 37.7945078900 |
| **42** | 0.0001682800 | | 37.7396746135 |
| **43** | 0.0001682215 | | 37.7411860589 |
| **44** | 0.0001688217 | | 37.7257173835 |
| **45** | 0.0001694113 | | 37.7105766182 |
| **46** | 0.0001700926 | | 37.6931469891 |
| **47** | 0.0001713809 | | 37.6603752966 |
| **48** | 0.0001713300 | | 37.6616670043 |
| **49** | 0.0001608232 | | 37.9365128595 |
| **50** | 0.0001631632 | | 37.8737785412 |
| **Total** | 0.0090312276 | | 1874.8179921670 |
| **Average** | 0.0001806246 | | 37.4963598433 |
| **Encryption Algorithm** | | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | | **Wreckfest 2016 - New Update Racing New Track 1080p60** | |
| **Resolution** | | | **1080p** | |
| **Frame Number** | | **Mean Square Error** | | **Peak Signal-to-Noise Ratio** |
| **1** | | 0.0003533480 | | 34.5179734786 |
| **2** | | 0.0001996951 | | 36.9963253585 |
| **3** | | 0.0001932104 | | 37.1396949339 |
| **4** | | 0.0001944094 | | 37.1128270285 |
| **5** | | 0.0001932503 | | 37.1387987095 |
| **6** | | 0.0001932820 | | 37.1380861958 |
| **7** | | 0.0001927320 | | 37.1504624062 |
| **8** | | 0.0001927081 | | 37.1510006177 |
| **9** | | 0.0001917431 | | 37.1728017068 |
| **10** | | 0.0001919882 | | 37.1672539967 |
| **11** | | 0.0001921901 | | 37.1626901920 |
| **12** | | 0.0001921791 | | 37.1629385674 |
| **13** | | 0.0001479312 | | 38.2994009527 |
| **14** | | 0.0001532392 | | 38.1463002418 |
| **15** | | 0.0001525315 | | 38.1664052070 |
| **16** | | 0.0001575866 | | 38.0248069915 |
| **17** | | 0.0001604411 | | 37.9468429194 |
| **18** | | 0.0001607148 | | 37.9394410228 |
| **19** | | 0.0001602664 | | 37.9515751167 |
| **20** | | 0.0001616571 | | 37.9140532669 |
| **21** | | 0.0001620900 | | 37.9024375732 |
| **22** | | 0.0001619395 | | 37.9064721615 |
| **23** | | 0.0001624345 | | 37.8932180177 |
| **24** | | 0.0001634844 | | 37.8652378209 |
| **25** | | 0.0001479243 | | 38.2996060596 |
| **26** | | 0.0001504864 | | 38.2250272892 |
| **27** | | 0.0001519372 | | 38.1833594470 |
| **28** | | 0.0001524249 | | 38.1694417481 |
| **29** | | 0.0001526294 | | 38.1636175430 |
| **30** | | 0.0001539031 | | 38.1275259951 |
| **31** | | 0.0001543919 | | 38.1137561737 |
| **32** | | 0.0001546035 | | 38.1078075051 |
| **33** | | 0.0001552709 | | 38.0890986528 |
| **34** | | 0.0001560564 | | 38.0671852831 |
| **35** | | 0.0001560826 | | 38.0664557408 |
| **36** | | 0.0001572918 | | 38.0329401272 |
| **37** | | 0.0001482429 | | 38.2902611827 |
| **38** | | 0.0001517049 | | 38.1900041179 |
| **39** | | 0.0001522880 | | 38.1733419848 |
| **40** | | 0.0001534910 | | 38.1391702676 |
| **41** | | 0.0001559715 | | 38.0695462488 |
| **42** | | 0.0001564440 | | 38.0564100922 |
| **43** | | 0.0001977413 | | 37.0390255455 |
| **44** | | 0.0001997098 | | 36.9960053680 |
| **45** | | 0.0001968040 | | 37.0596610051 |
| **46** | | 0.0001968487 | | 37.0586736962 |
| **47** | | 0.0001970741 | | 37.0537044509 |
| **48** | | 0.0001979124 | | 37.0352694096 |
| **49** | | 0.0001655906 | | 37.8096433930 |
| **50** | | 0.0001700474 | | 37.6942994751 |
| **Total** | | 0.0086679252 | | 1883.2778822858 |
| **Average** | | 0.0001733585 | | 37.6655576457 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **DiRT Rally 2016 - Driving Rally With A BMW 1080p60** | |
| **Resolution** | | **1080p** | |
| **Frame Number** | **Mean Square Error** | | **Peak Signal-to-Noise Ratio** |
| **1** | 0.0005952003 | | 32.2533682656 |
| **2** | 0.0002354520 | | 36.2809753683 |
| **3** | 0.0002291249 | | 36.3992766973 |
| **4** | 0.0002281912 | | 36.4170102497 |
| **5** | 0.0002269168 | | 36.4413337798 |
| **6** | 0.0002270327 | | 36.4391151708 |
| **7** | 0.0002265567 | | 36.4482311758 |
| **8** | 0.0002267473 | | 36.4445782821 |
| **9** | 0.0002265216 | | 36.4489034459 |
| **10** | 0.0002266385 | | 36.4466636292 |
| **11** | 0.0002264214 | | 36.4508248589 |
| **12** | 0.0002265202 | | 36.4489313627 |
| **13** | 0.0001674120 | | 37.7621351745 |
| **14** | 0.0001710104 | | 37.6697745708 |
| **15** | 0.0001731939 | | 37.6146752576 |
| **16** | 0.0001749981 | | 37.5696666921 |
| **17** | 0.0001782578 | | 37.4895134687 |
