Exploiting Partially Annotated Data for Temporal Relation Extraction

Qiang Ning, Zhongzhi Yu, Chuchu Fan, and Dan Roth

06/05/2018

University of Illinois, Urbana-Champaign

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CogCompTime: Our Online Demo For Temporal Understanding

They became friends when they attended the same university 9 years ago. Now they are planning their wedding this June.

The temporal system has identified the following nodes and relations.

They [E0: became] friends when they [E1: attended] the same university [T1: 9 years ago (2009)] . [T2: Now (PRESENT_REF)] they are [E2: planning] their wedding [T3: this June (2018-06)] .

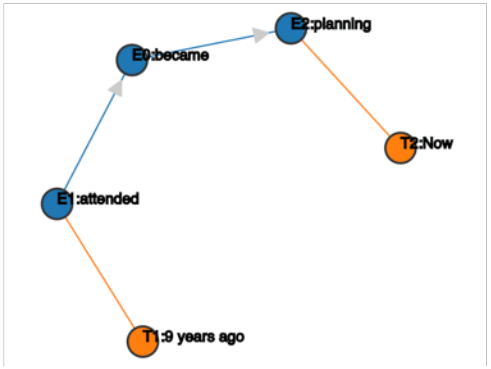
[E0: became] [E1: attended] [T1: 9 years ago (2009)] [T2: Now (PRESENT_REF)] [E2: planning] [T3: this June (2018-06)]

Timeline

```
|
|2009---------E1:attended
|
|-------------E0:became
|
|2018-05-15---E2:planning
|
V

Time Axis
```

Temporal Graph



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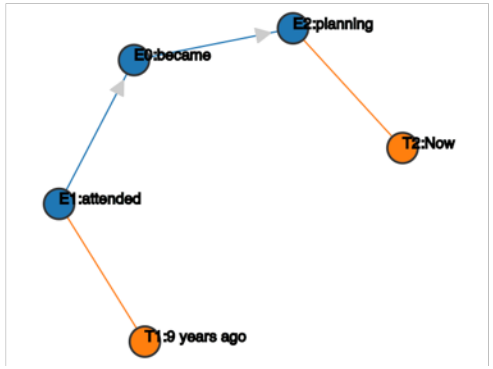

This demo is an effort following:

[1] Ning et al., EMNLP'17. A structured learning approach to temporal relation extraction
[2] Ning et al., NAACL'18. Improving temporal relation extraction via a globally acquired resource
[3] Ning et al., ACL'18. Joint reasoning for temporal and causal relations.
[4] Ning et al., ACL'18. A multi-axis modeling for temporal relation annotation

