DITHERED INDEX

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My Mom, who always pushed and believed in me.

ABSTRACT

Textures are commonly used for everyday graphics implementations, such as modeling, rendering and display. As the bandwidth of hardware maintains its current rate of improvement, random access memory and speed continue to outpace these improvements, creating a bottle neck for accessing subsequent information that is needed for the next operations. Improving textures by making them smaller to push through the pipeline, or able to access more in a single operation would be able to overcome bandwidth limitations.

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1 Introduction

1.1 Texture Compression

Compared to compression of every type of image, texture compression focuses on compressing a specific type of images that are used in graphics processing. While most of the methods used in other compression algorithms can apply to images without modification, texture based methods have the restrictions that random access be available to individual textels and decompression completes in a reasonable amount of time.

1.2 Motivation

When computers and hand-held devices are assembled, either in an assembly line or as a do-it-yourself project by an ambitious user, if the use of a screen such as an LCD display is needed, the device will often requires the use of a graphics processor, integrated into the motherboard or discrete as a graphics card. These graphics cards are often a computer in their own right, having a multitude of cores, a supply of their own Random Access Memory (RAM), and even a cooling system. Whether if the graphics is integrated or discrete, each of these various types of graphics processors support some form of graphics rendering, decoding and display. Most of these graphics processors have been developed to support the current de facto standard of the Microsoft DirectX application programming interface (API) to handle multimedia such as calculations for algorithms used by gaming engines, rendering, and video decoding. For operating systems that don't support proprietary drivers, such as those that come from nVidia or ATI, open source drivers are available under another standard called OpenGL that can support

most modern day video cards. Hand held devices such as smart phones and gaming devices also come with graphics processors that support programming in a different version of OpenGL called OpenGL for Embedded Systems (OpenGL ES).

As technology improves, graphics processing also improves along with it, becoming increasingly detailed and smooth. Unfortunately, to improve the visual appearance of the final rendered products, larger and more detailed textures have to be used. Image compression has helped in improving storage of large amounts of data in both lossy and lossless formats. Compression works by removing redundancies that are frequent in raw image data, resulting in files that take up a fraction of the space they would otherwise occupy in their raw format.

1.3 Applications

Reducing texture storage has many graphics applications which can benefit from a method that can lower the rate at which colors become lost due to transformation and lossy compression. Often, algorithms that perform texture compression can have statistics which can be used to determine whether the targeted block should be compressed to a lesser extent, or at all, if the resulting noise to signal ratio is not within an acceptable range.

2 Literature Review

2.1 Human Vision

2.1.1 The Human Eye

The human eye contains several structures that enables people to see human visual perception. The cornea and sclera protect the delicate inner structures of the eye, while the choroid provides nutrition through blood vessels throughout the eye. The muscles in the iris control the amount of light that enters the eye through the pupil, and so contracts in bright light, and dilates when there is a lack of lighting. Underneath the iris lies the lens. The lens has it's own muscle that changes it's size. By changing it's size, light can be focused properly on the retina. The retina processes the light it receives into signals that are transmitted via the optic nerve, and the image is reconstructed by the brain.

The retina contains 75 to 150 million rods that process overall illumination, and as such don't provide color information. In fact, the wide distribution of rods causes several rods to share a single nerve, so objects lack detail when seen in dim lighting. Cones have a narrower distribution, being concentrated at the central area of the retina called the fovea. Cones are highly sensitive to color in bright light. Each cone has it's own nerve connection, and so objects have a greater amount of detail. [Gonzalez and Woods 2006]

2.1.2 Tolerance and MacAdam Ellipses

The human eye can perceive about 10 million different colors. True color, also known as 24-bit color, uses 8 bits to represent each red, green, and blue component, allowing 256 different shades for each. All together, true color can display up to

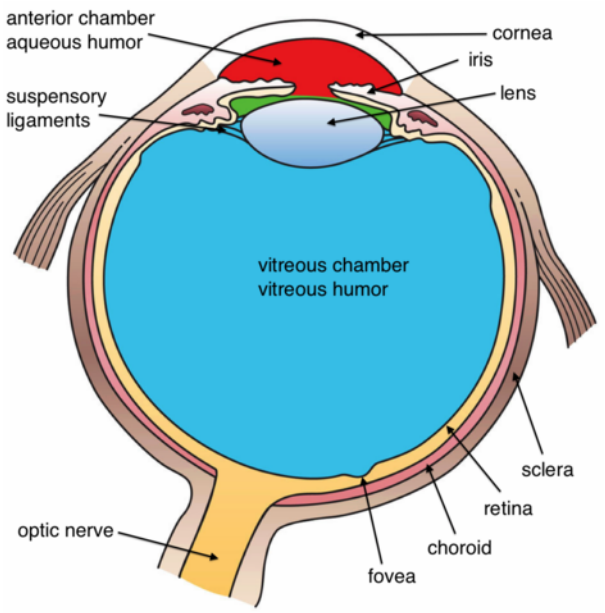

Figure 1: Diagram of structures within the human eye.

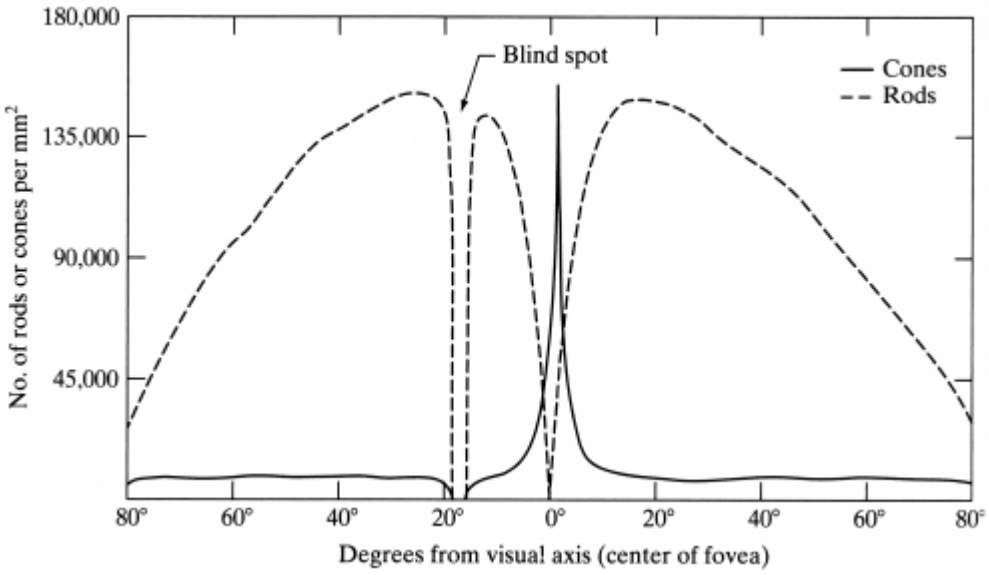

Figure 2: The distribution of rods and cones along the retina. Note the gap which is where the optic nerve would emerge.

16,777,216 different colors.

Color vision has a tendency to be subjective to different lighting and surroundings. By knowing how the human eye perceives color and visual details, slight adjustments can be made for a given color value without any detection or loss of visual information. [MacAdam 1942]

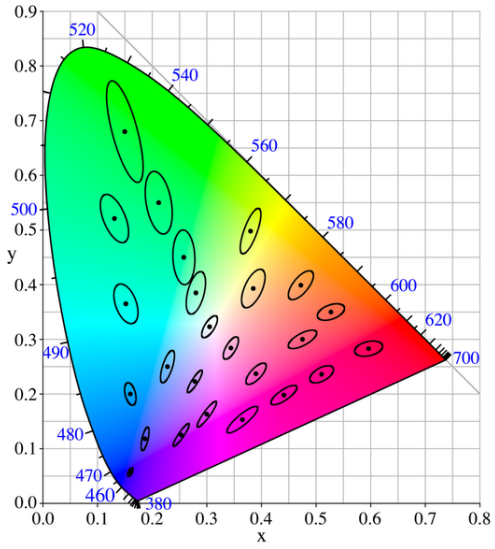

Figure 3: MacAdam ellipses shown ten times their actual size on the CIE 1931 XYZ color space. Colors inside an ellipse visually match the color in the center.

2.1.3 Dithering

When lowering the number of bits per channel used in a pixel, an often used method is simply rounding the component to the nearest number. While this process is easy to use, it also results in banding in an image. By using a number of dithering algorithms, a predetermined palette is selected and colors are replaced with their closest match using heuristics. As colors are swapped out, error can be accumulated

into the surrounding pixels, allowing a different color to be used when there is not a suitable match for an existing one, causing mixed patterns.

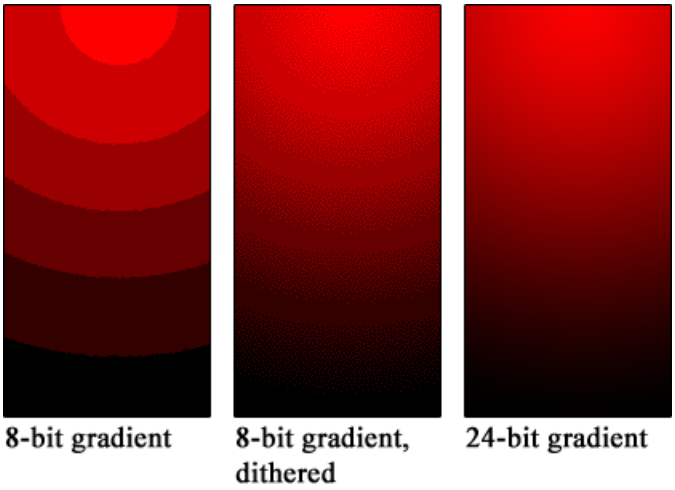

Figure 4: Banding in a gradient. Banding is reduced when dithering is applied.

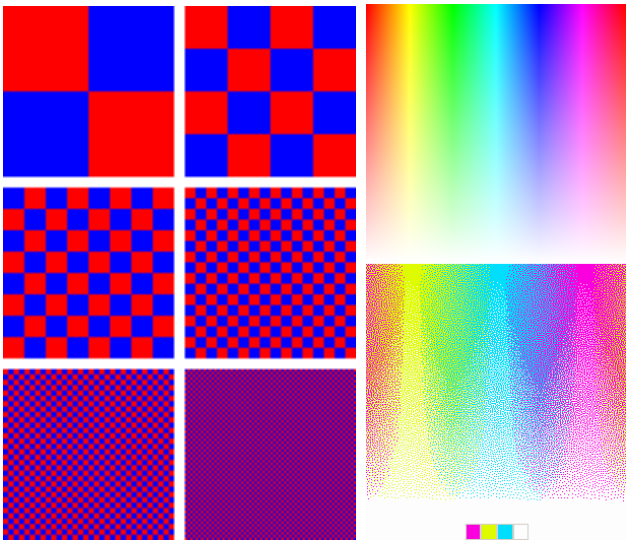

Figure 5: Using dithering, more colors can be represented using a reduced color palette.

In physical media, it is not uncommon to encounter half-toning. Halftones only use one color, and distribute varying sizes of dots to create the illusion of different tones. Dithering allows the use different colors placed such that it seems that there are more colors than actually available in the reduced palette. [Knuth 1987]

2.2 Compression

2.2.1 Defining Compression

Compression involves encoding information into fewer bits than would be occupied by the original. There are two types of compression currently in use. Lossless analyzes the input and identifies redundancies that can be represented in fewer bits. Using this method, no information is lost, and it is ideal for compressing text based files and images. Lossy compression instead removes finer details completely, which can be tuned according to what is acceptable for images and video.

2.2.2 Entropy

Entropy is defined as a measure of uncertainty given a random variable.

Shannon's theorem states such that it is impossible to compress data in a lossless form such that the average number of bits per symbol used is less than what was used in the source. As such, when fewer symbols are used to represent the compressed data, the resulting compressed information is considered to be a lossy format. [Shannon 2001]

$$H(X) = -\sum_{i=1}^{n} p(x_i) log_b p(x_i)$$

2.3 Lossless Compression

Lossless compression is most commonly used when any loss of information that would cause the target data to become meaningless if any part of it would be lost or if the user would prefer if all the data in an image be preserved. Lossless has the inherent problem that if a file has minimal redundancy to remove or is not large enough to detect eventual redundant information, the file may not compress at all, or it may even grow in size and occupying more space to accommodate compression information.

2.3.1 Huffman Coding

Huffman coding is an entropy encoder. Given an input, the algorithm will count each occurrence of every character encountered. With this, the frequency is calculated for each character and added to a frequency table. Using the table, a binary tree is constructed, giving characters with a higher frequency a shorter code representing it, and less frequent characters a longer code. These trees can also be constructed using pre-calculated frequencies for a particular subject matter.

Letter	Frequency	Letter	Frequency	Letter	Frequency	Letter	Frequency
e	0.12702	h	0.06094	w	0.02360	k	0.00772
t	0.09056	r	0.05987	f	0.02228	j	0.00153
a	0.08167	d	0.04253	g	0.02015	x	0.00150
o	0.07507	l	0.04025	y	0.01974	q	0.00095
i	0.06966	c	0.02782	p	0.01929	z	0.00074
n	0.06749	u	0.02758	b	0.01492		
s	0.06327	m	0.02406	v	0.00978		

Figure 6: Frequency for common letters in the English language.

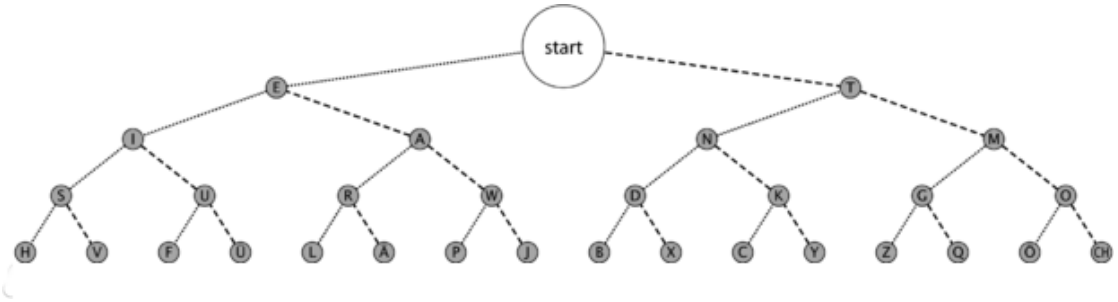

Figure 7: A Huffman binary tree. This is the tree also used for Morse code.

2.3.2 Lempel-Ziv-Welch

Lempel-Ziv-Welch and it's variants compress data using a dictionary coder, or substitution coder. As the algorithm encounters patterns that it has seen before, it substitutes these with a shorter representation provided that it is already in the dictionary. If not, it creates one on the spot and outputs the corresponding code. Dictionary algorithms work best on longer streams of input, as this allows the dictionary to accumulate entries and create longer strings. The Lempel-Ziv-Welch algorithm has the added benefit that the dictionary does not have to be stored with the compressed result, as it is reconstructed as it reads the file. [Ziv and Lempel 1978]

2.4 Lossy Compression

Lossy compression is used when loss of information is acceptable to a certain level. Lossy compression algorithms can often be fine tuned to the users needs. If smaller

```
w = NIL;
   while ( read a character k )
   {
      if wk exists in the dictionary
         w = wk;
      else
         add wk to the dictionary;
      output the code for w;
      w = k;
   }
```

Figure 8: Pseudo-code for LZW (compression).

```
read a character k;
   output k;
   w = k;
   while ( read a character k )
   /* k could be a character or a code. */
   {
      if k exists in the dictionary
         entry = dictionary entry for k;
         output entry;
         add w + entry[0] to dictionary;
         w = entry;
      else
         output entry = w + firstCharacterOf(w);
      add entry to dictionary;
      w = entry;
   }
```

Figure 9: Pseudo-code for LZW (decompression).

file size is desired, the user can lower the quality of the resulting image to reach the target size. Because large amounts of information can be removed from the source data, file sizes for lossy compression can easily be smaller than their lossless counterparts. Since some information is thrown out, these methods are typically reserved for images, video and audio formats since loss of information is acceptable to achieve the desired result.