| **18** | 0.0001812721 | | 37.4166891920 |
| **19** | 0.0001830816 | | 37.3735538276 |
| **20** | 0.0001850831 | | 37.3263323371 |
| **21** | 0.0001867178 | | 37.2881430834 |
| **22** | 0.0001882514 | | 37.2526167098 |
| **23** | 0.0001892699 | | 37.2291847490 |
| **24** | 0.0001905116 | | 37.2007855780 |
| **25** | 0.0001712550 | | 37.6635664797 |
| **26** | 0.0001735685 | | 37.6052904945 |
| **27** | 0.0001750891 | | 37.5674097930 |
| **28** | 0.0001774753 | | 37.5086216248 |
| **29** | 0.0001784421 | | 37.4850261624 |
| **30** | 0.0001799395 | | 37.4487346017 |
| **31** | 0.0001806980 | | 37.4304656425 |
| **32** | 0.0001817091 | | 37.4062329549 |
| **33** | 0.0001827282 | | 37.3819450034 |
| **34** | 0.0001839940 | | 37.3519637771 |
| **35** | 0.0001840845 | | 37.3498286270 |
| **36** | 0.0001851927 | | 37.3237617593 |
| **37** | 0.0001729969 | | 37.6196175969 |
| **38** | 0.0001750345 | | 37.5687627122 |
| **39** | 0.0001753744 | | 37.5603391576 |
| **40** | 0.0001764749 | | 37.5331704422 |
| **41** | 0.0001766115 | | 37.5298094107 |
| **42** | 0.0001773856 | | 37.5108155481 |
| **43** | 0.0001780940 | | 37.4935081580 |
| **44** | 0.0001786182 | | 37.4807433422 |
| **45** | 0.0001805380 | | 37.4343143033 |
| **46** | 0.0001839047 | | 37.3540710209 |
| **47** | 0.0001887587 | | 37.2409299172 |
| **48** | 0.0002017224 | | 36.9524594664 |
| **49** | 0.0001753740 | | 37.5603481569 |
| **50** | 0.0001843572 | | 37.3433986022 |
| **Total** | 0.0099498044 | | 1855.8174176816 |
| **Average** | 0.0001989961 | | 37.1163483536 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **FlatOut: Ultimate Carnage 1080p60 Action** | |
| **Resolution** | | **1080p** | |
| **Frame Number** | **Mean Square Error** | | **Peak Signal-to-Noise Ratio** |
| **1** | 0.0003794742 | | 34.2081779274 |
| **2** | 0.0001933137 | | 37.1373731326 |
| **3** | 0.0001872168 | | 37.2765524798 |
| **4** | 0.0001882002 | | 37.2538000020 |
| **5** | 0.0001872642 | | 37.2754532139 |
| **6** | 0.0001876292 | | 37.2669967254 |
| **7** | 0.0001873617 | | 37.2731907063 |
| **8** | 0.0001873174 | | 37.2742177535 |
| **9** | 0.0001871277 | | 37.2786195962 |
| **10** | 0.0001874901 | | 37.2702163854 |
| **11** | 0.0001873410 | | 37.2736721349 |
| **12** | 0.0001874360 | | 37.2714708132 |
| **13** | 0.0001449662 | | 38.3873325285 |
| **14** | 0.0001469661 | | 38.3278277662 |
| **15** | 0.0001464442 | | 38.3432786927 |
| **16** | 0.0001470517 | | 38.3252993203 |
| **17** | 0.0001472491 | | 38.3194724353 |
| **18** | 0.0001474082 | | 38.3147822154 |
| **19** | 0.0001476817 | | 38.3067338402 |
| **20** | 0.0001483457 | | 38.2872516233 |
| **21** | 0.0001485035 | | 38.2826335754 |
| **22** | 0.0001491571 | | 38.2635610223 |
| **23** | 0.0001490368 | | 38.2670658626 |
| **24** | 0.0001493835 | | 38.2569742774 |
| **25** | 0.0001499197 | | 38.2414117410 |
| **26** | 0.0001528150 | | 38.1583411027 |
| **27** | 0.0001524852 | | 38.1677227875 |
| **28** | 0.0001544269 | | 38.1127705591 |
| **29** | 0.0001541469 | | 38.1206525520 |
| **30** | 0.0001552651 | | 38.0892610109 |
| **31** | 0.0001555867 | | 38.0802747642 |
| **32** | 0.0001560489 | | 38.0673925078 |
| **33** | 0.0001561593 | | 38.0643228510 |
| **34** | 0.0001571505 | | 38.0368411004 |
| **35** | 0.0001570482 | | 38.0396696785 |
| **36** | 0.0001572736 | | 38.0334422599 |
| **37** | 0.0001537421 | | 38.1320732790 |
| **38** | 0.0001571369 | | 38.0372170764 |
| **39** | 0.0001559265 | | 38.0708013009 |
| **40** | 0.0001569623 | | 38.0420452098 |
| **41** | 0.0001563818 | | 38.0581368996 |
| **42** | 0.0001567083 | | 38.0490812945 |
| **43** | 0.0001596000 | | 37.9696714791 |
| **44** | 0.0001605910 | | 37.9427880519 |
| **45** | 0.0001596499 | | 37.9683145754 |
| **46** | 0.0001609114 | | 37.9341316226 |
| **47** | 0.0001606650 | | 37.9407878646 |
| **48** | 0.0001646373 | | 37.8347171214 |
| **49** | 0.0001549502 | | 38.0980776273 |
| **50** | 0.0001659553 | | 37.8000877515 |
| **Total** | 0.0083015099 | | 1892.8319880992 |
| **Average** | 0.0001660302 | | 37.8566397620 |

# PROCESSING TIME

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **VID\_20200717\_171254** | |
