ClaimBuster:
Monitoring Political Discourses and Spotting Factual Claims

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Introduction

Fact-checking has become a household terminology. One critical challenge it faces is that the amount of information to be fact-checked is beyond the capability of fact-checkers. An automated fact-checking system simply does not exist yet.

ClaimBuster [1] uses machine learning, natural language processing, database query and data mining techniques to aid citizens and professionals in fact-checking. It aims to monitor live political discourses (e.g., debates, interviews and speeches), social media, web and news to catch factual claims, detect matches with a curated repository of fact-checks done by professional news organizations, and deliver the matches instantly to readers and viewers (e.g., by displaying a pop-up warning if a presidential candidate makes a false claim during a live debate). For various types of new claims not checked before, ClaimBuster will automatically translate them into queries against knowledge databases and report if they check out. For claims where humans must be brought into the loop, ClaimBuster will provide algorithmic and computational tools to assist lay persons and professionals in understanding and verifying the claims. Its use will be expanded to verify both political and non-political claims in many types of narratives, discourses and documents such as legal documents and financial reports.

ClaimBuster is making strides toward fact-checkers' quest for the "Holy Grail" – a completely automated, instant fact-checking machine. The development of ClaimBuster started in December 2014. Since then, the project has received wide recognition in the fact-checking community and substantial media coverage. Its current prototype does not produce true-or-false verdicts yet. Instead, it focuses on one key step in the workflow – discovering factual claims that are worth checking. Given the plethora of political discourses and narratives we are constantly exposed to, ClaimBuster gives each sentence a score that indicates how likely it contains an important factual claim that should be checked. This essentially provides a priority ranking that helps fact-checkers efficiently focus on the top-ranked sentences without painstakingly sifting through a large number of sentences.

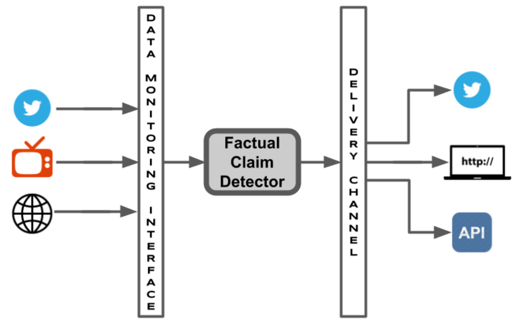

Figure 1: Current Components of ClaimBuster

System Overview

The current ClaimBuster system has three major components – (i) Data Monitoring Interface, (ii) Factual Claim Detector, and (iii) Delivery Channel (Figure 1).

Data Monitoring Interface: This component interfaces various data sources with ClaimBuster. It currently monitors social media (Twitter), broadcasted TV programs (presidential debates), and websites (congressional/parliamentary records).

ClaimBuster was tested in real-time during the live coverage of all twenty-one primary election debates and four general election debates for the 2016 U.S. presidential election. Closed captions of the debates on live TV broadcasts, captured by a decoding device, were fed to ClaimBuster, which immediately scored each sentence spoken by the candidates and posted the sentences and their scores to the project's website (idir.uta.edu/claimbuster). The top-scored claims (i.e., check-worthy factual claims) were also posted to the project's Twitter account (@ClaimBusterTM).

ClaimBuster has also been continuously monitoring a list of 2220 Twitter accounts (U.S. politicians, news and media organizations) using Twitter Streaming API [2] and retweeting the top-scored claims it finds

[*] Work performed at the University of Texas at Arlington.

[1] idir.uta.edu/claimbuster

[2] dev.twitter.com/streaming/overview

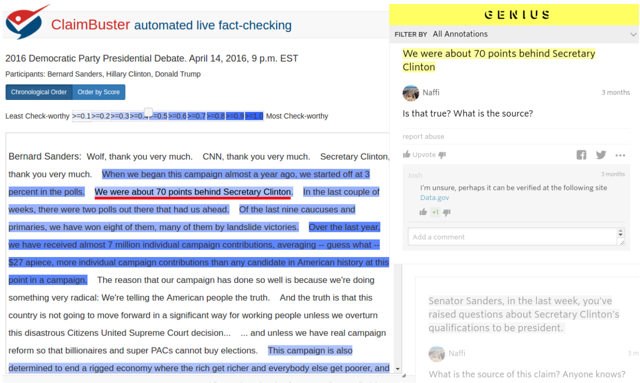

Figure 2: ClaimBuster Website Screenshot

in their tweets (see @ClaimBusterTM). It filters out non politics-related tweets using a classifier (Arslan 2015).

