Parallel Processing using MPI

Bonus Project

Team:

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Introduction:

Image processing techniques are computationally intensive. As for small images, using serial processing makes no problem. However, large or extremely large images like the ones captured by Google Maps or NASA satellites will definitely be a problem.
In this project we implement an image filtering system using parallel processing.

Project Information:

IMAGE FILTERING USING PARALLEL PROCESSING

Input: 1- A matrix (Gray-level image)
2- Filter

Output: A matrix (Filtered Image).

Description: First, the user will choose an image to be filtered, and a filter (either chosen or entered).The input matrix will be scattered among processes, then each process will apply the specified filter to its sub-image.
At the end, filtered sub-imaged will be gathered, and the root process will reshape all the sub-images into the final filtered image.

Applications: 1- Vertical edge detection.
2- Horizontal edge detection
3- Diagonal edge detection.
4- Smoothing an image.
5- Sharpening an image.