UNIVERSITY OF TEXAS ARLINGTON

IDIR

FrameAnnotator

A frame-semantic annotation tool

Sarbajit Roy
M.S. Thesis, IDIR Lab

Supervising Professor
Dr. Chengkai Li

Committee Members
Dr. Ramez Elmasri
Dr. Deokgun Park

Master's Thesis **April 10, 2019**

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

Shyamal Roy
(1st May 1959 – 6th March 2016)

Outline

- **The importance of Fact-Checking**
- **Motivation**
- **Modeling Factual Claims with Frames**
- **FrameNet**
- **Challenges**
- **FrameAnnotator**
  - Definition
  - Understanding with an example
  - Live Demonstration
- **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

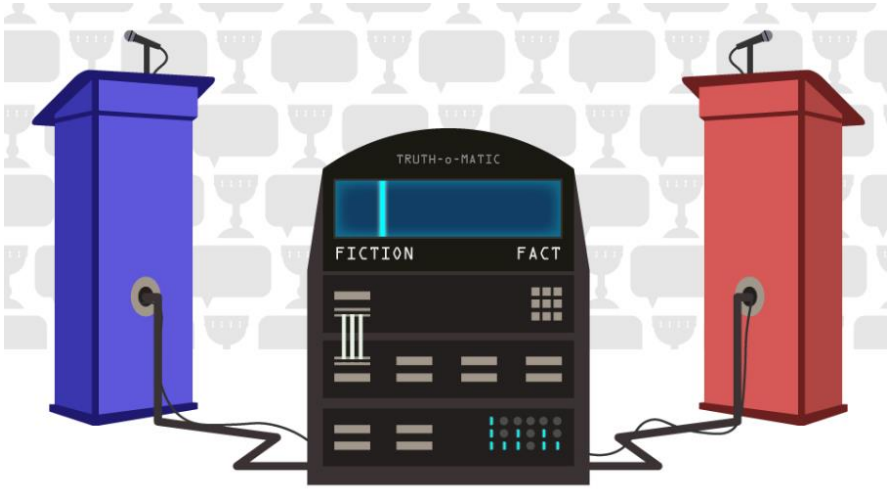
https://ktwop.com/2017/11/03/will-recognition-of-fake-news-be-followed-by-fake-science/

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

Motivation

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

An opportunity for automated fact-checking systems



https://nordicapis.com/automated-fact-checking-the-holy-grail-of-political-communication/

Modeling Factual Claims with Frames

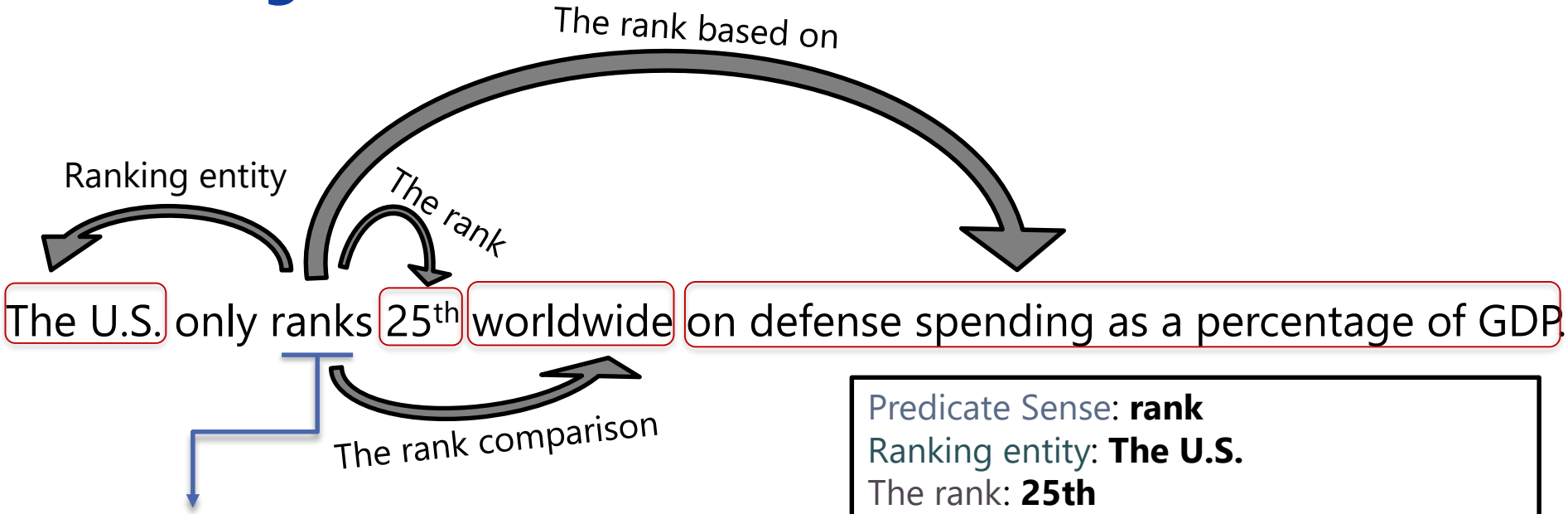
Increasing demands for fact-checking → growing interest in automating various fact-checking steps

