

## **A comparative analysis of image compression algorithms**

Neural Networks v/s JPEG compression

Performance and Time Comparisons

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Please note : Images are analysed on separate pages, the analysis is self explanatory  
PSNR stands for Peak Signal to Noise Ratio, and its in deciBel(dB) units

Image lena.bmp  
Neural Network Compression Time

real 0m13.704s  
user 0m53.555s  
sys 0m0.032s

Neural Network Decompression Time

real 0m2.159s  
user 0m2.152s  
sys 0m0.000s

Neural Network Performance

Images Compared

lena.bmp

lena\_neu.bmp

PSNR RED = 41.3265PSNR GREEN = 41.2804PSNR BLUE = 41.1619

JPEG Compression Time

real 0m4.584s  
user 0m4.444s  
sys 0m0.016s

JPEG Decompression Time

real 0m4.557s  
user 0m4.460s  
sys 0m0.016s

JPEG Performance

Images Compared

lena.bmp

lena\_JPEG.bmp

PSNR RED = 34.634PSNR GREEN = 33.9264PSNR BLUE = 31.8346

File Sizes in kilobytes

Original File Size

786

Neural Network Size

361

JPEG Size

59

Image com1.png  
Neural Network Compression Time

real 0m22.264s  
user 1m3.672s  
sys 0m0.040s

Neural Network Decompression Time

real 0m3.103s  
user 0m3.096s  
sys 0m0.000s

Neural Network Performance

Images Compared

com1.png

com1\_neu.bmp

PSNR RED = 45.1306PSNR GREEN = 45.4003PSNR BLUE = 45.5527

JPEG Compression Time

real 0m6.751s  
user 0m6.708s  
sys 0m0.028s

JPEG Decompression Time

real 0m6.653s  
user 0m6.628s  
sys 0m0.016s

JPEG Performance

Images Compared

com1.png

com1\_JPEG.bmp

PSNR RED = 30.067PSNR GREEN = 30.2042PSNR BLUE = 30.0149

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

519

JPEG Size

94

Image com2.png

Neural Network Compression Time

real 0m23.227s  
user 1m3.528s  
sys 0m0.044s

Neural Network Decompression Time

real 0m2.794s  
user 0m2.788s  
sys 0m0.000s

Neural Network Performance

Images Compared

com2.png

com2\_neu.bmp

PSNR RED = 45.5265PSNR GREEN = 44.7873PSNR BLUE = 46.0001

JPEG Compression Time

real 0m6.686s  
user 0m6.644s  
sys 0m0.028s

JPEG Decompression Time

real 0m6.675s  
user 0m6.656s  
sys 0m0.004s

JPEG Performance

Images Compared

com2.png

com2\_JPEG.bmp

PSNR RED = 33.6281PSNR GREEN = 34.5731PSNR BLUE = 33.9232

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

471

JPEG Size

80

Image com3.png  
Neural Network Compression Time

real 0m22.663s  
user 1m4.448s  
sys 0m0.048s

Neural Network Decompression Time

real 0m2.498s  
user 0m2.488s  
sys 0m0.004s

Neural Network Performance

Images Compared

com3.png

com3\_neu.bmp

PSNR RED = 43.7563PSNR GREEN = 43.7382PSNR BLUE = 44.052

JPEG Compression Time

real 0m6.670s  
user 0m6.636s  
sys 0m0.020s

JPEG Decompression Time

real 0m6.632s  
user 0m6.612s  
sys 0m0.008s

JPEG Performance

Images Compared

com3.png

com3\_JPEG.bmp

PSNR RED = 35.4003PSNR GREEN = 35.8462PSNR BLUE = 35.1365

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

420

JPEG Size

65

Image com4.png  
Neural Network Compression Time

real 0m23.364s  
user 1m3.616s  
sys 0m0.040s

Neural Network Decompression Time

real 0m2.954s  
user 0m2.940s  
sys 0m0.004s

Neural Network Performance

Images Compared

com4.png

com4\_neu.bmp

PSNR RED = 43.57PSNR GREEN = 44.1419PSNR BLUE = 44.0125

JPEG Compression Time

real 0m6.690s  
