

# Cross-Supervised Joint-Event-Extraction with Heterogeneous Information Networks



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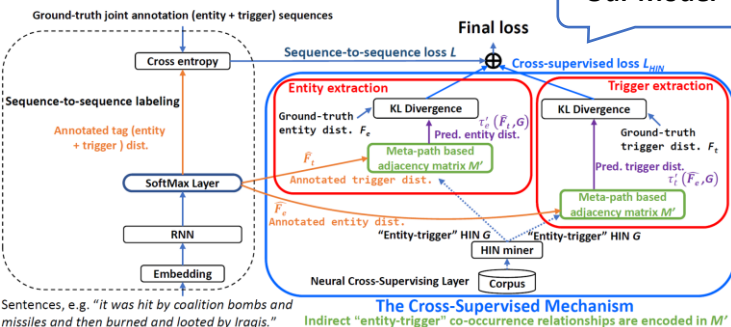
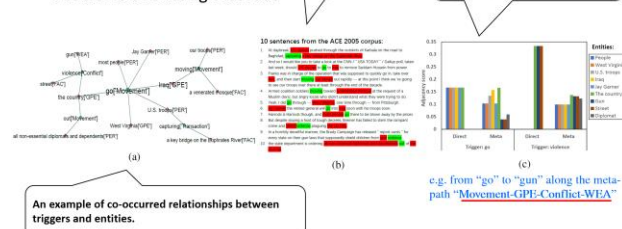
## Main contributions of this paper.

- **First** to use the indirect “entity-trigger” cooccurrence relationships (encoded in HIN) to improve the performance of the joint-event-extraction task.
- Proposed **Cross-Supervised-Mechanism**.
- **Verify** the indirect “entity-trigger” cooccurrence relationships is **helpful**.

## Heterogeneous Information Network of entities and triggers



## Problems of existing methods



## Comparison with different models without any pre-defined features

TABLE II: Comparison on real-world datasets

Model	Precision	ACE 2005 Recall	F1	Precision	NYT Recall	F1	Precision	CoNLL Recall	F1	Precision	WebNLG Recall	F1
Seq2Seq	0.442±0.025	0.493±0.0272	0.466±0.026	0.818±0.012	0.832±0.012	0.825±0.012	0.709±0.015	0.852±0.011	0.774±0.013	0.851±0.009	0.910±0.007	0.880±0.008
CRF	0.434±0.031	0.478±0.033	0.455±0.032	0.813±0.011	0.828±0.011	0.821±0.01	0.718±0.016	0.867±0.013	0.785±0.014	0.864±0.005	0.921±0.005	0.892±0.005
GCN	0.435±0.030	0.487±0.032	0.459±0.031	0.804±0.013	0.819±0.013	0.811±0.013	0.706±0.015	0.871±0.014	0.780±0.013	0.884±0.008	0.931±0.008	0.907±0.008
JEE	0.423±0.023	0.468±0.030	0.443±0.026	0.717±0.009	0.645±0.014	0.679±0.012	0.713±0.019	0.814±0.013	0.76±0.015	0.775±0.015	0.818±0.012	0.796±0.013
JT	0.469±0.003	0.426±0.005	0.447±0.004	0.725±0.012	0.691±0.006	0.708±0.009	0.738±0.025	0.837±0.006	0.784±0.021	0.818±0.011	0.829±0.007	0.873±0.008
CSM <sub>DA</sub>	0.455±0.024	0.494±0.022	0.474±0.023	0.835±0.012	0.847±0.012	0.841±0.012	0.730±0.017	0.856±0.021	0.788±0.019	0.908±0.005	0.941±0.004	0.924±0.004
CSM <sub>HIN</sub>	0.477±0.030	0.533±0.033	0.503±0.031	0.859±0.007	0.870±0.008	0.865±0.008	0.754±0.018	0.890±0.020	0.816±0.017	0.923±0.004	0.953±0.003	0.937±0.003

Model	Entity extraction			Trigger extraction		
	Precision	Recall	F1	Precision	Recall	F1
Seq2Seq	0.494	0.489	0.49	0.383	0.426	0.403
CRF	0.502	0.483	0.491	0.395	0.473	0.431
GCN	0.508	0.491	0.499	0.381	0.443	0.410
JEE	0.451	0.497	0.472	0.407	0.411	0.409
JT	0.492	0.458	0.474	0.447	0.414	0.432
CSM <sub>DA</sub>	0.509	0.535	0.52	0.404	0.442	0.422
CSM <sub>HIN</sub>	0.512	0.552	0.532	0.464	0.484	0.474

Our models