| **Resolution** | | **1080p** | |
| **Frame Number** | **Encryption (In seconds)** | | **Decryption (In seconds)** |
| **1** | 0.7682309151 | | 0.9041743279 |
| **2** | 0.7254314423 | | 0.7753074169 |
| **3** | 0.7233672142 | | 0.7580845356 |
| **4** | 0.7306780815 | | 0.7295014858 |
| **5** | 0.7295470238 | | 0.7288663387 |
| **6** | 0.7256069183 | | 0.7393457890 |
| **7** | 0.7399492264 | | 0.7275085449 |
| **8** | 0.7281870842 | | 0.7288510799 |
| **9** | 0.7239532471 | | 0.7139012814 |
| **10** | 0.7259967327 | | 0.7115561962 |
| **11** | 0.7318375111 | | 0.7103102207 |
| **12** | 0.7285845280 | | 0.7102096081 |
| **13** | 0.7241215706 | | 0.7177877426 |
| **14** | 0.7245180607 | | 0.7144052982 |
| **15** | 0.7260899544 | | 0.7171587944 |
| **16** | 0.7278497219 | | 0.7546200752 |
| **17** | 0.7306046486 | | 0.7540218830 |
| **18** | 0.7291018963 | | 0.7186396122 |
| **19** | 0.7257401943 | | 0.7152011395 |
| **20** | 0.7289962769 | | 0.7118499279 |
| **21** | 0.7286546230 | | 0.7160651684 |
| **22** | 0.7303826809 | | 0.7174773216 |
| **23** | 0.7231333256 | | 0.7348022461 |
| **24** | 0.7344341278 | | 0.7178459167 |
| **25** | 0.7189016342 | | 0.7102351189 |
| **26** | 0.7203991413 | | 0.7100577354 |
| **27** | 0.7253849506 | | 0.7078015804 |
| **28** | 0.7237079144 | | 0.7162406445 |
| **29** | 0.7210597992 | | 0.7150840759 |
| **30** | 0.7221817970 | | 0.7168607712 |
| **31** | 0.7227244377 | | 0.7155220509 |
| **32** | 0.7235422134 | | 0.7109470367 |
| **33** | 0.7264726162 | | 0.7096343040 |
| **34** | 0.7240831852 | | 0.7121210098 |
| **35** | 0.7270436287 | | 0.7121770382 |
| **36** | 0.7227995396 | | 0.7132065296 |
| **37** | 0.7283117771 | | 0.7305419445 |
| **38** | 0.7293243408 | | 0.7119765282 |
| **39** | 0.7294268608 | | 0.7143366337 |
| **40** | 0.7289385796 | | 0.7139022350 |
| **41** | 0.7271239758 | | 0.7121298313 |
| **42** | 0.7292585373 | | 0.7157964706 |
| **43** | 0.7757380009 | | 0.7222583294 |
| **44** | 0.7288606167 | | 0.7157299519 |
| **45** | 0.7295475006 | | 0.7127323151 |
| **46** | 0.7279469967 | | 0.7113397121 |
| **47** | 0.7273013592 | | 0.7144489288 |
| **48** | 0.7299723625 | | 0.7106590271 |
| **49** | 0.7265720367 | | 0.7148203850 |
| **50** | 0.7525801659 | | 0.7151658535 |
| **Total** | 36.4642009735 | | 36.1932179928 |
| **Average** | 0.7292840195 | | 0.7238643599 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **VID\_20200717\_171657\_01** | |
| **Resolution** | | **1080p** | |
| **Frame Number** | **Encryption (In seconds)** | | **Decryption (In seconds)** |
| **1** | 0.7743453979 | | 0.8462903500 |
| **2** | 0.7249574661 | | 0.7424449921 |
| **3** | 0.7591631413 | | 0.7273755074 |
| **4** | 0.7346251011 | | 0.7102127075 |
| **5** | 0.7121164799 | | 0.7059466839 |
| **6** | 0.7211122513 | | 0.7087152004 |
| **7** | 0.7282335758 | | 0.7072250843 |
| **8** | 0.7206227779 | | 0.7116627693 |
| **9** | 0.7178676128 | | 0.7058496475 |
| **10** | 0.7142074108 | | 0.7110047340 |
| **11** | 0.7178592682 | | 0.7085392475 |
| **12** | 0.7199170589 | | 0.7085921764 |
| **13** | 0.7212097645 | | 0.7136039734 |
| **14** | 0.7277641296 | | 0.7072002888 |
| **15** | 0.7195389271 | | 0.7059743404 |
| **16** | 0.7235441208 | | 0.7132999897 |
| **17** | 0.7152044773 | | 0.7036402225 |
| **18** | 0.7200801373 | | 0.7112476826 |
| **19** | 0.7273454666 | | 0.7127745152 |
| **20** | 0.7147483826 | | 0.7042293549 |
| **21** | 0.7206118107 | | 0.7056643963 |
| **22** | 0.7213990688 | | 0.7071146965 |
| **23** | 0.7186822891 | | 0.7065687180 |
| **24** | 0.7244997025 | | 0.7089385986 |
| **25** | 0.7153849602 | | 0.7066004276 |
| **26** | 0.7225728035 | | 0.7087635994 |
| **27** | 0.7182364464 | | 0.7089710236 |
| **28** | 0.7213199139 | | 0.7076292038 |
| **29** | 0.7206366062 | | 0.7077934742 |
| **30** | 0.7266621590 | | 0.7019982338 |
| **31** | 0.7290132046 | | 0.7070910931 |
| **32** | 0.7275502682 | | 0.7044718266 |
| **33** | 0.7230670452 | | 0.7067990303 |
| **34** | 0.7276368141 | | 0.7071518898 |
| **35** | 0.7506027222 | | 0.7102715969 |
| **36** | 0.7569160461 | | 0.7084107399 |
