Embedding in a large scale AceKG

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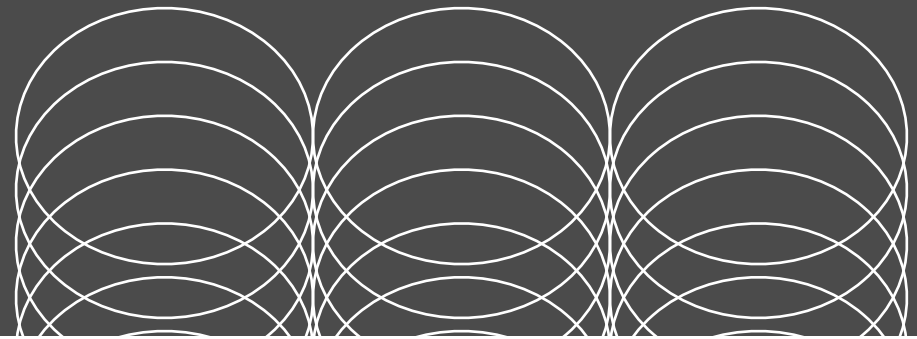
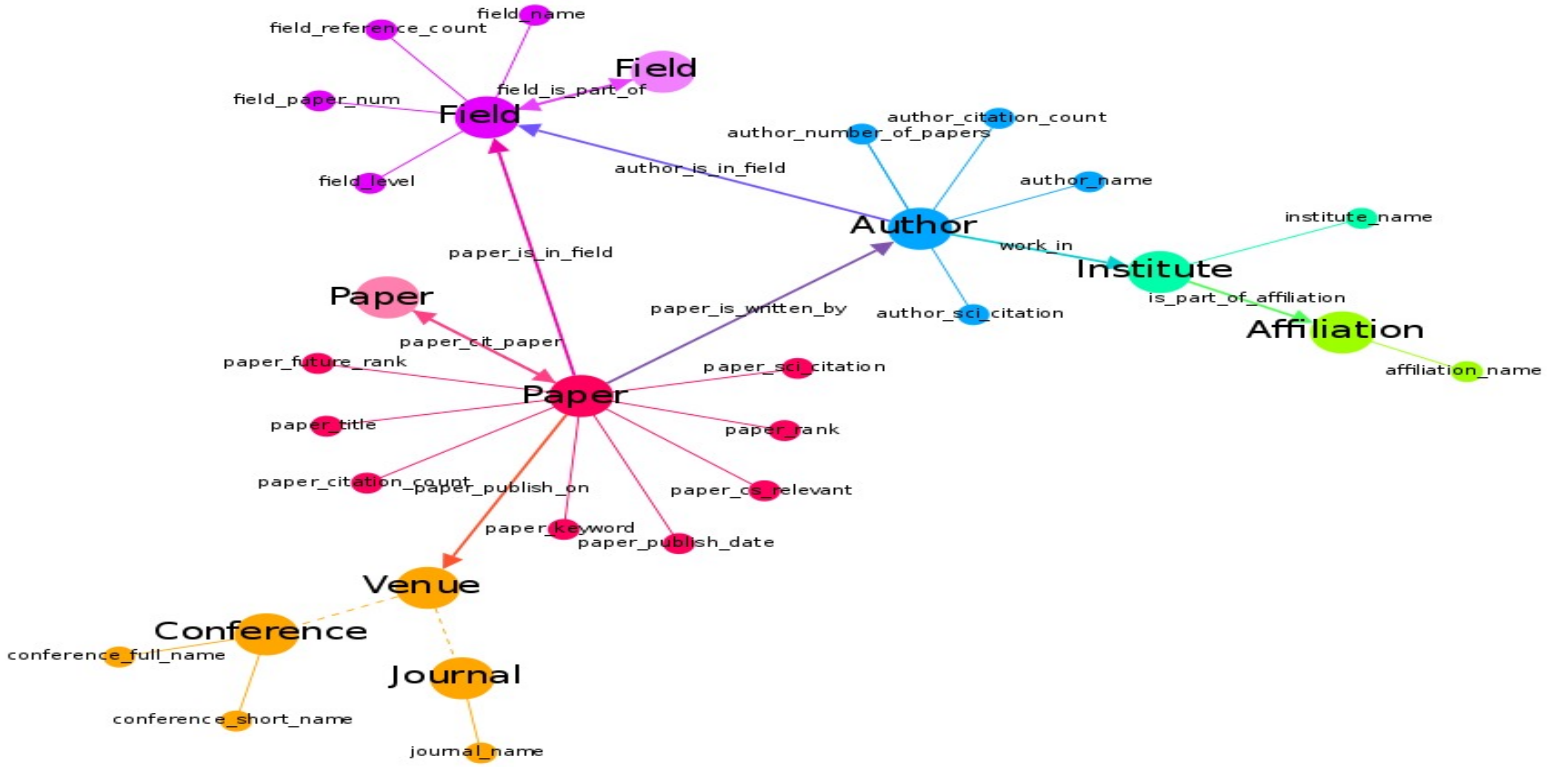
CONTENTS

