Tenicial Report

Due to paper space limited, more experimental results are shown in this tenicial report.

1 Experimental result of sampling

We show the experimental result of sampling in this section. The sample numbers we set are 5, 15, 20, 25, 30, 35. And the experimental results are shown in Table 1, Table 2, Table 3, Table 4.

From the results of Table 1 to Table 4, the performance of our model SageDy varies with number of samples. However, no matter how much we set the number of first sampling and second sampling, our model has certain stability in expressiveness.

Table 1. Experiment results on link prediction with Enron dataset.

Macro AUC	5	10	15	20	25	30	35
5	0.724967	0.732655	0.735259	0.736437	0.737553	0.738793	0.740529
10	0.722673	0.728811	0.730919	0.740033	0.739785	0.740963	0.744497
15	0.725835	0.725401	0.724347	0.728811	0.730733	0.733585	0.733337
20	0.728439	0.730361	0.736437	0.735631	0.734949	0.732345	0.740033
25	0.732407	0.733399	0.742265	0.739041	0.738979	0.732097	0.746853
30	0.707917	0.731849	0.742079	0.742947	0.741893	0.734763	0.747659
35	0.714551	0.735197	0.730981	0.737863	0.738235	0.736809	0.737553

Table 2. Experiment results on link prediction with UCI dataset.

Macro AUC	5	10	15	20	25	30	35
5	0.774367	0.762615	0.755229	0.766137	0.767253	0.778723	0.770529
10	0.762673	0.768811	0.770919	0.770033	0.769785	0.770963	0.764497
15	0.765835	0.765401	0.774347	0.778811	0.760733	0.763585	0.763337
20	0.778439	0.770361	0.766437	0.775631	0.764949	0.772345	0.760033
25	0.762407	0.783821	0.772265	0.779041	0.768979	0.772097	0.766853
30	0.767917	0.771849	0.782079	0.762947	0.771893	0.774763	0.767659
35	0.774551	0.765197	0.770981	0.777863	0.768235	0.766809	0.767553

Table 3. Experiment results on link prediction with ML-10M dataset.

Macro AUC	5	10	15	20	25	30	35
5	0.824267	0.832855	0.834259	0.836437	0.837553	0.838793	0.840529
10	0.822613	0.827811	0.830939	0.840033	0.839785	0.840963	0.844497
15	0.825435	0.824401	0.824347	0.828811	0.830733	0.836585	0.831337
20	0.826439	0.836361	0.836437	0.835631	0.834949	0.832345	0.842033
25	0.832407	0.833399	0.842265	0.839041	0.838979	0.832397	0.846853
30	0.807917	0.831849	0.843079	0.842947	0.841193	0.834263	0.847659
35	0.814551	0.835197	0.835981	0.837563	0.838235	0.836809	0.837553

Table 4. Experiment results on link prediction with Yelp dataset.

Macro AUC	5	10	15	20	25	30	35
5	0.654967	0.642655	0.665259	0.666437	0.677553	0.668793	0.650529
10	0.642673	0.658811	0.660919	0.650033	0.649785	0.650963	0.664497
15	0.675835	0.665401	0.654347	0.668811	0.670733	0.663585	0.673337
20	0.688439	0.670361	0.666437	0.675631	0.664949	0.652345	0.660033
25	0.662407	0.683399	0.682265	0.679041	0.678979	0.662097	0.676853
30	0.677917	0.671849	0.652079	0.662947	0.661893	0.654763	0.667659
35	0.654551	0.665197	0.660981	0.657863	0.658235	0.656809	0.667553

2 Experimental result of negative samples

In this section, we study the influence of the number of negative samples on the model SageDy. In our parameter settings, we set the number of negative samples to 10 by default. Here, we can set the number of negative samples to 5, 10, 15, 20, 25. Our experimental results are shown in Table 5.

From the result of the Table 5, we can see that the number of negative samples set as 10 obtains the best performance than other numbers. However we found that in our experimental results, no matter what value is set for the number of negative samples, our model expressiveness has a certain degree of stability.

Table 5. Experiment results on link prediction of negative sample

Evaluation Metric	Negative sample	Enron	UCI	ML-1OM	Yelp
	5	0.724892	0.774852	0.826546	0.664984
	10	0.736003	0.783821	0.848656	0.671986
Macro-AUC	15	0.730056	0.771981	0.835849	0.670018
	20	0.724856	0.761949	0.831654	0.664984
	25	0.728869	0.761919	0.840065	0.664949

3   Experimental result of dimension size

In this section, we study the effect of node embedding dimension size on the expressiveness of our model. Here, we list several dimensions for experimentation, eg., 32, 64, 128, 256. In the parameter settings of our model SageDy, the node embedding dimension size of our model is set to 128 by default.

From the experimental results, it can be seen that the 128-dimensional node embedding size can make our model have the best expressiveness. In contrast, other dimension settings also have better performance. At the same time, we can find that no matter how much the node embedding dimension size is set to, the expressiveness of our model does not fluctuate significantly.

Table 6. Experiment results on link prediction of dimension size

Evaluation Metric	Dimension size	Enron	UCI	ML-1OM	Yelp
Macro-AUC	32	0.730048	0.774891	0.827165	0.661398
	64	0.731562	0.778942	0.831793	0.665434
	128	0.736003	0.783821	0.848656	0.671986
	256	0.724862	0.774816	0.835674	0.658431