| **37** | 0.7465324402 | | 0.7096655369 |
| **38** | 0.7231724262 | | 0.7083787918 |
| **39** | 0.7157540321 | | 0.7096786499 |
| **40** | 0.7263813019 | | 0.7076687813 |
| **41** | 0.7226655483 | | 0.7074854374 |
| **42** | 0.7228462696 | | 0.7096059322 |
| **43** | 0.7787415981 | | 0.7058486938 |
| **44** | 0.7225153446 | | 0.7033841610 |
| **45** | 0.7168939114 | | 0.7048304081 |
| **46** | 0.7490046024 | | 0.7038383484 |
| **47** | 0.7464208603 | | 0.7012474537 |
| **48** | 0.7226490974 | | 0.7062246799 |
| **49** | 0.7371358871 | | 0.7098622322 |
| **50** | 0.7247357368 | | 0.7041628361 |
| **Total** | 36.3947038651 | | 35.5719499588 |
| **Average** | 0.7278940773 | | 0.7114389992 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **VID\_20200717\_171835** | |
| **Resolution** | | **1080p** | |
| **Frame Number** | **Encryption (In seconds)** | | **Decryption (In seconds)** |
| **1** | 0.7826631069 | | 0.8333153725 |
| **2** | 0.7469000816 | | 0.7170517445 |
| **3** | 0.7366807461 | | 0.7174544334 |
| **4** | 0.7165114880 | | 0.7164876461 |
| **5** | 0.7236568928 | | 0.7126538754 |
| **6** | 0.7205297947 | | 0.7226283550 |
| **7** | 0.7245483398 | | 0.7111258507 |
| **8** | 0.7211980820 | | 0.7136521339 |
| **9** | 0.7176504135 | | 0.7116401196 |
| **10** | 0.7298593521 | | 0.7278954983 |
| **11** | 0.7214732170 | | 0.7148392200 |
| **12** | 0.7178032398 | | 0.7141830921 |
| **13** | 0.7203962803 | | 0.7110221386 |
| **14** | 0.7208282948 | | 0.7100155354 |
| **15** | 0.7250339985 | | 0.7121219635 |
| **16** | 0.7249429226 | | 0.7090005875 |
| **17** | 0.7235012054 | | 0.7131814957 |
| **18** | 0.7268350124 | | 0.7118611336 |
| **19** | 0.7237484455 | | 0.7116603851 |
| **20** | 0.7231981754 | | 0.7126882076 |
| **21** | 0.7248780727 | | 0.7085540295 |
| **22** | 0.7220935822 | | 0.7078685760 |
| **23** | 0.7194266319 | | 0.7150251865 |
| **24** | 0.7233881950 | | 0.7142980099 |
| **25** | 0.7206363678 | | 0.7086944580 |
| **26** | 0.7236473560 | | 0.7140164375 |
| **27** | 0.7218401432 | | 0.7125270367 |
| **28** | 0.7209556103 | | 0.7129659653 |
| **29** | 0.7222914696 | | 0.7161631584 |
| **30** | 0.7239539623 | | 0.7130906582 |
| **31** | 0.7219336033 | | 0.7145390511 |
| **32** | 0.7226898670 | | 0.7140326500 |
| **33** | 0.7265472412 | | 0.7193429470 |
| **34** | 0.7234861851 | | 0.7104148865 |
| **35** | 0.7223508358 | | 0.7154686451 |
| **36** | 0.7274935246 | | 0.7120633125 |
| **37** | 0.7224793434 | | 0.7089521885 |
| **38** | 0.7238659859 | | 0.7101454735 |
| **39** | 0.7245261669 | | 0.7092936039 |
| **40** | 0.7268574238 | | 0.7026906013 |
| **41** | 0.7310039997 | | 0.7118752003 |
| **42** | 0.7317550182 | | 0.7078599930 |
| **43** | 0.7596974373 | | 0.7116713524 |
| **44** | 0.7230851650 | | 0.7086009979 |
| **45** | 0.7272078991 | | 0.7086880207 |
| **46** | 0.7267730236 | | 0.7098476887 |
| **47** | 0.7297091484 | | 0.7073020935 |
| **48** | 0.7288897038 | | 0.7065069675 |
| **49** | 0.7440292835 | | 0.7096233368 |
| **50** | 0.7336673737 | | 0.7077074051 |
| **Total** | 36.3491187096 | | 35.7343087196 |
| **Average** | 0.7269823742 | | 0.7146861744 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **VID\_20200717\_171931** | |
| **Resolution** | | **1080p** | |
| **Frame Number** | **Encryption (In seconds)** | | **Decryption (In seconds)** |
| **1** | 0.7699229717 | | 0.8473188877 |
| **2** | 0.7333641052 | | 0.7292485237 |
| **3** | 0.7262992859 | | 0.7266099453 |
| **4** | 0.7310788631 | | 0.7232403755 |
| **5** | 0.7210948467 | | 0.7201659679 |
| **6** | 0.7230365276 | | 0.7519793510 |
| **7** | 0.8432931900 | | 0.7313177586 |
| **8** | 1.0018119812 | | 0.7171959877 |
| **9** | 1.0050976276 | | 0.7139637470 |
| **10** | 0.7665495872 | | 0.7168724537 |
| **11** | 0.7615365982 | | 0.7175624371 |
| **12** | 0.7287907600 | | 0.7141435146 |
| **13** | 0.7239050865 | | 0.7162988186 |
| **14** | 0.7222564220 | | 0.7240788937 |
| **15** | 0.7244019508 | | 0.7158696651 |
| **16** | 0.7242569923 | | 0.7108833790 |
| **17** | 0.7219223976 | | 0.7320103645 |
| **18** | 0.7243397236 | | 0.7104327679 |
