Artificial intelligence and journalism: diluting the impact of disinformation and fake news through bots

Inteligencia artificial y periodismo: diluyendo el impacto de la desinformación y las noticias falsas a través de los bots

Jesús Miguel Flores Vivar. Professor at the Complutense University Madrid (UCM) and research professor (UPB, University of Perugia, and UNMSM). He was previously a professor at Nebrija University and The Open University of Catalonia (UOC). He is a lecturer and visiting professor at Latin American universities and a speaker at congresses and seminars in prestigious international institutions, such as Harvard University, UCLA (U.S.A), University of British Columbia (Vancouver, Canada) UNAM, Mexico and Italian universities, among others. He has had research stays at the UNESP (Brazil) and the University of California Davis (U.S.A). Author and co-author of twenty books and a hundred articles in specialized indexed journals, he is also the principal investigator of projects on cyberjournalism. He has received the Ideas and EBTs awards (OTRI-UCM). P.hD in Information Sciences from the Complutense University of Madrid.
Complutense University of Madrid, Spain
jmflores@ucm.es
ORCID: 0000-0003-1849-5315

Abstract:

The article addresses disinformation as a phenomenon that goes far beyond the term "fake news." These terms have been appropriated and misused by powerful actors to underestimate news coverage, giving rise to disinformation and, therefore, a sharp fall in news organizations' credibility. Disinformation includes all forms of falsehood, inaccurate or misleading information, intentionally designed, presented, and promoted to cause public harm or for profit. To counteract this phenomenon, institutions, organizations, universities, the media, and governments have backed several initiatives. Many of these initiatives rely on artificial intelligence that designs and develops bots and platforms through algorithms, whose objective is to fight against information toxicity. This paper analyzes the main developments of bots used to mitigate the impact of fake news.

Keywords:

Journalism, fake-news, artificial intelligence, disinformation, bots.

Resumen:

El artículo aborda la desinformación como un fenómeno que va mucho más allá del término "noticias falsas", conocido cada vez más en su modismo anglosajón `Fake news´. Estos términos han sido apropiados y usados engañosamente por poderosos actores para desestimar la cobertura informativa dando lugar a una completa desinformación y, por tanto, a una caída vertiginosa de la credibilidad de las organizaciones de noticias. La desinformación incluye todas las formas de lo falso, información inexacta o engañosa diseñada, presentada y promovida para causar intencionalmente daño público o con fines de lucro. Para contrarrestar este fenómeno, instituciones, organizaciones, medios de comunicación y gobiernos vienen promoviendo diversas iniciativas. Muchas de estas iniciativas recalan en la inteligencia artificial que, con el arte de los algoritmos, diseñan y desarrollan bots y plataformas cuyo objetivo es luchar contra la toxicidad de la información. El artículo analiza los principales desarrollos de bots utilizados para minimizar el impacto de las fake news.

Palabras clave:

Periodismo, noticias-falsas, desinformación, inteligencia-artificial, bots.

1. Introduction

Disinformation and fake news disseminated on the internet are a matter of great concern to countries, organizations, and media outlets. The underlying questions are: what is true and what is false on the Internet? How can we fight against fake news and the spread of hoaxes? How can we detect fake news?

We start from the undeniable principle that every citizen has the right to receive quality information, and the media must ensure that this information is truthful. This principle should not only be adopted by news organizations, but also information professionals who are either individually or collectively engaged in creating and disseminating news. However, citizens have not always had access to accurate information in recent years. Several studies show that access to fake news (unverified information) is higher than access to contrasted or verified news.

Although people have been propagating fake news for some time, nowadays, there are other ways of sharing it whether it be via social media, the internet, mobile phones, or artificial intelligence in the form of bots that disseminate fake news. All of these elements contribute to the diffusion of fake news and disinformation on a global scale. However, Artificial Intelligence (AI), can also help citizens counteract being disinformed by fake news. The strategy is based on fighting against it using the same weapons. In other words, fake news or hoaxes are disseminated by a form of artificial intelligence, such as bots (acronym for robots) through various digital media for illicit and harmful purposes, on the other hand, algorithmic developments creating "good bots" can help us to counteract such fake news.