2.4.1 Wavelet Transform

Wavelets are a tool to process a variety of signals. These transforms can be used to remove noise and blurring, and also compress data, which are easily invertible. The simplest transform is called the Haar transform. A single eight point signal can be decomposed into four average signal values, and four being their difference. This can be performed again on the results calculated for average value as many as three times for an eight point signal. At the end, the coefficients for each set can be stored and used to reconstruct the image. This type of compression is actually used in the JPEG 2000 file type. [Chui 1992]

2.4.2 Motion Compensation (MPEG-2)

Motion compensation is used in the MPEG-2 standard. It defines a picture that has been adjusted from a picture that was taken at a future point. In a movie, the most common reason the picture changes is because either the camera is moving or an object is moving within the frame. A frame that is created that contains the differences between the current frame and the next frame contains much more data if the camera has moved. By taking two frames and identifying the overlap from the camera panning, there is less data created, enabling a higher level of

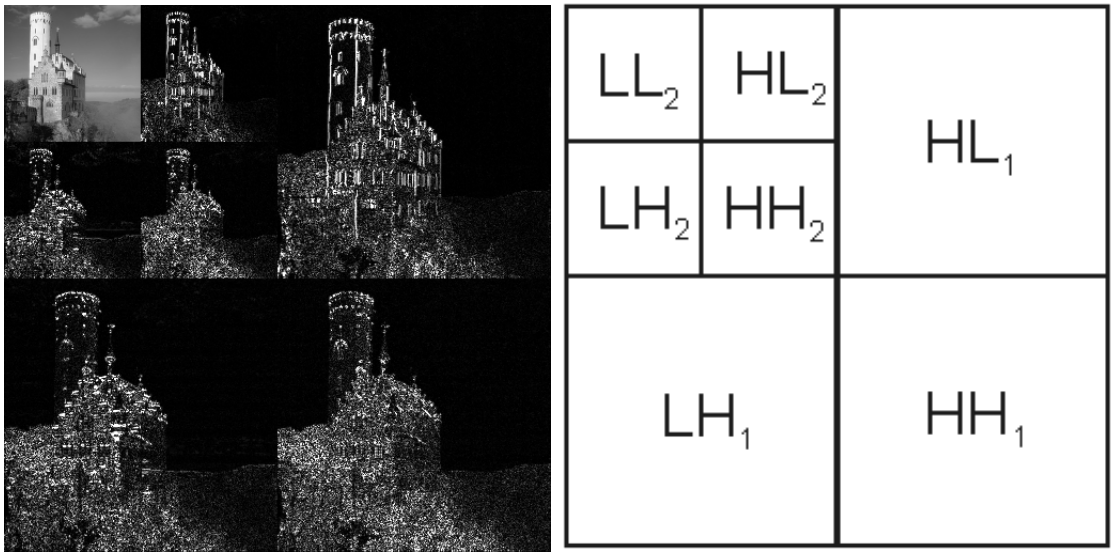

Figure 10: Image processed with a wavelet transform. Each block contains coefficients to reconstruct the original image.

compression. MPEG-2 contains several frames to reconstruct the video stream. I frames contain initial data that are used to predict data in P (predicted) B (bi-directionally predicted) frames. These frames are often sent ahead of time so they can be generated in a timely fashion. [Tudor 1995]

2.5 Textures

Textures typically are made up of images that are to be manipulated and mapped to a surface. This typically takes place the final step in the graphics pipeline and is performed by the texture mapping unit. Once all the objects are in place, textures are applied to the objects and the scene is finally rendered and shown on the output display. Textures can not only be used to contain color information, but also terrain information, lighting, and bump mapping in a different format. Textures

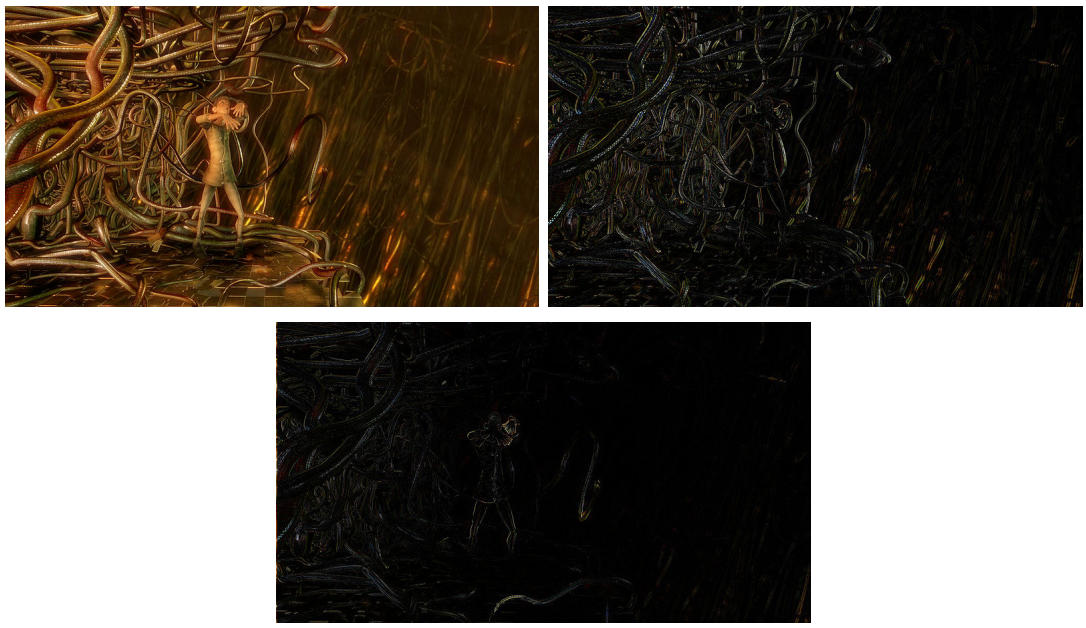

Figure 11: The original frame, the difference frame, and the motion compensated frame.

that contain vector information are often not compressed as doing so would cause a loss of critical information that is used to calculate lighting information.

Textures can be optimized in various ways to enable graphics processors to access them and use them in an efficient manner. In a larger scale game, the number of textures can easily number into the hundreds, and finding a way to organize them so they can be found quickly can vary from the type of texture to what colors they mostly contain.

2.5.1 Texture Storage Methods

When saving textures for future use, they can be stored in various ways to save space on the hard drive and to enable more textures to be pushed through available bandwidth. While the most common way to have more textures available for the same amount of space is to compress the textures individually, there are various other methods to improve the rate at which they are read, and how many textures the designer would have to make.

2.5.2 Atlas

To decrease the number of reads required to have all the textures readily accessible in memory, textures are often bunched together into a single large file called a texture atlas. When these are created, they can either be done by hand or by a texture design software that can often be provided by the maker of the graphics processor. Texture packing has a different problem in that they must be packed carefully enough so as to make use of all the space in the atlas possible as they often have specific size requirements. Because of the nature of texture compression algorithms, textures that differ in color greatly should be arranged differently to

avoid color bleeding into another texture. Textures that have different alpha channel requirements should be put into a different atlas altogether. A texture atlas is particularly efficient in that an entire scene can use up a single atlas, and the next scene can be rendered with another, keeping reads to hard disk or system memory to a minimum. [Sherrod 2008]

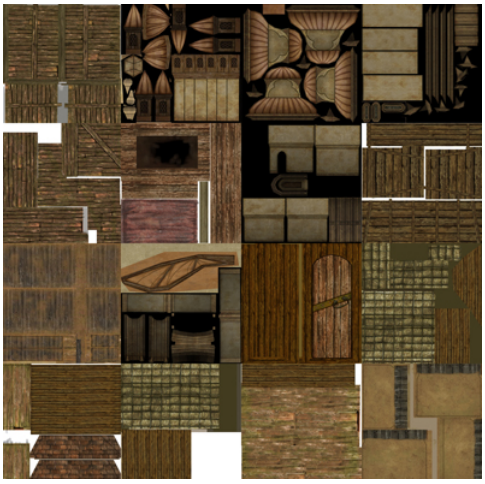

Figure 12: An atlas containing various textures for wooden objects such as doors, crates, flooring and walls.

2.5.3 Synthesis

Texture synthesis is a different way to render entire floors, walls and ceiling with a single texture that does not necessarily cover the entire space. By creating tile-able textures, a single texture can be used to cover surfaces without taking up the same amount of storage required of a larger texture. A common issue with tile-able textures is the lack of randomness in the surface which can be apparent in usually rich environments. Computer vision can be used to detect major features in a texture and in rendering the surface, can distribute the features randomly and seamlessly

to create a more appealing environment. This simply has the drawback in that the process can be resource intensive and may not be ideal to use on hardware with limited resources. [Efros and Freeman 2001]

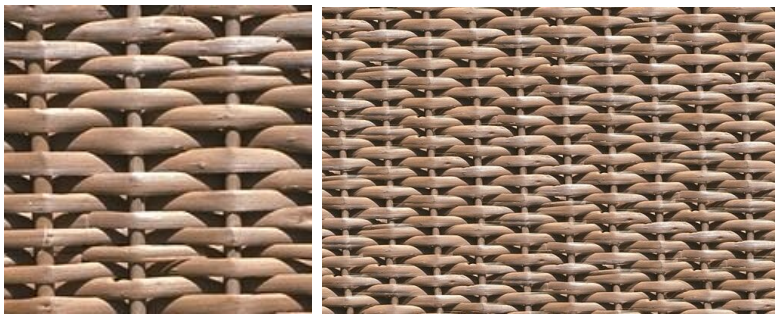

Figure 13: A regular texture which has been synthesized with minimal effort.

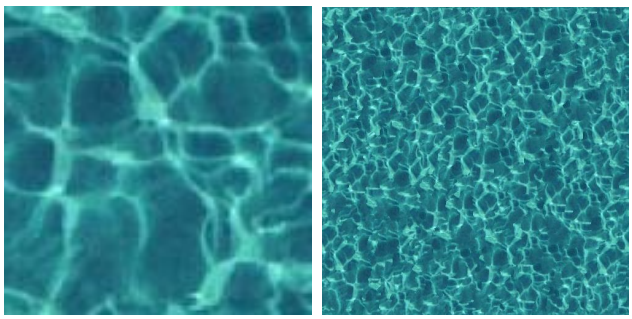

Figure 14: An irregular texture which has synthesized to a larger texture using various image processing techniques.

2.6 Texture Compression Methods

2.6.1 Ericsson Texture Compression

The Sony Ericsson Texture Compression algorithm, originally under the name iPACKMAN during development, targeted embedded devices such as cell phones.

ETC1 uses a four-by-four block of pixels to create the compressed 64-bit output. The block is then divided into either a four-by-two or a two-by-four block. A base color is then stored for each divided block, using four bits for each channel, which becomes RGB444. The remaining 20 bits for each divided block are used to store the modulation of luminance for each pixel. ETC1 is better suited for mobile devices and is supported under Android 2.2.

ETC2 is currently under development and is to be backward compatible with ETC1 and will be able to compress texture data that contains an alpha channel. [Ström and Akenine-Möller 2005]

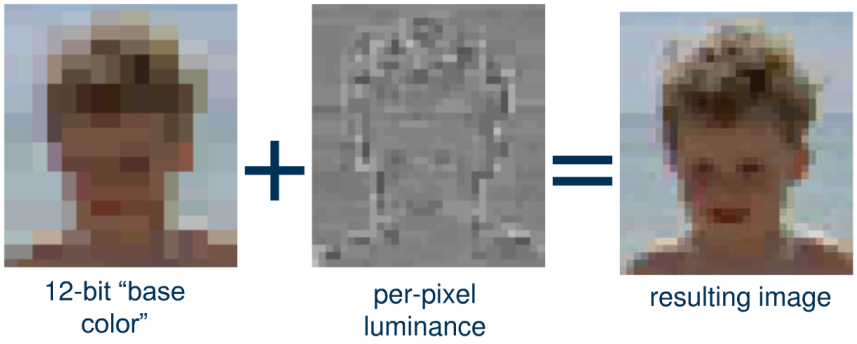

Figure 15: The base colors are shown for each block on the left image, while luminance modulation is shown in the middle. The final image is the decompressed image.

2.6.2 S3TC (DXT1-DXT5)

S3TC was developed by S3 Graphics and was improved over several iterations to compress textures that typically have already been arranged into larger texture atlases. S3TC has the ability to compress textures at a 1 to 6 ratio for textures without alpha information, and 1 to 4 for textures that do contain alpha informa-

tion.

DXT1 uses 16 input pixels and will output 64 bits of information. This consists of two 16-bit RGB555 values and a 4 by 4 lookup table.

DXT2 and DXT3 compresses data at a 1 to 4 ratio. Using 16 input pixels, it outputs 64 bits of channel data and 64 bits of color data, encoded in a similar fashion to DXT1. This method works better on gradient textures.

DXT4 and DXT5 can compress data at a 1 to 4 ratio. Using 16 input pixels, it outputs 64 bits of channel data and 64 bits of color data. This method is more suited for noisier textures. The reference data values for alpha and color data are calculated such that:

$$if a_0 > a_1, then \frac{a_2 = 6a_0 + 1a_1}{7}, \frac{a_3 = 5a_0 + 2a_1}{7}, ..., \frac{a_7 = 1a_0 + 6a_1}{7}$$

$$else \frac{a_2 = 4a_0 + 1a_1}{5} ... \frac{a_5 = 1a_0 + 4a_1}{5}$$

S3TC has the current problem that data can be lost in the interpolation process, resulting in artifacts in the decompressed texture. These can be avoided with using the proper method with the right type and kind of texture. [Iourcha et al. 1999]

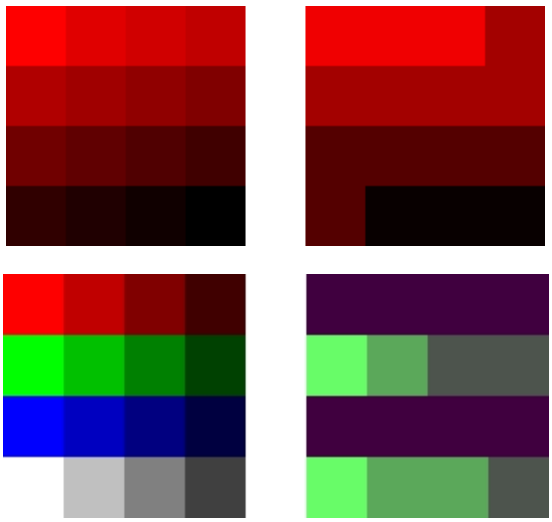

Figure 16: The errors for gradient textures is shown in the top set of images. The right shows the result of a reduced color palette, which cannot interpolate the original colors at all.

3 Research Goals

The main objective is to construct a lossy method that can dither and compress images into a smaller data set that returns satisfactory results after decompression. It is expected that smaller palettes and aggressive compression will result with smaller data sets, but can also return images that have degraded in quality. The opposite is also true in that larger palettes and easier compression results in larger data sets and higher quality images. The final goal is to find a compromise between these two algorithms.

This is will be achieved by first dithering an image, and then performing various methods to further compress the resulting data. This will include DXT compression and a self made algorithm that saves the difference between a source pixel and neighboring pixels.

3.1 Convert Images to PPM

The first objective is to convert test data into PPM format. Most of the images available from standard test image databases are in the TIFF or BMP format. These can easy converted by using the open source program Irfanview with the following command:

```
$ convert image.tiff image.ppm
```

This will result in a PPM file that contains the header, height, width and number of colors per channel. The remaining data is a raster of height rows from top to bottom containing a triplet of red, green and blue values.

Figure 17: Examples of regular images from the USC-SIPI Database.

3.2 Perform Dithering on Image Data

The next step is to perform dithering on the desired images to reduce the number of colors used in each image. For the purpose of this research, Ordered (Bayer) Dithering, Floyd-Steinberg Dithering, and Jarvis, Judice, and Ninke (JJN) Dithering were implemented. A fourth method I created will also be applied in this step, allowing the resulting image to be compared with published algorithms.

3.3 Perform Compression on Undithered Images

The same images will be compressed without performing dithering beforehand.

3.4 Perform Compression on Dithered Images

The images that have been dithered will be compressed using standard techniques that allow for random access. This will include DXT, ETC, and a custom compression method.

3.5 Analyze and Compare Results

As images are manipulated using dithering and compression, statistics are collected that will allow for quantitative and qualitative analysis. Using these, a decision can be made on which methods are more effective in returning images with fewer artifacts and noise.

3.6 Graphical User Interface

To view the results of using the above methods, a Graphical User Interface (GUI) will be developed. In the GUI, options will be available for dithering and compression methods. For dithering, Floyd-Steinbeg, Bayer (Ordered), and Jarvis-Judice-Ninke (JJN) will be available. For compression, DXT5 and ETC will be available.

The GUI will also allow the user to load files that are in the PPM format, perform any modifications to the image, and export the final decompressed image in the original PPM format.

4 Methodology

4.1 Representing an Image

The image data in a PPM file is represented with sets of RGB tuples that start with the upper left corner of the image, which is represented as coordinate (0,0) and proceeds in a left to right fashion as the file is read, each row being M units long and a column being N units high. The end of the file corresponds with the bottom right corner of the image to be represented as (M,N).

4.2 Applying Dithering to an Image

4.2.1 Ordered Dithering

Ordered dithering adds a specified amount of error given the location of single pixel.

4.2.2 Error Diffusion Dithering

Error diffusion works with a palette and finds the closest match to the pixel it is working with. This can be found by calculating the distance of the colors when placed on the color cube. The difference between the original and the substituted pixel is then used to calculate the amount of error that should be pushed to designated neighboring pixels based on the method used.

4.3 Converting PPM to TGA

DXT requires that files be in the TGA (Truevision Graphics Adapter) file format. PPM is used as the resulting file format after performing dithering. These can easily be converted using Irfanview or any software that supports the TGA file

format.

```
$ i_view32.exe image.ppm /convert=image.tga
$ i_view32.exe image.tga /convert=image.ppm
```

Figure 18: The command to convert a ppm formatted image to tga, and vice versa.

4.4 Applying Compression to An Image

4.4.1 Using DXT

Java allows for the use of external tools through proper system calls. Using the Process Class, Java can call an external tool and provide the desired input and output parameters. The resulting file type from this process is in DDS format.

```
Process p = new ProcessBuilder( "crunch.exe", "-file", filein,
                                                "/out", fileout );
```

While the process is running, a buffer is created that can get full and cause the program to block until the buffer is cleared. This is easily accomplished by providing a file for the buffer to output to directly.

```
p.redirectOutput(new File("output.txt"));
```

4.4.2 Using ETC

Java allows for the use of external tools through proper system calls. Using the Process Class, Java can call an external tool and provide the desired input and output parameters. The resulting file type from this process is in DDS format.

```
Process p = new ProcessBuilder("etcpack.exe", input, output);
```

While the process is running, a buffer is created that can get full and cause the program to block until the buffer is cleared. This is easily accomplished by providing a file for the buffer to output to directly.

```
p.redirectOutput(new File("output.txt"));
```

4.4.3 Using the Proposed Method

After dithering an image, each pixel can be represented as a single 8-bit entity. Using this information, a single pixel can be stored with increased accuracy while, neighboring pixels can be stored using fewer bits. Using a fixed number of bits, random access of a block of pixels is possible without having to decode the entire image.

Figure 19: Left: Original image. Right: Dithered Image.

Figure 20: The final decompressed image.

4.5 Tools

Various tools will be used to perform the proposed method. All images will be viewed using GIMP. The algorithms will be written from scratch as needed using the Java 7 JDK environment. Any quantitative data extracted will be stored in basic CSV file and images will be converted to PPM format to collect metrics.

4.6 Evaluation

4.6.1 Comparing Quantitative Results

The algorithm will be timed once the compression method has started to avoid overhead of reading the file and setting up various processes.

The primary methods of comparing original data to output data is Mean Square Error (MSE) and the Peak Signal to Noise Ratio (PSNR).

$$MSE = \frac{1}{MN}\sum_{y=1}^{M}\sum_{x=1}^{N}[I(x,y) - I'(x,y)]^2$$

$$PSNR = 20 * log_{10}(255/\sqrt{MSE})$$

4.6.2 Comparing Qualitative Results

The results can be evaluated visually without any use of calculating actual error that the method generates. The criteria will be based on the presence of color banding, artifacts or visible blocking, and loss of detail.