| **19** | 0.7257912159 | | 0.7247011662 |
| **20** | 0.7260246277 | | 0.7139229774 |
| **21** | 0.7244949341 | | 0.7109649181 |
| **22** | 0.7242310047 | | 0.7087416649 |
| **23** | 0.7317001820 | | 0.7098472118 |
| **24** | 0.7266621590 | | 0.7102749348 |
| **25** | 0.7254612446 | | 0.7119519711 |
| **26** | 0.7277212143 | | 0.7127757072 |
| **27** | 0.7294790745 | | 0.7160203457 |
| **28** | 0.7296478748 | | 0.7136192322 |
| **29** | 0.7295432091 | | 0.7760338783 |
| **30** | 0.7279684544 | | 0.7479076385 |
| **31** | 0.7314007282 | | 0.7144117355 |
| **32** | 0.7258374691 | | 0.7086429596 |
| **33** | 0.7272169590 | | 0.7135214806 |
| **34** | 0.7245113850 | | 0.7421989441 |
| **35** | 0.7254133224 | | 0.7532932758 |
| **36** | 0.7229945660 | | 0.7509105206 |
| **37** | 0.7245495319 | | 0.7516844273 |
| **38** | 0.7254252434 | | 0.7448723316 |
| **39** | 0.7279255390 | | 0.7240307331 |
| **40** | 0.7239899635 | | 0.7099194527 |
| **41** | 0.7653212547 | | 0.7189760208 |
| **42** | 0.7293334007 | | 0.7097420692 |
| **43** | 0.7306282520 | | 0.7336575985 |
| **44** | 0.7262644768 | | 0.7431910038 |
| **45** | 0.7305128574 | | 0.7123057842 |
| **46** | 0.7304835320 | | 0.7137577534 |
| **47** | 0.7285923958 | | 0.7116582394 |
| **48** | 0.7523832321 | | 0.7076373100 |
| **49** | 0.7263746262 | | 0.7181565762 |
| **50** | 0.7247517109 | | 0.7130215168 |
| **Total** | 37.1855945587 | | 36.2715442181 |
| **Average** | 0.7437118912 | | 0.7254308844 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **VID\_20200717\_172041** | |
| **Resolution** | | **1080p** | |
| **Frame Number** | **Encryption (In seconds)** | | **Decryption (In seconds)** |
| **1** | 0.8241229057 | | 0.8310966492 |
| **2** | 0.7562179565 | | 0.7445716858 |
| **3** | 0.7330739498 | | 0.7274415493 |
| **4** | 0.7344145775 | | 0.7278990746 |
| **5** | 0.7328660488 | | 0.7312321663 |
| **6** | 0.7290503979 | | 0.7199463844 |
| **7** | 0.7438688278 | | 0.7226278782 |
| **8** | 0.7308380604 | | 0.7168803215 |
| **9** | 0.7306070328 | | 0.7178006172 |
| **10** | 0.7298452854 | | 0.7127914429 |
| **11** | 0.7302021980 | | 0.7196996212 |
| **12** | 0.7319598198 | | 0.7133154869 |
| **13** | 0.7322640419 | | 0.7200539112 |
| **14** | 0.7292525768 | | 0.7184154987 |
| **15** | 0.7313468456 | | 0.7312045097 |
| **16** | 0.7358014584 | | 0.7296915054 |
| **17** | 0.7300097942 | | 0.7239785194 |
| **18** | 0.7293317318 | | 0.7749147415 |
| **19** | 0.7347345352 | | 0.7568001747 |
| **20** | 0.7290832996 | | 0.7360289097 |
| **21** | 0.7421278954 | | 0.7169432640 |
| **22** | 0.7316851616 | | 0.7164363861 |
| **23** | 0.7335500717 | | 0.7147850990 |
| **24** | 0.7244906425 | | 0.7211210728 |
| **25** | 0.7324934006 | | 0.7201106548 |
| **26** | 0.7296359539 | | 0.7182083130 |
| **27** | 0.7296373844 | | 0.7164094448 |
| **28** | 0.7320070267 | | 0.7112488747 |
| **29** | 0.7306251526 | | 0.7193713188 |
| **30** | 0.7298693657 | | 0.7201919556 |
| **31** | 0.7334499359 | | 0.7165122032 |
| **32** | 0.7366838455 | | 0.7670297623 |
| **33** | 0.7307074070 | | 0.7526519299 |
| **34** | 0.7229642868 | | 0.7554631233 |
| **35** | 0.7347261906 | | 0.7145602703 |
| **36** | 0.7296009064 | | 0.7125732899 |
| **37** | 0.7279665470 | | 0.7131316662 |
| **38** | 0.7314565182 | | 0.7128880024 |
| **39** | 0.7323801517 | | 0.7114200592 |
| **40** | 0.7273352146 | | 0.7088057995 |
| **41** | 0.7283027172 | | 0.7124319077 |
| **42** | 0.7267458439 | | 0.7174243927 |
| **43** | 0.7294771671 | | 0.7122058868 |
| **44** | 0.7284462452 | | 0.7082705498 |
| **45** | 0.7309427261 | | 0.7149336338 |
| **46** | 0.7260618210 | | 0.7091975212 |
| **47** | 0.7295262814 | | 0.7081091404 |
| **48** | 0.7267563343 | | 0.7077741623 |
| **49** | 0.7951521873 | | 0.7368106842 |
| **50** | 0.7256710529 | | 0.7488446236 |
| **Total** | 36.7293667793 | | 36.2922556400 |
| **Average** | 0.7345873356 | | 0.7258451128 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **Star Citizen: 325a Dream Weapons Combat Test AC - ULTRA 1080p60** | |
| **Resolution** | | **1080p** | |
| **Frame Number** | **Encryption (In seconds)** | | **Decryption (In seconds)** |