For several analysts, fake news discredits politicians' images and can even incite murder. In the latter case, messages sent via WhatsApp provoked a state of psychosis in India, which resulted in dozens of innocent people being executed. According to the consulting firm Gartner (2017), in 2022, western audiences will consume more fake news than true news. Any fake news circulated on the internet travels at speeds infinitely faster than a rumor or hoax that has been spread at any time in history. More and more experts agree that fake news is more than over seventy percent more likely to be viralized or replicated than true news and this (true) news must be up to six times longer than fake news to reach only 1,500 people.

This viral phenomenon comes from disruptive emerging technologies, the same ones we can use to prevent fake news from going viral, through innovations that have been taking place in the area of Artificial Intelligence. Although people have spread fake news and hoaxes by using bots, Artificial Intelligence has been used to help citizens counteract the disinformation from unverified news in recent years. The strategy is based on initiatives such as developing and creating "good bots" and algorithms designed to verify information. To do this, the AI would be able to read the informational chaos (infoxification) on the Internet and confirm the most dubious news, warning users (readers) about which news items belong to the controversial category of "fake news." The drawback is that many of the artificial intelligence initiatives to counter fakes are still in the experimental phase.

The article analyzes some types of Artificial Intelligence- such as bots- designed and created to aid news organizations in verifying the information and ensuring that readers who receive reliable and credible information. Therefore,

allowing them to make economic, politically and socially informed decisions and form educated opinions. The aim is to present a discussion and theoretical approach to the use of intelligent bots which will block the spread of fake news and disinformation

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2. Emerging information models based on algorithms and artificial intelligence

Why do we have to believe the fake news that is spread primarily via social media? According to a UN report, social networks have been a deadly weapon in Southern Sudan because of trash publications. Mysterious authors flood social media network threads with extravagant claims of misdeeds and malpractice- variations of blood libels- allegedly perpetrated by the group against which the publications are directed. For example, memes that seek to incite genocide- often report that some frightening act has been committed against children (*Lanier*, 2018: 132-133).

For Small and Vorgan (2009: 18), the brain of the "young generation-who are mainly social media users- is digitally concentrated from infancy, often at the expense of neural cabling that controls people's ability to do one thing after another." In this context, according to the theories of the dual process,

> "the mind sets in motion two processes while reading or receiving information, one is automatic and superficial, and the other requires effort and concentration, which is used to make strategic decisions. In circumstances in which the process is superficial, the brain automatically judges the integrity of information based on criteria such as how intimate or familiar it is or how easy it is to understand. Therefore, the more easily information is processed, the more familiar it may become and therefore believed to be true" (*Small and Vorgan*, 2009: 18).

Often, this fluidity with which we take in certain information leads to a collateral effect, which makes correcting and refuting the fake information make us believe the lie even more. An example of this is that there are still between 20% and 30% of North Americans who still believe that Iraq was hiding weapons of mass destruction, even though the invasion of the country and the subsequent war in 2003 proved the opposite. Another example is President Donald Trump's assertions that prestigious media such as The New York Times, Washington Post or CNN only report fake news. Trump's supporters believe what the president claims without a shadow of a doubt. Due to human nature and peoples' psychological conditioning, the enormous amount of information circulating on networks, and the proven fact that rumors or hoaxes are spread much faster than real news, makes it challenging to restrict the growing phenomenon of fake news.

In this scenario, among the various initiatives to curb the fake news phenomenon, a possible solution would be to use artificial intelligence using bots to distinguish between accurate information and the distortion of what is real. There are models of bots that can make hunting fake news or hoaxes faster and more efficient. Some are so sophisticated that

they are better than professional verifiers at analyzing quantifiable news attributes, such as the grammar structure, word choice, punctuation and complexity of the text. However, the real challenge for creating an efficient fake news detector is not so much how the algorithm is designed, but fundamentally how to find the right data to train the bot. Fake news is also complex, as it appears and disappears just as quickly, so it is challenging to compile it, find it and show it to the artificial intelligence machines.