PART ONE
Knowledge Graph in Acemap



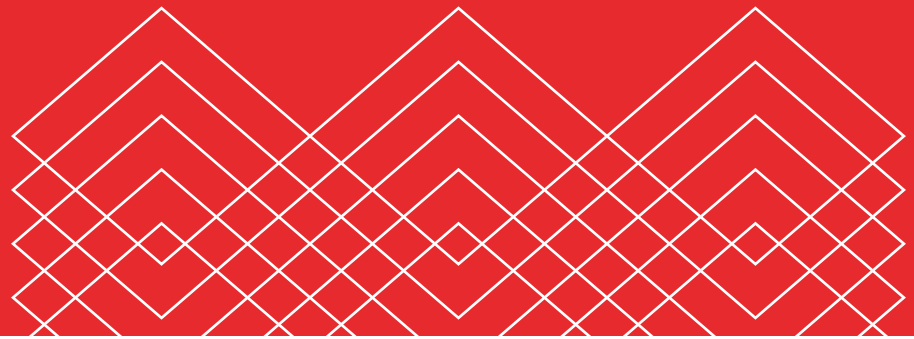
Knowledge Graph in Acemap

AceKG Schema



We cut small dataset from AceKG-AK18K to support this work.

PART TWO
Background of Embedding



What is Embedding

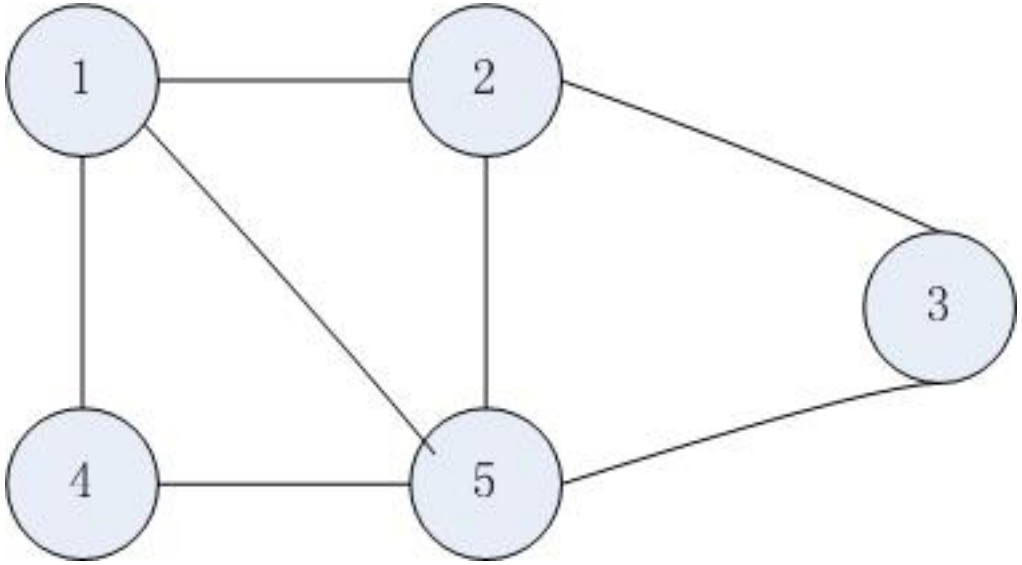
Embedding the discrete nodes and relations in a network into

