

CSC2552: Review 1, Paper 2

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497 words

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Paper 2

This paper by Vosoughi, Roy and Aral aims to be one of the pioneering studies to quantitatively describe the contribution of false news to the global online public space by analysing the statistical properties of information cascades from Twitter data. The main result of this paper is that false news spread faster and farther than true news, potentially due to their novelty factor, accelerated mostly by humans and less by robots.

A significant weakness of this paper is its lack of an unbiased dataset. Indeed, the paper uses readymade data provided directly by Twitter under a strict agreement contract. This diminishes the strength of the claim that humans are the main cause for the spreading of fake news, as no company, especially a publicly traded one like Twitter, would allow themselves to have major flaws revealed such as the lack of resistance to bots (also known as a Sybil attack vulnerability). Similarly, another related limitation is that the data is only released to the public under a restrictive access agreement prohibiting its use other than to validate the results of this paper, discouraging novel counter-arguments from being constructed using the same dataset. Some other notable weaknesses of this paper include sentiment extraction only from text and photos not audio or video as well as a naive assumption of statistical independence rather than conditional independence between cascades.

In a contrast, a major strength of this paper is the statistical rigour of the approach taken. While certain assumptions had to be made to get to analyse Twitter information cascade data, hypotheses were tested on both the original readymade data from the six independent fact-checking websites as well as on custom made data from three independent MIT students. In addition, any hypothesis presented such as the one regarding “impact of novelty on spreading rate” was thoroughly investigated and published alongside the paper in a clear supplementary paper format. This allows any claim that may be regarded with scepticism in such a new research area to be supported by stronger quantitative evidence. The main tradeoff here is the large amount of overhead work required, but this benefits the research by drastically improving the strength of the paper’s conclusions. This is especially important in algorithmically confounded and company-funded exploratory studies such as this one. Some other notable strengths of this paper include clear information visualisation and dual-redundant use of existing peer-reviewed algorithms for bot detection [1] [2].

The implications of the paper’s results are enlightening as they went against a commonly held belief of a bot-dominated spreading of fake news. The compromises made are generally reasonable since without such a comprehensive dataset the paper would struggle to conclusively argue that the collected data is representative of the population, a common issue in big data [3]. Nevertheless, the authors should perhaps have been a bit more conservative with the strength of their sentiment analysis claims as even the most modern algorithms struggle with reliable linguistic extractions [4].

[1] C. A. Davis, O. Varol, E. Ferrara, A. Flammini, F. Menczer, Botornot: A system to evaluate social bots, in Proceedings of the 25th International Conference Companion on World Wide Web (ACM, 2016).

[2] Almaatouq, A., Shmueli, E., Nouh, M., Alabdulkareem, A., Singh, V. K., Alsaleh, M., Pentland, A. Sandy. (2016). If it looks like a spammer and behaves like a spammer, it must be a spammer: analysis and detection of microblogging spam accounts. International Journal of Information Security, 15(5), 475491. doi:10.1007/s10207-016-0321-5

[3] Salganik, M. J. (2017). Bit by bit: social research in the digital age. Princeton University Press.

[4] Roebuck, K. (2012). Sentiment Analysis: High-impact Strategies - What You Need to Know: Definitions, Adoptions, Impact, Benefits, Maturity, Vendors. ISBN 9781743049457.