FrameAnnotator
A frame-semantic annotation tool

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I would really like to dedicate my M.S. Thesis to my father. This one is for you Baba!

Shyamal Roy
(1\textsuperscript{st} May 1959 – 6\textsuperscript{th} March 2016)
Outline

- The importance of Fact-Checking
- Motivation
- Modeling Factual Claims with Frames
- FrameNet
- Challenges
- FrameAnnotator
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  - Understanding with an example
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- Questions?
- References
- Acknowledgement
The importance of Fact-checking

There is a struggle with......

• Unprecedented amount of falsehoods,
• Hyperboles and half-truths

Which do harm to wealth, democracy, health, and national security

In fighting against false information, the number of active fact-checking organizations has grown

FAKE NEWS

(ferk 'njuːz)
False, often sensational, information disseminated under the guise of news.

Motivation

- Human based Fact-checking is hard:
  - Intellectually demanding,
  - Laborious,
  - Time-consuming

An opportunity for automated fact-checking systems

Representing claims in a structured and semantic way will help to capture various aspects:

- The domain and topic,
- The expression of facts,
- The entities involved and their relationships, quantities and many more

This claim modeling capability is useful for a variety of fact-checking steps.
Modeling Factual Claims with Frames

The U.S. only ranks 25th worldwide on defense spending as a percentage of GDP.

Predicate Sense: rank
Ranking entity: The U.S.
The rank: 25th
The rank comparison: worldwide
The rank based on: on defense spending.....
Modeling Factual Claims with Frames

Factual-claim specific frames
• Collected fact-checked claims from PolitiFact,
• Examined a subset of these claims one by one and grouped similar ones,
• Created new frames, if it doesn’t already exist in FrameNet collection,
• 20 frames (13 newly created) and 900 labelled factual claims so far

Few examples of factual-claim specific frames
• Oppose and support consistency,
• Vote,
• Correlation,
• Occupy rank
• **FrameNet** is a project housed at the International Computer Science Institute in Berkeley, California
  • A rich knowledge base that contains information about words by providing their description and associated frames,
  • A conceptual structure describing an event, relation, or object and the participants in it
    • The FrameNet lexical database contains over 1,200 semantic frames,
    • 13,000 lexical units, and
    • 202,000 example sentences
  • FrameNet has been used in applications like question answering, paraphrasing, information extraction, machine translation, and many more.
What is a Frame?

“Stand, top, rank”
All having a common-sense of background information

• The holistic background knowledge that unites these words

• A frame contains a textual frame definition, associated frame elements, lexical units, example sentences, and frame-to-frame relations
FrameNet

Frame Elements
• Provide additional information to the semantic structure of a sentence
• Types of Frame Elements:
  • core: Essential to the meaning of the frame
  • non-core: Generally descriptive (such as time, place, manner, etc.)

Lexical Units
• Lexical units (LU) are lemmas, with their POS, that evoke a specific frame

  Lexical units that suggest the Occupy_rank frame include the words “rank”, “stand”, and “top”

Frame-to-frame relations
• Relationships between different frames
  Some relations are subframe, inheritance, Perspectivized_in and so on
Modeling Factual Claims with Frames

Understanding an example with Occupy_rank frame

Under Gov. Mitt Romney, Massachusetts ranked 47th in job creation.

Under Gov. Mitt Romney, Massachusetts ranked 47th in job creation.

Under Gov. Mitt Romney, Massachusetts ranked 47th in job creation.

Comparison_set  Time  Item  Rank  Dimension
Under Gov. Mitt Romney, Massachusetts ranked 47th in job creation.
Under Gov. Mitt Romney, Massachusetts ranked 47th in job creation.

**Core:**
- Dimension – Along which the ranking is defined,
- Item – In which occupies the rank
- Rank – In which the item occupies

**Non-Core:**
- Comparison_set - Comparison among the entities
- Time – Time over which the item occupies the rank
Modeling Factual Claims with Frames

Understanding an example with Vote frame

Mitch MacConnell voted two times against the violence Against Women Act.

LU
Mitch MacConnell voted two times against the violence Against Women Act.

LU
Mitch MacConnell voted two times against the violence Against Women Act.

Agent  Frequency  Position  Side  Time  Issue
Challenges

• The current state-of-the-art frame semantic parsers suffer from lack of a large labeled dataset,
• Manual labeling of data is time consuming, and
• There are no open-source annotation tools available

To overcome all those challenges we developed the idea of
FrameAnnotator
A web-based public frame semantic annotation tool
FrameAnnotator

It allows users to create frame-semantic datasets and codify sentences

<sentence corpID="100" docID="20007" sentNo="0" pageNo="1" sPage="0" ID="4000071">
  <text>Bernie Sanders voted against the Brady Bill — background checks and waiting periods .

  <annotationSet cDate="06/04/2019 19:34:41 CDT Sat" luID="90000" luName="vote" frameID="9000" frameName="Vote" status="MANUAL" ID="6000013">
    <layer rank="1" name="Target">
      <label cBy="IDIR" end="19" start="15" name="Target"/>
    </layer>
    <layer rank="1" name="WE">
      <label cBy="IDIR" feID="50000" bgColor="#FF0000" fgColor="#FFFFFF" end="13" start="0" name="Agent"/>
    </layer>
    <layer rank="1" name="ME">
      <label cBy="IDIR" feID="50004" bgColor="#A52A2A" fgColor="#FFFFFF" end="27" start="21" name="Position"/>
      <label cBy="IDIR" feID="50002" bgColor="#008000" fgColor="#FFFFFF" end="83" start="29" name="Issue"/>
    </layer>
    <layer rank="1" name="GT"/>
    <layer rank="1" name="PT"/>
    <layer rank="1" name="Other"/>
    <layer rank="1" name="Sent"/>
    <layer rank="1" name="Verb"/>
  </annotationSet>
</sentence>
Understanding with an example - Frame Name: Vote

Bernie Sanders voted against the Brady Bill -- background checks and waiting periods.

Lexical Units

Agent  Action  Issue  Side  Position  Frequency  Time

Bernie Sanders voted against the Brady Bill -- background checks and waiting periods.
Understanding with an example - Frame Name: Vote

Bernie Sanders voted against the Brady Bill -- background checks and waiting periods.
https://idir.uta.edu/frameannotator/
Questions?
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