Weak Semi-Markov CRFs for NP Chunking in Informal Text

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Paper Contributions

In this paper, we contributed:

1. Noun phrase-annotated SMS corpus[1]

[1] Tao Chen and Min-Yen Kan (2013). "Creating a live, public short message service corpus: the NUS SMS corpus". In: *Language Resources and Evaluation*. Vol. 47. Springer Netherlands, pp. 299–335.

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2. Weak semi-Markov CRF

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We used Brat Rapid Annotation Tool (BRAT)[2] for annotations, recruiting undergraduate students to annotate the noun phrases.

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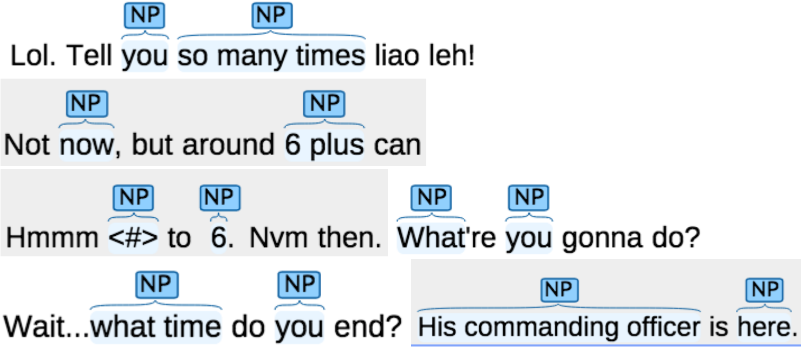

Lol. Tell you so many times liao leh!

Not now, but around 6 plus can

Hmmm <#> to 6. Nvm then. What're you gonna do?

Wait...what time do you end? His commanding officer is here.

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Annotations Statistics

64 annotators

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26,500	SMS messages

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76,490	noun phrases

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64	annotators
26,500	SMS messages
76,490	noun phrases
359,009	tokens

Models

Models Comparison

n : # words in the sentence, $|\mathcal{Y}|$: # labels, L : max segment length

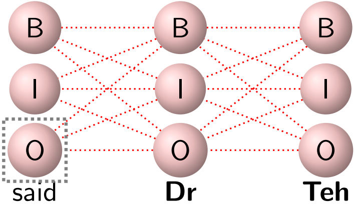

Fig. 1: Linear CRF: $O(n|\mathcal{Y}|^2)$

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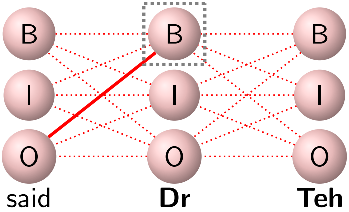

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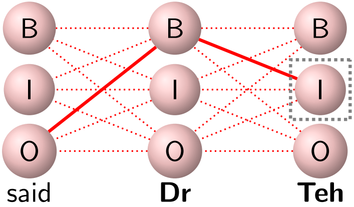

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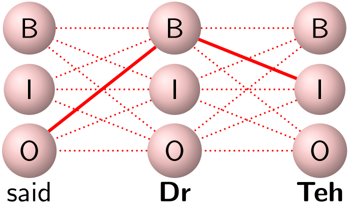

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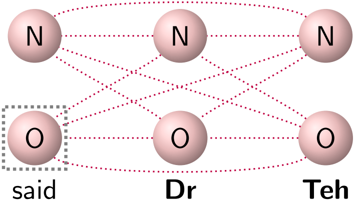

Fig. 2: Semi-CRF: $O(nL\,|\mathcal{Y}|^2)$

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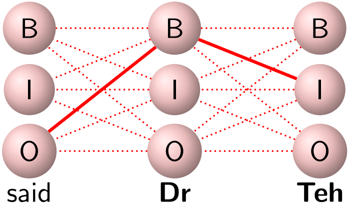

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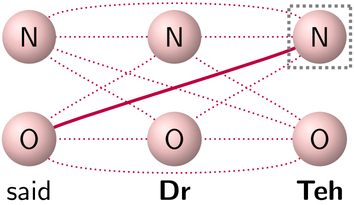