user 0m6.656s  
sys 0m0.020s

JPEG Decompression Time

real 0m6.642s  
user 0m6.628s  
sys 0m0.000s

JPEG Performance

Images Compared

com4.png

com4\_JPEG.bmp

PSNR RED = 33.8599PSNR GREEN = 34.6686PSNR BLUE = 34.1412

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

478

JPEG Size

78

Image com5.png

Neural Network Compression Time

real 0m22.772s

user 1m3.340s

sys 0m0.024s

Neural Network Decompression Time

real 0m2.976s

user 0m2.968s

sys 0m0.000s

Neural Network Performance

Images Compared

com5.png

com5\_neu.bmp

PSNR RED = 39.8704PSNR GREEN = 39.9062PSNR BLUE = 39.8029

JPEG Compression Time

real 0m6.724s

user 0m6.688s

sys 0m0.024s

JPEG Decompression Time

real 0m6.688s

user 0m6.668s

sys 0m0.004s

JPEG Performance

Images Compared

com5.png

com5\_JPEG.bmp

PSNR RED = 30.287PSNR GREEN = 30.5597PSNR BLUE = 30.0898

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

498

JPEG Size

114

Image com6.png  
Neural Network Compression Time

real 0m23.971s  
user 1m4.376s  
sys 0m0.040s

Neural Network Decompression Time

real 0m3.060s  
user 0m3.048s  
sys 0m0.004s

Neural Network Performance

Images Compared

com6.png

com6\_neu.bmp

PSNR RED = 44.8573PSNR GREEN = 45.2472PSNR BLUE = 45.0111

JPEG Compression Time

real 0m6.682s  
user 0m6.640s  
sys 0m0.024s

JPEG Decompression Time

real 0m6.654s  
user 0m6.624s  
sys 0m0.016s

JPEG Performance

Images Compared

com6.png

com6\_JPEG.bmp

PSNR RED = 31.4473PSNR GREEN = 31.6688PSNR BLUE = 31.2292

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

513

JPEG Size

86



Image com7.png

Neural Network Compression Time

real 0m24.693s  
user 1m6.112s  
sys 0m0.032s

Neural Network Decompression Time

real 0m2.609s  
user 0m2.596s  
sys 0m0.004s

Neural Network Performance

Images Compared

com7.png

com7\_neu.bmp

PSNR RED = 43.165PSNR GREEN = 43.4408PSNR BLUE = 43.236

JPEG Compression Time

real 0m6.680s  
user 0m6.656s  
sys 0m0.008s

JPEG Decompression Time

real 0m6.660s  
user 0m6.636s  
sys 0m0.008s

JPEG Performance

Images Compared

com7.png

com7\_JPEG.bmp

PSNR RED = 34.8362PSNR GREEN = 35.4204PSNR BLUE = 34.6771

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

444

JPEG Size

75

Image com8.png  
Neural Network Compression Time

real 0m23.525s  
user 1m7.812s  
sys 0m0.012s

Neural Network Decompression Time

real 0m3.066s  
user 0m3.052s  
sys 0m0.008s

Neural Network Performance

Images Compared

com8.png

com8\_neu.bmp

PSNR RED = 42.4088PSNR GREEN = 42.6756PSNR BLUE = 42.4497

JPEG Compression Time

real 0m6.739s  
user 0m6.688s  
sys 0m0.036s

JPEG Decompression Time

real 0m6.717s  
user 0m6.660s  
sys 0m0.044s

JPEG Performance

Images Compared

com8.png

com8\_JPEG.bmp

PSNR RED = 29.8785PSNR GREEN = 30.084PSNR BLUE = 29.6255

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

514

JPEG Size

108

Image com9.png  
Neural Network Compression Time

real 0m24.052s  
user 1m5.588s  
sys 0m0.020s

Neural Network Decompression Time

real 0m2.757s  
user 0m2.748s  
sys 0m0.000s

Neural Network Performance

Images Compared

com9.png

com9\_neu.bmp

PSNR RED = 44.3679PSNR GREEN = 45.0802PSNR BLUE = 44.3653

JPEG Compression Time

real 0m6.670s  
user 0m6.636s  
sys 0m0.020s

JPEG Decompression Time

real 0m6.634s  