| **1** | 0.8011612892 | | 0.8272545338 |
| **2** | 0.7244019508 | | 0.7190592289 |
| **3** | 0.7198059559 | | 0.7151036263 |
| **4** | 0.7203466892 | | 0.7154486179 |
| **5** | 0.7179288864 | | 0.7143712044 |
| **6** | 0.7219245434 | | 0.7101976871 |
| **7** | 0.7295470238 | | 0.7099938393 |
| **8** | 0.7269113064 | | 0.7039349079 |
| **9** | 0.7219991684 | | 0.7089147568 |
| **10** | 0.7215857506 | | 0.7274374962 |
| **11** | 0.7217783928 | | 0.7079660892 |
| **12** | 0.7213897705 | | 0.7123508453 |
| **13** | 0.7244615555 | | 0.7146029472 |
| **14** | 0.7191524506 | | 0.7133462429 |
| **15** | 0.7207007408 | | 0.7160792351 |
| **16** | 0.7181520462 | | 0.7105734348 |
| **17** | 0.7222189903 | | 0.7110328674 |
| **18** | 0.7205379009 | | 0.7132906914 |
| **19** | 0.7190063000 | | 0.7174739838 |
| **20** | 0.7181875706 | | 0.7139880657 |
| **21** | 0.7224960327 | | 0.7086853981 |
| **22** | 0.7218778133 | | 0.7081255913 |
| **23** | 0.7184414864 | | 0.7067322731 |
| **24** | 0.7227654457 | | 0.7137236595 |
| **25** | 0.7146337032 | | 0.7103679180 |
| **26** | 0.7133023739 | | 0.7007908821 |
| **27** | 0.7153801918 | | 0.7073810101 |
| **28** | 0.7115850449 | | 0.7089257240 |
| **29** | 0.7131145000 | | 0.7123696804 |
| **30** | 0.7139174938 | | 0.7098972797 |
| **31** | 0.7133445740 | | 0.7068576813 |
| **32** | 0.7211556435 | | 0.7138664722 |
| **33** | 0.7352468967 | | 0.7346034050 |
| **34** | 0.7499043941 | | 0.7476906776 |
| **35** | 0.7170774937 | | 0.7034382820 |
| **36** | 0.7171123028 | | 0.7079851627 |
| **37** | 0.7189445496 | | 0.7103188038 |
| **38** | 0.7160558701 | | 0.7045440674 |
| **39** | 0.7165367603 | | 0.7018642426 |
| **40** | 0.7221977711 | | 0.7038226128 |
| **41** | 0.7175538540 | | 0.7002279758 |
| **42** | 0.7190327644 | | 0.6979322433 |
| **43** | 0.7602987289 | | 0.7035183907 |
| **44** | 0.7156157494 | | 0.6977546215 |
| **45** | 0.7162337303 | | 0.7021515369 |
| **46** | 0.7170650959 | | 0.7000167370 |
| **47** | 0.7167735100 | | 0.7028203011 |
| **48** | 0.7200901508 | | 0.7006785870 |
| **49** | 0.7150895596 | | 0.7051362991 |
| **50** | 0.7394311428 | | 0.7002475262 |
| **Total** | 36.1434729099 | | 35.6148953438 |
| **Average** | 0.7228694582 | | 0.7122979069 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **Wreckfest 2016 - Racing 2 1080p60 HD HQ** | |
| **Resolution** | | **1080p** | |
| **Frame Number** | **Encryption (In seconds)** | | **Decryption (In seconds)** |
| **1** | 0.7873041630 | | 0.8689773083 |
| **2** | 0.7243442535 | | 0.7574737072 |
| **3** | 0.7189610004 | | 0.7215685844 |
| **4** | 0.7180845737 | | 0.7142164707 |
| **5** | 0.7190699577 | | 0.7076885700 |
| **6** | 0.7207386494 | | 0.7113449574 |
| **7** | 0.7344822884 | | 0.7099859715 |
| **8** | 0.7237029076 | | 0.7118299007 |
| **9** | 0.7212414742 | | 0.7117662430 |
| **10** | 0.7191443443 | | 0.7133562565 |
| **11** | 0.7197322845 | | 0.7113134861 |
| **12** | 0.7196037769 | | 0.7095954418 |
| **13** | 0.7201941013 | | 0.7188978195 |
| **14** | 0.7208020687 | | 0.7131187916 |
| **15** | 0.7209005356 | | 0.7129492760 |
| **16** | 0.7204484940 | | 0.7113521099 |
| **17** | 0.7178092003 | | 0.7116460800 |
| **18** | 0.7190756798 | | 0.7090442181 |
| **19** | 0.7188656330 | | 0.7071444988 |
| **20** | 0.7201650143 | | 0.7074325085 |
| **21** | 0.7244594097 | | 0.7114562988 |
| **22** | 0.7264332771 | | 0.7128043175 |
| **23** | 0.7226171494 | | 0.7121207714 |
| **24** | 0.7186491489 | | 0.7109994888 |
| **25** | 0.7217123508 | | 0.7157611847 |
| **26** | 0.7207653522 | | 0.7099523544 |
| **27** | 0.7275736332 | | 0.7155611515 |
| **28** | 0.7235393524 | | 0.7075281143 |
| **29** | 0.7268476486 | | 0.7119543552 |
| **30** | 0.7236814499 | | 0.7089993954 |
| **31** | 0.7244629860 | | 0.7170577049 |
| **32** | 0.7196383476 | | 0.7134056091 |
| **33** | 0.7211921215 | | 0.7176985741 |
| **34** | 0.7259635925 | | 0.7111358643 |
| **35** | 0.7206642628 | | 0.7059957981 |
| **36** | 0.7201263905 | | 0.7123587132 |
| **37** | 0.7213633060 | | 0.7121539116 |
| **38** | 0.7211406231 | | 0.7108519077 |
| **39** | 0.7247257233 | | 0.7115752697 |