different vectors in a low dimensional space

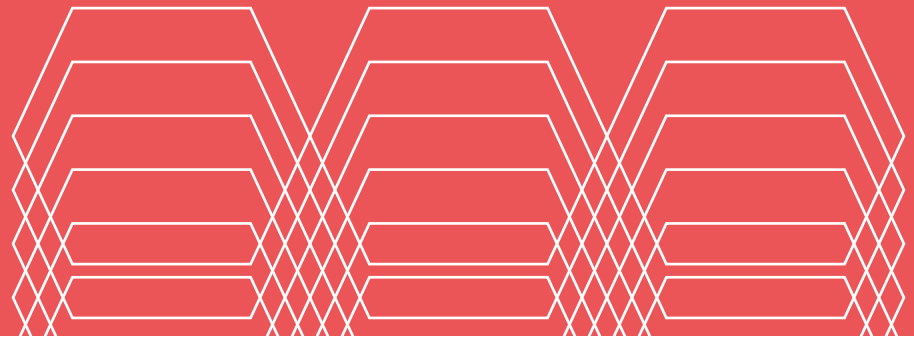
Why we need Embedding

Example: advertisement problem (independent set problem)

Solve a NP-hard problem with a better approximation and quicker



PART THREE
Triple Embedding



Triple embedding

TransE

TransH

HolE

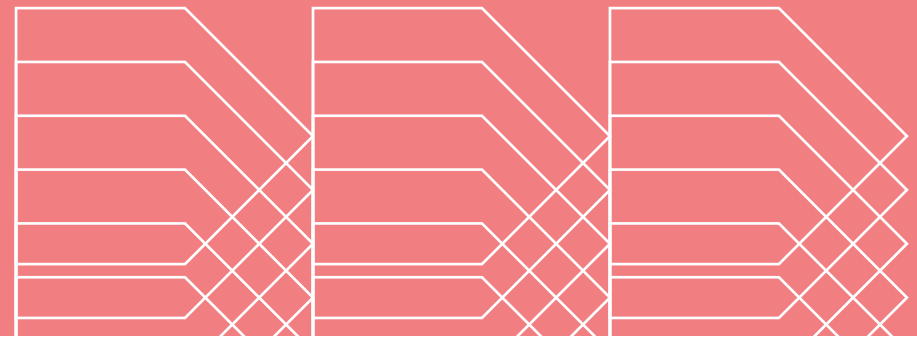
Dismult

Complex

Results

	MRR		Hits at		
Model	Raw	Filter	1	3	10
TransE	0.358	0.719	62.7	82.5	**89.2**
TransH	0.315	0.701	61.0	77.2	84.6
DistMult	0.432	0.749	68.7	79.5	86.1
HolE	**0.482**	**0.864**	**83.8**	**87.1**	88.2
ComplEx	0.440	0.817	75.4	85.8	89.0

