Cross-Language Performance Analysis in Image Processing

Investigate the performance characteristics of Python, C/C++, and Rust in image processing tasks through empirical comparison of language-specific implementations. This study should reveal each language's strengths in terms of development efficiency, runtime performance, and memory management.

Requirements

1. Python: OpenCV-Python (v4.11).

2. Rust: You can choose lib image, imageproc, rayon, etc.

3. C/C++: Your imlementation in Project 4.

4. Test different image processing functions with different image sizes.

5. What are your foundings? I am eager to know them. Please design comprehensive experiments, and write a detailed report.

Rules:

1. The project report and the source code must be submitted before the deadline. Any submission after the deadline (even by 1 second) will result in **a score of 0**. The deadline is 23:59 on June 1st.

2. Submit the following files:

   - `report.pdf`
   - The Python source file
   - The Rust source file (*.rs only, please)
   - The C/C++ source file

   Avoid submitting too many files. Use the exact filenames and extensions specified. The files should **NOT** be compressed into a single archive.

3. The score will depend on the quality of both the source code and the report. The report should be easy to understand and provide a clear description of the project, especially the highlights.