| **40** | 0.7214636803 | | 0.7074432373 |
| **41** | 0.7257924080 | | 0.7087714672 |
| **42** | 0.7295408249 | | 0.7097175121 |
| **43** | 0.7262985706 | | 0.7072529793 |
| **44** | 0.7253723145 | | 0.7096807957 |
| **45** | 0.7239000797 | | 0.7109937668 |
| **46** | 0.7251782417 | | 0.7112143040 |
| **47** | 0.7267158031 | | 0.7129628658 |
| **48** | 0.7263343334 | | 0.7119951248 |
| **49** | 0.7270791531 | | 0.7180938721 |
| **50** | 0.7831466198 | | 0.7087526321 |
| **Total** | 36.2610485554 | | 35.7869515419 |
| **Average** | 0.7252209711 | | 0.7157390308 |
| **Encryption Algorithm** | | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | | **Wreckfest 2016 - New Update Racing New Track 1080p60** | |
| **Resolution** | | | **1080p** | |
| **Frame Number** | | **Encryption (In seconds)** | | **Decryption (In seconds)** |
| **1** | | 0.7650487423 | | 0.8562576771 |
| **2** | | 0.7207589149 | | 0.7704069614 |
| **3** | | 0.7298650742 | | 0.7091326714 |
| **4** | | 0.7181384563 | | 0.7085945606 |
| **5** | | 0.7183833122 | | 0.7164590359 |
| **6** | | 0.7164311409 | | 0.7121810913 |
| **7** | | 0.7288770676 | | 0.7114045620 |
| **8** | | 0.7188544273 | | 0.7105822563 |
| **9** | | 0.7175207138 | | 0.7094202042 |
| **10** | | 0.7213628292 | | 0.7085723877 |
| **11** | | 0.7154037952 | | 0.7100787163 |
| **12** | | 0.7182939053 | | 0.7077360153 |
| **13** | | 0.7199778557 | | 0.7142760754 |
| **14** | | 0.7181122303 | | 0.7138328552 |
| **15** | | 0.7212946415 | | 0.7097470760 |
| **16** | | 0.7173402309 | | 0.7069983482 |
| **17** | | 0.7159922123 | | 0.7095630169 |
| **18** | | 0.7210211754 | | 0.7116706371 |
| **19** | | 0.7173347473 | | 0.7140097618 |
| **20** | | 0.7245004177 | | 0.7062540054 |
| **21** | | 0.7198719978 | | 0.7129247189 |
| **22** | | 0.7191247940 | | 0.7054760456 |
| **23** | | 0.7204942703 | | 0.7078938484 |
| **24** | | 0.7234492302 | | 0.7149827480 |
| **25** | | 0.7240972519 | | 0.7153198719 |
| **26** | | 0.7217583656 | | 0.7109193802 |
| **27** | | 0.7179918289 | | 0.7097332478 |
| **28** | | 0.7158176899 | | 0.7147951126 |
| **29** | | 0.7182323933 | | 0.7089662552 |
| **30** | | 0.7221119404 | | 0.7127993107 |
| **31** | | 0.7220437527 | | 0.7110962868 |
| **32** | | 0.7195060253 | | 0.7135531902 |
| **33** | | 0.7178425789 | | 0.7509419918 |
| **34** | | 0.7213270664 | | 0.7189900875 |
| **35** | | 0.7524681091 | | 0.7151176929 |
| **36** | | 0.7257864475 | | 0.7117695808 |
| **37** | | 0.7199797630 | | 0.7140812874 |
| **38** | | 0.7401056290 | | 0.7428736687 |
| **39** | | 0.7388288975 | | 0.7111959457 |
| **40** | | 0.7206807137 | | 0.7035934925 |
| **41** | | 0.7218339443 | | 0.7072956562 |
| **42** | | 0.7209143639 | | 0.7074577808 |
| **43** | | 0.7625081539 | | 0.7157151699 |
| **44** | | 0.7187466621 | | 0.7081427574 |
| **45** | | 0.7222433090 | | 0.7071104050 |
| **46** | | 0.7218027115 | | 0.7052361965 |
| **47** | | 0.7242081165 | | 0.7070450783 |
| **48** | | 0.7187640667 | | 0.7067379951 |
| **49** | | 0.7201192379 | | 0.7134571075 |
| **50** | | 0.7589900494 | | 0.7081489563 |
| **Total** | | 36.2161612511 | | 35.8105487823 |
| **Average** | | 0.7243232250 | | 0.7162109756 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **DiRT Rally 2016 - Driving Rally With A BMW 1080p60** | |
| **Resolution** | | **1080p** | |
| **Frame Number** | **Encryption (In seconds)** | | **Decryption (In seconds)** |
| **1** | 0.7902631760 | | 0.8748524189 |
| **2** | 0.7381982803 | | 0.7532935143 |
| **3** | 0.7358722687 | | 0.7213253975 |
| **4** | 0.7317874432 | | 0.7254283428 |
| **5** | 0.7375502586 | | 0.7131819725 |
| **6** | 0.7355854511 | | 0.7139685154 |
| **7** | 0.7521057129 | | 0.7144708633 |
| **8** | 0.7495098114 | | 0.7131881714 |
| **9** | 0.7330021858 | | 0.7116014957 |
| **10** | 0.7357139587 | | 0.7147500515 |
| **11** | 0.7323977947 | | 0.7123296261 |
| **12** | 0.7347509861 | | 0.7636065483 |
| **13** | 0.7313423157 | | 0.7204461098 |
| **14** | 0.7390873432 | | 0.7086095810 |
| **15** | 0.7329928875 | | 0.7139024734 |
| **16** | 0.7402231693 | | 0.7098846436 |
| **17** | 0.7310848236 | | 0.7161250114 |