user 0m6.588s  
sys 0m0.036s

JPEG Performance

Images Compared

com9.png

com9\_JPEG.bmp

PSNR RED = 35.1939PSNR GREEN = 35.2249PSNR BLUE = 34.8397

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

463

JPEG Size

58

Image com10.png

Neural Network Compression Time

real 0m24.028s

user 1m7.392s

sys 0m0.032s

Neural Network Decompression Time

real 0m2.892s

user 0m2.884s

sys 0m0.000s

Neural Network Performance

Images Compared

com10.png

com10\_neu.bmp

PSNR RED = 44.6592PSNR GREEN = 45.0563PSNR BLUE = 44.8822

JPEG Compression Time

real 0m6.691s

user 0m6.660s

sys 0m0.016s

JPEG Decompression Time

real 0m6.619s

user 0m6.584s

sys 0m0.020s

JPEG Performance

Images Compared

com10.png

com10\_JPEG.bmp

PSNR RED = 34.8581PSNR GREEN = 35.0491PSNR BLUE = 34.4471

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

481

JPEG Size

65

Image com11.png

Neural Network Compression Time

real 0m24.657s

user 1m6.468s

sys 0m0.040s

Neural Network Decompression Time

real 0m2.831s

user 0m2.812s

sys 0m0.012s

Neural Network Performance

Images Compared

com11.png

com11\_neu.bmp

PSNR RED = 43.3529PSNR GREEN = 43.7158PSNR BLUE = 43.8246

JPEG Compression Time

real 0m6.711s

user 0m6.668s

sys 0m0.032s

JPEG Decompression Time

real 0m6.705s

user 0m6.636s

sys 0m0.056s

JPEG Performance

Images Compared

com11.png

com11\_JPEG.bmp

PSNR RED = 32.11PSNR GREEN = 32.4182PSNR BLUE = 32.1244

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

473

JPEG Size

82

Image com12.png

Neural Network Compression Time

real 0m23.816s

user 1m7.508s

sys 0m0.064s

Neural Network Decompression Time

real 0m2.725s

user 0m2.716s

sys 0m0.000s

Neural Network Performance

Images Compared

com12.png

com12\_neu.bmp

PSNR RED = 44.6875PSNR GREEN = 45.2954PSNR BLUE = 44.9554

JPEG Compression Time

real 0m6.811s

user 0m6.780s

sys 0m0.012s

JPEG Decompression Time

real 0m6.647s

user 0m6.608s

sys 0m0.024s

JPEG Performance

Images Compared

com12.png

com12\_JPEG.bmp

PSNR RED = 34.9825PSNR GREEN = 35.2415PSNR BLUE = 34.9042

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

463

JPEG Size

64

Image com13.png

Neural Network Compression Time

real 0m23.999s

user 1m4.976s

sys 0m0.032s

Neural Network Decompression Time

real 0m3.326s

user 0m3.296s

sys 0m0.004s

Neural Network Performance

Images Compared

com13.png

com13\_neu.bmp

PSNR RED = 42.9397PSNR GREEN = 43.2172PSNR BLUE = 42.7656

JPEG Compression Time

real 0m6.718s

user 0m6.684s

sys 0m0.020s

JPEG Decompression Time

real 0m6.677s

user 0m6.660s

sys 0m0.008s

JPEG Performance

Images Compared

com13.png

com13\_JPEG.bmp

PSNR RED = 27.9091PSNR GREEN = 28.0006PSNR BLUE = 27.601

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

550

JPEG Size

115

Image com14.png

Neural Network Compression Time

real 0m24.308s

user 1m7.624s

sys 0m0.040s

Neural Network Decompression Time

real 0m3.032s

user 0m3.012s

sys 0m0.012s

Neural Network Performance

Images Compared

com14.png

com14\_neu.bmp

PSNR RED = 40.6839PSNR GREEN = 41.0613PSNR BLUE = 40.8571

JPEG Compression Time

real 0m6.734s

user 0m6.700s

sys 0m0.020s

JPEG Decompression Time

real 0m6.698s

user 0m6.640s

sys 0m0.020s

JPEG Performance

Images Compared

com14.png

com14\_JPEG.bmp