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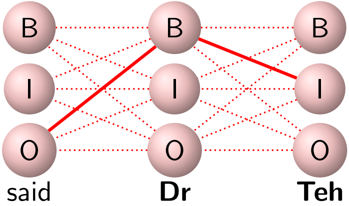

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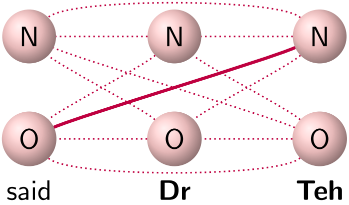

Fig. 2: Semi-CRF: $O(nL\,|\mathcal{Y}|^2)$

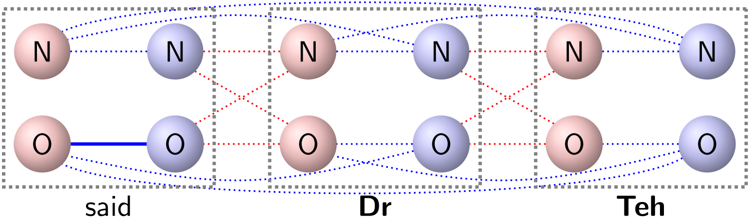

Fig. 3: Weak Semi-CRF: $O(n\,|\mathcal{Y}|^2 + nL\,|\mathcal{Y}|)$

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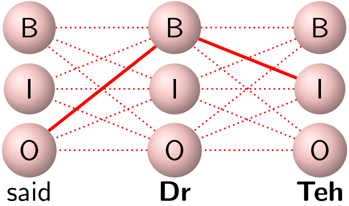

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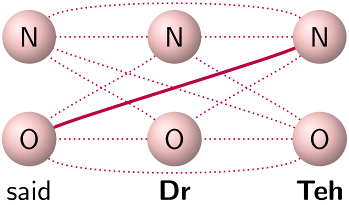
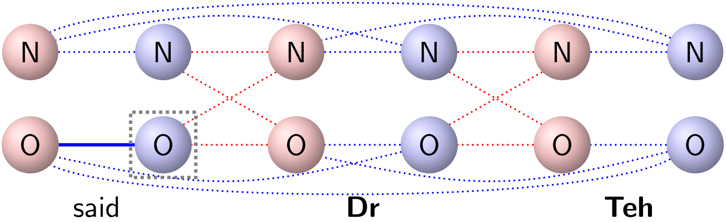


Fig. 2: Semi-CRF: $O(nL\,|\mathcal{Y}|^2)$



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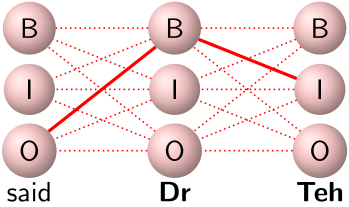

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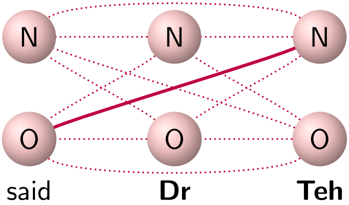
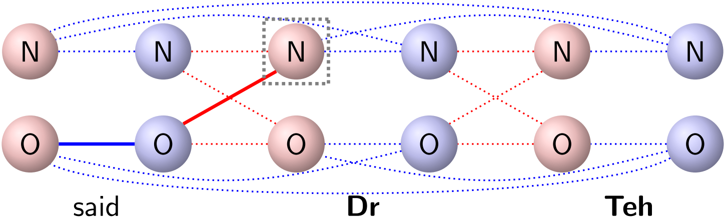


Fig. 2: Semi-CRF: $O(nL\,|\mathcal{Y}|^2)$



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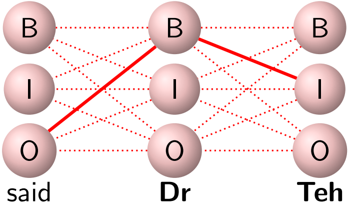

