Heterogeneous-attributes enhancement deep framework for network embedding

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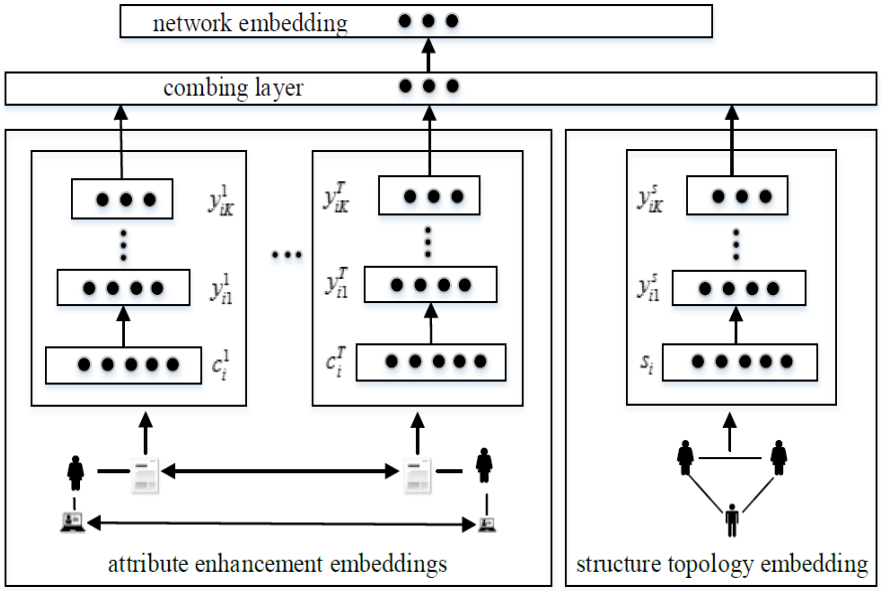
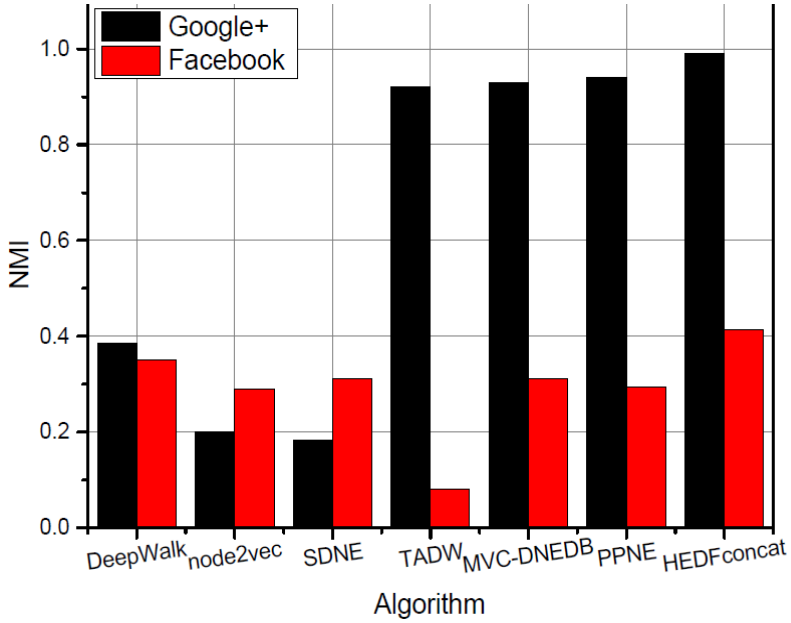
Problems & Ideas

- Problems in network embedding of data with attributes:
  - existing methods may fail to effectively handle the inconsistencies between the structure topology and attribute proximity;
  - the information redundancy captured is insufficient, when dealing with sparse data.
- Ideas: Heterogeneous-attributes Enhancement Deep Framework for Network Embedding
  - a semi-supervised deep learning model is designed, which can adjust attribute proximity by using structural adjacency;
  - using the combining layer to fuse multiple implicit representations of multi-views.



Main Contributions

- **Performance of vertex clustering**



- **Classification performance(Micro-F1) on three datasets**

Methods	Google+			Facebook			DBLP			NUS-WIDE		
Trainning Ratio	1%	2%	3%	10%	20%	30%	10%	20%	30%	10%	20%	30%
DeepWalk	64.97%	66.20%	69.01%	63.81%	73.52%	75.57%	55.16%	55.51%	55.57%	64.31%	65.25%	66.19%
node2vec	61.54%	62.41%	63.11%	65.36%	67.72%	74.07%	53.49%	53.75%	53.77%	63.13%	64.29%	66.65%
SDNE	63.64%	64.16%	66.65%	67.17%	70.82%	75.62%	73.12%	73.33%	73.40%	70.97%	72.43%	74.89%
TADW	86.53%	89.14%	92.47%	59.58%	60.87%	62.06%	62.75%	63.76%	66.22%	72.62%	74.25%	76.58%
MVC-DNE$_{DB}$	87.53%	90.64%	93.47%	67.64%	71.61%	75.44%	70.37%	73.39%	76.94%	77.17%	81.22%	84.96%
PPNE	87.42%	90.96%	92.61%	68.25%	72.89%	76.27%	72.32%	74.77%	77.13%	78.03%	82.17%	85.03%
HIN2Vec	80.55%	81.68%	82.60%	64.25%	66.62%	72.86%	65.91%	66.23%	66.25%	69.80%	71.07%	73.68%
HNE	80.61%	83.39%	86.65%	65.32%	70.28%	75.36%	68.48%	72.16%	75.72%	78.23%	82.29%	85.38%
HEDF$_{structure}$	63.66%	64.32%	66.81%	67.21%	70.97%	75.89%	73.14%	73.40%	73.44%	71.00%	72.56%	75.04%
HEDF$_{attribute}$	91.28%	92.10%	92.65%	61.64%	61.71%	62.44%	65.31%	67.77%	69.13%	75.74%	76.86%	77.74%
HEDF$_{concat}$	86.28%	91.10%	95.03%	65.93%	71.24%	76.17%	74.45%	75.91%	76.36%	78.55%	82.41%	85.52%
HEDF$_{atten}$	**91.58%**	**92.90%**	**96.92%**	**69.49%**	**74.54%**	**79.69%**	**76.92%**	**78.63%**	**79.91%**	**82.33%**	**85.02%**	**88.50%**