Figure 21: Left: Image banding. Right: Artifacts in the form of blocking.

5 Results

5.1 Observations

5.1.1 Dithering

The new dither method, relevance, performs on par with Floyd-Steinberg dithering. Of course in some cases it does better or worse than Floyd-Steinberg, depending on the image and the palette that was specified.

5.1.2 Compression

The new methods Relevance 1 and 2, are quicker to compress files compared to the DirectX method, while also providing a smaller file size. Decompressing the files unfortunately resulted in images with noise and worse SNR and RMS ratios. The time constraint was achieved in such that the decompression method was faster than the compression method.

5.1.3 Suggestions for Improvement

When using indexed colors, a single number is used to represent a single color. Instead of indexing a single color, and tile of two by two with four potential colors can be represented instead. As blocks are traversed, tiles can be created that represent the most common patterns, and blocks are then matched to the closest tile that is available. This can also eliminate the need for a pre-specified palette if so desired when used without dithering. Using method this also increases the amount of time it takes to compress a file, as the most suitable tile must be either found or created.

5.2 Statistics

5.2.1 Test Images

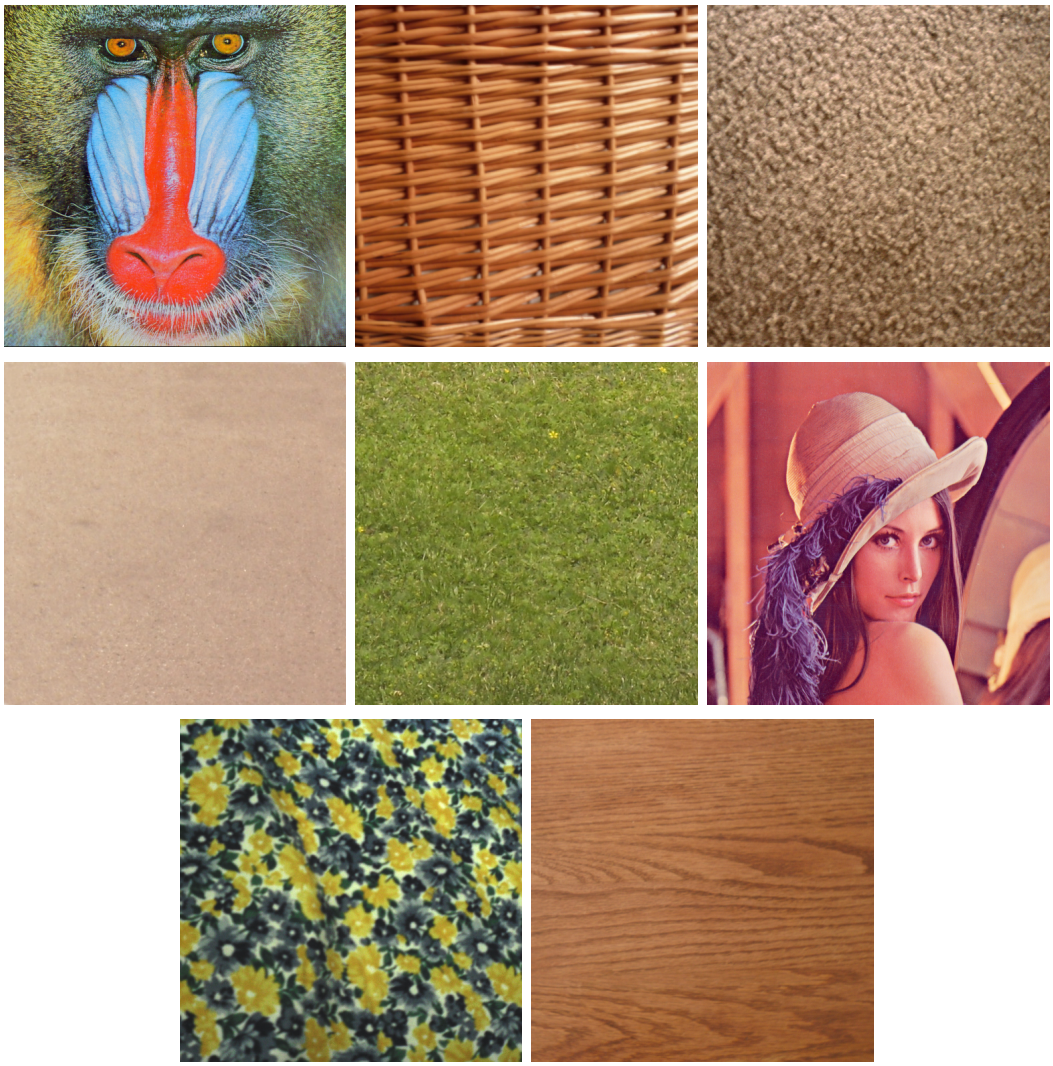

Figure 22: The set of test images used. In order: Baboon, Bamboo, Carpet, Concrete, Grass, Lena, Pattern, Wood.

5.2.2 Control Methods

Table 1: Statistics for Compressed Images without Dithering

Compression	Time	Ratio	Decompression	Time	RMS	SNR
Baboon						
Relevance 1	1919ms	5.999	Relevance 1 v1	421ms	39.69	1,060,630,235.584
Relevance 1	1841ms	5.999	Relevance 1 v2	421ms	35.629	1,181,519,065.976
Relevance 2	3198ms	4.799	Relevance 2	483ms	57.355	733,962,767.895
Direct X	5070ms	4.496	Direct X	15ms	0	?
Ericsson	749ms	5.997	Ericsson	47ms	18.702	2,250,964,814.121
Bamboo						
Relevance 1	1919ms	5.999	Relevance 1 v1	405ms	26.872	1,260,041,291.982
Relevance 1	1919ms	5.999	Relevance 1 v2	421ms	24.502	1,381,881,620.961
Relevance 2	3214ms	4.799	Relevance 2	514ms	37.155	911,296,486.788
Direct X	3962ms	4.496	Direct X	15ms	0	?
Ericsson	764ms	5.997	Ericsson	63ms	6.35	5,332,446,915.053
Carpet						
Relevance 1	1872ms	5.999	Relevance 1 v1	422ms	28.407	1,369,358,170.759
Relevance 1	1856ms	5.999	Relevance 1 v2	421ms	24.762	1,570,924,134.917
Relevance 2	3229ms	4.799	Relevance 2	530ms	26.665	1,458,822,488.542
Direct X	4337ms	4.496	Direct X	15ms	0	?
Ericsson	749ms	5.997	Ericsson	62ms	6.741	5,770,837,730.067
Concrete						
Relevance 1	1981ms	5.999	Relevance 1 v1	421ms	20.779	3,440,733,980.568
Relevance 1	1950ms	5.999	Relevance 1 v2	422ms	20.209	3,537,894,097.693
Relevance 2	3541ms	4.799	Relevance 2	546ms	20.666	3,459,555,345.508
Direct X	3042ms	4.496	Direct X	31ms	0	?
Ericsson	733ms	5.997	Ericsson	46ms	3.712	19,260,230,840.896
Grass						
Relevance 1	2137ms	5.999	Relevance 1 v1	422ms	29.245	916,449,743.625

Table 1: Statistics for Compressed Images without Dithering

Compression	Time	Ratio	Decompression	Time	RMS	SNR
Relevance 1	1872ms	5.999	Relevance 1 v2	421ms	25.179	1,064,423,354.96
Relevance 2	3120ms	4.799	Relevance 2	546ms	26.069	1,028,097,913.725
Direct X	4525ms	4.496	Direct X	16ms	0	?
Ericsson	765ms	5.997	Ericsson	47ms	6.183	4,334,989,886.56
Lena						
Relevance 1	1934ms	5.999	Relevance 1 v1	406ms	30.299	1,422,742,047.458
Relevance 1	1888ms	5.999	Relevance 1 v2	421ms	26.4	1,632,850,120.153
Relevance 2	3260ms	4.799	Relevance 2	500ms	36.439	1,183,007,591.766
Direct X	3946ms	4.496	Direct X	31ms	0	?
Ericsson	764ms	5.997	Ericsson	62ms	8.436	5,110,043,791.788
Pattern						
Relevance 1	1809ms	5.999	Relevance 1 v1	421ms	27.59	1,032,755,351.93
Relevance 1	1825ms	5.999	Relevance 1 v2	437ms	24.24	1,175,482,754.626
Relevance 2	3089ms	4.799	Relevance 2	500ms	33.923	839,952,886.47
Direct X	4415ms	4.496	Direct X	15ms	0	?
Ericsson	764ms	5.997	Ericsson	62ms	8.858	3,216,925,053.101
Wood						
Relevance 1	1888ms	5.999	Relevance 1 v1	436ms	25.748	1,144,359,365.153
Relevance 1	1872ms	5.999	Relevance 1 v2	421ms	24.428	1,206,183,277.641
Relevance 2	3198ms	4.799	Relevance 2	531ms	25.582	1,151,777,937.416
Direct X	3510ms	4.496	Direct X	31ms	0	?
Ericsson	734ms	5.997	Ericsson	62ms	4.406	6,687,333,399.41

5.2.3 Dither Methods

Table 2: Statistics for Dithered Images

# of Colors	Dither	Time	RMS	SNR
Baboon				
2-Colors	Floyd	156ms	214.174	196,552,397.51
2-Colors	Ordered	47ms	194.689	216,223,977.753
2-Colors	Jarvis	218ms	207.04	203,324,873.64
2-Colors	Relevance	156ms	213.559	197,119,007.129
8-Colors	Floyd	187ms	194.005	216,986,053.166
8-Colors	Ordered	62ms	169.463	248,410,852.54
8-Colors	Jarvis	249ms	185.09	227,437,488.701
8-Colors	Relevance	188ms	193.305	217,772,444.172
16-Colors	Floyd	218ms	85.012	495,181,809.812
16-Colors	Ordered	109ms	88.174	477,426,197.786
16-Colors	Jarvis	265ms	78.367	537,173,450.623
16-Colors	Relevance	219ms	84.973	495,411,303.21
216-Colors	Floyd	983ms	31.175	1,350,323,432.676
216-Colors	Ordered	889ms	68.005	619,023,622.822
216-Colors	Jarvis	1029ms	28.652	1,469,208,478.104
216-Colors	Relevance	982ms	30.606	1,375,443,873.434
Bamboo				
2-Colors	Floyd	156ms	223.108	151,761,859.581
2-Colors	Ordered	47ms	210.337	160,976,397.902
2-Colors	Jarvis	203ms	223.162	151,725,183.645
2-Colors	Relevance	156ms	223.125	151,750,261.88
8-Colors	Floyd	172ms	191.285	177,009,649.207
8-Colors	Ordered	78ms	156.865	215,848,873.953
8-Colors	Jarvis	234ms	191.287	177,007,891.603
8-Colors	Relevance	187ms	191.313	176,983,648.136

Table 2: Statistics for Dithered Images

# of Colors	Dither	Time	RMS	SNR
16-Colors	Floyd	218ms	59.759	566,597,746.163
16-Colors	Ordered	109ms	74.454	454,769,874.898
16-Colors	Jarvis	265ms	57.195	591,991,400.98
16-Colors	Relevance	265ms	58.821	575,633,960.664
216-Colors	Floyd	977ms	33.353	1,015,172,756.691
216-Colors	Ordered	879ms	68.504	494,270,168.871
216-Colors	Jarvis	1015ms	31.529	1,073,923,583.721
216-Colors	Relevance	984ms	32.884	1,029,658,169.317
Carpet				
2-Colors	Floyd	156ms	218.58	177,963,562.519
2-Colors	Ordered	48ms	209.209	185,934,963.338
2-Colors	Jarvis	218ms	217.444	178,893,269.622
2-Colors	Relevance	163ms	218.484	178,041,067.953
8-Colors	Floyd	181ms	209.902	185,320,997.499
8-Colors	Ordered	70ms	193.34	201,195,846.624
8-Colors	Jarvis	244ms	208.651	186,431,543.715
8-Colors	Relevance	188ms	209.891	185,330,175.626
16-Colors	Floyd	212ms	75.386	516,003,269.293
16-Colors	Ordered	107ms	86.271	450,894,550.353
16-Colors	Jarvis	271ms	72.906	533,550,613.12
16-Colors	Relevance	222ms	75.049	518,318,380.49
216-Colors	Floyd	955ms	31.84	1,221,703,638.878
216-Colors	Ordered	860ms	69.418	560,360,145.468
216-Colors	Jarvis	1005ms	28.8	1,350,671,216.249
216-Colors	Relevance	979ms	31.302	1,242,707,962.068
Concrete				
2-Colors	Floyd	157ms	208.935	342,193,715.759
2-Colors	Ordered	45ms	146.213	488,985,861.765

Table 2: Statistics for Dithered Images

# of Colors	Dither	Time	RMS	SNR
2-Colors	Jarvis	223ms	208.764	342,472,776.828
2-Colors	Relevance	164ms	208.973	342,131,114.81
8-Colors	Floyd	180ms	201.447	354,912,087.026
8-Colors	Ordered	67ms	146.212	488,988,109
8-Colors	Jarvis	240ms	201.245	355,269,836.413
8-Colors	Relevance	193ms	201.474	354,865,573.391
16-Colors	Floyd	225ms	57.436	1,244,800,127.07
16-Colors	Ordered	101ms	72.411	987,363,065.478
16-Colors	Jarvis	279ms	57.063	1,252,927,690.793
16-Colors	Relevance	219ms	57.466	1,244,153,043.458
216-Colors	Floyd	976ms	31.536	2,267,150,707.221
216-Colors	Ordered	889ms	69.296	1,031,743,253.768
216-Colors	Jarvis	1089ms	31.015	2,305,193,081.657
216-Colors	Relevance	994ms	31.488	2,270,615,818.127
Grass				
2-Colors	Floyd	157ms	222.793	120,296,867.498
2-Colors	Ordered	46ms	230.631	116,208,625.841
2-Colors	Jarvis	219ms	220.611	121,486,661.769
2-Colors	Relevance	164ms	222.751	120,319,819.539
8-Colors	Floyd	178ms	206.031	130,083,930.628
8-Colors	Ordered	69ms	186.744	143,518,938.026
8-Colors	Jarvis	239ms	203.75	131,540,397.042
8-Colors	Relevance	189ms	206	130,103,408.22
16-Colors	Floyd	214ms	81.631	328,321,226.555
16-Colors	Ordered	107ms	88.89	301,511,946.203
16-Colors	Jarvis	268ms	79.032	339,120,424.239
16-Colors	Relevance	227ms	81.589	328,492,180.713
216-Colors	Floyd	965ms	32.134	834,040,025.062

Table 2: Statistics for Dithered Images

# of Colors	Dither	Time	RMS	SNR
216-Colors	Ordered	872ms	69.51	385,577,053.197
216-Colors	Jarvis	993ms	29.495	908,682,383.523
216-Colors	Relevance	956ms	31.777	843,419,931.106
Lena				
2-Colors	Floyd	157ms	219.178	196,677,184.156
2-Colors	Ordered	46ms	193.86	222,363,483.601
2-Colors	Jarvis	218ms	217.771	197,947,984.61
2-Colors	Relevance	164ms	219.232	196,629,164.544
8-Colors	Floyd	180ms	195.065	220,990,269.531
8-Colors	Ordered	69ms	169.681	254,049,862.007
8-Colors	Jarvis	240ms	193.062	223,282,299.874
8-Colors	Relevance	186ms	195.112	220,936,338.647
16-Colors	Floyd	208ms	121.941	353,511,670.027
16-Colors	Ordered	107ms	82.906	519,953,626.805
16-Colors	Jarvis	264ms	111.776	385,657,309.253
16-Colors	Relevance	216ms	119.687	360,167,191.184
216-Colors	Floyd	983ms	34.344	1,255,175,651.949
216-Colors	Ordered	867ms	67.562	638,043,169.492
216-Colors	Jarvis	1016ms	32.416	1,329,833,823.785
216-Colors	Relevance	1008ms	34.087	1,264,622,474.905
Pattern				
2-Colors	Floyd	157ms	207.579	137,267,711.46
2-Colors	Ordered	46ms	182.602	156,043,672.319
2-Colors	Jarvis	218ms	206.719	137,838,982.096
2-Colors	Relevance	164ms	207.659	137,215,064.334
8-Colors	Floyd	178ms	195.999	145,377,586.777
8-Colors	Ordered	69ms	158.707	179,537,513.824
8-Colors	Jarvis	238ms	194.844	146,239,903.402

Table 2: Statistics for Dithered Images

# of Colors	Dither	Time	RMS	SNR
8-Colors	Relevance	187ms	196.091	145,309,495.793
16-Colors	Floyd	215ms	67.93	419,461,504.667
16-Colors	Ordered	107ms	83.479	341,328,508.086
16-Colors	Jarvis	278ms	65.18	437,156,332.018
16-Colors	Relevance	219ms	67.523	421,987,697.413
216-Colors	Floyd	932ms	31.172	914,077,355.897
216-Colors	Ordered	873ms	69.399	410,581,169.049
216-Colors	Jarvis	1009ms	28.646	994,686,654.307
216-Colors	Relevance	941ms	30.686	928,574,673.715
2-Colors	Floyd	157ms	207.579	137,267,711.46
2-Colors	Ordered	48ms	182.602	156,043,672.319
2-Colors	Jarvis	219ms	206.719	137,838,982.096
2-Colors	Relevance	164ms	207.659	137,215,064.334
8-Colors	Floyd	188ms	195.999	145,377,586.777
8-Colors	Ordered	72ms	158.707	179,537,513.824
8-Colors	Jarvis	238ms	194.844	146,239,903.402
8-Colors	Relevance	188ms	196.091	145,309,495.793
16-Colors	Floyd	216ms	67.93	419,461,504.667
16-Colors	Ordered	118ms	83.479	341,328,508.086
16-Colors	Jarvis	272ms	65.18	437,156,332.018
16-Colors	Relevance	221ms	67.523	421,987,697.413
216-Colors	Floyd	943ms	31.172	914,077,355.897
216-Colors	Ordered	869ms	69.399	410,581,169.049
216-Colors	Jarvis	996ms	28.646	994,686,654.307
216-Colors	Relevance	948ms	30.686	928,574,673.715
Wood				
2-Colors	Floyd	190ms	228.753	128,806,817.895
2-Colors	Ordered	46ms	237.99	123,807,699.143

