Misinformation Markup Chrome Extension

"This extension refutes conspiratorial nonsense"

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The Idea

- A chrome extension overlay that highlights misinformation and political bias
- By hovering over the highlighted text, reason as to why the information is wrong or why there is political bias is stated
    - Also gives in context when the original article / post was made to acknowledge that they might have been right at the time publication
- By clicking the highlighted text for misinformation, the user is brought to a credible article that supports the correct reasoning

What is "truth"?

- We consider truth to be the current consensus among individuals considered to be authorities on the subject being discussed.
- Truthful statements and their misinformative counterparts can be found on websites that do fact-checking and research.
- Website such as PolitiFact and Snopes are sources of such research. We can build a database of misinformative statements and truthful statements from such websites.
- The chrome extension marks up statements that the API returned as rumors
- We plan to to acknowledge that the writer could have been right at the time of publication by giving the date of publication

Current Research

- Our chrome extension scrapes the text off the website and sends it to our Python API. The Python API sends back the text as a list of sentences using an unsupervised sentence boundary detection algorithm. [1]
- When the chrome extension gets back the sentences from the API, it sends them to a different endpoint of the same API. This endpoint returns the list of sentences that are rumors, along with some extra details and sources.
- The API determines which sentences are rumors by comparing their similarity with a set of statements we have determined to be rumors, stored in a relational database.

Current Research Continued

- The similarity of two sentences is determined using the distance between their InferSent embedding vectors. [2]
- If the Euclidean distance between the two is greater than a threshold we determine, we treat the statements as if it is a rumor.
- Instead of having to check the distance between the vector and every other vector in our database, we construct a K-Dimensional Tree data structure in order to find the closest vector efficiently. We then calculate the distance between the two and use that distance.

The Prototype

- During a 24-hour weekend span of time, we created a prototype for our idea
- It is an offline Chrome Extension that can be downloaded and works with an offline local Python back-end
- It currently works for misinformation only, not political bias
- Link to code: https://github.com/abhay-sheshadri/Rapid-Rebut

Examples

At 16, she travels the world, speaking out personally against inaction to global climate change. She famously gave an earful to the gathered United Nations, accusing them uncaringly poisoning her generation. She was just recently named Time Magazine's "Person of the Year." And now, in a show of defiance to fight against who she refers to as : "The American face of ignorance and irrationality", Greta Thunberg is going on a

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Prototype Flaws

- Cannot be added through the Chrome Store yet because:
    1. The Python works as a local server host right now, so it only works on an individual machine. It is unrealistic to expect Chrome Extension users to download the necessary back-end. We would have to host it on a free online server host
    2. There is a process to getting on the Chrome Store. At the time of making this prototype, we felt that it was not worth publishing it with the missing features and the possible long process. After significant progress, we plan on publishing it.
- It does not work on all websites
    1. The highlighting part behind the JavaScript that puts HTML <mark> tags around text breaks the existing JavaScript in websites such as Twitter and Facebook
        - This is likely because our JavaScript loads in after theirs and theirs relies on the current elements we change remaining the same

Prototype Flaws Continued

- Our Database currently relies on manual entry
    - How it works as of now is that we manually enter wrong information along with the correct information and the correct link, which has its similarity checked with sentences on a website
    - Due to the manual entry, the database is not as large as it can be
    - We plan to automate the database entry for when new articles come out from what we deem credible

What's Next

1. Fix current highlighting issues
   - We plan to first try either a library that finds and highlights text only given text like Mark.js or Chrome's API for marking text
     - Since their entire business surrounds highlighting text, we feel that they might have figured out the JavaScript issue and may have even found a better way to highlight text only given words (which is what our extension does as well)
   - If that fails, we must research how to load our JavaScript before the website's own JavaScript
2. Add political bias checking
   - We may highlight conservative bias in red and liberal bias in blue to easily distinguish the leanings of a statement
     - This would mean we need to highlight wrong information in another color (maybe orange)

What's Next Continued

3. Host the Python on a free server host such as Heroku
4. Automate the Database
   - Whenever a new article comes out for sites that we deem trustworthy, such as Politifact.com and FactCheck.org, we can scrape the incorrect claim, correct reasoning, URL, and date to automatically add entries to an online database
     - We also want to automatically remove older entries that involve current events
5. Add Youtube transcript support
   - We must get the transcript of the video to then give an overall rating on the accuracy of a Youtube video as well as individual pieces of misinformation and bias
6. Publish the Chrome Extension to the Chrome Store

Citations

[1] Kiss, Tibor & Strunk, Jan. (2006). Unsupervised Multilingual Sentence Boundary Detection. Computational Linguistics. 32. 485-525. 10.1162/coli.2006.32.4.485.

[2] Alexis Conneau, Douwe Kiela, Holger Schwenk, Loic Barrault, & Antoine Bordes. (2017). Supervised Learning of Universal Sentence Representations from Natural Language Inference Data.