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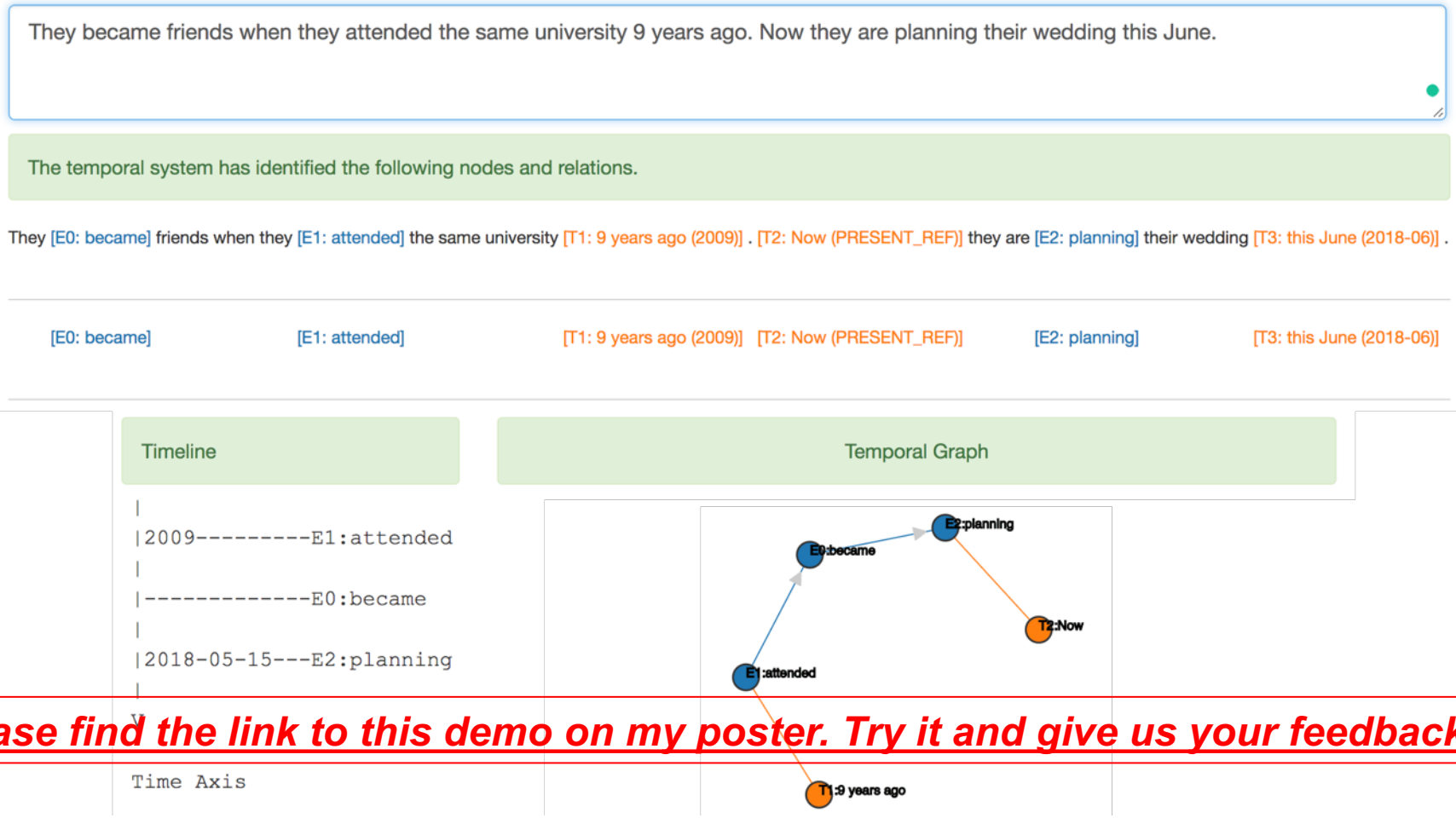

Please find the link to this demo on my poster. Try it and give us your feedback!

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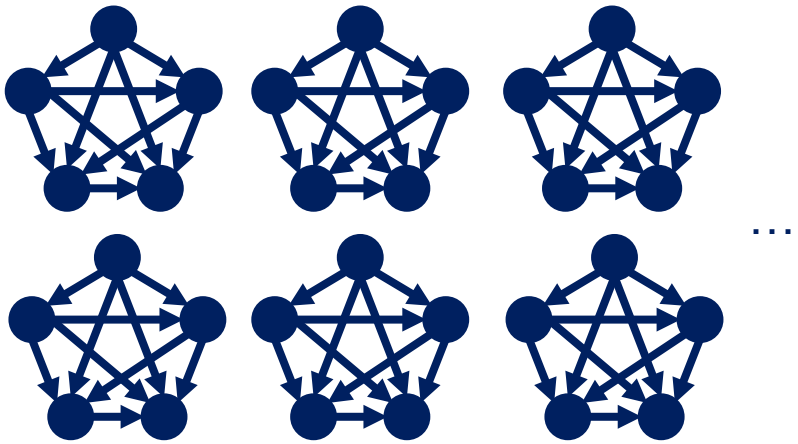
Motivation Of This Work