Table 2: Statistics for Dithered Images

# of Colors	Dither	Time	RMS	SNR
2-Colors	Jarvis	218ms	228.683	128,846,306.069
2-Colors	Relevance	163ms	228.74	128,814,019.791
8-Colors	Floyd	178ms	205.341	143,492,806.627
8-Colors	Ordered	68ms	179.312	164,322,369.947
8-Colors	Jarvis	236ms	205.186	143,601,580.355
8-Colors	Relevance	187ms	205.368	143,474,242.277
16-Colors	Floyd	212ms	78.228	376,654,875.428
16-Colors	Ordered	106ms	82.079	358,981,539.76
16-Colors	Jarvis	273ms	77.349	380,933,563.849
16-Colors	Relevance	221ms	78.053	377,499,766.376
216-Colors	Floyd	1094ms	34.488	854,344,021.913
216-Colors	Ordered	902ms	69.105	426,379,841.171
216-Colors	Jarvis	1034ms	33.559	878,001,810.09
216-Colors	Relevance	953ms	34.324	858,425,647.366

5.2.4 Compression Methods

Table 3: Statistics for Compressed Images with Dithering

# of Colors	Dither	Compression	Time	Ratio
Baboon				
2-Colors	Floyd	Relevance 1	406ms	5.999
2-Colors	Ordered	Relevance 1	406ms	5.999
2-Colors	Jarvis	Relevance 1	406ms	5.999
2-Colors	Relevance	Relevance 1	406ms	5.999
8-Colors	Floyd	Relevance 1	405ms	5.999
8-Colors	Ordered	Relevance 1	421ms	5.999
8-Colors	Jarvis	Relevance 1	421ms	5.999
8-Colors	Relevance	Relevance 1	406ms	5.999
16-Colors	Floyd	Relevance 1	455ms	5.999
16-Colors	Ordered	Relevance 1	452ms	5.999
16-Colors	Jarvis	Relevance 1	437ms	5.999
16-Colors	Relevance	Relevance 1	437ms	5.999
216-Colors	Floyd	Relevance 1	858ms	5.999
216-Colors	Ordered	Relevance 1	951ms	5.999
216-Colors	Jarvis	Relevance 1	858ms	5.999
216-Colors	Relevance	Relevance 1	842ms	5.999
2-Colors	Floyd	Relevance 2	686ms	4.799
2-Colors	Ordered	Relevance 2	702ms	4.799
2-Colors	Jarvis	Relevance 2	687ms	4.799
2-Colors	Relevance	Relevance 2	640ms	4.799
8-Colors	Floyd	Relevance 2	671ms	4.799
8-Colors	Ordered	Relevance 2	702ms	4.799
8-Colors	Jarvis	Relevance 2	687ms	4.799
8-Colors	Relevance	Relevance 2	655ms	4.799
16-Colors	Floyd	Relevance 2	702ms	4.799

Table 3: Statistics for Compressed Images with Dithering

# of Colors	Dither	Compression	Time	Ratio
16-Colors	Ordered	Relevance 2	765ms	4.799
16-Colors	Jarvis	Relevance 2	717ms	4.799
16-Colors	Relevance	Relevance 2	686ms	4.799
216-Colors	Floyd	Relevance 2	1326ms	4.799
216-Colors	Ordered	Relevance 2	1529ms	4.799
216-Colors	Jarvis	Relevance 2	1295ms	4.799
216-Colors	Relevance	Relevance 2	1310ms	4.799
2-Colors	Floyd	Direct X	1170ms	4.496
2-Colors	Ordered	Direct X	951ms	4.496
2-Colors	Jarvis	Direct X	1201ms	4.496
2-Colors	Relevance	Direct X	1170ms	4.496
8-Colors	Floyd	Direct X	3822ms	4.496
8-Colors	Ordered	Direct X	2277ms	4.496
8-Colors	Jarvis	Direct X	3853ms	4.496
8-Colors	Relevance	Direct X	3790ms	4.496
16-Colors	Floyd	Direct X	3712ms	4.496
16-Colors	Ordered	Direct X	3713ms	4.496
16-Colors	Jarvis	Direct X	3760ms	4.496
16-Colors	Relevance	Direct X	3759ms	4.496
216-Colors	Floyd	Direct X	4368ms	4.496
216-Colors	Ordered	Direct X	3962ms	4.496
216-Colors	Jarvis	Direct X	4227ms	4.496
216-Colors	Relevance	Direct X	4337ms	4.496
2-Colors	Floyd	Ericsson	670ms	5.997
2-Colors	Ordered	Ericsson	655ms	5.997
2-Colors	Jarvis	Ericsson	670ms	5.997
2-Colors	Relevance	Ericsson	671ms	5.997
8-Colors	Floyd	Ericsson	749ms	5.997

Table 3: Statistics for Compressed Images with Dithering

# of Colors	Dither	Compression	Time	Ratio
8-Colors	Ordered	Ericsson	687ms	5.997
8-Colors	Jarvis	Ericsson	749ms	5.997
8-Colors	Relevance	Ericsson	764ms	5.997
16-Colors	Floyd	Ericsson	749ms	5.997
16-Colors	Ordered	Ericsson	749ms	5.997
16-Colors	Jarvis	Ericsson	733ms	5.997
16-Colors	Relevance	Ericsson	734ms	5.997
216-Colors	Floyd	Ericsson	749ms	5.997
216-Colors	Ordered	Ericsson	749ms	5.997
216-Colors	Jarvis	Ericsson	764ms	5.997
216-Colors	Relevance	Ericsson	749ms	5.997
Bamboo				
2-Colors	Floyd	Relevance 1	405ms	5.999
2-Colors	Ordered	Relevance 1	390ms	5.999
2-Colors	Jarvis	Relevance 1	406ms	5.999
2-Colors	Relevance	Relevance 1	390ms	5.999
8-Colors	Floyd	Relevance 1	405ms	5.999
8-Colors	Ordered	Relevance 1	421ms	5.999
8-Colors	Jarvis	Relevance 1	421ms	5.999
8-Colors	Relevance	Relevance 1	421ms	5.999
16-Colors	Floyd	Relevance 1	437ms	5.999
16-Colors	Ordered	Relevance 1	436ms	5.999
16-Colors	Jarvis	Relevance 1	452ms	5.999
16-Colors	Relevance	Relevance 1	437ms	5.999
216-Colors	Floyd	Relevance 1	936ms	5.999
216-Colors	Ordered	Relevance 1	1030ms	5.999
216-Colors	Jarvis	Relevance 1	921ms	5.999
216-Colors	Relevance	Relevance 1	936ms	5.999

Table 3: Statistics for Compressed Images with Dithering

# of Colors	Dither	Compression	Time	Ratio
2-Colors	Floyd	Relevance 2	640ms	4.799
2-Colors	Ordered	Relevance 2	671ms	4.799
2-Colors	Jarvis	Relevance 2	655ms	4.799
2-Colors	Relevance	Relevance 2	640ms	4.799
8-Colors	Floyd	Relevance 2	655ms	4.799
8-Colors	Ordered	Relevance 2	702ms	4.799
8-Colors	Jarvis	Relevance 2	656ms	4.799
8-Colors	Relevance	Relevance 2	656ms	4.799
16-Colors	Floyd	Relevance 2	718ms	4.799
16-Colors	Ordered	Relevance 2	749ms	4.799
16-Colors	Jarvis	Relevance 2	749ms	4.799
16-Colors	Relevance	Relevance 2	733ms	4.799
216-Colors	Floyd	Relevance 2	1433ms	4.799
216-Colors	Ordered	Relevance 2	1630ms	4.799
216-Colors	Jarvis	Relevance 2	1431ms	4.799
216-Colors	Relevance	Relevance 2	1423ms	4.799
2-Colors	Floyd	Direct X	1226ms	4.496
2-Colors	Ordered	Direct X	993ms	4.496
2-Colors	Jarvis	Direct X	1336ms	4.496
2-Colors	Relevance	Direct X	1263ms	4.496
8-Colors	Floyd	Direct X	3636ms	4.496
8-Colors	Ordered	Direct X	1669ms	4.496
8-Colors	Jarvis	Direct X	3825ms	4.496
8-Colors	Relevance	Direct X	3683ms	4.496
16-Colors	Floyd	Direct X	3923ms	4.496
16-Colors	Ordered	Direct X	3432ms	4.496
16-Colors	Jarvis	Direct X	3878ms	4.496
16-Colors	Relevance	Direct X	3741ms	4.496

Table 3: Statistics for Compressed Images with Dithering

# of Colors	Dither	Compression	Time	Ratio
216-Colors	Floyd	Direct X	3934ms	4.496
216-Colors	Ordered	Direct X	4134ms	4.496
216-Colors	Jarvis	Direct X	3810ms	4.496
216-Colors	Relevance	Direct X	4093ms	4.496
2-Colors	Floyd	Ericsson	684ms	5.997
2-Colors	Ordered	Ericsson	639ms	5.997
2-Colors	Jarvis	Ericsson	666ms	5.997
2-Colors	Relevance	Ericsson	683ms	5.997
8-Colors	Floyd	Ericsson	765ms	5.997
8-Colors	Ordered	Ericsson	652ms	5.997
8-Colors	Jarvis	Ericsson	757ms	5.997
8-Colors	Relevance	Ericsson	769ms	5.997
16-Colors	Floyd	Ericsson	746ms	5.997
16-Colors	Ordered	Ericsson	740ms	5.997
16-Colors	Jarvis	Ericsson	745ms	5.997
16-Colors	Relevance	Ericsson	739ms	5.997
216-Colors	Floyd	Ericsson	749ms	5.997
216-Colors	Ordered	Ericsson	770ms	5.997
216-Colors	Jarvis	Ericsson	756ms	5.997
216-Colors	Relevance	Ericsson	751ms	5.997
Carpet				
2-Colors	Floyd	Relevance 1	402ms	5.999
2-Colors	Ordered	Relevance 1	407ms	5.999
2-Colors	Jarvis	Relevance 1	402ms	5.999
2-Colors	Relevance	Relevance 1	401ms	5.999
8-Colors	Floyd	Relevance 1	423ms	5.999
8-Colors	Ordered	Relevance 1	433ms	5.999
8-Colors	Jarvis	Relevance 1	499ms	5.999

Table 3: Statistics for Compressed Images with Dithering

# of Colors	Dither	Compression	Time	Ratio
8-Colors	Relevance	Relevance 1	452ms	5.999
16-Colors	Floyd	Relevance 1	451ms	5.999
16-Colors	Ordered	Relevance 1	459ms	5.999
16-Colors	Jarvis	Relevance 1	450ms	5.999
16-Colors	Relevance	Relevance 1	445ms	5.999
216-Colors	Floyd	Relevance 1	894ms	5.999
216-Colors	Ordered	Relevance 1	1097ms	5.999
216-Colors	Jarvis	Relevance 1	919ms	5.999
216-Colors	Relevance	Relevance 1	905ms	5.999
2-Colors	Floyd	Relevance 2	651ms	4.799
2-Colors	Ordered	Relevance 2	689ms	4.799
2-Colors	Jarvis	Relevance 2	654ms	4.799
2-Colors	Relevance	Relevance 2	640ms	4.799
8-Colors	Floyd	Relevance 2	660ms	4.799
8-Colors	Ordered	Relevance 2	724ms	4.799
8-Colors	Jarvis	Relevance 2	762ms	4.799
8-Colors	Relevance	Relevance 2	654ms	4.799
16-Colors	Floyd	Relevance 2	711ms	4.799
16-Colors	Ordered	Relevance 2	791ms	4.799
16-Colors	Jarvis	Relevance 2	713ms	4.799
16-Colors	Relevance	Relevance 2	712ms	4.799
216-Colors	Floyd	Relevance 2	1384ms	4.799
216-Colors	Ordered	Relevance 2	1589ms	4.799
216-Colors	Jarvis	Relevance 2	1395ms	4.799
216-Colors	Relevance	Relevance 2	1506ms	4.799
2-Colors	Floyd	Direct X	1685ms	4.496
2-Colors	Ordered	Direct X	864ms	4.496
2-Colors	Jarvis	Direct X	1230ms	4.496

Table 3: Statistics for Compressed Images with Dithering

# of Colors	Dither	Compression	Time	Ratio
2-Colors	Relevance	Direct X	1169ms	4.496
8-Colors	Floyd	Direct X	4492ms	4.496
8-Colors	Ordered	Direct X	2086ms	4.496
8-Colors	Jarvis	Direct X	4471ms	4.496
8-Colors	Relevance	Direct X	3931ms	4.496
16-Colors	Floyd	Direct X	4942ms	4.496
16-Colors	Ordered	Direct X	3341ms	4.496
16-Colors	Jarvis	Direct X	4210ms	4.496
16-Colors	Relevance	Direct X	4225ms	4.496
216-Colors	Floyd	Direct X	4119ms	4.496
216-Colors	Ordered	Direct X	4081ms	4.496
216-Colors	Jarvis	Direct X	4031ms	4.496
216-Colors	Relevance	Direct X	4170ms	4.496
2-Colors	Floyd	Ericsson	688ms	5.997
2-Colors	Ordered	Ericsson	664ms	5.997
2-Colors	Jarvis	Ericsson	733ms	5.997
2-Colors	Relevance	Ericsson	687ms	5.997
8-Colors	Floyd	Ericsson	753ms	5.997
8-Colors	Ordered	Ericsson	717ms	5.997
8-Colors	Jarvis	Ericsson	752ms	5.997
8-Colors	Relevance	Ericsson	766ms	5.997
16-Colors	Floyd	Ericsson	747ms	5.997
16-Colors	Ordered	Ericsson	743ms	5.997
16-Colors	Jarvis	Ericsson	755ms	5.997
16-Colors	Relevance	Ericsson	755ms	5.997
216-Colors	Floyd	Ericsson	751ms	5.997
216-Colors	Ordered	Ericsson	759ms	5.997
216-Colors	Jarvis	Ericsson	751ms	5.997

Table 3: Statistics for Compressed Images with Dithering

# of Colors	Dither	Compression	Time	Ratio
216-Colors	Relevance	Ericsson	749ms	5.997
Concrete				
2-Colors	Floyd	Relevance 1	415ms	5.999
2-Colors	Ordered	Relevance 1	403ms	5.999
2-Colors	Jarvis	Relevance 1	402ms	5.999
2-Colors	Relevance	Relevance 1	401ms	5.999
8-Colors	Floyd	Relevance 1	424ms	5.999
8-Colors	Ordered	Relevance 1	427ms	5.999
8-Colors	Jarvis	Relevance 1	422ms	5.999
8-Colors	Relevance	Relevance 1	422ms	5.999
16-Colors	Floyd	Relevance 1	446ms	5.999
16-Colors	Ordered	Relevance 1	462ms	5.999
16-Colors	Jarvis	Relevance 1	456ms	5.999
16-Colors	Relevance	Relevance 1	449ms	5.999
216-Colors	Floyd	Relevance 1	1046ms	5.999
216-Colors	Ordered	Relevance 1	1152ms	5.999
216-Colors	Jarvis	Relevance 1	1047ms	5.999
216-Colors	Relevance	Relevance 1	1045ms	5.999
2-Colors	Floyd	Relevance 2	649ms	4.799
2-Colors	Ordered	Relevance 2	711ms	4.799
2-Colors	Jarvis	Relevance 2	665ms	4.799
2-Colors	Relevance	Relevance 2	642ms	4.799
8-Colors	Floyd	Relevance 2	670ms	4.799
8-Colors	Ordered	Relevance 2	722ms	4.799
8-Colors	Jarvis	Relevance 2	680ms	4.799
8-Colors	Relevance	Relevance 2	669ms	4.799
16-Colors	Floyd	Relevance 2	726ms	4.799
16-Colors	Ordered	Relevance 2	776ms	4.799

Table 3: Statistics for Compressed Images with Dithering

# of Colors	Dither	Compression	Time	Ratio
16-Colors	Jarvis	Relevance 2	735ms	4.799
16-Colors	Relevance	Relevance 2	732ms	4.799
216-Colors	Floyd	Relevance 2	1630ms	4.799
216-Colors	Ordered	Relevance 2	1821ms	4.799
216-Colors	Jarvis	Relevance 2	1629ms	4.799
216-Colors	Relevance	Relevance 2	1626ms	4.799
2-Colors	Floyd	Direct X	918ms	4.496
2-Colors	Ordered	Direct X	274ms	4.496
2-Colors	Jarvis	Direct X	922ms	4.496
2-Colors	Relevance	Direct X	879ms	4.496
8-Colors	Floyd	Direct X	3227ms	4.496
8-Colors	Ordered	Direct X	277ms	4.496
8-Colors	Jarvis	Direct X	3371ms	4.496
8-Colors	Relevance	Direct X	3331ms	4.496
16-Colors	Floyd	Direct X	3574ms	4.496
16-Colors	Ordered	Direct X	2303ms	4.496
16-Colors	Jarvis	Direct X	3677ms	4.496
16-Colors	Relevance	Direct X	3588ms	4.496
216-Colors	Floyd	Direct X	3310ms	4.496
216-Colors	Ordered	Direct X	3072ms	4.496
216-Colors	Jarvis	Direct X	3238ms	4.496
216-Colors	Relevance	Direct X	3260ms	4.496
2-Colors	Floyd	Ericsson	646ms	5.997
2-Colors	Ordered	Ericsson	642ms	5.997
2-Colors	Jarvis	Ericsson	636ms	5.997
2-Colors	Relevance	Ericsson	643ms	5.997
8-Colors	Floyd	Ericsson	747ms	5.997
8-Colors	Ordered	Ericsson	643ms	5.997

