

CMPT 365 Multimedia Systems

Project 2

Deadline 6:00pm, Apr 16, 2021

Note: This is NOT a group-based project. Each student should submit a project report and the codes. We will use code scan tools to ensure that the programs are written by yourself. In the report, you can discuss any interesting and insightful observations, e.g., challenges you've encountered and your solutions, comparison with commercial tools, e.g., ZIP/Photoshop, fast/smart implementation, impact of different configurations, etc.

Submission guideline: TA will announce.

Create a program that reads an uncompressed TIFF image file and compress/decompress it.

Your program should first show an open file dialog box for the user to select the TIFF file, which follows the same format specification/constraints as in Project 1.

Your program should compress the image with your own (1) lossless compression and (2) lossy compression, and then decompress and output the results as follows:

1. Displays the original image (right side) together with the decompressed image from lossless compression (left side) (– yes, these two should look exactly the same, but if you use some conversions or transforms, e.g., RGB to YUV, then there would be small round off errors; it's good if you provide discussions on their impact) ; also display the compression ratio at the bottom;
2. Refreshes by the original image (right side) together with the decompressed image from lossy compression (right) of a compression ratio around 10; also display the exact compression ratio at the bottom;
3. Refreshes by the original image (right side) together with the decompressed image from lossy compression (right) of a compression ratio around 20; also display the exact compression ratio at the bottom.

We can accept a range of [8,12] for compression ratio 10 and [16,24] for compression ratio 20.

You should submit the source code together with its executable version. You should also submit a short report (2-3 pages) describing the following issues:

1. The key techniques used in your solution and their respective impacts to the image quality. You may want to draw a simple diagram for the processing flow (like that for JPEG in the slides);
2. The percentage of the computation times of the different modules (try to figure out a way to measure them);
3. Image quality comparison with other commercial tools (e.g., Photoshop);
4. Any other problem/interesting issues you have encountered.

Grading scheme:

1. File input (2 marks)
2. Lossless compression implementation (4 marks)
3. Lossy compression implementation (8 marks)
4. Discussion in report (6 mark)