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DeepInf: Social Influence Prediction with Deep Learning

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Motivation and Problem Formulation

Question:
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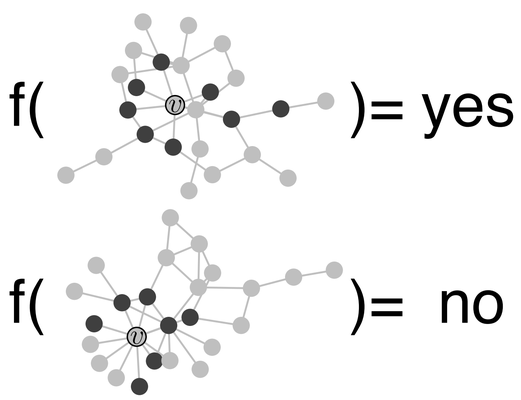
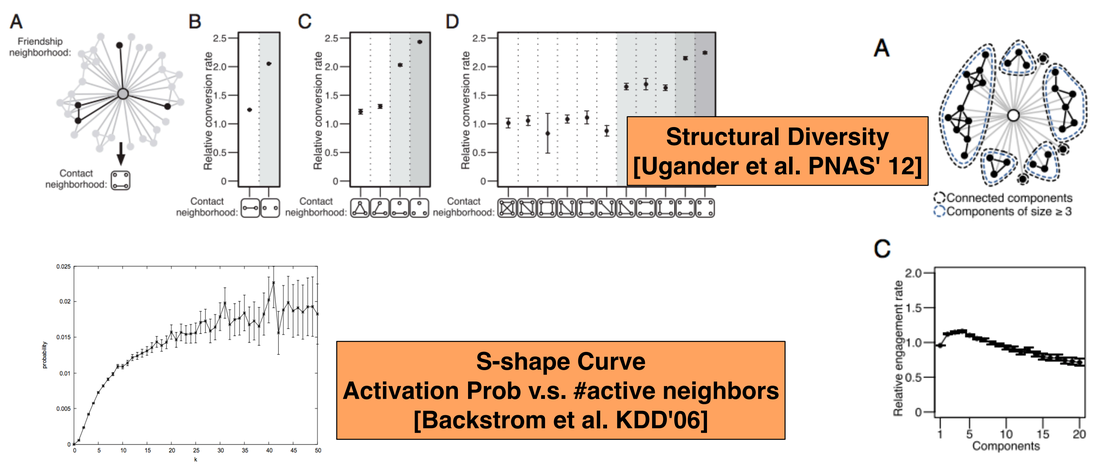
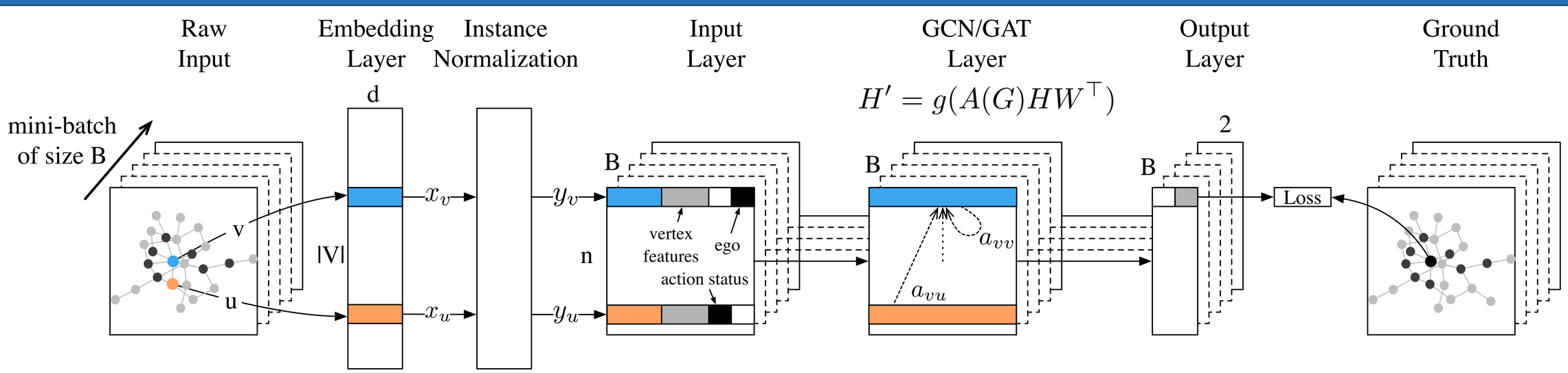


