Social Science : The spread of true and false news online

The goal of this study was to determine how "false" news spread in contrast to "true" news in social media and specifically in Twitter feed.

First of all they started by defining set of variables relative to this problem:
- We define news as an assertion with claims whether shared or not.
- Cascades can be as small as size one (meaning no one retweeted the original tweet).
- The number of cascades that make up a rumor is equal to the number of times the story or claim was independently tweeted by a user (not retweeted).

Using a data set of all fact-checked rumor cascades that spread on Twitter between 2006 and 2017, the data include: ~126,000 rumor cascades spread by ~3 million people more than 4.5 million times. they looked for the differential diffusion of true, false, and mixed (partially true, partially false) news stories and sampling all rumor cascades investigated by six independent fact-checking organizations (snopes.com, politifact.com, factcheck.org, truthor-fiction.com, hoax-slayer.com, and urbanlegends.about.com) by parsing the title, body, and verdict (true, false, or mixed) of each rumor investigation reported on their websites and automatically collecting the cascades corresponding to those rumors on Twitter. The result was a sample of rumor cascades whose veracity had been agreed on by these organizations between 95 and 98% of the time.

Analysis of all news categories showed that news about politics, urban legends, and science spread to the most people, whereas news about politics and urban legends spread the fastest and were the most viral in terms of their structural virality. Falsehood diffused farther and faster than the truth, they found that falsehoods were 70% more likely to be retweeted than the truth.

Structural elements of the network or individual characteristics of the users (more followers, more followings, verified account...) involved in the cascades does not explain why falsity travels with greater velocity than the truth. Users who spread false news had significantly fewer followers, followed significantly fewer people, were significantly less active on Twitter, were verified significantly less often, and had been on Twitter for significantly less time.

False news spreads farther, faster, deeper, and more broadly than the truth because humans, not robots, are more likely to spread it.

False news can drive the misallocation of resources during terror attacks and natural disasters, the misalignment of business investments, and misinformed elections.

Fake News: Fundamental Theories, Detection Strategies and Challenges

This paper starts by showing the different theories about fake news across multiple disciplines, from a social and psychological perspective humans have been proven to be irrational/vulnerable when differentiating between truth/false news (typical accuracy in the range of 55-58%), as for fake news, it is relatively easier to obtain public trust, and it has three main characteristics:

- **Validity effect**: individuals tend to trust fake news after repeated exposure.
- **Confirmation bias:** individuals tend to believe fake news when it confirms their per-existing knowledge.
- **Peer pressure/Bandwagon affect**: normal people can frequently and unintentionally participate in fake news activities as well, due to social identity or self-preexisting knowledge. So the borderline between malicious and normal users becomes unclear.

Then there is the role of social media in spreading fake news, as of Aug. 2017, 67% of Americans get their news from social media. Social media accelerates dissemination of fake news, It breaks the physical distance barrier among individuals, and It provides rich platforms to share, forward, vote, and review to encourage users to participate and discuss online news.

In order to suggest solutions to the limit the spread of fake news we must first define "fake news", as this paper did:

	Authenticity	Intention	News?
Fake news	False	Bad	Yes
False news	False	Unknown	Yes
Satire news	Unknown	Not bad	Yes
Disinformation	False	Bad	Unknown
Misinformation	False	Unknown	Unknown
Rumor	Unknown	Unknown	Unknown

In order to detect fake news the authors suggest different approaches:

- **Knowledge-based Fake News Detection:** news detection aims to assess news authenticity by comparing the knowledge extracted from to-be-verified news content with known facts, aka fact-checking.
- **Style-based Fake News Detection:** the style of writing, i.e. the form of text rather than its meaning.
- **Propagation-based Fake News Detection:** a principled way to characterize and understand hierarchical propagation network features. We perform a statistical comparative analysis over these features, including micro-level and macro-level, of fake news and true news.
- **Credibility-based Fake News Detection:** the information about authors of news articles can indicate news credibility and help detect fake news.