ClaimBuster also gathers data from websites. For instance, recently it started to monitor "Hansard" – the transcripts of proceedings of the Australian parliament. [3] Similar to the presidential debates, the transcripts and claim scores are posted to the project's website (idir.uta.edu/claimbuster/hansard).

Factual Claim Detector: Given a sentence, ClaimBuster gives it a score between 0.0 and 1.0. The higher the score, the more likely the sentence contains check-worthy factual claims. The lower the score, the more non-factual, subjective and opinionated the sentence is. ClaimBuster's score is based on a classification and scoring model. The model was trained using tens of thousands of sentences from past general election debates that were labeled by human coders. Its features include the tokens' in sentences and the tokens part-of-speech (POS) tags. The recall and precision in detecting check-worthy factual claim are 0.74% and 0.79%, respectively. Post-hoc analysis of the claims from the presidential debates checked by professional fact-checkers at CNN, PolitiFact.com and FactCheck.org reveals a highly positive correlation between ClaimBuster and journalism organizations in deciding which claims to check and the topics of the selected claims. More details about the model and the empirical results can be found in (Hassan, Li, and Tremayne 2015).

Delivery Channel: Figure 2 is a screenshot of the ClaimBuster website when it is applied on a debate. (The interface for Australian Hansard is similar.) Sentences in the transcript are highlighted in different shades of blue proportional to their ClaimBuster scores. The website allows a user to order the sentences by time or score and to use a slider to specify the minimum score for sentences to be highlighted. It also allows a user to annotate any sentence. The annotated sentences have red underlines and users can discuss these sentences while collaboratively vetting the claims. The website further provides visualizations on ClaimBuster scores given to the sentences by different speakers. It also allows a user to type or paste their own text into a box and then apply the factual claim detector on its content. The accompanying video of this submission explains the visualizations and the text box, in addition to other features of ClaimBuster.

ClaimBuster also delivers its results through a variety of other channels, including its Twitter account, API and Slackbot [4]. Its Twitter account (@ClaimBusterTM) retweets highly-scored tweets from politicians and organizations and posts highly-scored claims from presidential debates. A Slackbot and an API are developed for users to supply their own text (e.g., providing the URL to a cloud-based folder containing legislative record files) and subscribe to ClaimBuster results on the text. The Slackbot will be published in a public directory. The API will be extended to allow users develop their own applications that communicate with ClaimBuster.

One challenge in delivering live coverage of events such as the presidential debates is the lack of speaker identity in the closed captions of TV broadcasts. To timely display the speakers of the sentences, ClaimBuster queries Twitter Streaming API with the keywords in a sentence and infers the speaker identity from the tweets in the query result. The idea is, during a popular live event, active Twitter users tend to mention the speaker while tweeting about a statement. Details of this component can be found in (Joseph 2015).

Demonstration Scenario

ClaimBuster is developed using the Django web framework. To create a responsive user-friendly front-end, we use Bootstrap, a unified framework of HTML, CSS, and JavaScript. The back-end uses Python for scoring model implementation and MySQL for data storage.

In the AAAI demo session, we will demonstrate the ClaimBuster website and its various functions. We will also demonstrate its Twitter account and Slackbot. In addition to the current prototype, several other components of ClaimBuster are under development. They include a repository of known fact-checks, a semantic claim matching algorithm, and a knowledge-graph based fact-checking algorithm. These components will allow us to put together an end-to-end, fully automated fact-checking system for various types of factual claims. We expect the system to be ready online before AAAI.

References

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