Distributed LDA on Harp

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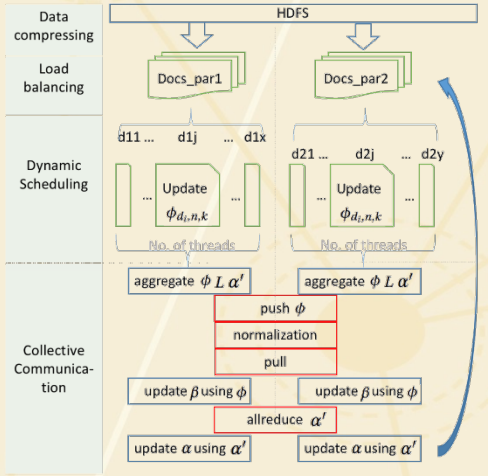
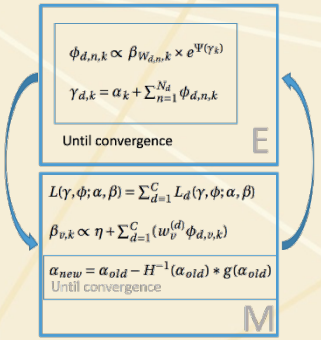
ABSTRACT

Harp LDA is a distributed variational bayes inference (VB) algorithm for LDA model which would be able to model a large and continuously expanding dataset using Harp collective communication library. We demonstrate how variational bayes inference converges within Map-Collective jobs provided by Harp. We provide results of the experiments conducted on a corpus of Wikipedia Dataset.

WORK FLOW



ALGORITHM



MATERIALS AND METHODS

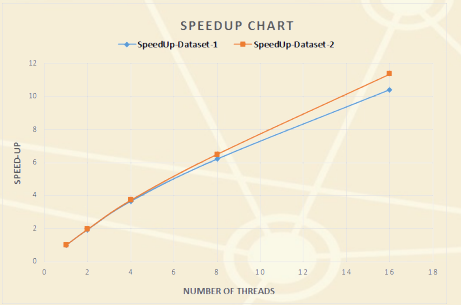
Harp[2] is a collective communication library plugged in Hadoop plug-in to accelerate machine learning algorithms.

LDA[3] is a popular topic modeling algorithm. We follow the Mr.LDA[4] to implement distributed variational inference LDA on Harp with it's dynamic schedueler, allreduce and push-pull communication models.

DATASETS

	Dataset-1	Dataset-2
docsize	744	7698
numOfWords	89907	435840
numOfTokenS	535156	5308848

EXPERIMENTS



CONCLUSIONS

Harp-LDA is proposed to provide high scalability achieve better performance with shorter time and memory requirements. A clear evidence of convergence of likelihood after a certain number of iterations is depicted.

The results from the speed up chart illustrate high scalability.

REFERENCE

[1] B. Zhang, Y. Ruan, J. Qiu, Harp: Collective Communication on Hadoop, in the proceedings of IEEE International Conference on Cloud Engineering (IC2E2015), March 9-13, 2015.

[2] Harp project https://github.iu.edu/IU-Big-Data-Lab/Harp

[3] Blei, David M., Andrew Y. Ng, and Michael I. Jordan. "Latent dirichlet allocation." Journal of machine Learning research 3.Jan (2003): 993-1022.

[4] Zhai, Ke, et al. "Mr. LDA: A flexible large scale topic modeling package using variational inference in mapreduce." Proceedings of the 21st international conference on World Wide Web. ACM, 2012.

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