Image Sharpening using C++

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1 Introduction

In this project, we developed a C++ application that sharpens images in the PPM format. The code was developed based on an initial outline provided in a Git repository, which we cloned and further developed. The sharpened image is saved as a new PPM file.

2 Methodology

2.1 Cloning and Setting Up the Repository

The initial source code was cloned from a Git repository. The application was built and run using the provided Makefile.

2.2 Image Sharpening Process

The image sharpening process involves three key transformations:

1. **S1: Smoothen** - This function smooths the image to reduce noise.
2. **S2: Find Details** - This function finds the details of the image by subtracting the smoothened image from the original.

3. **S3: Sharpen** - This function enhances the image details by adding the details back to the smoothened image.

Each phase was timed using the C++ `chrono` library. The experiment was repeated five times for each input image, and the average time was calculated.

3 Results

The average time taken for each image is summarized in the table below:

Image	Average Time (seconds)
Image 1	0.02003176
Image 2	0.06897276
Image 3	0.1271818
Image 4	0.2479008
Image 5	0.3186422
Image 6	0.7142
Image 7	1.934964

Table 1: Average processing time for each image.

4 Conclusion

The experiment showed a significant variation in the time taken for different images, depending on their resolution and complexity.

5 Appendix

5.1 Source Code

The source code for the project is included in the `src` folder. The relevant scripts for timing and automation are also included.