With these developments, the information ecosystem and, consequently, journalism is experiencing a constructive content model which is based on a latent and growing process of algorithmatization. In this sense, several researchers affirm that "fully automated journalism does not work directly on reality rather algorithms act on a reality codified in data, which are ordered and finite sets of specific norms, and when applied to a problem lead to its solution," (Túñez-López, Toural-Bran and Cacheiro-Requeijo, 2018: 751).

Nowadays, various experiments are being carried out with algorithms that are capable of analyzing vast quantities of news, reports, and statements at high speed**,** and can identify the information that is false with a high success rate. Unfortunately, these same AI tools are also useful for the enemy. Recently it was reported in the news that a team of Open AI researchers had managed to create and run a machine that automatically writes quite convincing fake news.

2.1 The damage of Fake news, disinformation, and post-truth

In recent years, the term fake news has gained prominence in the media following the manipulation of public opinion and votes in the 2016 U.S elections, and also in the U.K's Brexit referendum. The scandal involving the company Cambridge Analytica, which made fraudulent use of millions of Facebook users' data, relived its prominence in 2018.

However, not everyone approves of the use of the term fake news to refer to the phenomenon, and some consider it to be very restrictive and insufficiently descriptive of the underlying problem. This is the case of the European Comssion (2018), which prefers to speak of disinformation that is defined as "false, inaccurate or misleading information designed, presented or promoted to cause public harm intentionally or to obtain a benefit." For the European Commission (Ibid), the term "fake news" is inadequate because it does not address the complexity of the problem.

Content is often not false, or entirely false instead it is fabricated information, mixed with facts and practices that have little to do with the concept of news, such as automatic accounts on social media used for astroturfing (disguising a political or commercial entity's actions such as spontaneous public reactions), the use of fake follower networks, manipulated videos, targeted advertising, organized trolls or visual memes.

According to David Alandete (2019),

> Fake news doesn't have to be an absolute lie. It usually has some real connection with what is happening, but this is generally a grotesque distortion and is always conducive to sensationalism and populism. A distortion that takes particular advantage of the radical change in which the channels that transmit the information have suffered since the emergence of digital platforms such as Facebook, Twitter, and Google. The truth is that, although in a different order, these companies are also responsible for the problem and must be held accountable for their actions.

In short, it deals with a wide range of practices that manipulate public opinion on the internet, which goes beyond publishing fake news.

However, it is essential to acknowledge that the heart of the matter of fake news (and post-truth culture if there is such a thing) does not lie in the traditional media but the recent proliferation of ideologically polarized websites and social networks. In recent years there has been an "explosion of fake news, phagocytized by social media, namely Facebook" and other social media sites. Viralising fake news, which looks like real news, and sharing it as if it were real news. Thus, fake news is viralized on social networks much more quickly than accurate and contrasted information. A study by the MIT Initiative on the Digital Economy, published in the Science journal by Vosoughi, Roy, and Aral (2018: 1148), analyzed around 126 000 news threads on Twitter between 2006 and 2017 tweeted over 4.5 million times by 3 million people.

The results were disappointing. In the authors' words, the truth takes about six times longer than a lie to reach 1500 people. Fake content spreads significantly further, more quickly, and is more profoundly inserted in the threads and conversation cascades than true news. Among all the categories of hoaxes, those related to politics are disseminated more widely than those connected to terrorism, natural disasters, science, financial information or urban legends.

