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Brief MPI Project Write up

To distribute data from Rank 0 to the other ranks, I decided to use MPI_Ssend to send image resolution and an array containing image data. I chose to use MPI_Ssend because I am using a for loop and only need to block locally until the buffer is available for reuse. MPI_Ssend is globally and locally blocking, because it is globally blocking it wastes computation time for the other ranks. If I used MPI_ISend it is possible Rank 0 would start sending to another rank before the buffer data could have been fully sent.

I received the data using MPI_Rec. This is locally blocking. It would have been possible to use MPI_IRec but I want to be sure the data is fully transferred before I needed to use it and it would not have saved time because I am immediately passing the array into a function to compute the histogram.

To give each rank every ranks histogram I used MPI_Gather. I stored the histograms in an array of size total ranks * 768. MPI_Gather globally and locally blocking; synchronizing the ranks before each rank compares other images histograms.