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



Predicate
Meaning : stand, position, order

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

- **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 .

LU

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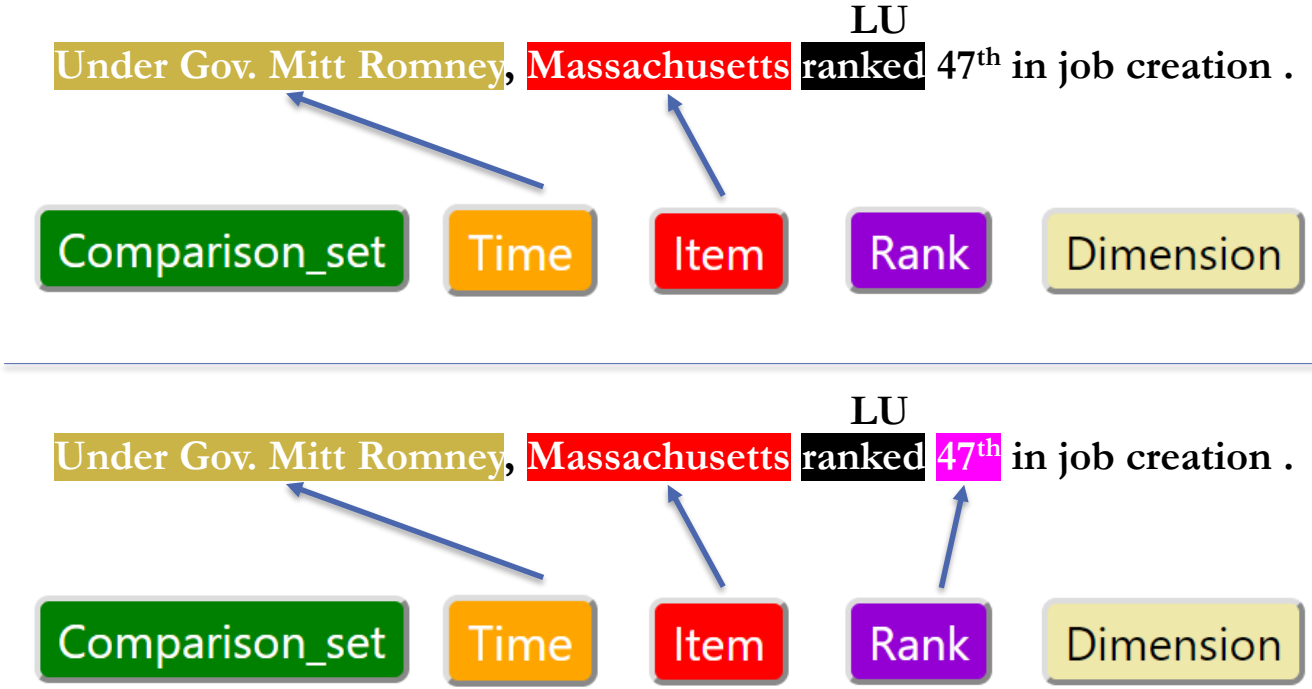
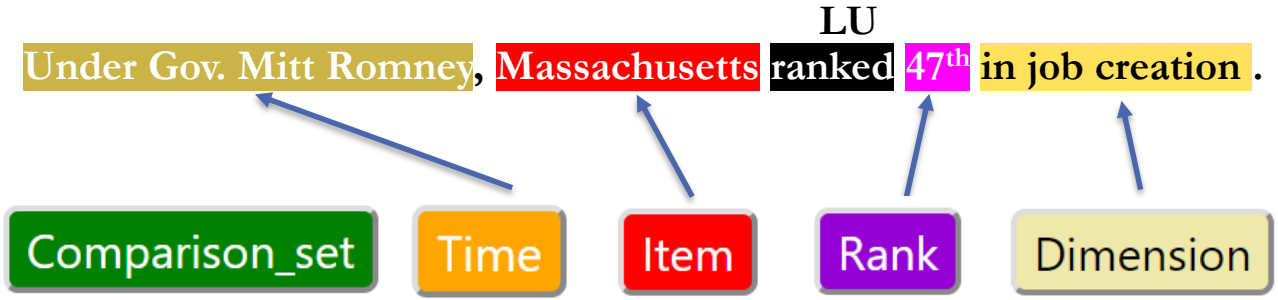
LU