Fig 1. Rumour cascades.
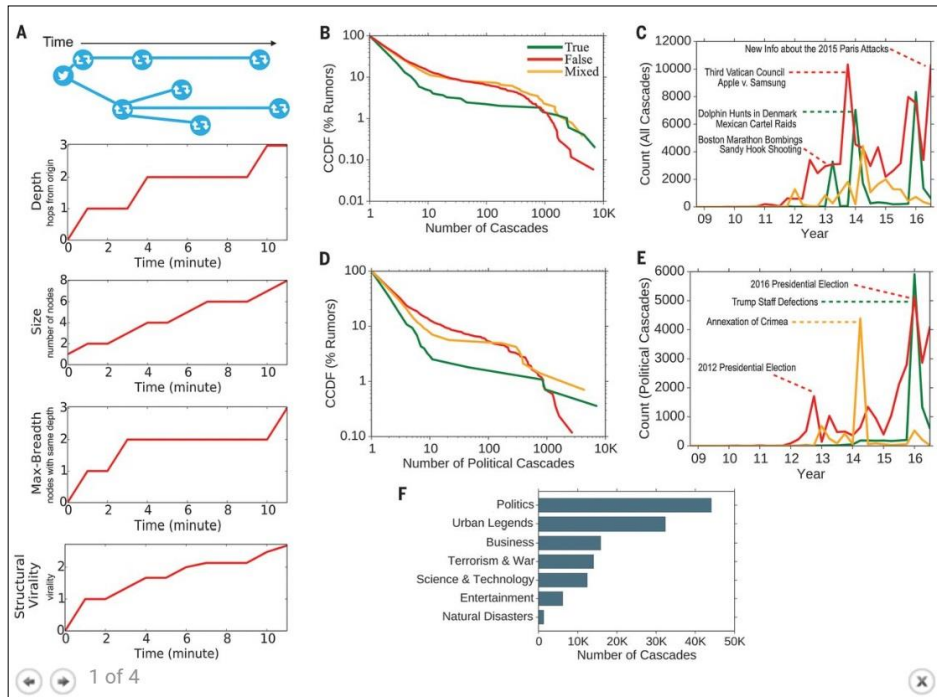
Regarding the concept of Disinformation, which is also called information manipulation or media manipulation, several experts affirm that it is the action and the effect of ensuring a lack of awareness or ignorance and preventing the circulation or disclosure of data, arguments, news or information that is not favorable to those who want to disinform.

Magallon poses the question (2019), why is it more complicated to recognize The Truth if we know more about who we are than at any time in history? Does being more informed mean being better informed today? Disinformation is something that seems to be impossible to understand through the current replication mechanisms. As if a kind of collective empathy were developing around the disillusionment of being informed and the individual feeling of being more and better informed than ever meant the collective acknowledgment that comprehensive education and a life with greater choice paradoxically implies a better understanding of our limitations as a civilization, culture and society.

Serrano (2013) states that most citizens consider themselves to be informed of international news after reading the press or watching the daily news. However, the reality is far from being the univocal image presented by the media since we are not told what has happened.

Wikipedia states that disinformation is usually one of the chicaneries of agnotology and occurs in the media, but these are not the only means by which one can be disinformed. It can happen in countries or religious sects that have prohibited books in places where governments do not accept media or foreigners' opposition and nations at war which hide information.

Regarding the definition of Postruth, according to the Fundeu BBVA (2016), the concept of Post-truth- or emotional lie- is a neologism that describes deliberate distortion of reality, to create and shape public opinion and influence social attitudes in which objective facts are less influential than appeals to emotions and personal beliefs. For some authors, Post-truth is simply a lie (falsehood) or scam covered up by the politically correct term "Post-truth," which conceals traditional political propaganda and is a euphemism for public relations and strategic communication as an instrument for manipulation and propaganda.

