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CS 361 – Section 400

Browse Smart

The Problem:

The general population has a difficult time understanding scientific papers and are therefore often incapable of reading them and drawing their own well-informed conclusions about them. Because of this, they usually must resort to reading summaries of studies online. However, these articles are often poorly written or even misinterpret the results of the studies themselves or disregard the possibility that the study being summarized is not accurate. Even reputable sources for science-related news sometimes publish articles that are either too simplified and miss major points of the original papers or that are not simplified enough and cause readers confusion.

One example of how communicating scientific findings to the average person is difficult can be found in the fact that a scientific study can never "prove" anything. This means that the Intergovernmental Panel on Climate Change (IPCC) can run a statistical analysis on global weather data from the past 30 years, and the result might be that they are 95% confident that global climate change is the result of human activity. The problem here is that many laypeople, including both those reading simplified articles about the findings and those writing them, look at a number like 95%, and only see that the IPCC isn't *positive*. This is enough for some people to dismiss the evidence of climate change as insufficient.

Perhaps even worse is the fact that the issue doesn't end with the public simply misunderstanding scientific findings. In fact, these basic misunderstandings can become further twisted as they spread from person to person, and this misinformation can become widespread very quickly. This is true in todays internet-driven era more than ever before. A bleak illustration of the potential for harm that this can cause can be found in the anti-vaccine movement.

Regarding the effects of the paper published in 1998 by Dr. Andrew Wakefield, which drew a link between vaccines and autism, an article on boston.com said, "Immunization rates in Britain dropped from 92 percent to 73 percent, and were as low as 50 percent in some parts of London. The effect was not nearly as dramatic in the United States, but researchers have estimated that as many as 125,000 U.S. children born in the late 1990s did not get the MMR vaccine because of the Wakefield splash" [2]. As of July, 2014, an estimated one in four parents in the United states believe that vaccines cause autism in previously healthy children [3]. As a result, not as many children are getting vaccinated, and previously well-controlled diseases, such as whooping cough and measles, are seeing renewed outbreak sizes in recent years. Furthermore, numerous celebrities, including, but not limited to Jim Carey, Alicia Silverstone, and even President Donald Trump have publicly expressed their beliefs that vaccinating children is dangerous. This is an enormous issue, because countless people admire these public figures and look to them when they don't know what to think themselves.

The Solution:

I propose a browser add-on that will recognize when a user is viewing a page related to a scientific study and provide links to the original source and/or other relevant pages, as well as warn the user if the page they are viewing is potentially inaccurate. This extension will have 3 primary functions:

1) The extension will send the user a warning if they are viewing a webpage that is likely to have inaccurate information. This can be determined by comparing keywords in the viewed page to those in pages about the same topic, as well as by examining user-submitted flags on inaccurate or misleading information.

   After sending the warning, the extension will provide the user with a more reliable page relating to the same topic.

   - Importance: This feature will tell the user before they have even had a chance to read it whether a page has potentially inaccurate or misleading information. This will quickly give the user the opportunity to pursue their research into the topic at a more reliable source.
   - Example: If a user found themselves at the page on TalkNetwork "Proof from the CDC that Vaccines Cause Autism (Video)" [4], the extension would recognize that talknetwork.com is not a reputable

source by any means, and would find a more reputable source, giving preference to pages that also say that vaccines cause autism, if reputable sources with such an opinion can be found, so as to avoid bias.

2) The extension will trace the topic as far back as it can find and provide the user with a link to the "original" source.
   - Importance: This will show the user where the discussion originated, so they can judge for themselves whether one side stemmed from a basic misunderstanding of the original source.
   - Example: If a user is viewing a page related to the vaccine debate, the extension will give them a link to the paper by Andrew Wakefield on The Lancet, which originally suggested a link between vaccines and autism, and which says "RETRACTED" in big red letters across the top of the page, and again across the findings section.
3) On highly-divisive issues, the extension, even if the user is viewing a reliable page, the extension will search for and provide a link to another reliable source that discusses an alternate point of view.
   - Importance: Often times an issue doesn't have an obvious right or wrong side, and in this case, it is important for one to be able to look at the issue from multiple conflicting angles so that he/she can form a personal opinion.
   - Example: An example of a highly divisive issue in science is that of GMOs. If a user was reading an article about the dangers of GMOs, the extension would direct them to one about their possible benefits, and visa versa

Conclusion:

This proposed solution, if implemented and used on a wide scale, could greatly reduce the public's misunderstanding of scientific findings, which would in turn reduce the occurrences of problems like resurgence of previously well-controlled diseases. Furthermore, being a browser extension, this system would have a very minimal UI, and it would need hardly any upkeep after being implemented, so it would be very inexpensive, overall.

Citations:

[1] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3852879/

[2] http://archive.boston.com/lifestyle/health/articles/2011/01/06/will_autism_fraud_report_be_a_vaccine_booster/

[3] http://www.medicaldaily.com/history-autism-and-vaccines-how-one-man-unraveled-worlds-faith-vaccinations-294474

[4] http://www.talknetwork.com/2016-12-14-proof-from-the-cdc-that-vaccines-cause-autism-video.html