Table 3: Statistics for Compressed Images with Dithering

# of Colors	Dither	Compression	Time	Ratio
8-Colors	Jarvis	Ericsson	739ms	5.997
8-Colors	Relevance	Ericsson	748ms	5.997
16-Colors	Floyd	Ericsson	727ms	5.997
16-Colors	Ordered	Ericsson	808ms	5.997
16-Colors	Jarvis	Ericsson	723ms	5.997
16-Colors	Relevance	Ericsson	725ms	5.997
216-Colors	Floyd	Ericsson	760ms	5.997
216-Colors	Ordered	Ericsson	772ms	5.997
216-Colors	Jarvis	Ericsson	759ms	5.997
216-Colors	Relevance	Ericsson	766ms	5.997
Grass				
2-Colors	Floyd	Relevance 1	402ms	5.999
2-Colors	Ordered	Relevance 1	406ms	5.999
2-Colors	Jarvis	Relevance 1	400ms	5.999
2-Colors	Relevance	Relevance 1	402ms	5.999
8-Colors	Floyd	Relevance 1	414ms	5.999
8-Colors	Ordered	Relevance 1	424ms	5.999
8-Colors	Jarvis	Relevance 1	414ms	5.999
8-Colors	Relevance	Relevance 1	414ms	5.999
16-Colors	Floyd	Relevance 1	431ms	5.999
16-Colors	Ordered	Relevance 1	446ms	5.999
16-Colors	Jarvis	Relevance 1	432ms	5.999
16-Colors	Relevance	Relevance 1	434ms	5.999
216-Colors	Floyd	Relevance 1	810ms	5.999
216-Colors	Ordered	Relevance 1	918ms	5.999
216-Colors	Jarvis	Relevance 1	817ms	5.999
216-Colors	Relevance	Relevance 1	811ms	5.999
2-Colors	Floyd	Relevance 2	645ms	4.799

Table 3: Statistics for Compressed Images with Dithering

# of Colors	Dither	Compression	Time	Ratio
2-Colors	Ordered	Relevance 2	688ms	4.799
2-Colors	Jarvis	Relevance 2	650ms	4.799
2-Colors	Relevance	Relevance 2	647ms	4.799
8-Colors	Floyd	Relevance 2	654ms	4.799
8-Colors	Ordered	Relevance 2	715ms	4.799
8-Colors	Jarvis	Relevance 2	671ms	4.799
8-Colors	Relevance	Relevance 2	649ms	4.799
16-Colors	Floyd	Relevance 2	696ms	4.799
16-Colors	Ordered	Relevance 2	767ms	4.799
16-Colors	Jarvis	Relevance 2	711ms	4.799
16-Colors	Relevance	Relevance 2	710ms	4.799
216-Colors	Floyd	Relevance 2	1268ms	4.799
216-Colors	Ordered	Relevance 2	1469ms	4.799
216-Colors	Jarvis	Relevance 2	1277ms	4.799
216-Colors	Relevance	Relevance 2	1292ms	4.799
2-Colors	Floyd	Direct X	1207ms	4.496
2-Colors	Ordered	Direct X	1107ms	4.496
2-Colors	Jarvis	Direct X	1276ms	4.496
2-Colors	Relevance	Direct X	1226ms	4.496
8-Colors	Floyd	Direct X	3691ms	4.496
8-Colors	Ordered	Direct X	1979ms	4.496
8-Colors	Jarvis	Direct X	3903ms	4.496
8-Colors	Relevance	Direct X	3851ms	4.496
16-Colors	Floyd	Direct X	4298ms	4.496
16-Colors	Ordered	Direct X	3790ms	4.496
16-Colors	Jarvis	Direct X	4317ms	4.496
16-Colors	Relevance	Direct X	4351ms	4.496
216-Colors	Floyd	Direct X	3954ms	4.496

Table 3: Statistics for Compressed Images with Dithering

# of Colors	Dither	Compression	Time	Ratio
216-Colors	Ordered	Direct X	3683ms	4.496
216-Colors	Jarvis	Direct X	3776ms	4.496
216-Colors	Relevance	Direct X	4117ms	4.496
2-Colors	Floyd	Ericsson	697ms	5.997
2-Colors	Ordered	Ericsson	655ms	5.997
2-Colors	Jarvis	Ericsson	676ms	5.997
2-Colors	Relevance	Ericsson	694ms	5.997
8-Colors	Floyd	Ericsson	735ms	5.997
8-Colors	Ordered	Ericsson	664ms	5.997
8-Colors	Jarvis	Ericsson	738ms	5.997
8-Colors	Relevance	Ericsson	743ms	5.997
16-Colors	Floyd	Ericsson	748ms	5.997
16-Colors	Ordered	Ericsson	727ms	5.997
16-Colors	Jarvis	Ericsson	744ms	5.997
16-Colors	Relevance	Ericsson	749ms	5.997
216-Colors	Floyd	Ericsson	749ms	5.997
216-Colors	Ordered	Ericsson	747ms	5.997
216-Colors	Jarvis	Ericsson	746ms	5.997
216-Colors	Relevance	Ericsson	747ms	5.997
Lena				
2-Colors	Floyd	Relevance 1	401ms	5.999
2-Colors	Ordered	Relevance 1	412ms	5.999
2-Colors	Jarvis	Relevance 1	401ms	5.999
2-Colors	Relevance	Relevance 1	402ms	5.999
8-Colors	Floyd	Relevance 1	420ms	5.999
8-Colors	Ordered	Relevance 1	421ms	5.999
8-Colors	Jarvis	Relevance 1	416ms	5.999
8-Colors	Relevance	Relevance 1	424ms	5.999

Table 3: Statistics for Compressed Images with Dithering

# of Colors	Dither	Compression	Time	Ratio
16-Colors	Floyd	Relevance 1	442ms	5.999
16-Colors	Ordered	Relevance 1	452ms	5.999
16-Colors	Jarvis	Relevance 1	444ms	5.999
16-Colors	Relevance	Relevance 1	447ms	5.999
216-Colors	Floyd	Relevance 1	951ms	5.999
216-Colors	Ordered	Relevance 1	1052ms	5.999
216-Colors	Jarvis	Relevance 1	952ms	5.999
216-Colors	Relevance	Relevance 1	948ms	5.999
2-Colors	Floyd	Relevance 2	643ms	4.799
2-Colors	Ordered	Relevance 2	689ms	4.799
2-Colors	Jarvis	Relevance 2	664ms	4.799
2-Colors	Relevance	Relevance 2	642ms	4.799
8-Colors	Floyd	Relevance 2	658ms	4.799
8-Colors	Ordered	Relevance 2	716ms	4.799
8-Colors	Jarvis	Relevance 2	673ms	4.799
8-Colors	Relevance	Relevance 2	727ms	4.799
16-Colors	Floyd	Relevance 2	772ms	4.799
16-Colors	Ordered	Relevance 2	763ms	4.799
16-Colors	Jarvis	Relevance 2	717ms	4.799
16-Colors	Relevance	Relevance 2	713ms	4.799
216-Colors	Floyd	Relevance 2	1458ms	4.799
216-Colors	Ordered	Relevance 2	1663ms	4.799
216-Colors	Jarvis	Relevance 2	1461ms	4.799
216-Colors	Relevance	Relevance 2	1454ms	4.799
2-Colors	Floyd	Direct X	1099ms	4.496
2-Colors	Ordered	Direct X	675ms	4.496
2-Colors	Jarvis	Direct X	1214ms	4.496
2-Colors	Relevance	Direct X	1093ms	4.496

Table 3: Statistics for Compressed Images with Dithering

# of Colors	Dither	Compression	Time	Ratio
8-Colors	Floyd	Direct X	3451ms	4.496
8-Colors	Ordered	Direct X	1640ms	4.496
8-Colors	Jarvis	Direct X	3598ms	4.496
8-Colors	Relevance	Direct X	3495ms	4.496
16-Colors	Floyd	Direct X	3034ms	4.496
16-Colors	Ordered	Direct X	2898ms	4.496
16-Colors	Jarvis	Direct X	3266ms	4.496
16-Colors	Relevance	Direct X	3279ms	4.496
216-Colors	Floyd	Direct X	3822ms	4.496
216-Colors	Ordered	Direct X	3467ms	4.496
216-Colors	Jarvis	Direct X	3756ms	4.496
216-Colors	Relevance	Direct X	3768ms	4.496
2-Colors	Floyd	Ericsson	675ms	5.997
2-Colors	Ordered	Ericsson	639ms	5.997
2-Colors	Jarvis	Ericsson	662ms	5.997
2-Colors	Relevance	Ericsson	672ms	5.997
8-Colors	Floyd	Ericsson	772ms	5.997
8-Colors	Ordered	Ericsson	717ms	5.997
8-Colors	Jarvis	Ericsson	766ms	5.997
8-Colors	Relevance	Ericsson	776ms	5.997
16-Colors	Floyd	Ericsson	892ms	5.997
16-Colors	Ordered	Ericsson	762ms	5.997
16-Colors	Jarvis	Ericsson	759ms	5.997
16-Colors	Relevance	Ericsson	777ms	5.997
216-Colors	Floyd	Ericsson	753ms	5.997
216-Colors	Ordered	Ericsson	900ms	5.997
216-Colors	Jarvis	Ericsson	786ms	5.997
216-Colors	Relevance	Ericsson	755ms	5.997

Table 3: Statistics for Compressed Images with Dithering

# of Colors	Dither	Compression	Time	Ratio
Pattern				
2-Colors	Floyd	Relevance 1	398ms	5.999
2-Colors	Ordered	Relevance 1	408ms	5.999
2-Colors	Jarvis	Relevance 1	401ms	5.999
2-Colors	Relevance	Relevance 1	410ms	5.999
8-Colors	Floyd	Relevance 1	442ms	5.999
8-Colors	Ordered	Relevance 1	456ms	5.999
8-Colors	Jarvis	Relevance 1	421ms	5.999
8-Colors	Relevance	Relevance 1	413ms	5.999
16-Colors	Floyd	Relevance 1	440ms	5.999
16-Colors	Ordered	Relevance 1	442ms	5.999
16-Colors	Jarvis	Relevance 1	449ms	5.999
16-Colors	Relevance	Relevance 1	435ms	5.999
216-Colors	Floyd	Relevance 1	759ms	5.999
216-Colors	Ordered	Relevance 1	921ms	5.999
216-Colors	Jarvis	Relevance 1	759ms	5.999
216-Colors	Relevance	Relevance 1	813ms	5.999
2-Colors	Floyd	Relevance 2	643ms	4.799
2-Colors	Ordered	Relevance 2	688ms	4.799
2-Colors	Jarvis	Relevance 2	664ms	4.799
2-Colors	Relevance	Relevance 2	641ms	4.799
8-Colors	Floyd	Relevance 2	655ms	4.799
8-Colors	Ordered	Relevance 2	695ms	4.799
8-Colors	Jarvis	Relevance 2	665ms	4.799
8-Colors	Relevance	Relevance 2	651ms	4.799
16-Colors	Floyd	Relevance 2	688ms	4.799
16-Colors	Ordered	Relevance 2	747ms	4.799
16-Colors	Jarvis	Relevance 2	693ms	4.799

Table 3: Statistics for Compressed Images with Dithering

# of Colors	Dither	Compression	Time	Ratio
16-Colors	Relevance	Relevance 2	690ms	4.799
216-Colors	Floyd	Relevance 2	1174ms	4.799
216-Colors	Ordered	Relevance 2	1374ms	4.799
216-Colors	Jarvis	Relevance 2	1170ms	4.799
216-Colors	Relevance	Relevance 2	1172ms	4.799
2-Colors	Floyd	Direct X	1330ms	4.496
2-Colors	Ordered	Direct X	915ms	4.496
2-Colors	Jarvis	Direct X	1313ms	4.496
2-Colors	Relevance	Direct X	1267ms	4.496
8-Colors	Floyd	Direct X	3712ms	4.496
8-Colors	Ordered	Direct X	1966ms	4.496
8-Colors	Jarvis	Direct X	3914ms	4.496
8-Colors	Relevance	Direct X	4060ms	4.496
16-Colors	Floyd	Direct X	4096ms	4.496
16-Colors	Ordered	Direct X	3636ms	4.496
16-Colors	Jarvis	Direct X	4079ms	4.496
16-Colors	Relevance	Direct X	4195ms	4.496
216-Colors	Floyd	Direct X	3914ms	4.496
216-Colors	Ordered	Direct X	3757ms	4.496
216-Colors	Jarvis	Direct X	3805ms	4.496
216-Colors	Relevance	Direct X	3878ms	4.496
2-Colors	Floyd	Ericsson	675ms	5.997
2-Colors	Ordered	Ericsson	611ms	5.997
2-Colors	Jarvis	Ericsson	662ms	5.997
2-Colors	Relevance	Ericsson	685ms	5.997
8-Colors	Floyd	Ericsson	736ms	5.997
8-Colors	Ordered	Ericsson	622ms	5.997
8-Colors	Jarvis	Ericsson	737ms	5.997

Table 3: Statistics for Compressed Images with Dithering

# of Colors	Dither	Compression	Time	Ratio
8-Colors	Relevance	Ericsson	739ms	5.997
16-Colors	Floyd	Ericsson	783ms	5.997
16-Colors	Ordered	Ericsson	742ms	5.997
16-Colors	Jarvis	Ericsson	749ms	5.997
16-Colors	Relevance	Ericsson	747ms	5.997
216-Colors	Floyd	Ericsson	747ms	5.997
216-Colors	Ordered	Ericsson	755ms	5.997
216-Colors	Jarvis	Ericsson	743ms	5.997
216-Colors	Relevance	Ericsson	746ms	5.997
Wood				
2-Colors	Floyd	Relevance 1	398ms	5.999
2-Colors	Ordered	Relevance 1	407ms	5.999
2-Colors	Jarvis	Relevance 1	401ms	5.999
2-Colors	Relevance	Relevance 1	408ms	5.999
8-Colors	Floyd	Relevance 1	420ms	5.999
8-Colors	Ordered	Relevance 1	507ms	5.999
8-Colors	Jarvis	Relevance 1	416ms	5.999
8-Colors	Relevance	Relevance 1	414ms	5.999
16-Colors	Floyd	Relevance 1	441ms	5.999
16-Colors	Ordered	Relevance 1	454ms	5.999
16-Colors	Jarvis	Relevance 1	441ms	5.999
16-Colors	Relevance	Relevance 1	443ms	5.999
216-Colors	Floyd	Relevance 1	901ms	5.999
216-Colors	Ordered	Relevance 1	1011ms	5.999
216-Colors	Jarvis	Relevance 1	963ms	5.999
216-Colors	Relevance	Relevance 1	916ms	5.999
2-Colors	Floyd	Relevance 2	732ms	4.799
2-Colors	Ordered	Relevance 2	691ms	4.799

Table 3: Statistics for Compressed Images with Dithering

# of Colors	Dither	Compression	Time	Ratio
2-Colors	Jarvis	Relevance 2	650ms	4.799
2-Colors	Relevance	Relevance 2	640ms	4.799
8-Colors	Floyd	Relevance 2	663ms	4.799
8-Colors	Ordered	Relevance 2	724ms	4.799
8-Colors	Jarvis	Relevance 2	672ms	4.799
8-Colors	Relevance	Relevance 2	662ms	4.799
16-Colors	Floyd	Relevance 2	817ms	4.799
16-Colors	Ordered	Relevance 2	778ms	4.799
16-Colors	Jarvis	Relevance 2	720ms	4.799
16-Colors	Relevance	Relevance 2	717ms	4.799
216-Colors	Floyd	Relevance 2	1411ms	4.799
216-Colors	Ordered	Relevance 2	1704ms	4.799
216-Colors	Jarvis	Relevance 2	1426ms	4.799
216-Colors	Relevance	Relevance 2	1418ms	4.799
2-Colors	Floyd	Direct X	1059ms	4.496
2-Colors	Ordered	Direct X	896ms	4.496
2-Colors	Jarvis	Direct X	1171ms	4.496
2-Colors	Relevance	Direct X	1055ms	4.496
8-Colors	Floyd	Direct X	3650ms	4.496
8-Colors	Ordered	Direct X	1654ms	4.496
8-Colors	Jarvis	Direct X	3803ms	4.496
8-Colors	Relevance	Direct X	3689ms	4.496
16-Colors	Floyd	Direct X	3909ms	4.496
16-Colors	Ordered	Direct X	2569ms	4.496
16-Colors	Jarvis	Direct X	3898ms	4.496
16-Colors	Relevance	Direct X	3984ms	4.496
216-Colors	Floyd	Direct X	3728ms	4.496
216-Colors	Ordered	Direct X	3711ms	4.496

Table 3: Statistics for Compressed Images with Dithering

# of Colors	Dither	Compression	Time	Ratio
216-Colors	Jarvis	Direct X	3688ms	4.496
216-Colors	Relevance	Direct X	3721ms	4.496
2-Colors	Floyd	Ericsson	727ms	5.997
2-Colors	Ordered	Ericsson	648ms	5.997
2-Colors	Jarvis	Ericsson	681ms	5.997
2-Colors	Relevance	Ericsson	705ms	5.997
8-Colors	Floyd	Ericsson	760ms	5.997
8-Colors	Ordered	Ericsson	669ms	5.997
8-Colors	Jarvis	Ericsson	757ms	5.997
8-Colors	Relevance	Ericsson	760ms	5.997
16-Colors	Floyd	Ericsson	747ms	5.997
16-Colors	Ordered	Ericsson	707ms	5.997
16-Colors	Jarvis	Ericsson	745ms	5.997
16-Colors	Relevance	Ericsson	748ms	5.997
216-Colors	Floyd	Ericsson	767ms	5.997
216-Colors	Ordered	Ericsson	747ms	5.997
216-Colors	Jarvis	Ericsson	746ms	5.997
216-Colors	Relevance	Ericsson	747ms	5.997