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

Modeling Factual Claims with Frames



Modeling Factual Claims with Frames



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

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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 .

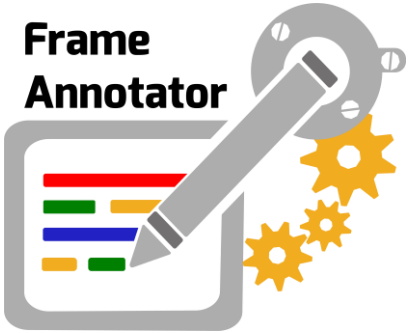
LU

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

Challenges

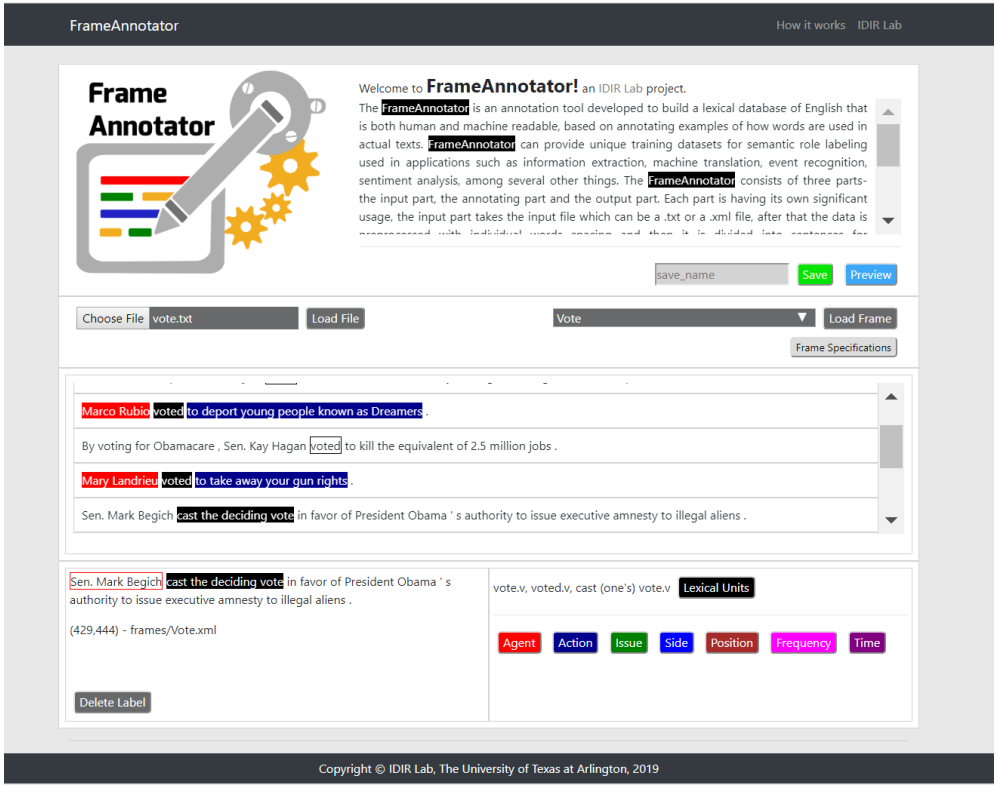
- The current state-of-the-art frame semantic parsers suffer from lack of a large labeled dataset,
- Manual labeling of data is time consuming, and
- There are no open-source annotation tools available

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

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  </annotationSet>
</sentence>
```

FrameAnnotator

Understanding with an example - Frame Name : Vote

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

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

Lexical Units

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

Agent Action Issue Side Position Frequency Time

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

FrameAnnotator

Understanding with an example - Frame Name : **Vote**

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

```
<sentence corpID="100" docID="20007" sentNo="0" paragNo="1" aPos="0" ID="4000071">
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</sentence>
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Demonstration

https://idir.uta.edu/frameannotator/

Questions ?

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Thank you!