For Mcintyre (2018), Postruth, in the Spanish Language Dictionary, is described as "deliberate distortion of a reality, which manipulates beliefs and emotions to influence public opinion and social attitudes." In English, the term post-truth was first used in 1992, in the context of critical reflections on the notorious scandals of the Nixon and Reagan presidencies. It reached its zenith in 2016 when Trump won the elections, coinciding with the Brexit; consequently, The Oxford dictionary consecrated it as the "word of the year." Several experts wonder how we can be facing a situation in which "alternative facts" replace facts, whereby feelings outweigh indisputable evidence. Mcintyre (Ibid) traces the origins of the phenomenon back to the 50s, when American tobacco companies conspired to conceal the carcinogenic effects of tobacco, creating a roadmap of "scientific denialism," the most well-known milestones are the questioning of "evolutionism" or the denial of human influence on "climate change." In this line, Daniel Gascón (2018), affirms that the post-truth is not a usual lie. Even though it is not clear what it is. Gascón refers to the Oxford English Dictionary which defines it as a situation in which "objective facts are less influential in shaping public opinion than appeals to

emotion and personal belief." According to the DRAE (known as the Dictionary of the Royal Academy in English), it is "the deliberate distortion that manipulates beliefs and emotions to influence public opinion."

In the political sphere, it is called the politics of Post-truth (or post-factual politics), whereby appeals to emotions disconnected from public policy details frame the debate, repeatedly affirming discussion points in which the exact replicas or the facts are ignored. The post-truth differs from the traditional dispute and falsification of the truth, giving it "secondary" importance. It is summed up as the idea that "something that appears to be true is more important than the truth itself."

D'Ancona (2017:23), a British journalist, affirms that the era of the post-truth came about in 2016. It was the year in which the United Kingdom said yes to the Brexit, and Donald Trump won the U.S elections, marking a before and after, not only due to the type of lies- a lie is always a lie- but due to the publics' response to the lies. It is a type of reaction in which the strength of emotions, multiplied by social media activity, can shake the foundations of modern democracy.

2.2. Artifical Intelligence Ecosystem, algorithms and bots

In the algorithmic world, social network algorithms are often "adaptive," meaning that they make small changes to themselves at all times to obtain better results. "Better" in this case, means more seductive and, therefore, more profitable. In this type of algorithm there is always a bit of randomness (Lanier, 2018: 27).

When an algorithm provides people with experiences, it turns out the randomness that facilitates the algorithmic adaptation can also induce addiction. The algorithm is seeking out the perfect parameters to manipulate the brain, while the mind, in its attempt to find more profound meaning, changes in response to the algorithm's experiments; it plays cat and mouse relying on pure mathematics (Ibidem: 28-29).

In this context, States, universities, and media companies invest considerable resources in the development of manipulated news detection algorithms. Nevertheless, this technology, which is still in its early stages, needs human detectives (fact-checkers) to find false information circulating on the Internet. In this line, Google has developed artificial intelligence, whose mission is to counteract fake news. The new Google News application, available in 127 countries, joins Google's new artificial intelligence updates, and also include Google Maps and Google Duplex.

With this initiative, Google News launches its artificial intelligence content delivery system in a world full of fake news. According to the MIT study above, it showed that fake news is 70% more likely to be tweeted. In the recent *Edelman Trust* Barometer survey (2019: 23), 59% of people said that they weren't sure whether any given story was "true" or not. According to Alison Gow, editor-in-chief of Trinity Mirror, quoted by *Lisa Calhoun* (2018), "access to reliable, quality information should be anyone's right, wherever they live."

Unfortunately, artificial intelligence is also used by people who seek to harm- or at least disturb- the news ecosystem as well as news organizations that are struggling.

In February 2019, the specialized media echoed a disturbing project: the OpenAI Research Institute in San Francisco (U.S.A), an institution founded by Elon Musk, had created an algorithm capable of writing fake news. However, the objective of the project was different: to develop a system trained with large amounts of texts from the web, capable of translating texts and answering questions, among other actions. But those responsible soon realized the potential of this artificial intelligence to write false texts and to do so in a believable way. Will Knight (2019) reproduces an example of how the algorithm works in his MIT Technology Review paper. The system was given the phrase: "Russia has declared war on the United States after Donald Trump accidentally…". And the algorithm created the continuation of the "news":

> "Russia has declared war on the United States after Donald Trump accidentally fired a missile in the air.