PSNR RED = 31.3979PSNR GREEN = 31.7101PSNR BLUE = 31.2066

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

508

JPEG Size

98



Image com15.png

Neural Network Compression Time

real 0m24.545s

user 1m7.064s

sys 0m0.048s

Neural Network Decompression Time

real 0m2.675s

user 0m2.664s

sys 0m0.008s

Neural Network Performance

Images Compared

com15.png

com15\_neu.bmp

PSNR RED = 42.8831PSNR GREEN = 43.1998PSNR BLUE = 43.0023

JPEG Compression Time

real 0m6.685s

user 0m6.636s

sys 0m0.036s

JPEG Decompression Time

real 0m6.646s

user 0m6.624s

sys 0m0.008s

JPEG Performance

Images Compared

com15.png

com15\_JPEG.bmp

PSNR RED = 33.7856PSNR GREEN = 34.4536PSNR BLUE = 33.8958

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

454

JPEG Size

73

Image com16.png

Neural Network Compression Time

real 0m24.468s

user 1m6.184s

sys 0m0.044s

Neural Network Decompression Time

real 0m2.897s

user 0m2.888s

sys 0m0.000s

Neural Network Performance

Images Compared

com16.png

com16\_neu.bmp

PSNR RED = 47.8072PSNR GREEN = 47.7347PSNR BLUE = 47.4245

JPEG Compression Time

real 0m6.666s

user 0m6.628s

sys 0m0.024s

JPEG Decompression Time

real 0m6.650s

user 0m6.620s

sys 0m0.008s

JPEG Performance

Images Compared

com16.png

com16\_JPEG.bmp

PSNR RED = 33.6353PSNR GREEN = 33.9281PSNR BLUE = 33.4116

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

493

JPEG Size

67

Image com17.png

Neural Network Compression Time

real 0m23.772s

user 1m6.720s

sys 0m0.028s

Neural Network Decompression Time

real 0m2.833s

user 0m2.820s

sys 0m0.004s

Neural Network Performance

Images Compared

com17.png

com17\_neu.bmp

PSNR RED = 45.1839PSNR GREEN = 45.4692PSNR BLUE = 44.4986

JPEG Compression Time

real 0m6.703s

user 0m6.636s

sys 0m0.052s

JPEG Decompression Time

real 0m6.652s

user 0m6.612s

sys 0m0.028s

JPEG Performance

Images Compared

com17.png

com17\_JPEG.bmp

PSNR RED = 34.0956PSNR GREEN = 34.3378PSNR BLUE = 33.6602

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

480

JPEG Size

68

Image com18.png

Neural Network Compression Time

real 0m23.671s

user 1m3.988s

sys 0m0.036s

Neural Network Decompression Time

real 0m3.159s

user 0m3.148s

sys 0m0.004s

Neural Network Performance

Images Compared

com18.png

com18\_neu.bmp

PSNR RED = 40.7566PSNR GREEN = 40.8369PSNR BLUE = 40.5931

JPEG Compression Time

real 0m6.701s

user 0m6.668s

sys 0m0.016s

JPEG Decompression Time

real 0m6.661s

user 0m6.636s

sys 0m0.012s

JPEG Performance

Images Compared

com18.png

com18\_JPEG.bmp

PSNR RED = 30.9618PSNR GREEN = 31.194PSNR BLUE = 30.5861

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

523

JPEG Size

99

Image com19.png  
Neural Network Compression Time

real 0m23.879s  
user 1m4.120s  
sys 0m0.068s

Neural Network Decompression Time

real 0m3.040s  
user 0m3.024s  
sys 0m0.008s

Neural Network Performance

Images Compared

com19.png

com19\_neu.bmp

PSNR RED = 44.3034PSNR GREEN = 45.1831PSNR BLUE = 44.7417

JPEG Compression Time

real 0m6.683s  
user 0m6.636s  
sys 0m0.032s

JPEG Decompression Time

real 0m6.649s  
user 0m6.624s  
sys 0m0.012s

JPEG Performance

Images Compared

com19.png

com19\_JPEG.bmp

PSNR RED = 32.6615PSNR GREEN = 32.9781PSNR BLUE = 32.4744