Ideal annotation:
many complete ones



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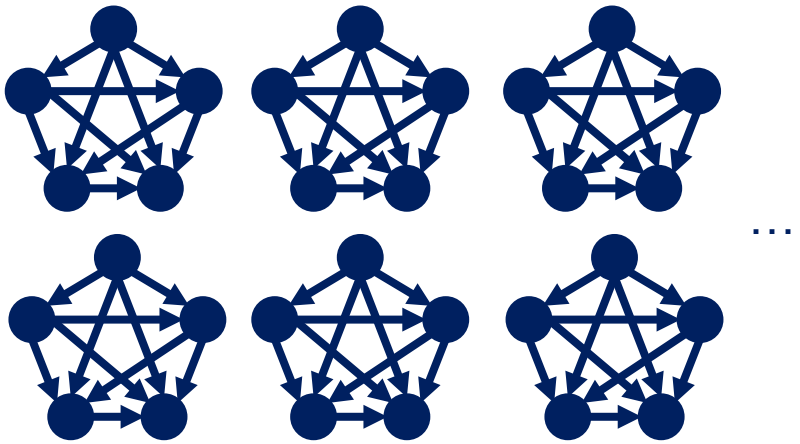
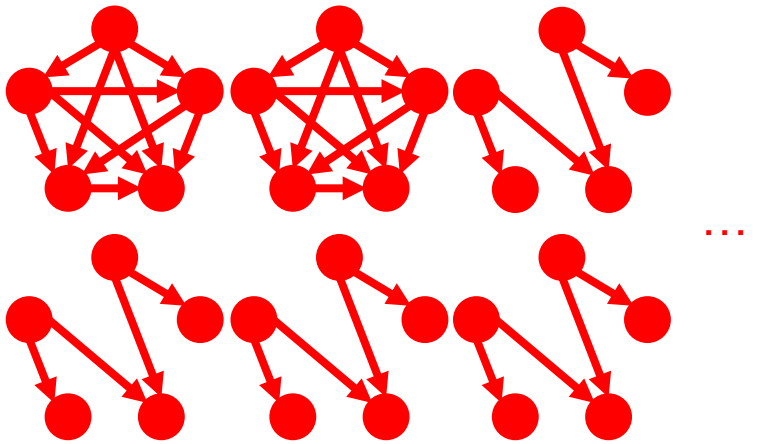


In many cases:
a few complete + many incomplete ones



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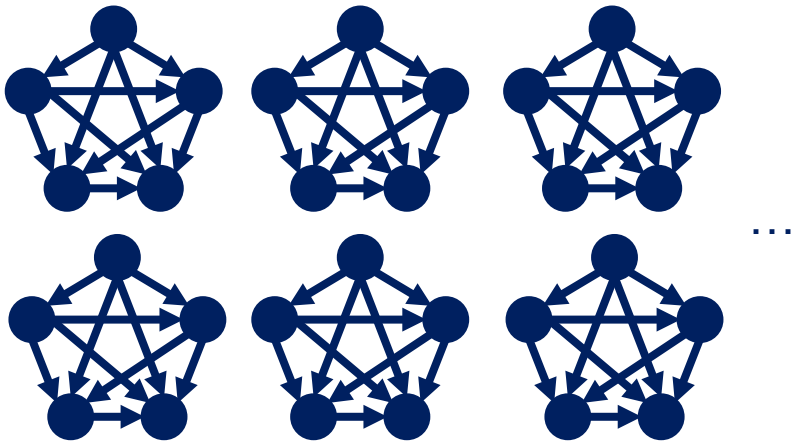

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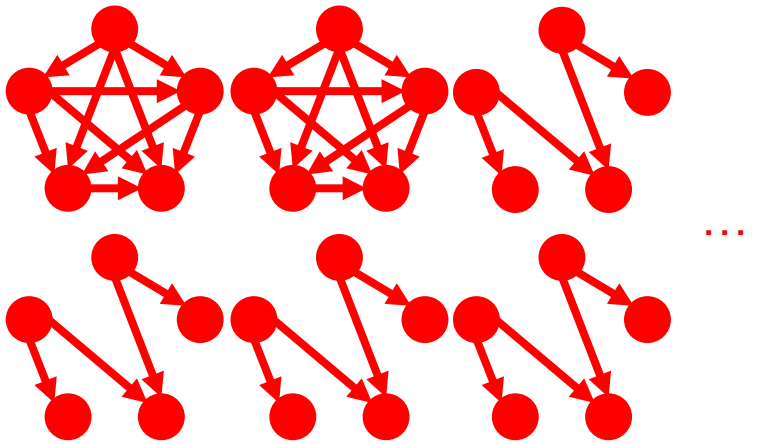

