

Frame- and Entity-Based Knowledge for Common-Sense Argumentative Reasoning



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Summary

Common-sense Argumentative Reasoning

Given a debate title, a claim and a reason choose a correct warrant to complete the argumentative reasoning chain (SemEval-2018 Task 12)

Motivation

- External world knowledge is essential for reasoning comprehension
- No shared task system focused on enriching models with external knowledge
- Related work shows improvements for natural language inference and question answering with symbolic knowledge

Contributions

- Explore external knowledge beyond lexical
→ **WIKIDATA** (fact knowledge about entities)
→ **FRAMENET** (prototypical situations)
- ! Both resources lead to a small improvement
- ! More work needed on integration of multiple annotation types
- ! Logic-based modeling of reasoning is missing

Code and Models



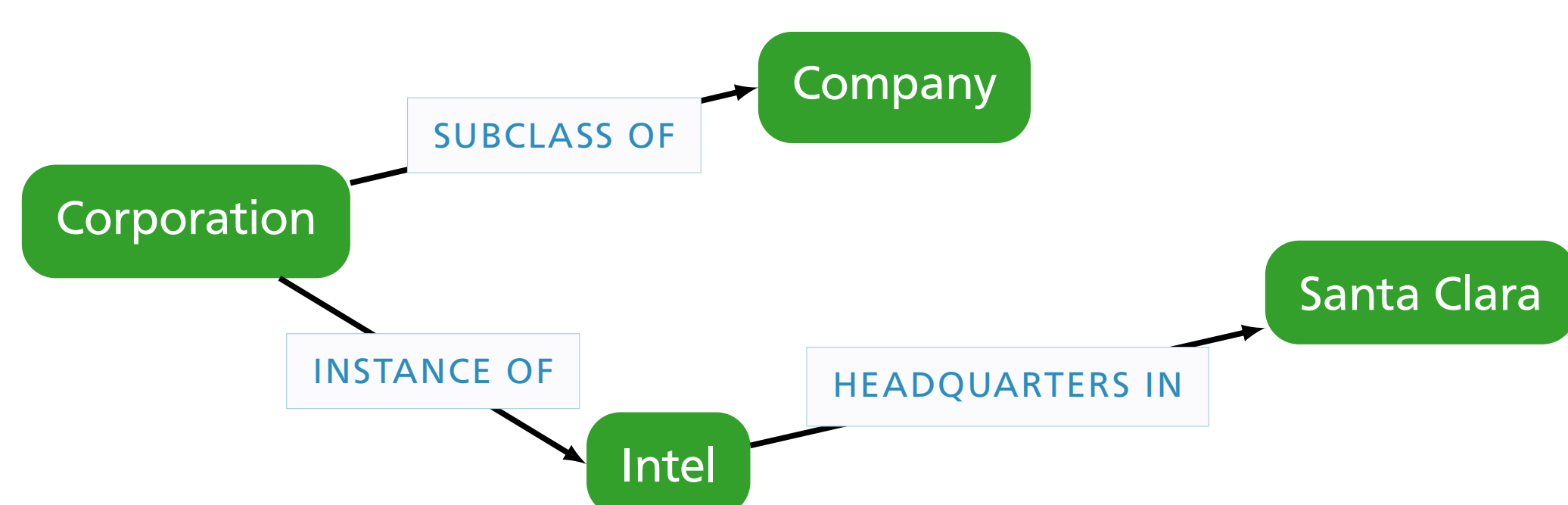
⚡ Read the paper

⚡ Download the code

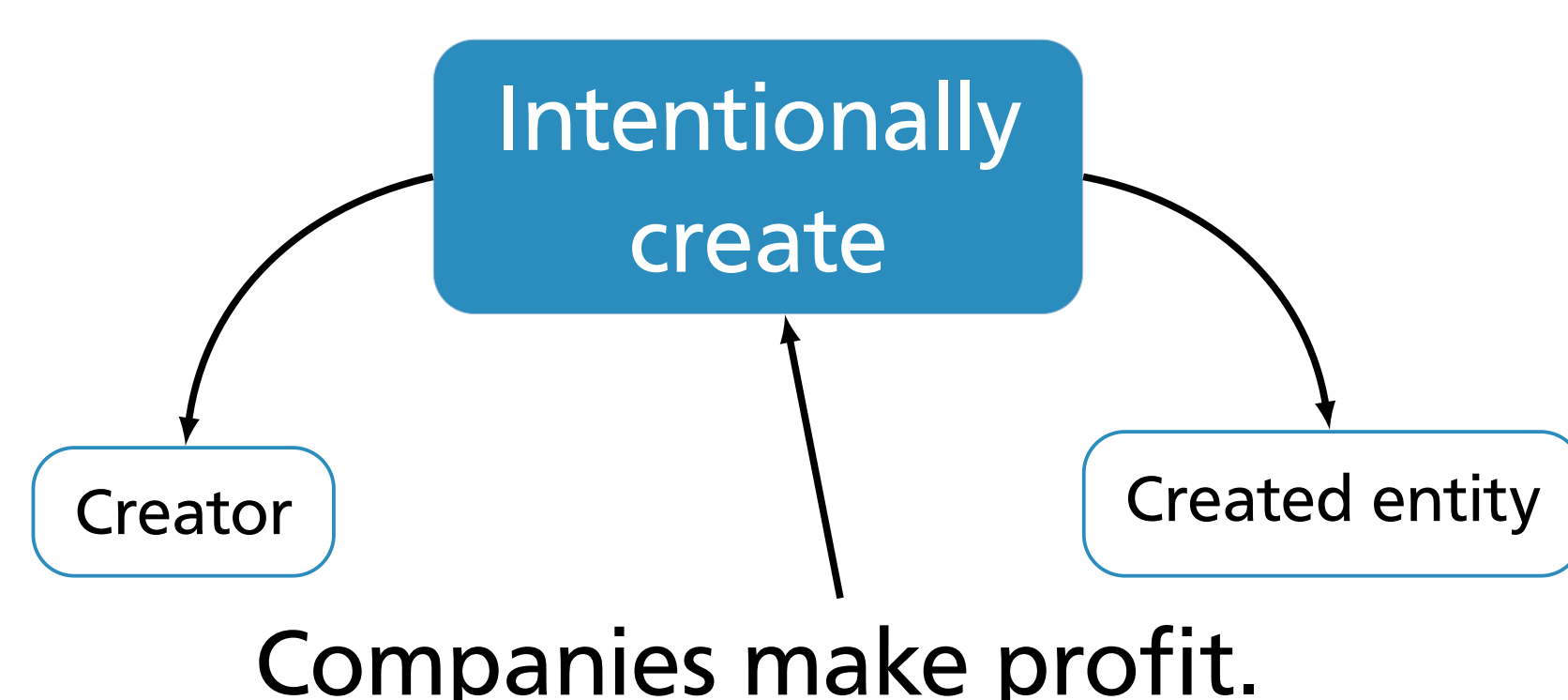
Built with
Python, PyTorch

<https://github.com/UKPLab/emnlp2018-argmin-commonsense-knowledge>

WIKIDATA



FRAMENET



Can companies be trusted?

Reason **Corporations** have only one **goal**: to **make profit**.

Warrant 1

They do not have to satisfy customers to make a profit.

Warrant 2

They have to satisfy customers to make a profit.

Claim **Companies** can't be **trusted**.

Do police use deadly force too often?

Reason **Police** **use** the excuse of **fear** for life to **abuse use of force**.

Warrant 1

The excuse is rarely warranted.

Warrant 2

The excuse is sometimes warranted.

Claim **Police** is too **willing** to use force.

