Video Compression

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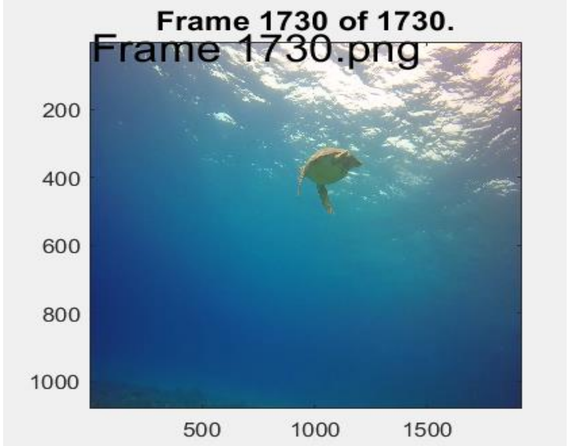
Abstract

With today's high video usage, it is very important and crucial that videos become smaller in data size, and in structure in a way that the data does relinquish in quality or resolution. There are currently high profile services such as Netflix and Youtube that can currently do this with very little negative effects. It is important that while doing research on Video/film compression with intent that the concepts and compression techniques will be fully understood . The research that was completed was for the reason of comparing different algorithms with respect to resolution, pixel and the overall integrity of the data. The subjective study portion that we came upon included different coding standards and video quality assessments algorithms to calculate their efficiency. There are many complex challenges that come with implementing a video compression algorithm, such as the type of data that will be used and also the algorithm choice for the particular video format. Lastly while conducting research many different video editing techniques such as video editing proxy were introduced.

Goals

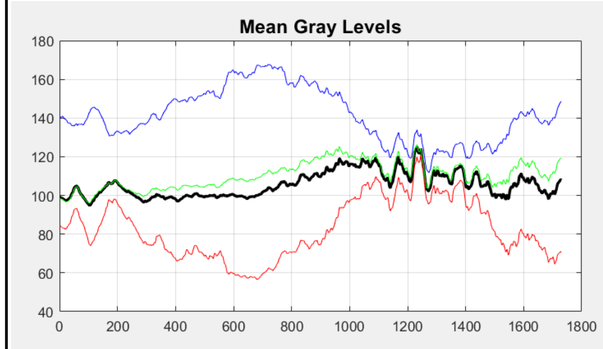
The goal of this project is to implement a simple, but yet effective compression program that the NNMC Film department will be able to use with ease to compress the videos that they will capture to reduce the amount of memory storage that a typical uncompressed video file would take. In order to complete this program, research on Video/Film compression was done with respect to the easiest but most powerful compression algorithm that is accessible to the group.

Data Collection and Methods

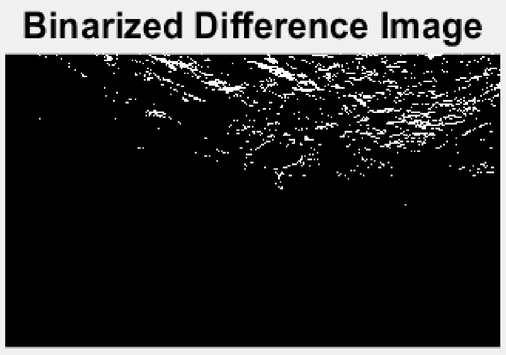


•Figure 1.1 Shows frames of the video

•Figure 1.2 Shows the adaptive frame of the video

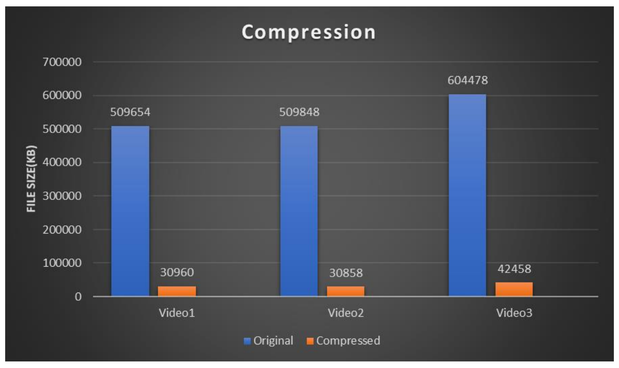


•Figure 1.3 Shows the different mean gray levels

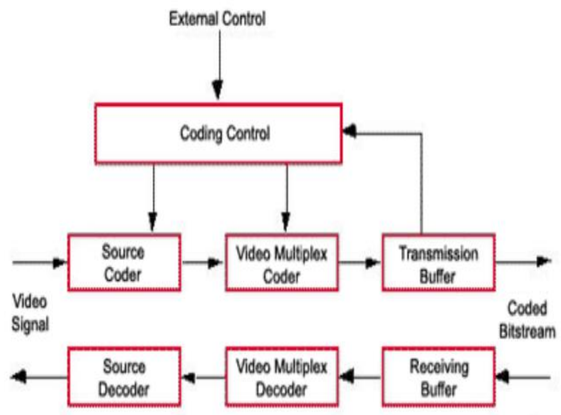


•Figure 1.4 shows the binary image of the current frame

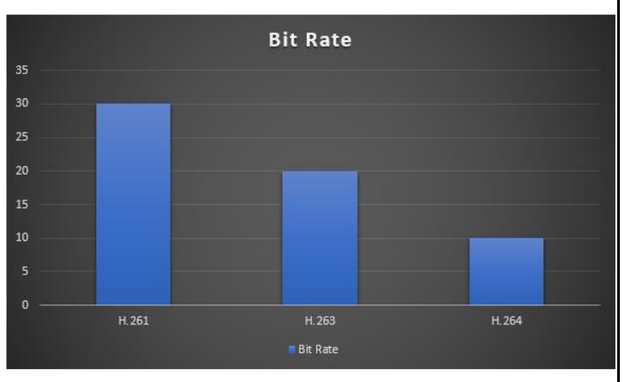
Data Analysis and Findings



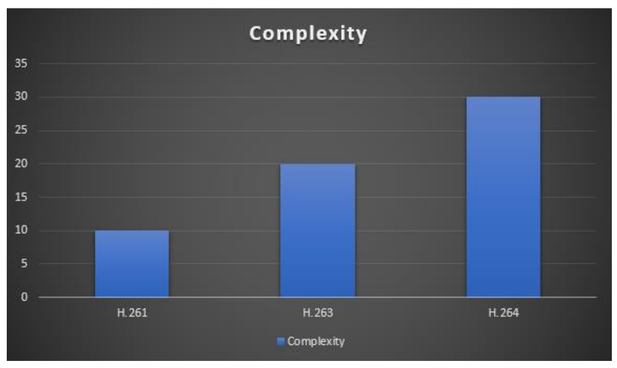
•Figure 1.5 Before and after comparison of the data size



•Figure 1.6 Shows the compression and decompression flow



•Figure 1.7 Comparison of Bit rates between different compression techniques



•Figure 1.8 Comparison of Complexity between different compression techniques

Procedures

- In order to conduct research on Video/Film compression access to IEEE Xplore Digital Library database was required
- A programing language that will allow the implementation of the compression of data
- One of the challenges that presented itself during this project is the group did not have access to the IEEE Xplore Digital Library database. As a result, this slowed down the progress the group was making. The solution was some colleagues of Dr. Ahmed that has access to the database that was needed and graciously gave up there time and retrieved the articles that would be researched by the group during the length of the project.

Materials

•H.264 Algorithm: The most used video compression algorithm that is used in North America

•Windows 10

•Microsoft Excel

•MATLAB

•IEEE Xplore Digital Library Database

Acknowledgements

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