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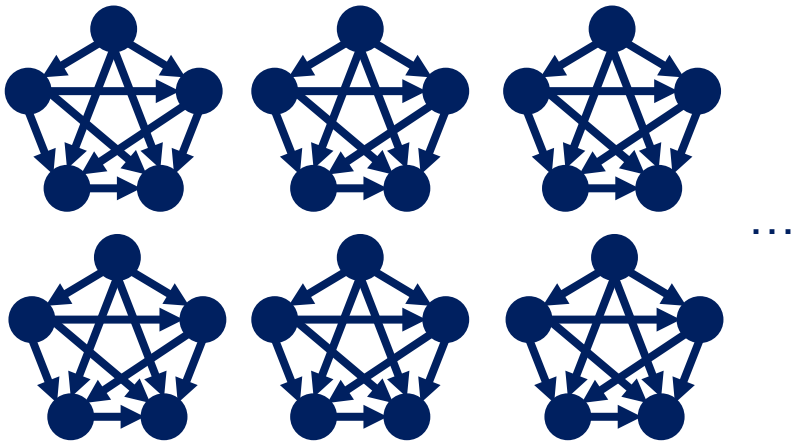

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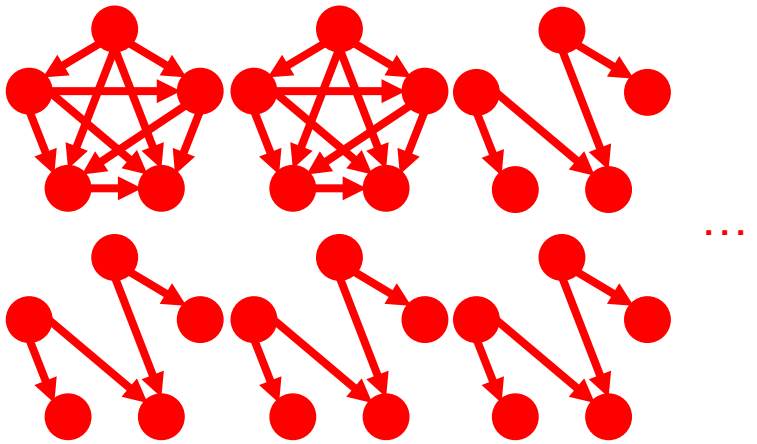
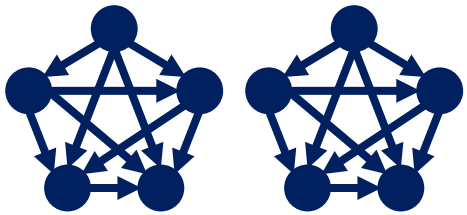


- How can we learn from imperfect supervision, e.g., partial, noisy, or indirect? (this work tries to answer this question via *bootstrapping*, *structural constraints*, and *partial annotation*, using temporal relation extraction as a demonstration)
- How can we theoretically characterize the benefit of *bootstrapping*, *structural constraints*, and *partial data*?

A More Interesting Question

- For general structural data collection, which one is better?

Fully annotated



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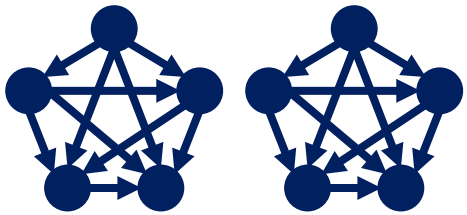

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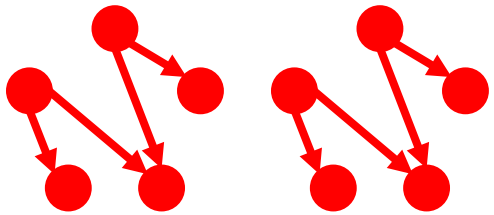

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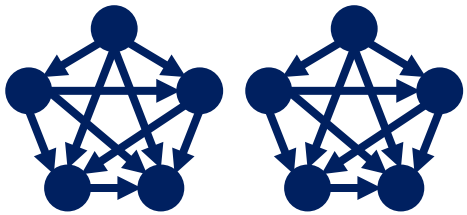

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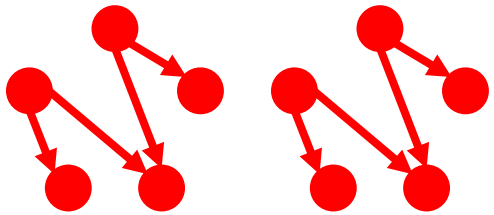
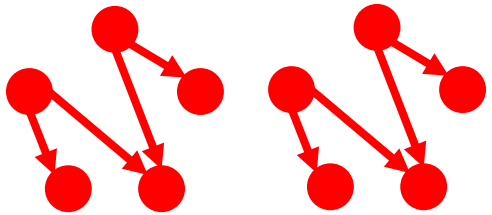


…but more



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