To sum up, as indicated in Fig. 5 and Fig. 6, the proposed SSGD algorithm manages to improve the convergence and prediction performance by around 10% by initializing SGD using historical bandwidth information. The convergence of the algorithm also shows improvement with approximately 50% compared to SGD algorithm. SGD is affected by the setting of parameters as presented in earlier discussion for Fig. 2 to Fig. 4. There is no one optimum setting of the parameters which is suitable for all sizes of dataset.

6. CONCLUSION

Predicting available bandwidth between a transmitting and a receiving node in a large scale network is crucial in delivering better QoS for data intensive application such as multimedia streaming. In this regard, mesh measurement is computationally expensive and hence it is an ongoing challenge for the research community to predict the bandwidth information from a subset of nodes. However, ensuring good convergence of predicted values as well as achieving high accuracy is challenging. In this paper, we have proposed to enhance conventional matrix factorization by SGD by the use of SVD where each node maintains a set of historical data and the matrix is decomposed into two smaller matrices as pre-processing step. Convergence and prediction accuracy of the proposed SSGD algorithm are significantly improved with the proposed enhancements. In the future, we are going to investigate on the influence of variance in dataset and the neighbour selection and run the tests with larger dataset.

7. REFERENCES

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