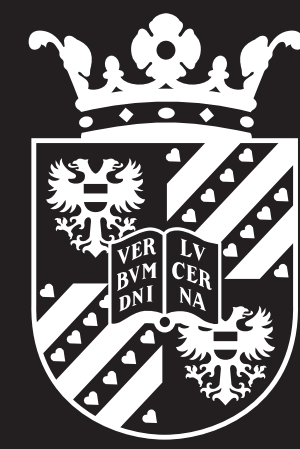


# The Meaning Factory: Formal Semantics for Recognizing Textual Entailment and Determining Semantic Similarity

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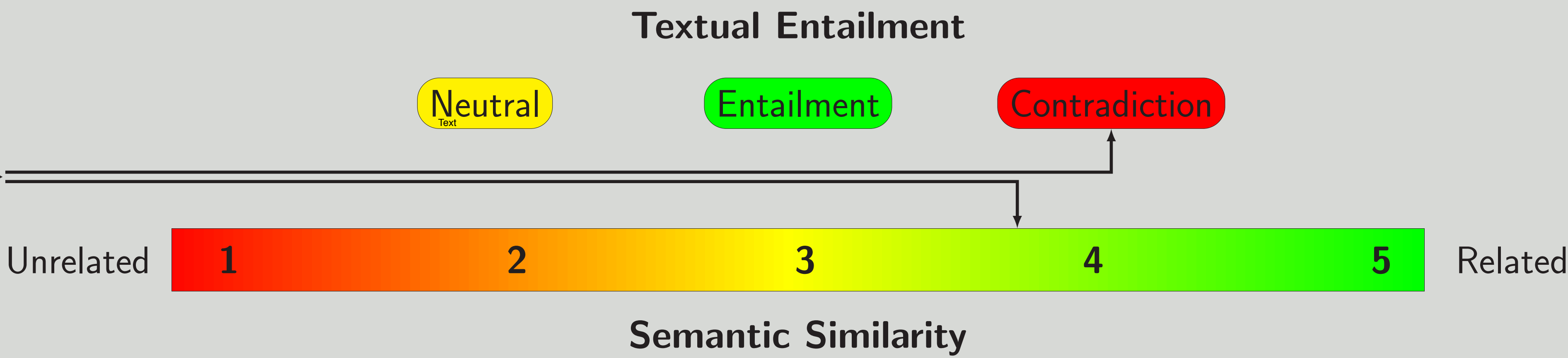
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## SemEval: Shared Task 1

### Example 266

*t* The brown horse is near a red barrel at the rodeo

*h* The brown horse is far from a red barrel at the rodeo

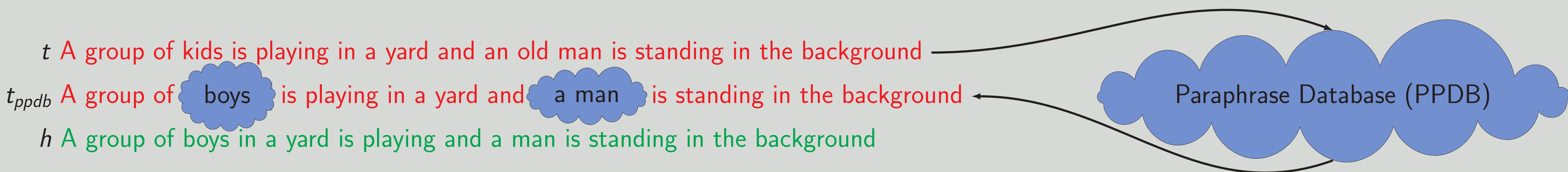


## Research questions

- ▶ Can paraphrasing techniques increase the accuracy of our systems for RTE and Determining Semantic Similarity?
- ▶ Are meaning representations used for textual entailment useful for predicting semantic similarity?
- ▶ Are similarity features useful for boosting the accuracy of an RTE system?

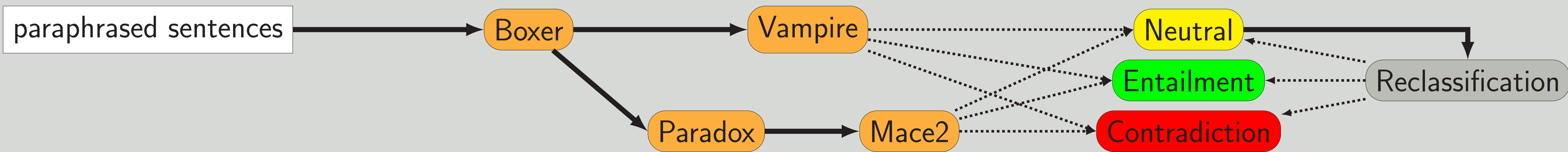
## Paraphrasing techniques

- ▶ Rephrase sentences by using PPDB, The Paraphrase Database (Ganitkevitch et al., 2013)

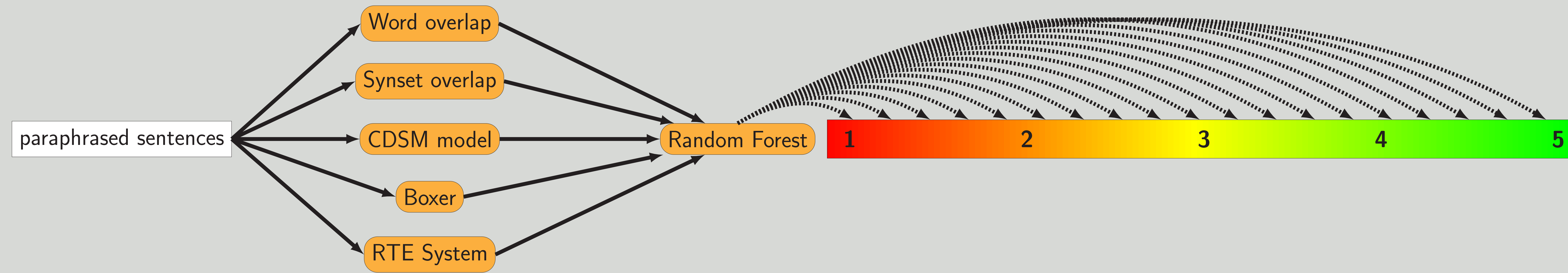


## RTE with the semantic parser Boxer

1. Produce a formal semantic representation for each sentence
2. Translate the semantic representations into first-order logic
3. Use off-the-shelf theorem provers and model builders to check for entailment and contradiction



## Determining Semantic Similarity



## Conclusions and Results

- ▶ Our system ranked top 5 for RTE and top 3 for DSS (Best MSE)
- ▶ Paraphrasing techniques improved results for both systems
- ▶ Features based on our RTE system improved our DSS system
- ▶ Reclassification of neutrals using our DSS system scores was useful

	: Determining Semantic Similarity	
Feature group	p [+PPDB]	p [-PPDB]
RTE system	0.737	0.649
Boxer	0.667	0.634
Word overlap	0.676	0.647
All features	<b>0.827</b>	0.819

	: Recognizing Textual Entailment
RTE configuration	Accuracy
most frequent class	56.7
–PPDB, –reclassification	77.6
+PPDB, –reclassification	79.6
+PPDB, +reclassification	<b>81.6</b>

Boxer is developed in tandem with the Groningen Meaning Bank – A free semantically annotated corpus that anyone can edit



- ▶ Comprises deep, integrated semantic representations
- ▶ Over 10,000 texts
- ▶ Periodic releases are freely available

