Detecting Check-worthy Factual Claims in Presidential Debates

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Motivation

People make claims all the time

"I built a net worth of more than $10 billion"
-Donald Trump in 2016 GOP presidential candidate debate.
factcheck.org checked this claim as False.[1]

"... our Navy is smaller than it's been since 1917."
-Mitt Romney in 2012 Presidential candidate debate.
Politifact.org checked this claim as Pants on Fire.[2]

Fact-checking is growing, but human challenges remain
- 64 active fact-checking sites worldwide[3], up from 44 in 2014.
- Falsehoods growing faster than fact-checkers.

Limitations of current approach

Find Claims	Determine Accuracy	Write Report	Publish

Journalists spend hours going through documents to identify claims.

-Significant time gap between speech and reporting times.
-Audience does not get correct information.

-Requires advanced writing skills to persuade readers.
-Such skilled writers are sparse.

Lack of Structured Journalism and use of old publishing frameworks hinders Semantic Web applications.

Dataset

- U.S. Presidential Debate Transcripts [1960 - 2012]
- 11 Presidential Elections. 30 Debates
- 20788 Sentences [excluding short sentences (less than 5 words)]
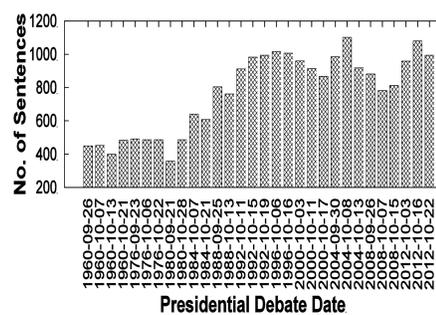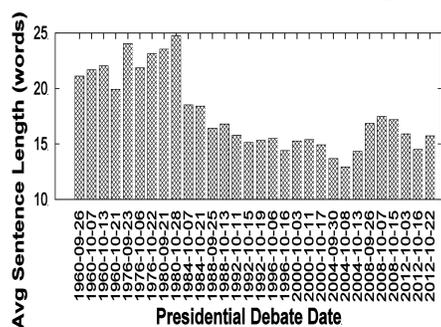
Problem Formulation

Three categories of sentences

Non-Factual Sentence (**NFS**): (Opinions, beliefs, declarations)
- But I think it's time to talk about the future.
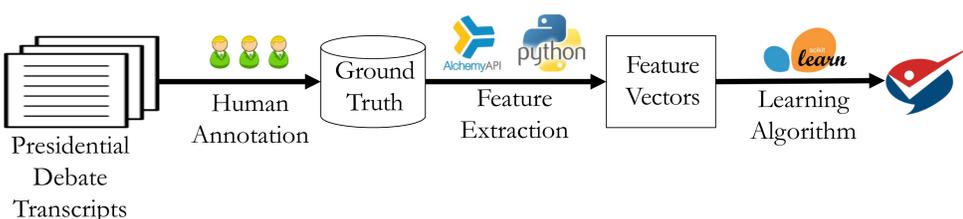- You remember the last time you said that?

Unimportant Factual Sentence (**UFS**):
- Next Tuesday is Election Day.
- Two days ago we ate lunch at a restaurant.

Check-worthy Factual Sentence (**CFS**):
- He voted against the first Gulf War.
- Over a million and a quarter Americans are HIV-positive.

Goal: Given a sentence, find if it belongs to CFS category. A supervised learning problem.

