



A Tunable Model for Graph Generation Using LSTM and Conditional VAE

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Motivation & Objectives

- ◆ Graph generation has a wide range of applications.
- ◆ The previous studies of generative models for graphs using machine learning have tried to reproduce features according to data.
- ◆ The existing models cannot tune a specific feature of graphs.
- ◆ We propose a generative model that enables to tune specific features of graphs.

Proposed Model

- ◆ The proposed model is composed of Conditional Variational Auto Encoder (CVAE) with Long Short Term Memory (LSTM) based encoder and decoder.
- ◆ Depth First Search (DFS) code encodes a graph into a sequence of edges, and the sequence is inputted to LSMT.
- ◆ A graph with features specified by a conditional vector is generated.

Results & Conclusions

- ◆ A dataset generated by Connecting Nearest Neighbor model for evaluation of our model.

conditional vector	scaling exponent	clustering coefficient	# of data
[-1.1 0.2]	-1.1	0.2	400
[-0.8 0.4]	-0.8	0.4	400
[-0.5 0.6]	-0.5	0.6	400

- ◆ We can confirm that the scaling exponents are distributed around each value specified by the conditional vectors.

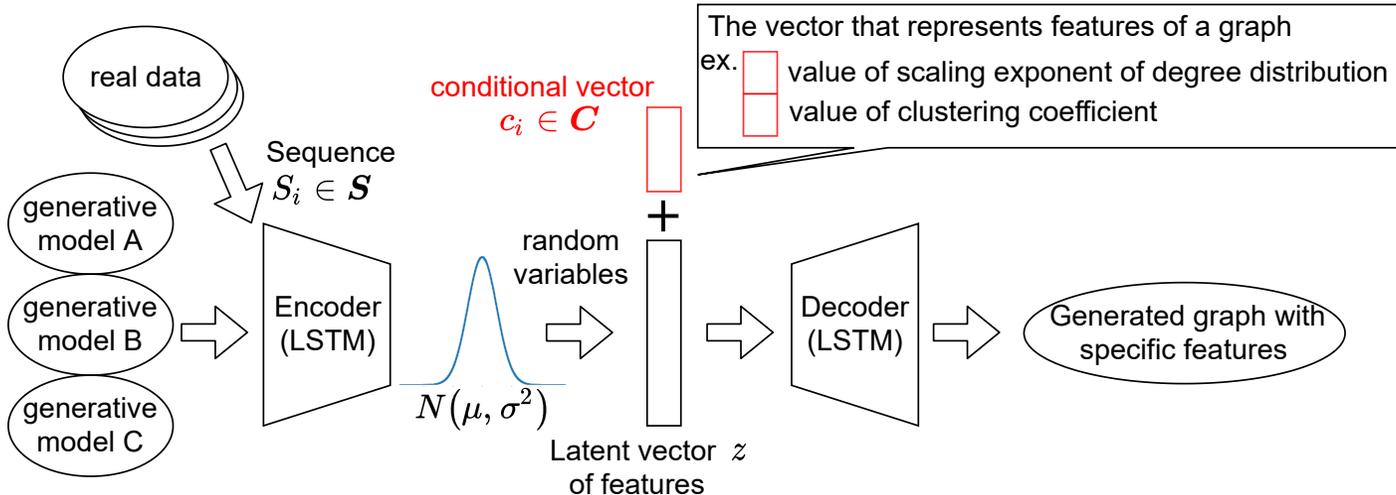


Fig. 1 The proposed model.

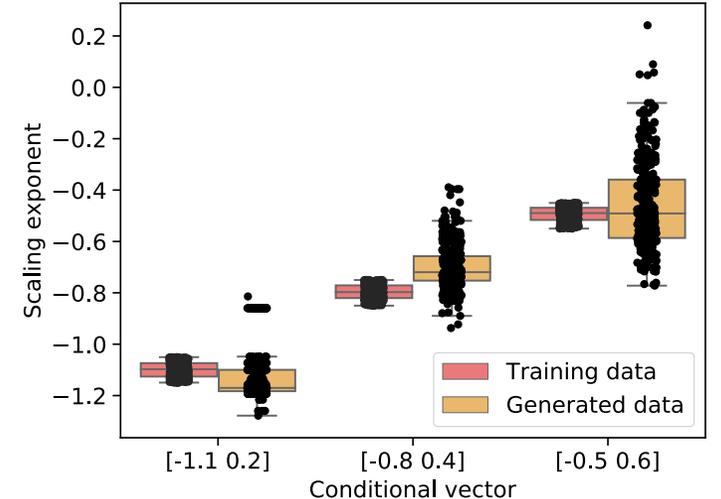


Fig. 2 Scaling exponent of degree distributions.