> Russia said it had "identified the missile's trajectory and will take necessary measures to ensure the security of the Russian population and the country's strategic nuclear forces. The White House said it was "extremely concerned by the Russian violation" of a treaty banning intermediate-range ballistic missiles. The U.S and Russia have had an uneasy relationship since 2014 when Moscow annexed Ukraine's Crimea region and backed separatists in eastern Ukraine" (Knight, 2019).

3. Fact-checker and algorithms that verify information

With the emergence of fake news, new professional profiles have also emerged called Fact-checkers or information verifiers. They are a type of "fake news hunters." The fact-checker or fake news hunter spends their working day in front of a computer, tracking the internet with the help of an algorithm. From this, the following example emerges: suddenly, an alert goes off. The programmed algorithm has detected the existence of manipulated and harmful news for one of the companies it defends. In this case, a car manufacturer. The headline of the news falsely denounces that the brand's latest model has a manufacturing defect that has caused fatalities on the road. The hunter activates the protocol. It traces who is behind that information. Is it a regular troll? An unsatisfied customer? Time is running out. The news has already been shared on Facebook and a solution needs to be found quickly.

Jorge Benítez (2018) gives an account of this Fact-Checker profile that he calls "fake news hunter" in an article published by the newspaper El Mundo:

> "In these cases, a risk committee composed of those responsible for networks, cybersecurity, and the company's marketing is convened to classify the alert, assessing the damage and influence," explains Guillermo López, co-founder and CEO of Torusware, a Galician company specializing in the detection of fake news. Therefore, the car manufacturer tries to mitigate the effects of fake news. A timely press release or a tweet can prevent the corporate image and consequently the sales from deteriorating".

In this scenario, the artificial intelligence algorithms are starting to show their effectiveness in detecting fake news. The hunt for fake news has become an arduous and complicated task. The immense flow of information that reaches portals through content aggregators and which circulates and expands on social networks makes it very difficult for human crawlers to verify a particular news item, especially when it is a new story. Often when it's possible to prove that a news item is fake, the damage has already been done and continues to spread.

3.1. Academic and professional Institutions fighting against fake news

University research teams are involved in fighting against fake news. Thus, a research team at the University of Michigan has created an algorithm for hunting fake news that has proven to do better than humans: it has managed to identify fake news with a success rate of 76%, compared to human hunters at 70%. Adam Conner-Simons (2018) MIT's Computer Science and Artificial Intelligence Lab (CSAIL), in collaboration with Qatar Computing Research Institute (QCRI), has approached the issue of detecting Fake news, by focusing on news sources. The system developed by the MIT researchers uses Machine Learning to determine the accuracy of an information source and identify whether it is politically biased or ideologized.

Another example of the detection of fake news through artificial intelligence is the system based on deep learning developed by the British startup Fabula. In this case, the hoax is not identified by analyzing the text, but by studying how the stories are shared, to recognize the patterns of diffusion that can only correspond to fake news.

Probably, the great unknown is not so much the capacity of the technology to disseminate disinformation, fake news, or hoaxes, but the lack of ethics in a network culture- or Cyberculture. A culture in which people cannot discern between what is credible, truthful information, and what is an attempt to manipulate behavior, opinion and even the will to act and decide.

With this panorama, we considered addressing some of the bots that have been developed as entrepreneurial initiatives to detect fake news, hoaxes, or disinformation. The following criteria of the selection of the bots analyzed is based on the most known and representative in each area, linked to the area of journalistic news.

3.2 Study and typology of information verification bots.

The following sections detail the references and characteristics of some of the bots selected for information verification.