Presidential Debate Transcripts → Human Annotation → Ground Truth → Feature Extraction → Feature Vectors → Learning Algorithm
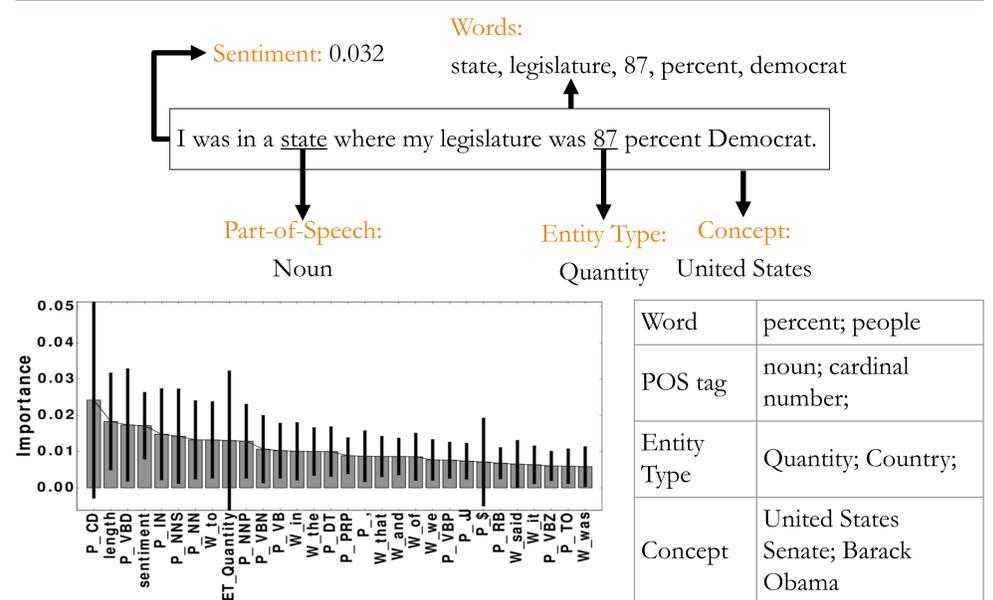
Ground Truth Collection

- Developed a data collection platform bit.ly/claimbusters
- Accumulated 226 participants in 3 months.
- 600 screening sentences were used to detect spammer and low-quality participants.
- Sentences agreed by 2 top-quality participants were used as ground truth.

Class	Count
CFS	1673
UFS	482
NFS	5860

OI: Wages are going up for the first time in a decade.

Will the general public be interested in knowing whether (part of) this sentence is true or false?
- There is no factual claim in this sentence.
- There is a factual claim but it is unimportant
- There is an important factual claim.

Submit   Skip this sentence   Modify My Previous Responses

Feature Extraction & Selection

Sentiment: 0.032

Words: state, legislature, 87, percent, democrat

I was in a state where my legislature was 87 percent Democrat.

Part-of-Speech: Noun

Entity Type: Quantity

Concept: United States

Word	percent; people
POS tag	noun; cardinal number;
Entity Type	Quantity; Country;
Concept	United States Senate; Barack Obama

Evaluation

	Precision	Recall	F-measure
NFS	0.90	0.96	0.93
UFS	0.65	0.26	0.37
CFS	0.79	0.74	0.77

K	P@K	NDCG@K
25	1	1
50	1	1
100	0.960	0.970
200	0.940	0.951
300	0.853	0.881

- 4 fold cross validation.
- Algorithms: Naïve Bayes, Random Forest, Support Vector Machine.
- Support Vector Machine generally outperformed others.

Prototype: idir.uta.edu/ClaimBuster

ClaimBuster

2016 Republican Party Presidential Debate. Sept. 16, 2015, 7 p.m.
Venue: Ronald Reagan Presidential Library, Simi Valley, California. Broadcasted by: CNN.
Speakers: Dana Bash, Jeb Bush, Ben Carson, Chris Christie, Ted Cruz, Carly Fiorina, Hugh Hewitt, Mike Huckabee, John Kasich, Rand Paul, Marco Rubio, Jake Trump, Scott Walker
Transcript Source: http://time.com/4037239/second-republican-debate-transcript-cnn/

1. www.factcheck.org/2015/08/factchecking-the-gop-debate-late-edition/
2. www.politifact.com/truth-o-meter/statements/2012/jan/18/mitt-romney/mitt-romney-says-us-navy-smallest-1917-air-force-s/
3. http://reporterslab.org/snapshot-of-fact-checking-around-the-world-july-2015/