CS 4481b Report

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Peppers Offset Histograms

Goldhill Offset Histograms

Comments: The images with larger offsets show the same impulse pattern for both images. This is because the width of the Goldhill and Peppers images are 360 and 256 respectively, and there is a greater chance of matching a pixel in the same proximity as the original pixel. This causes the frequency of matches to increase every time the width of the image is reached. This can be clearly seen in the smaller offsets where the peppers frequency is greatest at the two ends since the width of the image is equal to the offset. Similarly, this can’t be seen with the Goldhill 256 histogram because the width of the image is greater than the offset.

Peppers Matching Length Histograms

Goldhill Matching Length Histograms

Comments: The matching length histograms look fairly similar when using a log scale, but the size of match length 0 specifically decreases by a great amount when the matching length is increased. This is of course because the program scans over more values and is able to match with a previous value in the buffer easier. The Goldhill images have more outliers with larger matching length, but the values for each frequency are fairly consistent between both images for each respective matching length.

Average, Standard Deviation, and encoding/decoding time

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Offset Ave. | Offset Std. | Match Ave. | Match Std. | Encoding Time (s) | Decoding Time (s) |
| Peppers 256 | 73.32 | 90.35 | 0.85 | 0.57 | 0.04 | 0.01 |
| Peppers 1024 | 239.44 | 258.25 | 1.22 | 0.56 | 0.10 | 0.01 |
| Peppers 5120 | 1038.01 | 1301.39 | 1.57 | 0.66 | 0.39 | 0.01 |
| Goldhill 256 | 45.36 | 65.99 | 0.84 | 0.76 | 0.06 | 0.02 |
| Goldhill 1024 | 213.22 | 242.39 | 1.27 | 0.81 | 0.16 | 0.02 |
| Goldhill 5120 | 1044.66 | 1314.11 | 1.64 | 0.93 | 0.61 | 0.02 |

Justification for suitable searching\_buffer\_size

For both these images I would say that the searching\_buffer\_size of 1024 was the most suitable. When looking at the histograms of the offsets for 5120, once the offset reaches around 1000 the impulses stay around the same. Although it is good to still have matches, the offset numbers themselves are much too high when considering that the match length not frequently above 2. The improvement in match length average is greater for the Goldhill image than the peppers image, but it comes at the cost of a significantly higher encoding time. Even though the searching\_buffer\_size of 5120 improves the match length, it doesn’t create enough improvement to justify using it when 1024 offers decent encoding at a much faster rate.