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

509

JPEG Size

77

Image com20.png

Neural Network Compression Time

real 0m24.984s

user 1m11.880s

sys 0m0.036s

Neural Network Decompression Time

real 0m2.422s

user 0m2.408s

sys 0m0.008s

Neural Network Performance

Images Compared

com20.png

com20\_neu.bmp

PSNR RED = 45.0621PSNR GREEN = 45.6193PSNR BLUE = 44.7153

JPEG Compression Time

real 0m6.679s

user 0m6.620s

sys 0m0.044s

JPEG Decompression Time

real 0m6.615s

user 0m6.584s

sys 0m0.016s

JPEG Performance

Images Compared

com20.png

com20\_JPEG.bmp

PSNR RED = 34.1853PSNR GREEN = 34.4649PSNR BLUE = 33.4199

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

409

JPEG Size

64

Image com21.png

Neural Network Compression Time

real 0m24.192s

user 1m5.436s

sys 0m0.040s

Neural Network Decompression Time

real 0m3.041s

user 0m3.020s

sys 0m0.012s

Neural Network Performance

Images Compared

com21.png

com21\_neu.bmp

PSNR RED = 44.8253PSNR GREEN = 45.0352PSNR BLUE = 44.6524

JPEG Compression Time

real 0m6.666s

user 0m6.644s

sys 0m0.008s

JPEG Decompression Time

real 0m6.667s

user 0m6.612s

sys 0m0.020s

JPEG Performance

Images Compared

com21.png

com21\_JPEG.bmp

PSNR RED = 31.9194PSNR GREEN = 32.06PSNR BLUE = 31.4292

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

514

JPEG Size

79

Image com22.png

Neural Network Compression Time

real 0m24.309s

user 1m7.768s

sys 0m0.048s

Neural Network Decompression Time

real 0m3.007s

user 0m3.000s

sys 0m0.000s

Neural Network Performance

Images Compared

com22.png

com22\_neu.bmp

PSNR RED = 41.6372PSNR GREEN = 41.7408PSNR BLUE = 41.4165

JPEG Compression Time

real 0m6.686s

user 0m6.648s

sys 0m0.024s

JPEG Decompression Time

real 0m6.670s

user 0m6.628s

sys 0m0.028s

JPEG Performance

Images Compared

com22.png

com22\_JPEG.bmp

PSNR RED = 32.6422PSNR GREEN = 32.874PSNR BLUE = 32.1073

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

501

JPEG Size

87



Image com23.png

Neural Network Compression Time

real 0m24.481s

user 1m6.544s

sys 0m0.020s

Neural Network Decompression Time

real 0m2.460s

user 0m2.448s

sys 0m0.004s

Neural Network Performance

Images Compared

com23.png

com23\_neu.bmp

PSNR RED = 40.517PSNR GREEN = 40.8961PSNR BLUE = 40.4858

JPEG Compression Time

real 0m6.699s

user 0m6.640s

sys 0m0.044s

JPEG Decompression Time

real 0m6.633s

user 0m6.612s

sys 0m0.008s

JPEG Performance

Images Compared

com23.png

com23\_JPEG.bmp

PSNR RED = 36.5026PSNR GREEN = 37.0811PSNR BLUE = 36.0093

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

415

JPEG Size

67

Image com24.png

Neural Network Compression Time

real 0m24.172s  
user 1m6.604s  
sys 0m0.032s

Neural Network Decompression Time

real 0m2.759s  
user 0m2.752s  
sys 0m0.004s

Neural Network Performance

Images Compared

com24.png

com24\_neu.bmp

PSNR RED = 42.4325PSNR GREEN = 42.4787PSNR BLUE = 42.3985

JPEG Compression Time

real 0m6.696s  
user 0m6.664s  
sys 0m0.016s

JPEG Decompression Time

real 0m6.674s  
user 0m6.644s  
sys 0m0.016s

JPEG Performance

Images Compared

com24.png

com24\_JPEG.bmp

PSNR RED = 30.9327PSNR GREEN = 31.0993PSNR BLUE = 30.0444

File Sizes in kilobytes

Original File Size

1152

Neural Network Size

462

JPEG Size

94