5.2.5 Decompression Methods

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
Baboon					
2-Colors	Floyd	Relevance 1 v1	328ms	217.069	193,930,919.66
2-Colors	Ordered	Relevance 1 v1	375ms	187.094	225,001,895.902
2-Colors	Jarvis	Relevance 1 v1	312ms	212.351	198,240,290.775
2-Colors	Relevance	Relevance 1 v1	312ms	216.684	194,275,859.071
8-Colors	Floyd	Relevance 1 v1	328ms	197.973	212,637,128.463
8-Colors	Ordered	Relevance 1 v1	375ms	160.278	262,646,380.594
8-Colors	Jarvis	Relevance 1 v1	312ms	192.689	218,467,991.477
8-Colors	Relevance	Relevance 1 v1	312ms	197.743	212,884,503.401
16-Colors	Floyd	Relevance 1 v1	312ms	90.211	466,645,375.913
16-Colors	Ordered	Relevance 1 v1	374ms	74.125	567,913,013.582
16-Colors	Jarvis	Relevance 1 v1	297ms	85.163	494,304,131.62
16-Colors	Relevance	Relevance 1 v1	312ms	90.514	465,082,265.939
216-Colors	Floyd	Relevance 1 v1	327ms	43.485	968,070,935.916
216-Colors	Ordered	Relevance 1 v1	358ms	50.747	829,540,538.56
216-Colors	Jarvis	Relevance 1 v1	296ms	41.912	1,004,411,849.416
216-Colors	Relevance	Relevance 1 v1	328ms	43.133	975,962,105.92
2-Colors	Floyd	Relevance 1 v2	327ms	194.475	216,461,499.729
2-Colors	Ordered	Relevance 1 v2	374ms	173.078	243,222,956.791
2-Colors	Jarvis	Relevance 1 v2	312ms	184.767	227,835,139.583
2-Colors	Relevance	Relevance 1 v2	312ms	190.7	220,747,374.865
8-Colors	Floyd	Relevance 1 v2	327ms	174.228	241,616,649.153
8-Colors	Ordered	Relevance 1 v2	374ms	145.839	288,649,735.579
8-Colors	Jarvis	Relevance 1 v2	312ms	164.622	255,716,174.88
8-Colors	Relevance	Relevance 1 v2	327ms	170.059	247,540,628.361
16-Colors	Floyd	Relevance 1 v2	343ms	81.576	516,039,344.14

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
16-Colors	Ordered	Relevance 1 v2	374ms	67.943	619,581,830.1
16-Colors	Jarvis	Relevance 1 v2	328ms	75.549	557,204,548.818
16-Colors	Relevance	Relevance 1 v2	328ms	80.687	521,728,227.331
216-Colors	Floyd	Relevance 1 v2	344ms	38.561	1,091,694,780.829
216-Colors	Ordered	Relevance 1 v2	390ms	46.552	904,296,090.232
216-Colors	Jarvis	Relevance 1 v2	327ms	36.968	1,138,729,760.612
216-Colors	Relevance	Relevance 1 v2	328ms	37.913	1,110,351,674.312
2-Colors	Floyd	Relevance 2	468ms	214.174	196,552,397.51
2-Colors	Ordered	Relevance 2	500ms	194.689	216,223,977.753
2-Colors	Jarvis	Relevance 2	468ms	207.04	203,324,873.64
2-Colors	Relevance	Relevance 2	468ms	213.559	197,119,007.129
8-Colors	Floyd	Relevance 2	452ms	194.005	216,986,053.166
8-Colors	Ordered	Relevance 2	500ms	169.463	248,410,852.54
8-Colors	Jarvis	Relevance 2	467ms	185.09	227,437,488.701
8-Colors	Relevance	Relevance 2	468ms	193.305	217,772,444.172
16-Colors	Floyd	Relevance 2	453ms	88.812	473,992,859.15
16-Colors	Ordered	Relevance 2	468ms	90.251	466,439,350.479
16-Colors	Jarvis	Relevance 2	468ms	80.905	520,320,348.654
16-Colors	Relevance	Relevance 2	468ms	89.241	471,718,936.367
216-Colors	Floyd	Relevance 2	452ms	71.496	588,793,694.995
216-Colors	Ordered	Relevance 2	452ms	84.845	496,156,332.733
216-Colors	Jarvis	Relevance 2	452ms	68.856	611,372,592.37
216-Colors	Relevance	Relevance 2	452ms	70.024	601,171,472.283
2-Colors	Floyd	Direct X	16ms	214.174	196,552,397.51
2-Colors	Ordered	Direct X	16ms	194.689	216,223,977.753
2-Colors	Jarvis	Direct X	16ms	207.04	203,324,873.64
2-Colors	Relevance	Direct X	16ms	213.559	197,119,007.129
8-Colors	Floyd	Direct X	16ms	194.005	216,986,053.166

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
8-Colors	Ordered	Direct X	15ms	169.463	248,410,852.54
8-Colors	Jarvis	Direct X	16ms	185.09	227,437,488.701
8-Colors	Relevance	Direct X	16ms	193.305	217,772,444.172
16-Colors	Floyd	Direct X	16ms	85.012	495,181,809.812
16-Colors	Ordered	Direct X	16ms	88.174	477,426,197.786
16-Colors	Jarvis	Direct X	16ms	78.367	537,173,450.623
16-Colors	Relevance	Direct X	31ms	84.973	495,411,303.21
216-Colors	Floyd	Direct X	32ms	31.175	1,350,323,432.676
216-Colors	Ordered	Direct X	16ms	68.005	619,023,622.822
216-Colors	Jarvis	Direct X	15ms	28.652	1,469,208,478.104
216-Colors	Relevance	Direct X	16ms	30.606	1,375,443,873.434
2-Colors	Floyd	Ericsson	47ms	213.099	197,544,163.81
2-Colors	Ordered	Ericsson	47ms	193.477	217,578,329.888
2-Colors	Jarvis	Ericsson	47ms	205.872	204,478,788.772
2-Colors	Relevance	Ericsson	62ms	212.516	198,086,408.725
8-Colors	Floyd	Ericsson	63ms	140.656	299,287,381.445
8-Colors	Ordered	Ericsson	46ms	153.549	274,157,011.434
8-Colors	Jarvis	Ericsson	62ms	146.416	287,513,191.534
8-Colors	Relevance	Ericsson	63ms	140.781	299,021,488.996
16-Colors	Floyd	Ericsson	63ms	79.349	530,519,418.281
16-Colors	Ordered	Ericsson	62ms	84.475	498,330,139.108
16-Colors	Jarvis	Ericsson	62ms	73.695	571,228,152.622
16-Colors	Relevance	Ericsson	47ms	79.822	527,380,133.409
216-Colors	Floyd	Ericsson	47ms	28.414	1,481,537,074.562
216-Colors	Ordered	Ericsson	47ms	68.259	616,715,599.122
216-Colors	Jarvis	Ericsson	46ms	27.623	1,523,954,804.212
216-Colors	Relevance	Ericsson	47ms	28.208	1,492,367,834.02
Bamboo					

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
2-Colors	Floyd	Relevance 1 v1	312ms	223.168	151,720,950.326
2-Colors	Ordered	Relevance 1 v1	374ms	192.603	175,798,076.272
2-Colors	Jarvis	Relevance 1 v1	312ms	223.303	151,628,945.094
2-Colors	Relevance	Relevance 1 v1	328ms	223.167	151,721,477.805
8-Colors	Floyd	Relevance 1 v1	327ms	191.393	176,909,934.519
8-Colors	Ordered	Relevance 1 v1	374ms	142.549	237,526,714.777
8-Colors	Jarvis	Relevance 1 v1	312ms	191.388	176,913,754.025
8-Colors	Relevance	Relevance 1 v1	328ms	191.402	176,901,103.153
16-Colors	Floyd	Relevance 1 v1	328ms	60.069	563,667,987.088
16-Colors	Ordered	Relevance 1 v1	437ms	50.243	673,906,524.376
16-Colors	Jarvis	Relevance 1 v1	312ms	57.656	587,267,126.556
16-Colors	Relevance	Relevance 1 v1	312ms	59.107	572,845,603.86
216-Colors	Floyd	Relevance 1 v1	328ms	33.885	999,226,145.045
216-Colors	Ordered	Relevance 1 v1	374ms	41.918	807,743,027.869
216-Colors	Jarvis	Relevance 1 v1	297ms	32.161	1,052,797,665.734
216-Colors	Relevance	Relevance 1 v1	312ms	33.439	1,012,580,958.751
2-Colors	Floyd	Relevance 1 v2	343ms	202.877	166,895,132.894
2-Colors	Ordered	Relevance 1 v2	390ms	181.666	186,381,409.351
2-Colors	Jarvis	Relevance 1 v2	312ms	197.309	171,604,999.674
2-Colors	Relevance	Relevance 1 v2	327ms	199.891	169,388,320.215
8-Colors	Floyd	Relevance 1 v2	328ms	168.918	200,447,212.572
8-Colors	Ordered	Relevance 1 v2	390ms	135.301	250,251,513.845
8-Colors	Jarvis	Relevance 1 v2	328ms	165.385	204,729,342.423
8-Colors	Relevance	Relevance 1 v2	327ms	165.408	204,701,122.277
16-Colors	Floyd	Relevance 1 v2	328ms	53.223	636,176,030.137
16-Colors	Ordered	Relevance 1 v2	374ms	46.325	730,906,446.415
16-Colors	Jarvis	Relevance 1 v2	327ms	50.268	673,568,581.291
16-Colors	Relevance	Relevance 1 v2	328ms	51.949	651,779,456.246

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
216-Colors	Floyd	Relevance 1 v2	328ms	30.033	1,127,386,750.96
216-Colors	Ordered	Relevance 1 v2	390ms	38.864	871,215,856.7
216-Colors	Jarvis	Relevance 1 v2	312ms	28.202	1,200,598,872.852
216-Colors	Relevance	Relevance 1 v2	327ms	29.383	1,152,325,740.956
2-Colors	Floyd	Relevance 2	468ms	223.108	151,761,859.581
2-Colors	Ordered	Relevance 2	484ms	210.337	160,976,397.902
2-Colors	Jarvis	Relevance 2	483ms	223.162	151,725,183.645
2-Colors	Relevance	Relevance 2	468ms	223.125	151,750,261.88
8-Colors	Floyd	Relevance 2	468ms	191.285	177,009,649.207
8-Colors	Ordered	Relevance 2	468ms	156.865	215,848,873.953
8-Colors	Jarvis	Relevance 2	468ms	191.287	177,007,891.603
8-Colors	Relevance	Relevance 2	468ms	191.313	176,983,648.136
16-Colors	Floyd	Relevance 2	484ms	60.77	557,170,190.871
16-Colors	Ordered	Relevance 2	484ms	74.812	452,589,081.012
16-Colors	Jarvis	Relevance 2	569ms	57.724	586,568,341.891
16-Colors	Relevance	Relevance 2	461ms	59.613	567,986,152.091
216-Colors	Floyd	Relevance 2	444ms	45.768	739,798,432.374
216-Colors	Ordered	Relevance 2	452ms	69.233	489,062,864.366
216-Colors	Jarvis	Relevance 2	459ms	41.679	812,387,711.021
216-Colors	Relevance	Relevance 2	466ms	42.588	795,040,060.471
2-Colors	Floyd	Direct X	20ms	223.108	151,761,859.581
2-Colors	Ordered	Direct X	21ms	210.337	160,976,397.902
2-Colors	Jarvis	Direct X	20ms	223.162	151,725,183.645
2-Colors	Relevance	Direct X	20ms	223.125	151,750,261.88
8-Colors	Floyd	Direct X	22ms	191.285	177,009,649.207
8-Colors	Ordered	Direct X	20ms	156.865	215,848,873.953
8-Colors	Jarvis	Direct X	20ms	191.287	177,007,891.603
8-Colors	Relevance	Direct X	20ms	191.313	176,983,648.136

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
16-Colors	Floyd	Direct X	20ms	59.759	566,597,746.163
16-Colors	Ordered	Direct X	20ms	74.454	454,769,874.898
16-Colors	Jarvis	Direct X	20ms	57.195	591,991,400.98
16-Colors	Relevance	Direct X	21ms	58.821	575,633,960.664
216-Colors	Floyd	Direct X	20ms	33.353	1,015,172,756.691
216-Colors	Ordered	Direct X	19ms	68.504	494,270,168.871
216-Colors	Jarvis	Direct X	20ms	31.529	1,073,923,583.721
216-Colors	Relevance	Direct X	20ms	32.884	1,029,658,169.317
2-Colors	Floyd	Ericsson	57ms	221.828	152,637,459.505
2-Colors	Ordered	Ericsson	64ms	209.305	161,769,939.17
2-Colors	Jarvis	Ericsson	57ms	221.824	152,639,824.176
2-Colors	Relevance	Ericsson	58ms	221.928	152,568,711.895
8-Colors	Floyd	Ericsson	60ms	143.382	236,146,252.579
8-Colors	Ordered	Ericsson	59ms	131.174	258,124,906.402
8-Colors	Jarvis	Ericsson	58ms	144.9	233,673,597.837
8-Colors	Relevance	Ericsson	59ms	143.506	235,943,582.167
16-Colors	Floyd	Ericsson	57ms	50.308	673,041,123.124
16-Colors	Ordered	Ericsson	56ms	70.634	479,364,169.555
16-Colors	Jarvis	Ericsson	56ms	47.9	706,869,985.836
16-Colors	Relevance	Ericsson	57ms	49.673	681,639,553.193
216-Colors	Floyd	Ericsson	56ms	23.156	1,462,235,325.366
216-Colors	Ordered	Ericsson	58ms	66.818	506,740,642.517
216-Colors	Jarvis	Ericsson	56ms	23.247	1,456,503,804.632
216-Colors	Relevance	Ericsson	57ms	22.905	1,478,271,053.986
Carpet					
2-Colors	Floyd	Relevance 1 v1	323ms	218.726	177,844,563.904
2-Colors	Ordered	Relevance 1 v1	377ms	195.819	198,648,664.181
2-Colors	Jarvis	Relevance 1 v1	311ms	218.271	178,215,514.515

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
2-Colors	Relevance	Relevance 1 v1	321ms	218.845	177,747,500.515
8-Colors	Floyd	Relevance 1 v1	341ms	210.63	184,680,405.418
8-Colors	Ordered	Relevance 1 v1	372ms	179.336	216,906,428.445
8-Colors	Jarvis	Relevance 1 v1	319ms	209.732	185,471,122.321
8-Colors	Relevance	Relevance 1 v1	321ms	210.496	184,798,284.286
16-Colors	Floyd	Relevance 1 v1	323ms	76.57	508,023,432.35
16-Colors	Ordered	Relevance 1 v1	376ms	65.648	592,538,928.06
16-Colors	Jarvis	Relevance 1 v1	312ms	74.501	522,130,145.997
16-Colors	Relevance	Relevance 1 v1	320ms	76.203	510,467,553.274
216-Colors	Floyd	Relevance 1 v1	326ms	34.325	1,133,249,919.003
216-Colors	Ordered	Relevance 1 v1	377ms	43.361	897,108,844.842
216-Colors	Jarvis	Relevance 1 v1	317ms	31.677	1,228,009,540.42
216-Colors	Relevance	Relevance 1 v1	321ms	33.736	1,153,052,048.434
2-Colors	Floyd	Relevance 1 v2	338ms	196.081	198,383,066.707
2-Colors	Ordered	Relevance 1 v2	386ms	182.696	212,917,353.995
2-Colors	Jarvis	Relevance 1 v2	321ms	189.8	204,948,772.967
2-Colors	Relevance	Relevance 1 v2	327ms	195.122	199,358,788.674
8-Colors	Floyd	Relevance 1 v2	338ms	187.526	207,434,094.607
8-Colors	Ordered	Relevance 1 v2	413ms	167.833	231,772,871.339
8-Colors	Jarvis	Relevance 1 v2	381ms	181.166	214,716,068.231
8-Colors	Relevance	Relevance 1 v2	331ms	185.045	210,214,463.57
16-Colors	Floyd	Relevance 1 v2	333ms	67.941	572,544,952.199
16-Colors	Ordered	Relevance 1 v2	389ms	61.102	636,623,315.764
16-Colors	Jarvis	Relevance 1 v2	333ms	64.149	606,384,334.967
16-Colors	Relevance	Relevance 1 v2	330ms	64.967	598,757,980.035
216-Colors	Floyd	Relevance 1 v2	377ms	29.621	1,313,221,450.269
216-Colors	Ordered	Relevance 1 v2	449ms	39.369	988,076,049.013
216-Colors	Jarvis	Relevance 1 v2	323ms	26.939	1,443,969,733.431

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
216-Colors	Relevance	Relevance 1 v2	329ms	28.752	1,352,913,783.914
2-Colors	Floyd	Relevance 2	502ms	218.58	177,963,562.519
2-Colors	Ordered	Relevance 2	490ms	209.209	185,934,963.338
2-Colors	Jarvis	Relevance 2	472ms	217.444	178,893,269.622
2-Colors	Relevance	Relevance 2	480ms	218.484	178,041,067.953
8-Colors	Floyd	Relevance 2	452ms	209.902	185,320,997.499
8-Colors	Ordered	Relevance 2	474ms	193.34	201,195,846.624
8-Colors	Jarvis	Relevance 2	450ms	208.651	186,431,543.715
8-Colors	Relevance	Relevance 2	457ms	209.891	185,330,175.626
16-Colors	Floyd	Relevance 2	477ms	75.497	515,244,780.055
16-Colors	Ordered	Relevance 2	487ms	86.271	450,894,550.353
16-Colors	Jarvis	Relevance 2	470ms	72.92	533,448,899.665
16-Colors	Relevance	Relevance 2	452ms	75.128	517,771,974.388
216-Colors	Floyd	Relevance 2	456ms	34.127	1,139,849,198.277
216-Colors	Ordered	Relevance 2	457ms	70.826	549,225,314.287
216-Colors	Jarvis	Relevance 2	454ms	31.626	1,229,986,580.827
216-Colors	Relevance	Relevance 2	481ms	34.913	1,114,187,439.302
2-Colors	Floyd	Direct X	20ms	218.58	177,963,562.519
2-Colors	Ordered	Direct X	20ms	209.209	185,934,963.338
2-Colors	Jarvis	Direct X	21ms	217.444	178,893,269.622
2-Colors	Relevance	Direct X	20ms	218.484	178,041,067.953
8-Colors	Floyd	Direct X	20ms	209.902	185,320,997.499
8-Colors	Ordered	Direct X	20ms	193.34	201,195,846.624
8-Colors	Jarvis	Direct X	21ms	208.651	186,431,543.715
8-Colors	Relevance	Direct X	20ms	209.891	185,330,175.626
16-Colors	Floyd	Direct X	20ms	75.386	516,003,269.293
16-Colors	Ordered	Direct X	20ms	86.271	450,894,550.353
16-Colors	Jarvis	Direct X	20ms	72.906	533,550,613.12

