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Efficient Parallel Algorithm for Computing the Closeness Centrality in Social Networks

This article covers the concept of closeness centrality. This idea is the metric use for large scale analysis across social networks, like Facebook, in determining the distance between different vertices (users). In the paper the authors present a new algorithm that can more effectively compute closeness centrality by increasing the cache hit rate, which reduces memory use and make a parallel Breadth First Search to reduce run time.

The Algorithm designed by them is called BigGraph and in the paper they compared there’s to the norm of NetworKit and Teex Graph. Both algorithms had the same big O notation of vertices \* vertices + edges. The NetworKit and Teex Graph use the normal Breadth First search to run, while the Big graph algorithm we execute in parallel with global queues and maps, pre-allocated for all the threads. To test and validity they ran five datasets all of different size, type of data, and what network. To analyze the speed, they ran with different number of parallel threads, varied from 1 to 36 threads. They did this ten times for each data set. From the test they collected the BigGraph execution time and speed up, and when compared toTeex it was 1.27-2.21 times faster and 14.78-68.21 faster than NetworKit.

In this paper a Breadth First Search algorithm was used, and the writers used it to do parallel computing. With the data it showed the new idea clearly ran faster every single time but there was no report on how it effects the memory compared to the others which does leave questions on is it better. The paper showed that this algorithm could have an impact on our social networks and allowing these network giants the ability to compare and find data a lot faster that could benefit us.

Bibliography:

Du, Phuong Hanh, et al. “An Efficient Parallel Algorithm for Computing the Closeness Centrality in Social Networks.” *Proceedings of the Ninth International Symposium on Information and Communication Technology - SoICT 2018*, 6 Dec. 2018, pp. 456–462., doi:10.1145/3287921.3287981.