Results

- We use the intra-warrant attention model from the dataset paper (Habernal et al., 2018)
- + Word embeddings are concatenated with **FRAMENET** and **WIKIDATA** embeddings

Table 1: Mean and max accuracy over 10 runs on the ARC dev. and test sets

Approach	mean		max
	Dev.	Test	Test
Habernal et al. (2018)	0.6712	0.5570	0.5878
+WD	0.6623	0.5680	0.6036
+FN	0.6741	0.5676	0.6104
+FN/WD	0.6630	0.5592	0.5946

Figure 1: Performance for the '+WD' approach by the number of WD entities in an instance.

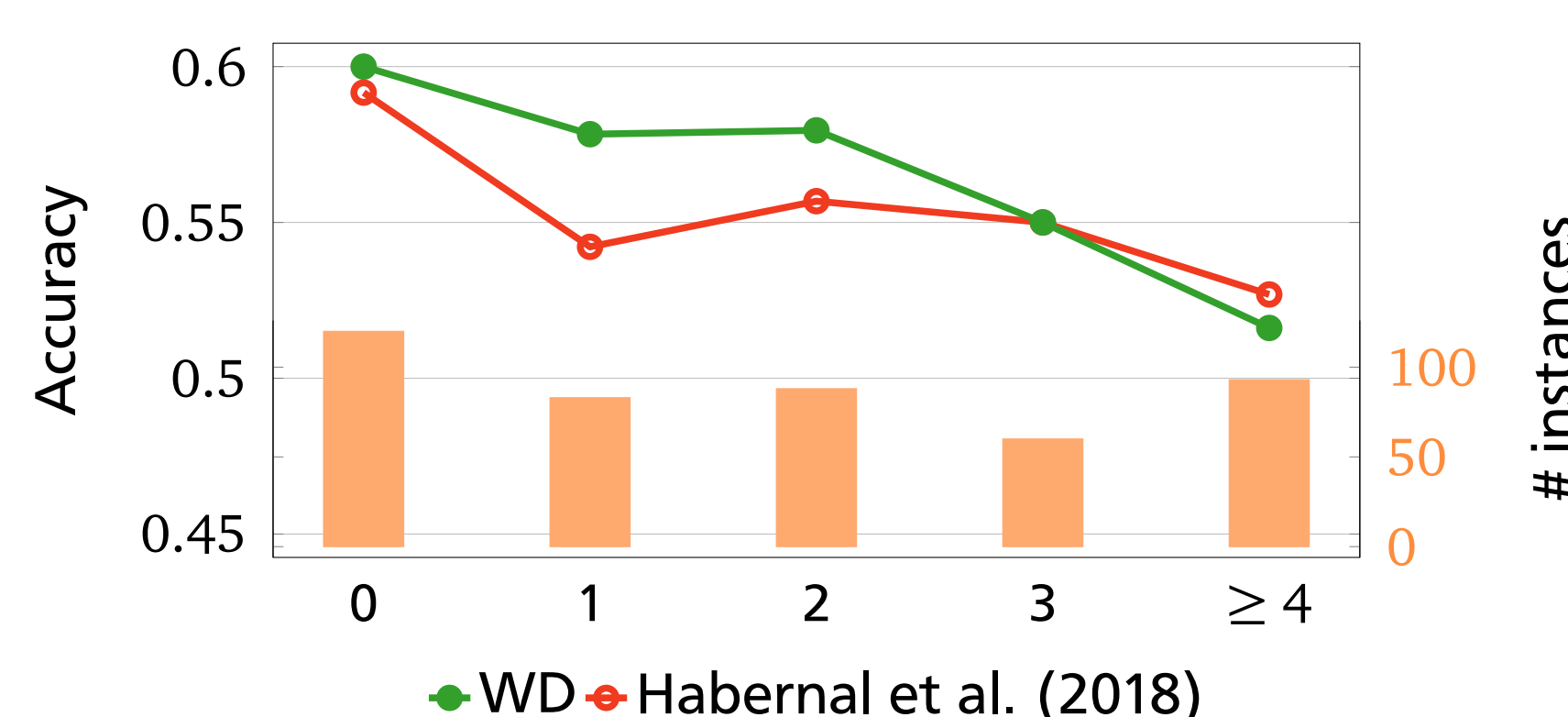
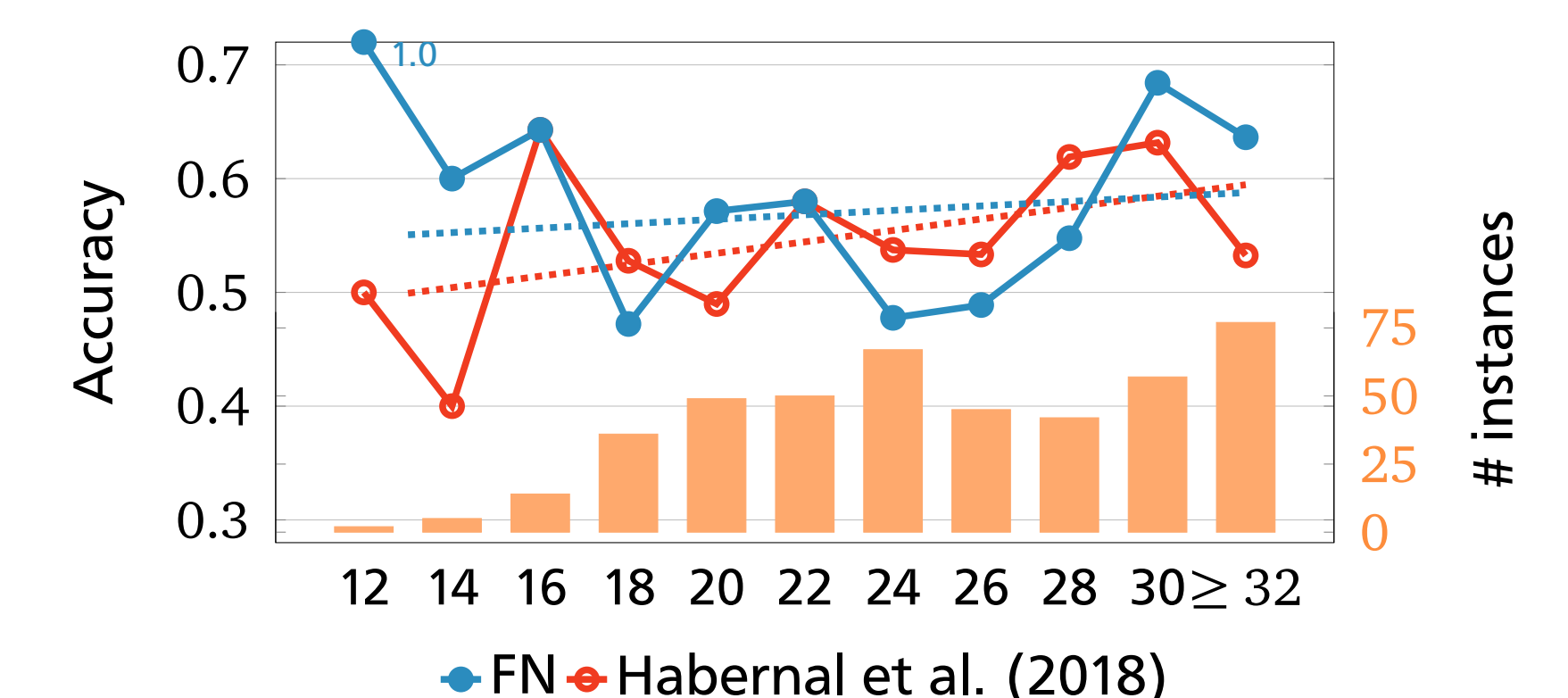


Figure 2: Performance for the '+FN' approach by the number of frames in an instance.



Integrated components

FrameNet event parsing

- Multimodal Frame Identification with Multilingual Evaluation. Teresa Botschen et al. NAACL 2018

Identifying entities and linking them to Wikidata

- Mixing Context Granularities for Improved Entity Linking on Question Answering Data across Entity Categories. Daniil Sorokin and Iryna Gurevych. *SEM 2018