Exploiting Definitions for Frame Identification

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April 2021
FrameNet - Frame Example

**Definition**
This frame describes food and meal preparation...

**Cooking_creation**

**Lexical Units (LU)**
Bake, cook, fry, grill, ...

**Frame Elements**
Cook, Produced food, Container, Ingredients, ...

**Frame-frame Relations**
Inherits from: Intentionally_create ...


Frame Semantic Parsing

01 Target identification
   Identify frame-evoking predicates

02 Frame identification
   Identify the evoked frame

03 Argument identification
   Identify arguments of a frame and label them with semantic roles
The pandemic has sparked a lot of problems for the economy.

**Lexical Unit**
spark.v

**Definition**
provide the stimulus for

**Associated Frame**
Cause_to_start

**Frame Definition**
A cause, animate or inanimate, causes a process, the effect, to begin.

**Lexical Unit**
spark.v

**Definition**
with obj. ignite

**Associated Frame**
Setting_fire

**Frame Definition**
This frame describes the creation of a flame by a kindler or non-sentient cause...
Our Model - FIDO

Overview of the FIDO architecture. Each green block represents a different candidate pair (lexical unit, frame) for the same Target.
Our Model - A Real Example

The pandemic has sparked a lot of problems for the economy.

Definition of LU: spark.v
Definition of Frame: Cause_to_start
# Dataset

<table>
<thead>
<tr>
<th>FrameNet 1.5</th>
<th>Same data split as Das et al. (2014)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FrameNet 1.7</td>
<td>Same data split as Swayamdipta et al. (2017)</td>
</tr>
<tr>
<td>YAGS</td>
<td>YAGS (Hartmann et al., 2017) is a FrameNet-annotated test set based on question answering data from Yahoo! Answers¹</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>FN 1.5</th>
<th>FN 1.7</th>
<th>YAGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Train</td>
<td>15,017</td>
<td>19,391</td>
<td>--</td>
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<tr>
<td>Dev</td>
<td>4,463</td>
<td>2,272</td>
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<tr>
<td>Test</td>
<td>4,457</td>
<td>6,714</td>
<td>2,093</td>
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## Dataset Sizes

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¹https://webscope.sandbox.yahoo.com/
Experimental Results

**FN 1.5**

<table>
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<tr>
<th>Method</th>
<th>Score</th>
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<tbody>
<tr>
<td>Hermann et al. 2014</td>
<td>88.4</td>
</tr>
<tr>
<td>Hermann et al. 2017</td>
<td>87.6</td>
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<td>Open-SESAME 2017</td>
<td>86.9</td>
</tr>
<tr>
<td>Yang and Mitchell 2017</td>
<td>88.2</td>
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<tr>
<td>Botschen et al. 2018</td>
<td>88.8</td>
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<tr>
<td>Peng et al. 2018</td>
<td>90</td>
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<tr>
<td>FIDO</td>
<td>91.3</td>
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**FN 1.7**

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<tr>
<td>FIDO</td>
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</table>

**YAGS**

<table>
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<th>Score</th>
</tr>
</thead>
<tbody>
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<td>Peng et al. 2018</td>
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</tr>
<tr>
<td>FIDO</td>
<td>70.5</td>
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Analysis - Ablation Study

[Graph showing performance metrics for different configurations of FIDO, with two lines representing FN 1.5 and FN 1.7, indicating a decrease in performance as configuration moves from FIDO (FRdef only) to FIDO (LUdef only) to FIDO (NO def).]
Conclusion

- We tackled the frame identification problem by assessing the **semantic coherence** between the meaning of a target word in a sentence, and a candidate frame.

- Specifically, we exploited the **frame and lexical unit definitions** provided by FrameNet.

- Our experiments show that a BERT based model achieves better performance than previous systems on two versions of FrameNet data and the YAGS dataset.

- Our code will be available at [https://github.com/tyjiangU/fido](https://github.com/tyjiangU/fido).
THANKS!
Reference