– Fatima de Aosfatos 	An article published by Alessandra Monnerat (2018) in the Knight Center at the University of Texas in Austin, described how a conversational bot could help combat fake news during the Brazilian elections in which Jair Bolsonaro won. Brazilian voters had a robot assistant available to combat disinformation during that year's general elections. Her name is Fátima, a conversational bot developed by the fact-checking site team Aos Fatos in collaboration with Facebook. The launch was scheduled for June 2018. Through Messenger, the instantaneous messaging service from Facebook, the bot would provide information through conversation, with suggestions on how to analyze news published online. Fátima, whose name is a play on the words "FactMa," an abbreviation of Fact Machine, would recommend that readers check to see if a story was published by a known news site or if the language used in the text conformed to journalistic standards. According to Aos Fatos' statement, from the teachings of Fatima, news consumers learned how to distinguish news from opinions, to find reliable information on various topics, and to know whether a source is reliable or not.
– TruthBuzz 	Based on the ICFJ Knight Fellowships, the TruthBuzz program aims to help reporters use compelling story methods that improve the scope and impact of the verification of fact-finding and help "protect" audiences by arming them against false or misleading information. Through a collaboration with First Draft News, interns and their newsroom partners will receive fact-checking and verification training. The TruthBuzz Initiative aims to improve the scope and influence of facts by communicating and sharing proven information convincingly. It was initially launched as a global competition to find new ways to help verified facts reach the widest audience possible. The winning 2017 entries, which included political caricatures, videos, and an application modeled on a classic video game, identified novel methods to combat disinformation and share solid, instantly understandable data checks.
– Facterbot 	Facterbot is a Facebook Messenger chatbot designed to send compelling fake news to users' inboxes. In addition to informing users about the most recent information, it aims to help fact-checkers to do their job better. Facterbot was designed by David Jiménez, a master's student in journalism innovation at the Miguel Hernández University. For Jiménez, "fake stories are shared more than the findings of facts that disprove them." While Fatima (from AosFatos) and Projeto Lupe! take advantage of the respective checks to answer questions in real-time. Facterbot delivers a general summary of popular information on Mondays, Wednesdays, and Fridays. Users can choose between pre-selected answers to learn more about each story or ask questions about different topics. It even offers Spanish translations.

– Fake News Detector 	The Fake News Detector allows you to detect and point out Fake news, Click Baits, and news. How does it work? By classifying a news ítem, other people who use Fake News Detector will see its classification, will be more attentive to it, and will also be able to classify it. This information is stored in a database and is read by the robot, El Robinho. The Robinho is based on the information from the developers and gradually learns to automatically classify a news ítem as Fake News, Click Bait. Etc, based on its text. By doing so, even news that no one had ever seen can be classified quickly.
– Projeto Lupe (Agência Lupa!) 	According to Poynter, in April 2018, six months before the Brazilian elections, a fact-checker had been using Facebook support to reach their readers better. The project called, "¡Projeto Lupe!", allows people to request verified information, ranging from candidates' statements to fake viral news. Any information can be obtained just by sending a message to Agência Lupa on Facebook, which has approximately 125 million monthly users in Brazil. According to Cristina Tardáguila, the director of Agência Lupa, "When people are well informed, they can make better decisions. We want to help Brazilian voters to find accurate information about those who aspire to become the leaders of our country". The bot was inspired by a Messenger model tested by Les Decodéurs from Le Monde during the 2017 French elections and was adapted for Agência Lupa by AppCivico. The project, which also includes fact-checking videos and educational items about the electoral process, is funded with $ 75,000 from Facebook, which was primarily interested in Brazil before the October general election, specifically the role of chatbots to curb online disinformation.
– Les Décodeurs (Le Monde) 	Decoders is a section from the French newspaper Le Monde's website, created on March 10, 2014, whose aim is to verify information on various topics. It uses a multidisciplinary team of professionals, made up of approximately ten people, dedicated to the platform. The journalists of this section created the Decodex in 2017, a search engine that serves as a tool to evaluate the reliability of sources. The initiative was one of the first of its kind created in France, following the movement of fact-checking that began at the beginning of the 21st century. Les Decodeurs has been a subject of debate. Some critics have complained about errors and a political bias supposedly anchored in the left. Others recognize the importance of the approach, but question its limitations. As for the search engine, the accusations of ideological filtering were also made, as well as comments about Le Monde's underlying conflict of interests.

Source: created by the author.