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
16-Colors	Relevance	Direct X	20ms	75.049	518,318,380.49
216-Colors	Floyd	Direct X	21ms	31.84	1,221,703,638.878
216-Colors	Ordered	Direct X	21ms	69.418	560,360,145.468
216-Colors	Jarvis	Direct X	21ms	28.8	1,350,671,216.249
216-Colors	Relevance	Direct X	21ms	31.302	1,242,707,962.068
2-Colors	Floyd	Ericsson	57ms	218.197	178,275,739.996
2-Colors	Ordered	Ericsson	61ms	208.085	186,939,245.965
2-Colors	Jarvis	Ericsson	57ms	216.899	179,342,620.706
2-Colors	Relevance	Ericsson	57ms	218.12	178,338,693.073
8-Colors	Floyd	Ericsson	59ms	144.892	268,470,160.142
8-Colors	Ordered	Ericsson	57ms	169.049	230,106,263.16
8-Colors	Jarvis	Ericsson	58ms	151.75	256,337,050.372
8-Colors	Relevance	Ericsson	58ms	145.094	268,096,379.95
16-Colors	Floyd	Ericsson	56ms	44.232	879,441,757.429
16-Colors	Ordered	Ericsson	57ms	80.776	481,571,339.971
16-Colors	Jarvis	Ericsson	55ms	42.238	920,951,961.61
16-Colors	Relevance	Ericsson	57ms	43.946	885,152,174.967
216-Colors	Floyd	Ericsson	56ms	22.201	1,752,148,822.438
216-Colors	Ordered	Ericsson	56ms	67.594	575,484,971.523
216-Colors	Jarvis	Ericsson	56ms	20.558	1,892,151,102.817
216-Colors	Relevance	Ericsson	57ms	21.898	1,776,385,129.097
Concrete					
2-Colors	Floyd	Relevance 1 v1	328ms	209.082	341,953,344.684
2-Colors	Ordered	Relevance 1 v1	371ms	146.213	488,985,861.765
2-Colors	Jarvis	Relevance 1 v1	317ms	208.856	342,323,009.43
2-Colors	Relevance	Relevance 1 v1	319ms	208.758	342,483,830.398
8-Colors	Floyd	Relevance 1 v1	329ms	201.427	354,948,985.17
8-Colors	Ordered	Relevance 1 v1	372ms	146.212	488,988,531.75

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
8-Colors	Jarvis	Relevance 1 v1	311ms	201.189	355,368,713.047
8-Colors	Relevance	Relevance 1 v1	316ms	201.283	355,202,899.865
16-Colors	Floyd	Relevance 1 v1	320ms	57.469	1,244,074,171.836
16-Colors	Ordered	Relevance 1 v1	370ms	42.059	1,699,888,358.212
16-Colors	Jarvis	Relevance 1 v1	309ms	57.161	1,250,782,230.451
16-Colors	Relevance	Relevance 1 v1	316ms	57.522	1,242,939,819.732
216-Colors	Floyd	Relevance 1 v1	323ms	31.689	2,256,184,217.455
216-Colors	Ordered	Relevance 1 v1	375ms	39.965	1,788,964,702.247
216-Colors	Jarvis	Relevance 1 v1	309ms	31.308	2,283,665,780.24
216-Colors	Relevance	Relevance 1 v1	315ms	31.655	2,258,577,251.616
2-Colors	Floyd	Relevance 1 v2	336ms	191.389	373,563,992.809
2-Colors	Ordered	Relevance 1 v2	380ms	146.213	488,985,861.765
2-Colors	Jarvis	Relevance 1 v2	323ms	179.521	398,261,102.354
2-Colors	Relevance	Relevance 1 v2	325ms	177.942	401,795,269.828
8-Colors	Floyd	Relevance 1 v2	336ms	178.664	400,170,396.524
8-Colors	Ordered	Relevance 1 v2	381ms	146.207	489,005,264.912
8-Colors	Jarvis	Relevance 1 v2	320ms	173.432	412,242,933.276
8-Colors	Relevance	Relevance 1 v2	326ms	173.636	411,758,701.891
16-Colors	Floyd	Relevance 1 v2	336ms	49.695	1,438,689,670.545
16-Colors	Ordered	Relevance 1 v2	384ms	40.944	1,746,214,619.697
16-Colors	Jarvis	Relevance 1 v2	318ms	49.254	1,451,569,467.925
16-Colors	Relevance	Relevance 1 v2	326ms	48.918	1,461,548,991.082
216-Colors	Floyd	Relevance 1 v2	335ms	27.605	2,589,928,020.754
216-Colors	Ordered	Relevance 1 v2	383ms	35.53	2,012,269,124.961
216-Colors	Jarvis	Relevance 1 v2	316ms	27.044	2,643,685,547.48
216-Colors	Relevance	Relevance 1 v2	330ms	27.086	2,639,593,197.812
2-Colors	Floyd	Relevance 2	482ms	208.935	342,193,715.759
2-Colors	Ordered	Relevance 2	497ms	146.213	488,985,861.765

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
2-Colors	Jarvis	Relevance 2	482ms	208.764	342,472,776.828
2-Colors	Relevance	Relevance 2	485ms	208.973	342,131,114.81
8-Colors	Floyd	Relevance 2	458ms	201.447	354,912,087.026
8-Colors	Ordered	Relevance 2	493ms	146.212	488,988,109
8-Colors	Jarvis	Relevance 2	465ms	201.245	355,269,836.413
8-Colors	Relevance	Relevance 2	464ms	201.474	354,865,573.391
16-Colors	Floyd	Relevance 2	463ms	57.436	1,244,800,127.07
16-Colors	Ordered	Relevance 2	481ms	72.411	987,363,065.478
16-Colors	Jarvis	Relevance 2	467ms	57.063	1,252,927,690.793
16-Colors	Relevance	Relevance 2	477ms	57.466	1,244,153,043.458
216-Colors	Floyd	Relevance 2	475ms	31.388	2,277,842,231.759
216-Colors	Ordered	Relevance 2	472ms	69.296	1,031,743,253.768
216-Colors	Jarvis	Relevance 2	474ms	30.89	2,314,525,748.701
216-Colors	Relevance	Relevance 2	463ms	31.338	2,281,416,326.624
2-Colors	Floyd	Direct X	20ms	208.935	342,193,715.759
2-Colors	Ordered	Direct X	20ms	146.213	488,985,861.765
2-Colors	Jarvis	Direct X	20ms	208.764	342,472,776.828
2-Colors	Relevance	Direct X	20ms	208.973	342,131,114.81
8-Colors	Floyd	Direct X	20ms	201.447	354,912,087.026
8-Colors	Ordered	Direct X	21ms	146.212	488,988,109
8-Colors	Jarvis	Direct X	20ms	201.245	355,269,836.413
8-Colors	Relevance	Direct X	20ms	201.474	354,865,573.391
16-Colors	Floyd	Direct X	20ms	57.436	1,244,800,127.07
16-Colors	Ordered	Direct X	20ms	72.411	987,363,065.478
16-Colors	Jarvis	Direct X	20ms	57.063	1,252,927,690.793
16-Colors	Relevance	Direct X	20ms	57.466	1,244,153,043.458
216-Colors	Floyd	Direct X	20ms	31.536	2,267,150,707.221
216-Colors	Ordered	Direct X	20ms	69.296	1,031,743,253.768

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
216-Colors	Jarvis	Direct X	19ms	31.015	2,305,193,081.657
216-Colors	Relevance	Direct X	20ms	31.488	2,270,615,818.127
2-Colors	Floyd	Ericsson	57ms	207.417	344,697,137.013
2-Colors	Ordered	Ericsson	55ms	146.213	488,985,861.765
2-Colors	Jarvis	Ericsson	57ms	207.021	345,356,858.125
2-Colors	Relevance	Ericsson	57ms	207.457	344,630,511.911
8-Colors	Floyd	Ericsson	58ms	138.248	517,160,367.565
8-Colors	Ordered	Ericsson	56ms	146.21	488,996,965.655
8-Colors	Jarvis	Ericsson	58ms	140.416	509,173,161.393
8-Colors	Relevance	Ericsson	58ms	137.861	518,609,473.702
16-Colors	Floyd	Ericsson	55ms	34.127	2,095,014,146.475
16-Colors	Ordered	Ericsson	56ms	68.85	1,038,437,461.678
16-Colors	Jarvis	Ericsson	57ms	34.558	2,068,848,348.301
16-Colors	Relevance	Ericsson	56ms	34.282	2,085,536,808.49
216-Colors	Floyd	Ericsson	55ms	24.446	2,924,699,235.627
216-Colors	Ordered	Ericsson	57ms	65.793	1,086,679,084.236
216-Colors	Jarvis	Ericsson	55ms	25.02	2,857,524,243.835
216-Colors	Relevance	Ericsson	55ms	24.498	2,918,406,390.067
Grass					
2-Colors	Floyd	Relevance 1 v1	330ms	223.544	119,893,038.291
2-Colors	Ordered	Relevance 1 v1	376ms	204.704	130,927,172.175
2-Colors	Jarvis	Relevance 1 v1	310ms	222.225	120,604,692.301
2-Colors	Relevance	Relevance 1 v1	315ms	223.332	120,006,909.186
8-Colors	Floyd	Relevance 1 v1	324ms	206.691	129,668,732.074
8-Colors	Ordered	Relevance 1 v1	375ms	178.887	149,822,996.997
8-Colors	Jarvis	Relevance 1 v1	310ms	205.27	130,566,439.082
8-Colors	Relevance	Relevance 1 v1	315ms	206.627	129,708,866.617
16-Colors	Floyd	Relevance 1 v1	322ms	83.3	321,743,053.408

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
16-Colors	Ordered	Relevance 1 v1	373ms	63.544	421,774,665.532
16-Colors	Jarvis	Relevance 1 v1	314ms	81.497	328,862,745.265
16-Colors	Relevance	Relevance 1 v1	315ms	83.232	322,006,549.641
216-Colors	Floyd	Relevance 1 v1	325ms	35.286	759,543,368
216-Colors	Ordered	Relevance 1 v1	371ms	44.214	606,174,578.375
216-Colors	Jarvis	Relevance 1 v1	310ms	33.222	806,738,830.881
216-Colors	Relevance	Relevance 1 v1	316ms	34.94	767,061,500.74
2-Colors	Floyd	Relevance 1 v2	335ms	202.133	132,592,863.951
2-Colors	Ordered	Relevance 1 v2	381ms	182.227	147,076,299.267
2-Colors	Jarvis	Relevance 1 v2	322ms	194.323	137,921,291.348
2-Colors	Relevance	Relevance 1 v2	329ms	199.228	134,526,144.883
8-Colors	Floyd	Relevance 1 v2	330ms	181.875	147,361,512.97
8-Colors	Ordered	Relevance 1 v2	381ms	167.077	160,413,493.434
8-Colors	Jarvis	Relevance 1 v2	322ms	177.503	150,990,485.75
8-Colors	Relevance	Relevance 1 v2	326ms	182.504	146,853,196.652
16-Colors	Floyd	Relevance 1 v2	328ms	72.156	371,433,482.417
16-Colors	Ordered	Relevance 1 v2	381ms	58.191	460,579,166.503
16-Colors	Jarvis	Relevance 1 v2	320ms	69.783	384,068,947.662
16-Colors	Relevance	Relevance 1 v2	328ms	70.911	377,959,168.953
216-Colors	Floyd	Relevance 1 v2	335ms	30.065	891,451,793.031
216-Colors	Ordered	Relevance 1 v2	380ms	39.607	676,680,442.834
216-Colors	Jarvis	Relevance 1 v2	317ms	27.736	966,286,344.181
216-Colors	Relevance	Relevance 1 v2	329ms	29.394	911,799,469.165
2-Colors	Floyd	Relevance 2	467ms	222.793	120,296,867.498
2-Colors	Ordered	Relevance 2	482ms	230.631	116,208,625.841
2-Colors	Jarvis	Relevance 2	476ms	220.611	121,486,661.769
2-Colors	Relevance	Relevance 2	472ms	222.751	120,319,819.539
8-Colors	Floyd	Relevance 2	453ms	206.031	130,083,930.628

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
8-Colors	Ordered	Relevance 2	487ms	186.744	143,518,938.026
8-Colors	Jarvis	Relevance 2	460ms	203.75	131,540,397.042
8-Colors	Relevance	Relevance 2	448ms	206	130,103,408.22
16-Colors	Floyd	Relevance 2	459ms	81.634	328,312,674.661
16-Colors	Ordered	Relevance 2	475ms	88.89	301,511,946.203
16-Colors	Jarvis	Relevance 2	467ms	79.034	339,110,871.519
16-Colors	Relevance	Relevance 2	463ms	81.598	328,455,479.094
216-Colors	Floyd	Relevance 2	465ms	32.618	821,669,844.981
216-Colors	Ordered	Relevance 2	462ms	69.509	385,578,442.753
216-Colors	Jarvis	Relevance 2	465ms	30.044	892,078,728.666
216-Colors	Relevance	Relevance 2	456ms	32.244	831,210,936.637
2-Colors	Floyd	Direct X	20ms	222.793	120,296,867.498
2-Colors	Ordered	Direct X	20ms	230.631	116,208,625.841
2-Colors	Jarvis	Direct X	20ms	220.611	121,486,661.769
2-Colors	Relevance	Direct X	20ms	222.751	120,319,819.539
8-Colors	Floyd	Direct X	20ms	206.031	130,083,930.628
8-Colors	Ordered	Direct X	20ms	186.744	143,518,938.026
8-Colors	Jarvis	Direct X	20ms	203.75	131,540,397.042
8-Colors	Relevance	Direct X	20ms	206	130,103,408.22
16-Colors	Floyd	Direct X	20ms	81.631	328,321,226.555
16-Colors	Ordered	Direct X	20ms	88.89	301,511,946.203
16-Colors	Jarvis	Direct X	20ms	79.032	339,120,424.239
16-Colors	Relevance	Direct X	24ms	81.589	328,492,180.713
216-Colors	Floyd	Direct X	20ms	32.134	834,040,025.062
216-Colors	Ordered	Direct X	20ms	69.51	385,577,053.197
216-Colors	Jarvis	Direct X	20ms	29.495	908,682,383.523
216-Colors	Relevance	Direct X	21ms	31.777	843,419,931.106
2-Colors	Floyd	Ericsson	57ms	222.557	120,424,623.479

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
2-Colors	Ordered	Ericsson	56ms	229.598	116,731,653.01
2-Colors	Jarvis	Ericsson	57ms	220.188	121,720,377.46
2-Colors	Relevance	Ericsson	56ms	222.548	120,429,341.973
8-Colors	Floyd	Ericsson	57ms	136.907	195,762,970.693
8-Colors	Ordered	Ericsson	57ms	165.891	161,559,742.584
8-Colors	Jarvis	Ericsson	59ms	148.988	179,888,635.408
8-Colors	Relevance	Ericsson	60ms	137.351	195,130,777.923
16-Colors	Floyd	Ericsson	56ms	58.971	454,486,944.657
16-Colors	Ordered	Ericsson	58ms	89.477	299,533,237.572
16-Colors	Jarvis	Ericsson	56ms	54.504	491,727,617.415
16-Colors	Relevance	Ericsson	56ms	58.553	457,725,876.193
216-Colors	Floyd	Ericsson	56ms	23.776	1,127,220,315.428
216-Colors	Ordered	Ericsson	55ms	68	394,134,594.833
216-Colors	Jarvis	Ericsson	55ms	23.797	1,126,270,402.634
216-Colors	Relevance	Ericsson	56ms	23.788	1,126,691,938.853
Lena					
2-Colors	Floyd	Relevance 1 v1	327ms	219.94	195,995,905.621
2-Colors	Ordered	Relevance 1 v1	373ms	185.213	232,744,498.631
2-Colors	Jarvis	Relevance 1 v1	311ms	218.964	196,870,146.252
2-Colors	Relevance	Relevance 1 v1	318ms	220.162	195,798,442.755
8-Colors	Floyd	Relevance 1 v1	327ms	196.062	219,866,612.765
8-Colors	Ordered	Relevance 1 v1	373ms	153.558	280,723,822.197
8-Colors	Jarvis	Relevance 1 v1	314ms	194.835	221,250,277.711
8-Colors	Relevance	Relevance 1 v1	316ms	196.106	219,816,572.022
16-Colors	Floyd	Relevance 1 v1	321ms	122.809	351,011,621.848
16-Colors	Ordered	Relevance 1 v1	374ms	65.801	655,118,291.543
16-Colors	Jarvis	Relevance 1 v1	311ms	113.194	380,826,335.965
16-Colors	Relevance	Relevance 1 v1	317ms	120.691	357,172,490.24

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
216-Colors	Floyd	Relevance 1 v1	326ms	37.646	1,145,065,733.103
216-Colors	Ordered	Relevance 1 v1	371ms	44.644	965,570,678.776
216-Colors	Jarvis	Relevance 1 v1	314ms	36.354	1,185,781,246.86
216-Colors	Relevance	Relevance 1 v1	322ms	37.408	1,152,371,657.6
2-Colors	Floyd	Relevance 1 v2	333ms	198.004	217,709,743.003
2-Colors	Ordered	Relevance 1 v2	381ms	176.463	244,286,173.953
2-Colors	Jarvis	Relevance 1 v2	316ms	191.813	224,737,006.277
2-Colors	Relevance	Relevance 1 v2	326ms	195.448	220,557,300.722
8-Colors	Floyd	Relevance 1 v2	334ms	173.403	248,596,154.208
8-Colors	Ordered	Relevance 1 v2	380ms	142.839	301,790,765.833
8-Colors	Jarvis	Relevance 1 v2	322ms	167.501	257,355,862.902
8-Colors	Relevance	Relevance 1 v2	328ms	169.855	253,788,960.169
16-Colors	Floyd	Relevance 1 v2	329ms	108.934	395,719,269.634
16-Colors	Ordered	Relevance 1 v2	383ms	61.552	700,346,472.808
16-Colors	Jarvis	Relevance 1 v2	320ms	97.701	441,219,460.029
16-Colors	Relevance	Relevance 1 v2	330ms	105.989	406,717,675.474
216-Colors	Floyd	Relevance 1 v2	334ms	31.882	1,352,091,649.561
216-Colors	Ordered	Relevance 1 v2	379ms	39.768	1,083,979,091.547
216-Colors	Jarvis	Relevance 1 v2	318ms	30.037	1,435,165,457.496
216-Colors	Relevance	Relevance 1 v2	326ms	31.175	1,382,735,944.03
2-Colors	Floyd	Relevance 2	473ms	219.178	196,677,184.156
2-Colors	Ordered	Relevance 2	483ms	193.86	222,363,483.601
2-Colors	Jarvis	Relevance 2	469ms	217.771	197,947,984.61
2-Colors	Relevance	Relevance 2	470ms	219.232	196,629,164.544
8-Colors	Floyd	Relevance 2	451ms	195.065	220,990,269.531
8-Colors	Ordered	Relevance 2	473ms	169.681	254,049,862.007
8-Colors	Jarvis	Relevance 2	464ms	193.062	223,282,299.874
8-Colors	Relevance	Relevance 2	449ms	195.112	220,936,338.647

