Predictive Encoding User Guide

Prepared for Dr. Weiss

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Compilation:

Compilation for the predictive encoding programs can be done by issuing the make command in the root of the directories. They also can be individually compiled using make at the root by issuing the following commands:

- make delta
- make dpcm
- make prev

Usage:

All of the predictive encoding executables will take an input image in and encode it to a given output filename.The output file then will be decoded to output_file_name_decoded.png. Statistics fo compression rate, root mean square error (RMSE) and signal to noise ratio (SNR) will be printed out after the decoding process takes place.

Previous Pixel

The previous pixel program computes the number of bits required to encode an image losslessly.

Example:

```
./prev Cat.png
Entropy: 4.39404
Encoding will need: 5 bits/pixel
Compression is limited to about 24/4.39404 or 6:1
```

Delta executable

The delta program command line arguments should be an input file followed by a floating point value and what the output of the encoded image should be. The program will generate two files, the encoded file and a decoded png file.

General Form:

```
./delta <input_file> <delta (positive float)>  <output_file.bin>
```

Example:

```
./delta Cat.png 4.3 Cat.bin
Encoding Image Using: Cat.bin
Image was encoded using 1-bit per pixel.
Compression Rate: 87.4995%

Decoding Image
Decoded Image Written To: Cat_decoded.png

Root Mean Square: 20.5538
Signal to Noise Ratio: 32.3561
```

DPCM executable

The dpcm program command line arguments should be an input file followed by a 1 or 2, a 4 or 8, and what the output of the encoded image should be. The first integer value specifies what predictor to use and the second value specifies which quantizer to use. The program will generate two files, the encoded file and a decoded png file.

General Form:

```
./dpcm <input_file> [1|2] [4|8] <output_file.bin>
```

Examples:

```
./dpcm circles.png 1 4 circles.bin
Encoding Image Using: circles.bin
Image was encoded using 6-bit per pixel.
Compression Rate: 74.8023%

Decoding Image

Root Mean Square: 0.992505
Signal to Noise Ratio: 8512.14
```

```
./dpcm circles.png 2 4 circles.bin
Encoding Image Using: circles.bin
Image was encoded using 6-bit per pixel.
Compression Rate: 74.6562%

Decoding Image

Root Mean Square: 17.154
Signal to Noise Ratio: 34.3526
```