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ECE 6730 Parallel Systems

11/16/2017

Report

In this lab, students were required to implement Floyd's Algorithm both serially and in parallel. The following data exhibits the speedup possible when using a parallel algorithm versus the serial implementation. Floyd's Algorithm has a N^3 complexity, making it ideal for speedup. This parallel implementation uses a checkerboard decomposition method that uses a cartesian topology followed by the creation of both row and column communicators.

I would like to note that at the time I was data collecting, Palmetto was down for maintenance. I therefore had to use the parallel implementation with the maximum of 4 processing nodes on my Macbook Pro within a virtual machine. The parallel algorithm still showed significant speedup, which is promising.

Nodes	total time serial	floyd time serial	total time parallel	floyd time parallel	n processes
1000	3.471	3.466	2.551	2.488	4
2000	27.325	27.3	17.88	17.704	4
3000	90.394	90.371	60.828	60.4	4

Blue = Serial Total Time; Red = Serial Floyd Time; Orange = Parallel Total Time; Green = Parallel Floyd

Performance Comparison of Floyd's Algorithm