| **18** | 0.7348861694 | | 0.7117238045 |
| **19** | 0.7370102406 | | 0.7052564621 |
| **20** | 0.7349920273 | | 0.7142055035 |
| **21** | 0.7346560955 | | 0.7050254345 |
| **22** | 0.7358405590 | | 0.7113461494 |
| **23** | 0.7332544327 | | 0.7114255428 |
| **24** | 0.7345056534 | | 0.7085931301 |
| **25** | 0.7323048115 | | 0.7162966728 |
| **26** | 0.7329430580 | | 0.7072205544 |
| **27** | 0.7351419926 | | 0.7086713314 |
| **28** | 0.7368185520 | | 0.7090339661 |
| **29** | 0.7332921028 | | 0.7084784508 |
| **30** | 0.7351939678 | | 0.7451348305 |
| **31** | 0.7312071323 | | 0.7200257778 |
| **32** | 0.7365486622 | | 0.7148647308 |
| **33** | 0.7301132679 | | 0.7123410702 |
| **34** | 0.7337512970 | | 0.7120344639 |
| **35** | 0.7343332767 | | 0.7123935223 |
| **36** | 0.7366576195 | | 0.7088897228 |
| **37** | 0.7334816456 | | 0.7165131569 |
| **38** | 0.7368285656 | | 0.7057528496 |
| **39** | 0.7349350452 | | 0.7107329369 |
| **40** | 0.7748255730 | | 0.7062222958 |
| **41** | 0.7718422413 | | 0.7066595554 |
| **42** | 0.8090789318 | | 0.7138559818 |
| **43** | 0.7373421192 | | 0.7079718113 |
| **44** | 0.7354738712 | | 0.7060141563 |
| **45** | 0.7329552174 | | 0.7069447041 |
| **46** | 0.7330951691 | | 0.7429146767 |
| **47** | 0.7440941334 | | 0.7566630840 |
| **48** | 0.7400679588 | | 0.7499189377 |
| **49** | 0.7546145916 | | 0.7563538551 |
| **50** | 0.7374162674 | | 0.7460579872 |
| **Total** | 37.0109701157 | | 36.0765018463 |
| **Average** | 0.7402194023 | | 0.7215300369 |

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| **Encryption Algorithm** | | **Modified Permutation Approach Using Logistic Maps-Integrated Fisher-Yates Shuffling Algorithm** | |
| **Video Stream** | | **FlatOut: Ultimate Carnage 1080p60 Action** | |
| **Resolution** | | **1080p** | |
| **Frame Number** | **Encryption (In seconds)** | | **Decryption (In seconds)** |
| **1** | 0.7704970837 | | 0.8214249611 |
| **2** | 0.7256841660 | | 0.7256958485 |
| **3** | 0.7235560417 | | 0.7171144485 |
| **4** | 0.7208306789 | | 0.7152879238 |
| **5** | 0.7345004082 | | 0.7127966881 |
| **6** | 0.7343394756 | | 0.7109341621 |
| **7** | 0.7188427448 | | 0.7128903866 |
| **8** | 0.7234427929 | | 0.7119870186 |
| **9** | 0.7220726013 | | 0.7633702755 |
| **10** | 0.7210826874 | | 0.7403006554 |
| **11** | 0.7263915539 | | 0.7131316662 |
| **12** | 0.7258973122 | | 0.7191236019 |
| **13** | 0.7249860764 | | 0.7167074680 |
| **14** | 0.7228891850 | | 0.7351238728 |
| **15** | 0.7239151001 | | 0.7129900455 |
| **16** | 0.7239453793 | | 0.7137701511 |
| **17** | 0.7226672173 | | 0.7096021175 |
| **18** | 0.7228949070 | | 0.7105076313 |
| **19** | 0.7208654881 | | 0.7156338692 |
| **20** | 0.7223041058 | | 0.7107105255 |
| **21** | 0.7194023132 | | 0.7122581005 |
| **22** | 0.7204573154 | | 0.7148363590 |
| **23** | 0.7557468414 | | 0.7124099731 |
| **24** | 0.7244982719 | | 0.7087516785 |
| **25** | 0.7240352631 | | 0.7128643990 |
| **26** | 0.7195689678 | | 0.7083828449 |
| **27** | 0.7267718315 | | 0.7072501183 |
| **28** | 0.7226376534 | | 0.7067813873 |
| **29** | 0.7252705097 | | 0.7194664478 |
| **30** | 0.7343368530 | | 0.7197003365 |
| **31** | 0.7225782871 | | 0.7132482529 |
| **32** | 0.7174639702 | | 0.7108914852 |
| **33** | 0.7220277786 | | 0.7253637314 |
| **34** | 0.7202334404 | | 0.7086076736 |
| **35** | 0.7195909023 | | 0.7151844501 |
| **36** | 0.7183618546 | | 0.7227017879 |
| **37** | 0.7225220203 | | 0.7202494144 |
| **38** | 0.7197413445 | | 0.7071888447 |
| **39** | 0.7237360477 | | 0.7132740021 |
| **40** | 0.7214808464 | | 0.7085945606 |
| **41** | 0.7241563797 | | 0.7087314129 |
| **42** | 0.7245705128 | | 0.7074728012 |
| **43** | 0.7279145718 | | 0.7147583961 |
| **44** | 0.7451465130 | | 0.7114021778 |
| **45** | 0.7686228752 | | 0.7082715034 |
| **46** | 0.7492294312 | | 0.7099251747 |
| **47** | 0.7239575386 | | 0.7099547386 |
| **48** | 0.7262051105 | | 0.7099506855 |
| **49** | 0.7294628620 | | 0.7162246704 |
| **50** | 0.7241170406 | | 0.7106571198 |
| **Total** | 36.3554501534 | | 35.8644578457 |
| **Average** | 0.7271090031 | | 0.7172891569 |