Graph Classification Problem



Complex and non-linear patterns
Requires domain knowledge and hand-craft features

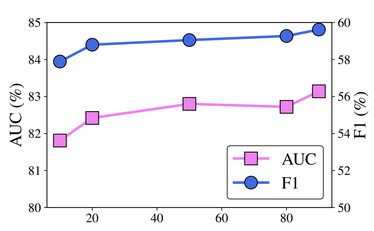
DeepInf Framework



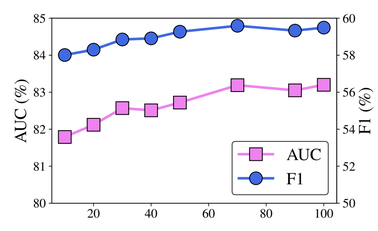
Experimental Results && Visualization

Data	Model	AUC	Prec.	Rec.	F1
OAG	LR	65.55	32.26	**69.97**	44.16
	SVM	65.48	32.17	69.82	44.04
	PSCN	69.16	36.45	64.64	46.61
	DeepInf-GAT	**71.79**	**40.77**	60.97	**48.86**
Digg	LR	84.72	56.78	73.12	63.92
	SVM	86.01	63.42	67.34	65.32
	PSCN	87.37	64.75	68.15	66.40
	DeepInf-GAT	**90.65**	**66.82**	**78.49**	**72.19**
Twitter	LR	78.07	45.86	**69.81**	55.36
	SVM	79.42	**49.12**	67.31	56.79
	PSCN	78.74	47.36	67.29	55.59
	DeepInf-GAT	**80.22**	48.41	69.08	**56.93**
Weibo	LR	77.10	42.34	72.88	53.56
	SVM	77.11	43.27	70.79	53.71
	PSCN	81.31	47.72	71.53	57.24
	DeepInf-GAT	**82.72**	**48.53**	**76.09**	**59.27**

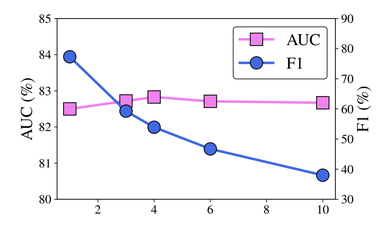
1. LR & SVM: linear model with hand-craft features
2. PSCN(ICML'16): SOTA graph classification model



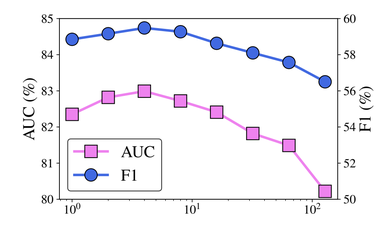
Restart Probability



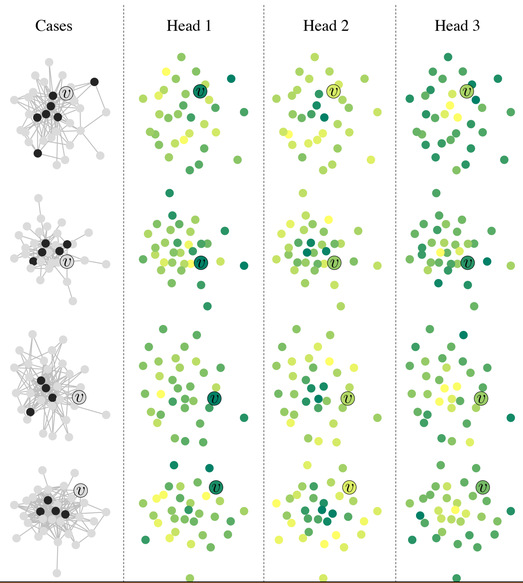
Size of Sampled Networks



Positive Negative Ratio



#Attention Heads



Attention coefficients for different attention heads

Coda&Data: https://github.com/xptree/DeepInf