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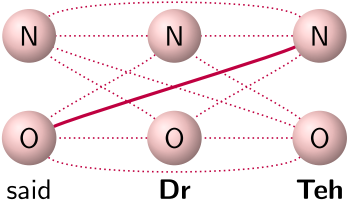

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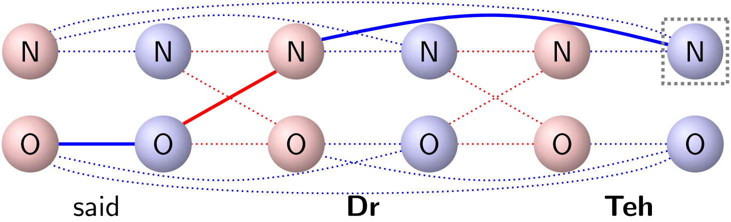

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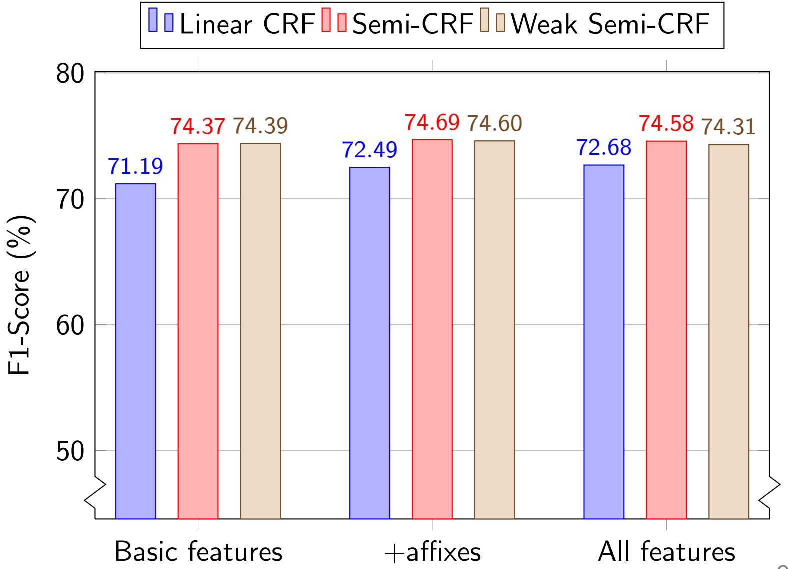
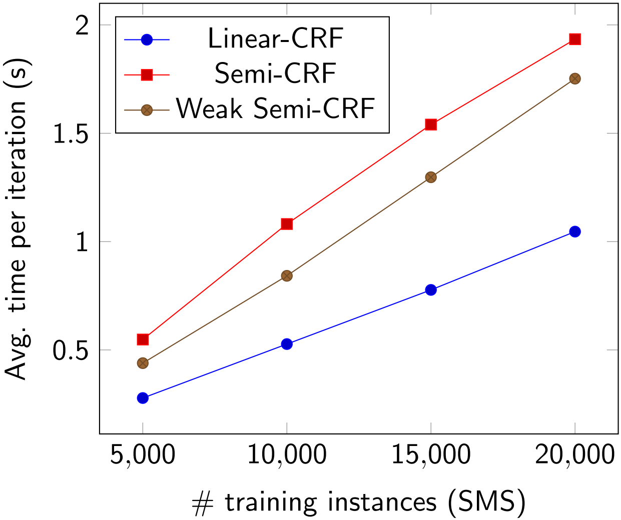
Empirical Verification

F1-Score


Linear CRF
Semi-CRF
Weak Semi-CRF
F1-Score (%)
80
70
60
50
71.19
74.37
74.39
72.49
74.69
74.60
72.68
74.58
74.31
Basic features
+affixes
All features

Training Speed



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- We can split the decisions of selecting segment length and segment type to improve the training time, while maintaining similar accuracy

Thank You

Code and data available at:
`http://statnlp.org/research/ie/`

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