PART FOUR
Network Embedding



Network embedding

Deepwalk

PTE

Line

Metapath2vec

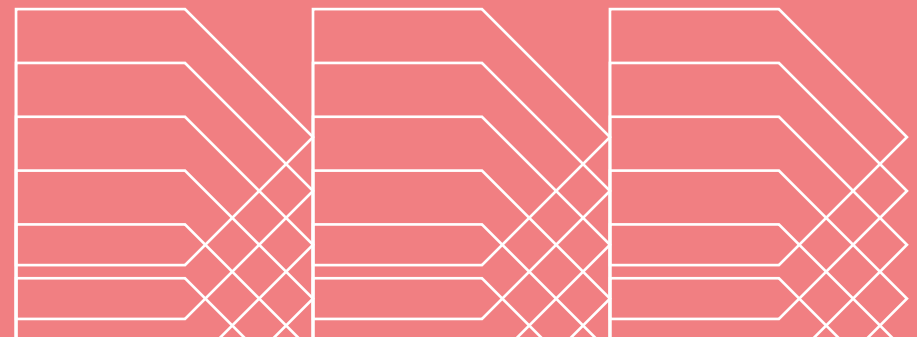
Classification Results

Metric	Method	FOS_BI	FOS_CS	FOS_EC	FOS_ME	FOS_PH	FOS_5F	Google
Micro-F1	DeepWalk	0.792	0.545	0.692	0.663	0.774	0.731	0.948
	LINE(1st+2nd)	0.722	0.633	0.717	0.701	0.779	0.755	0.955
	PTE	0.759	0.574	0.654	0.694	0.723	0.664	0.966
	metapath2vec	0.828	0.678	0.753	0.770	0.794	0.831	0.971
Macro-F1	DeepWalk	0.547	0.454	0.277	0.496	0.592	0.589	0.942
	LINE(1st+2nd)	0.445	0.542	0.385	0.577	0.640	0.655	0.949
	PTE	0.495	0.454	0.276	0.555	0.571	0.528	0.961
	metapath2vec	0.637	0.570	0.485	0.659	0.635	0.682	0.968

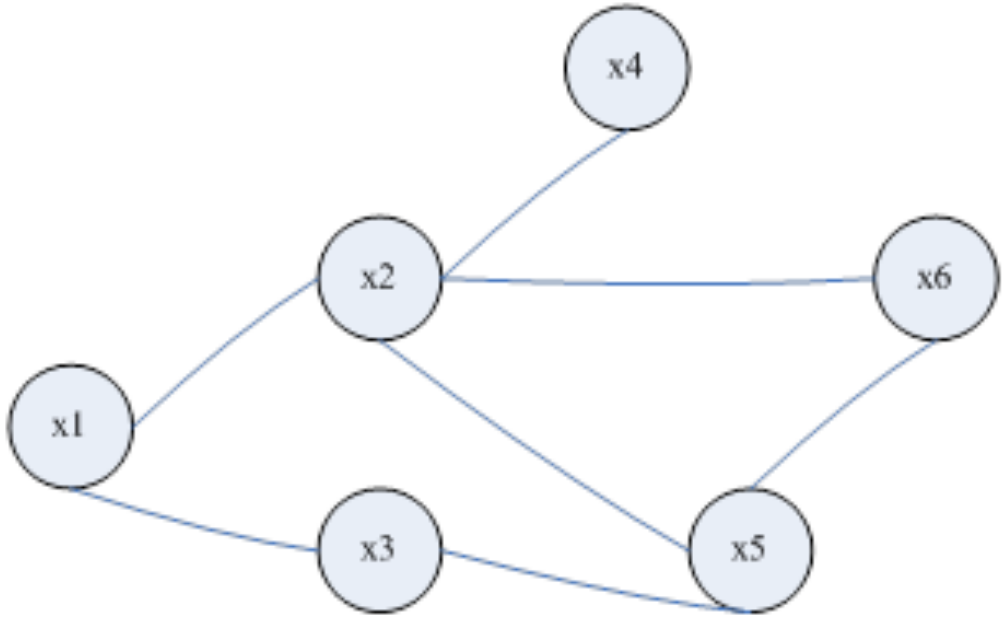
Clustering Results

Model	FOS-labeled	Google-labeled
DeepWalk	0.277	0.394
PTE	0.153	0.602
LINE(1st+2nd)	0.305	0.459
metapath2vec	0.427	0.836

PART FIVE
Embedding with Graph Model



Using Graph Model to conduct Embedding



THANKS