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
16-Colors	Floyd	Relevance 2	466ms	121.963	353,446,123.332
16-Colors	Ordered	Relevance 2	473ms	83.053	519,037,759.68
16-Colors	Jarvis	Relevance 2	466ms	111.783	385,635,100.693
16-Colors	Relevance	Relevance 2	468ms	119.782	359,881,014.381
216-Colors	Floyd	Relevance 2	456ms	47.869	900,535,627.963
216-Colors	Ordered	Relevance 2	450ms	72.952	590,898,846.042
216-Colors	Jarvis	Relevance 2	443ms	42.303	1,019,016,481.913
216-Colors	Relevance	Relevance 2	448ms	47.581	905,978,305.497
2-Colors	Floyd	Direct X	20ms	219.178	196,677,184.156
2-Colors	Ordered	Direct X	20ms	193.86	222,363,483.601
2-Colors	Jarvis	Direct X	20ms	217.771	197,947,984.61
2-Colors	Relevance	Direct X	20ms	219.232	196,629,164.544
8-Colors	Floyd	Direct X	20ms	195.065	220,990,269.531
8-Colors	Ordered	Direct X	20ms	169.681	254,049,862.007
8-Colors	Jarvis	Direct X	20ms	193.062	223,282,299.874
8-Colors	Relevance	Direct X	20ms	195.112	220,936,338.647
16-Colors	Floyd	Direct X	20ms	121.941	353,511,670.027
16-Colors	Ordered	Direct X	20ms	82.906	519,953,626.805
16-Colors	Jarvis	Direct X	20ms	111.776	385,657,309.253
16-Colors	Relevance	Direct X	20ms	119.687	360,167,191.184
216-Colors	Floyd	Direct X	25ms	34.344	1,255,175,651.949
216-Colors	Ordered	Direct X	20ms	67.562	638,043,169.492
216-Colors	Jarvis	Direct X	20ms	32.416	1,329,833,823.785
216-Colors	Relevance	Direct X	20ms	34.087	1,264,622,474.905
2-Colors	Floyd	Ericsson	57ms	217.698	198,014,434.495
2-Colors	Ordered	Ericsson	56ms	192.888	223,484,432.977
2-Colors	Jarvis	Ericsson	58ms	216.284	199,309,027.546
2-Colors	Relevance	Ericsson	57ms	217.802	197,919,915.64

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
8-Colors	Floyd	Ericsson	59ms	145.132	297,022,815.257
8-Colors	Ordered	Ericsson	61ms	145.533	296,203,754.453
8-Colors	Jarvis	Ericsson	59ms	145.521	296,227,175.05
8-Colors	Relevance	Ericsson	58ms	145.064	297,161,504.195
16-Colors	Floyd	Ericsson	57ms	118.946	362,411,680.284
16-Colors	Ordered	Ericsson	56ms	78.652	548,076,406.467
16-Colors	Jarvis	Ericsson	66ms	107.948	399,336,642.469
16-Colors	Relevance	Ericsson	59ms	115.897	371,944,584.176
216-Colors	Floyd	Ericsson	56ms	24.891	1,731,881,098.884
216-Colors	Ordered	Ericsson	74ms	65.999	653,152,009.338
216-Colors	Jarvis	Ericsson	56ms	24.718	1,743,986,186.453
216-Colors	Relevance	Ericsson	56ms	24.823	1,736,587,030.18
Pattern					
2-Colors	Floyd	Relevance 1 v1	329ms	208.151	136,890,795.629
2-Colors	Ordered	Relevance 1 v1	369ms	169.375	168,229,660.533
2-Colors	Jarvis	Relevance 1 v1	315ms	207.073	137,603,134.438
2-Colors	Relevance	Relevance 1 v1	317ms	207.971	137,009,136.419
8-Colors	Floyd	Relevance 1 v1	330ms	196.626	144,914,601.046
8-Colors	Ordered	Relevance 1 v1	375ms	144.969	196,551,370.705
8-Colors	Jarvis	Relevance 1 v1	312ms	195.727	145,579,618.632
8-Colors	Relevance	Relevance 1 v1	319ms	196.51	144,999,897.352
16-Colors	Floyd	Relevance 1 v1	319ms	69.249	411,469,229.222
16-Colors	Ordered	Relevance 1 v1	376ms	60.472	471,188,111.61
16-Colors	Jarvis	Relevance 1 v1	314ms	66.787	426,638,083.846
16-Colors	Relevance	Relevance 1 v1	322ms	68.902	413,545,088.179
216-Colors	Floyd	Relevance 1 v1	327ms	33.947	839,355,913.116
216-Colors	Ordered	Relevance 1 v1	372ms	42.862	664,784,695.478
216-Colors	Jarvis	Relevance 1 v1	317ms	31.818	895,532,810.777

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
216-Colors	Relevance	Relevance 1 v1	319ms	33.53	849,812,894.673
2-Colors	Floyd	Relevance 1 v2	340ms	184.982	154,036,446.984
2-Colors	Ordered	Relevance 1 v2	453ms	159.547	178,592,549.676
2-Colors	Jarvis	Relevance 1 v2	321ms	180.714	157,674,442.079
2-Colors	Relevance	Relevance 1 v2	328ms	182.578	156,064,175.877
8-Colors	Floyd	Relevance 1 v2	360ms	172.539	165,144,427.83
8-Colors	Ordered	Relevance 1 v2	370ms	137.195	207,688,709.744
8-Colors	Jarvis	Relevance 1 v2	332ms	169.25	168,354,392.519
8-Colors	Relevance	Relevance 1 v2	357ms	168.571	169,031,730.209
16-Colors	Floyd	Relevance 1 v2	336ms	60.649	469,815,306.786
16-Colors	Ordered	Relevance 1 v2	381ms	55.179	516,393,355.061
16-Colors	Jarvis	Relevance 1 v2	320ms	57.72	493,658,014.064
16-Colors	Relevance	Relevance 1 v2	326ms	59.522	478,711,564.965
216-Colors	Floyd	Relevance 1 v2	337ms	29.104	979,054,364.133
216-Colors	Ordered	Relevance 1 v2	389ms	38.426	741,523,965.745
216-Colors	Jarvis	Relevance 1 v2	321ms	26.991	1,055,689,877.381
216-Colors	Relevance	Relevance 1 v2	327ms	28.313	1,006,377,746.529
2-Colors	Floyd	Relevance 2	470ms	207.579	137,267,711.46
2-Colors	Ordered	Relevance 2	479ms	182.602	156,043,672.319
2-Colors	Jarvis	Relevance 2	480ms	206.719	137,838,982.096
2-Colors	Relevance	Relevance 2	474ms	207.659	137,215,064.334
8-Colors	Floyd	Relevance 2	450ms	195.999	145,377,586.777
8-Colors	Ordered	Relevance 2	468ms	158.707	179,537,513.824
8-Colors	Jarvis	Relevance 2	451ms	194.844	146,239,903.402
8-Colors	Relevance	Relevance 2	459ms	196.091	145,309,495.793
16-Colors	Floyd	Relevance 2	459ms	72.284	394,192,052.134
16-Colors	Ordered	Relevance 2	458ms	83.836	339,877,084.437
16-Colors	Jarvis	Relevance 2	448ms	69.106	412,320,495.09

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
16-Colors	Relevance	Relevance 2	458ms	71.801	396,848,304.137
216-Colors	Floyd	Relevance 2	452ms	46.309	615,297,068.435
216-Colors	Ordered	Relevance 2	457ms	72.11	395,143,698.539
216-Colors	Jarvis	Relevance 2	462ms	45.153	631,047,683.398
216-Colors	Relevance	Relevance 2	446ms	47.079	605,240,487.076
2-Colors	Floyd	Direct X	20ms	207.579	137,267,711.46
2-Colors	Ordered	Direct X	20ms	182.602	156,043,672.319
2-Colors	Jarvis	Direct X	20ms	206.719	137,838,982.096
2-Colors	Relevance	Direct X	20ms	207.659	137,215,064.334
8-Colors	Floyd	Direct X	20ms	195.999	145,377,586.777
8-Colors	Ordered	Direct X	21ms	158.707	179,537,513.824
8-Colors	Jarvis	Direct X	20ms	194.844	146,239,903.402
8-Colors	Relevance	Direct X	27ms	196.091	145,309,495.793
16-Colors	Floyd	Direct X	24ms	67.93	419,461,504.667
16-Colors	Ordered	Direct X	20ms	83.479	341,328,508.086
16-Colors	Jarvis	Direct X	20ms	65.18	437,156,332.018
16-Colors	Relevance	Direct X	20ms	67.523	421,987,697.413
216-Colors	Floyd	Direct X	20ms	31.172	914,077,355.897
216-Colors	Ordered	Direct X	20ms	69.399	410,581,169.049
216-Colors	Jarvis	Direct X	21ms	28.646	994,686,654.307
216-Colors	Relevance	Direct X	20ms	30.686	928,574,673.715
2-Colors	Floyd	Ericsson	57ms	205.145	138,896,482.525
2-Colors	Ordered	Ericsson	56ms	181.174	157,273,752.373
2-Colors	Jarvis	Ericsson	58ms	204.367	139,424,975.31
2-Colors	Relevance	Ericsson	87ms	205.439	138,697,861.649
8-Colors	Floyd	Ericsson	57ms	132.201	215,534,423.937
8-Colors	Ordered	Ericsson	56ms	144.394	197,334,704.827
8-Colors	Jarvis	Ericsson	58ms	135.58	210,163,751.634

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
8-Colors	Relevance	Ericsson	64ms	132.58	214,918,067.368
16-Colors	Floyd	Ericsson	56ms	45.743	622,914,391.202
16-Colors	Ordered	Ericsson	56ms	77.557	367,390,965.039
16-Colors	Jarvis	Ericsson	56ms	43.682	652,303,481.497
16-Colors	Relevance	Ericsson	56ms	45.187	630,581,842.647
216-Colors	Floyd	Ericsson	56ms	23.24	1,226,060,405.924
216-Colors	Ordered	Ericsson	55ms	68.377	416,719,478.522
216-Colors	Jarvis	Ericsson	57ms	22.803	1,249,559,372.889
216-Colors	Relevance	Ericsson	56ms	23.15	1,230,862,285.011
Wood					
2-Colors	Floyd	Relevance 1 v1	329ms	228.457	128,973,921.555
2-Colors	Ordered	Relevance 1 v1	371ms	218.331	134,955,379.613
2-Colors	Jarvis	Relevance 1 v1	314ms	228.706	128,833,659.625
2-Colors	Relevance	Relevance 1 v1	318ms	228.756	128,805,468.647
8-Colors	Floyd	Relevance 1 v1	327ms	205.403	143,449,681.819
8-Colors	Ordered	Relevance 1 v1	369ms	161.053	182,952,559.68
8-Colors	Jarvis	Relevance 1 v1	310ms	205.239	143,564,185.423
8-Colors	Relevance	Relevance 1 v1	324ms	205.657	143,272,472.702
16-Colors	Floyd	Relevance 1 v1	336ms	78.297	376,320,841.662
16-Colors	Ordered	Relevance 1 v1	376ms	58.379	504,717,528.559
16-Colors	Jarvis	Relevance 1 v1	308ms	77.511	380,141,295.872
16-Colors	Relevance	Relevance 1 v1	320ms	78.115	377,200,621.749
216-Colors	Floyd	Relevance 1 v1	327ms	34.677	849,702,485.1
216-Colors	Ordered	Relevance 1 v1	368ms	43.571	676,245,253.152
216-Colors	Jarvis	Relevance 1 v1	309ms	33.941	868,122,172.274
216-Colors	Relevance	Relevance 1 v1	316ms	34.542	853,016,183.149
2-Colors	Floyd	Relevance 1 v2	334ms	209.761	140,469,395.785
2-Colors	Ordered	Relevance 1 v2	380ms	197.119	149,478,119.611

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
2-Colors	Jarvis	Relevance 1 v2	317ms	200.729	146,789,517.313
2-Colors	Relevance	Relevance 1 v2	326ms	208.637	141,225,953.016
8-Colors	Floyd	Relevance 1 v2	336ms	183.705	160,393,099.038
8-Colors	Ordered	Relevance 1 v2	402ms	151.612	194,344,756.776
8-Colors	Jarvis	Relevance 1 v2	318ms	177.071	166,401,863.539
8-Colors	Relevance	Relevance 1 v2	323ms	177.714	165,799,924.388
16-Colors	Floyd	Relevance 1 v2	332ms	68.341	431,146,596.08
16-Colors	Ordered	Relevance 1 v2	383ms	51.94	567,289,377.291
16-Colors	Jarvis	Relevance 1 v2	321ms	66.683	441,864,823.094
16-Colors	Relevance	Relevance 1 v2	326ms	67.589	435,944,128.429
216-Colors	Floyd	Relevance 1 v2	332ms	30.58	963,522,028.01
216-Colors	Ordered	Relevance 1 v2	382ms	39.411	747,625,045.994
216-Colors	Jarvis	Relevance 1 v2	318ms	29.418	1,001,581,523.282
216-Colors	Relevance	Relevance 1 v2	339ms	30.023	981,404,410.567
2-Colors	Floyd	Relevance 2	514ms	228.753	128,806,817.895
2-Colors	Ordered	Relevance 2	480ms	237.99	123,807,699.143
2-Colors	Jarvis	Relevance 2	473ms	228.683	128,846,306.069
2-Colors	Relevance	Relevance 2	470ms	228.74	128,814,019.791
8-Colors	Floyd	Relevance 2	454ms	205.341	143,492,806.627
8-Colors	Ordered	Relevance 2	482ms	179.312	164,322,369.947
8-Colors	Jarvis	Relevance 2	463ms	205.186	143,601,580.355
8-Colors	Relevance	Relevance 2	466ms	205.368	143,474,242.277
16-Colors	Floyd	Relevance 2	485ms	78.228	376,654,875.428
16-Colors	Ordered	Relevance 2	498ms	82.079	358,981,539.76
16-Colors	Jarvis	Relevance 2	466ms	77.349	380,933,563.849
16-Colors	Relevance	Relevance 2	464ms	78.053	377,499,766.376
216-Colors	Floyd	Relevance 2	476ms	35.172	837,740,182.611
216-Colors	Ordered	Relevance 2	488ms	69.059	426,666,097.012

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
216-Colors	Jarvis	Relevance 2	470ms	34.241	860,525,930.093
216-Colors	Relevance	Relevance 2	464ms	34.978	842,379,162.037
2-Colors	Floyd	Direct X	20ms	228.753	128,806,817.895
2-Colors	Ordered	Direct X	20ms	237.99	123,807,699.143
2-Colors	Jarvis	Direct X	20ms	228.683	128,846,306.069
2-Colors	Relevance	Direct X	20ms	228.74	128,814,019.791
8-Colors	Floyd	Direct X	20ms	205.341	143,492,806.627
8-Colors	Ordered	Direct X	20ms	179.312	164,322,369.947
8-Colors	Jarvis	Direct X	20ms	205.186	143,601,580.355
8-Colors	Relevance	Direct X	19ms	205.368	143,474,242.277
16-Colors	Floyd	Direct X	20ms	78.228	376,654,875.428
16-Colors	Ordered	Direct X	20ms	82.079	358,981,539.76
16-Colors	Jarvis	Direct X	20ms	77.349	380,933,563.849
16-Colors	Relevance	Direct X	24ms	78.053	377,499,766.376
216-Colors	Floyd	Direct X	20ms	34.488	854,344,021.913
216-Colors	Ordered	Direct X	20ms	69.105	426,379,841.171
216-Colors	Jarvis	Direct X	20ms	33.559	878,001,810.09
216-Colors	Relevance	Direct X	20ms	34.324	858,425,647.366
2-Colors	Floyd	Ericsson	58ms	228.624	128,879,553.514
2-Colors	Ordered	Ericsson	55ms	236.588	124,541,171.332
2-Colors	Jarvis	Ericsson	57ms	228.434	128,986,812.236
2-Colors	Relevance	Ericsson	57ms	228.623	128,880,441.106
8-Colors	Floyd	Ericsson	58ms	149.529	197,052,118.977
8-Colors	Ordered	Ericsson	57ms	144.337	204,140,803.964
8-Colors	Jarvis	Ericsson	61ms	152.189	193,607,226.018
8-Colors	Relevance	Ericsson	59ms	149.723	196,796,272.341
16-Colors	Floyd	Ericsson	56ms	56.508	521,431,460.832
16-Colors	Ordered	Ericsson	55ms	76.332	386,012,264.032

Table 4: Statistics for Decompressed Images with Dithering

# of Colors	Dither	Decompression	Time	RMS	SNR
16-Colors	Jarvis	Ericsson	56ms	54.554	540,104,291.742
16-Colors	Relevance	Ericsson	56ms	56.903	517,810,462.638
216-Colors	Floyd	Ericsson	55ms	22.862	1,288,835,380.543
216-Colors	Ordered	Ericsson	56ms	67.921	433,810,350.567
216-Colors	Jarvis	Ericsson	56ms	23.611	1,247,958,058.807
216-Colors	Relevance	Ericsson	56ms	22.809	1,291,812,776.785

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