4. Methodology

To carry out this work, we have taken the triangulation methodology of qualitative and quantitative techniques (Gaitán & Piñuel, 1998: 286). The starting point has been the longitudinal analysis of various scientific texts (articles, reports, papers and to a lesser extent, books) whose subject matter focus on the study and reflections on the dissemination of

fake news and the strategies for verifying it through the use of bots created and designed by increasingly sophisticated algorithms for the type of information that has been shared on social networks in recent years.

In this context, the methodology used is descriptive-exploratory. It is based on the bibliography on the environment of fake news, disinformation, and Post-truth in order to present a detailed analysis where the concepts, dimensions, and metrics are examined to approach the phenomenon of Fake. Also, studies carried out by MIT (Massachusetts Institute Technology) research teams, the European Union Expert Group report and the information verification projects carried out by the Duke University Reporters' Lab have been used, highlighting the fact that this research center has a website whose map, which is continuously updated, geographically locates the 225 fact-checking initiatives in the world (Duke Reporter's Lab, 2018). From these, 155 remained active at the end of 2018, while the rest had not been updated or remained inactive.

A second method used was the selection and analysis of the various applications of artificial intelligence bots fundamentally created to help verify information from citizens, professionals, and journalistic organizations, which have been developed as entrepreneurial initiatives to detect fake news, hoaxes, or disinformation. The criteria followed in the selection of intelligent bots analyzed were based on the most known and representative in each area, linked to the field of journalistic news and which have generated interest in the media. In this context, the characteristics, uses and implementation of bots in news organizations have improved the media's credibility.

The results obtained are intended to extricate an in-depth analysis of bots that can help citizens access contrasted and verifiable information for decision making and offer some reflections on initiatives and developments based on Artificial Intelligence, as allies in the construction of quality information.

5. Conclusions

Considering the limitations of tackling a job of this magnitude, in which bots are created and expand rapidly in an era marked by the immediacy of information processes, the analysis carried out shows the complexity of the fake news and disinformation problem. It requires a solution that involves strengthening Artificial Intelligence to advance the development of increasingly sophisticated bots that prevent fake news from being spread, which ultimately harms the media's and journalists' credibility. The goal is to eradicate media disinformation and improve the ability of platforms and the media to address the phenomenon in its magnitude. The media ecosystem promotes transparency and must encourage the development of algorithms that will enhance user confidence. In this regard, journalists' capacity to detect fake news, and users' literacy needs to be improved. Even though the differential dissemination of the truth and lies is significant with or without robots or bots activity, we are concerned that human judgment may be biased by harmful bots. This implies that disinformation containment policies should also emphasize behavioral interventions, such as labeling and incentives to discourage the spread of disinformation, rather than focusing exclusively on restricting bots. Understanding how fake news is spread is the first step in containing it.

Algorithms developed to create bots allow us to understand several cases in which algorithms, automation, and artificial intelligence can improve journalism, such as in the computational search for stories and automated content production. Journalists must develop a critical eye to see the pros and cons of algorithms and their use in journalism and society at large. It is equally important to know how news algorithms are implemented and how they are implemented at work.

Therefore, it is necessary to use a sophisticated bot detection algorithm to identify and remove all the "other" bots before running the news analysis. As we have seen in our analysis, some initiatives are being carried out, but it is necessary to continue advancing the creation of state-of-the-art bots. The bots studied have accelerated the dissemination of true and fake news and have affected the spread of both equally. This suggests that fake news spreads further, more quickly, more profoundly and more widely than the truth because humans, not bots, are more likely to spread it.

Finally, more research is warranted on the behavioral explanations for differences in the dissemination of true and fake news. In particular, more robust identification of the human judgment factors that drive the spread of true news and fake news online, which requires more direct interaction with users through interviews, surveys, and laboratory experiments. In future work, it is essential to encourage these and other approaches to research human interface factors that drive the diffusion of accurate and fake news. We therefore, hope that this analysis will succeed in encouraging further research, in collaboration with international researchers to study the causes and consequences of the spread of fake news affecting democratic societies, as well as the potential eradication of it.

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