# Identifying Bots that Spread Fake News

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## 1 Introduction

Fake news is not new. However, the phenomenal growth of online social media coupled with ease in publishing unverified content and click based advertisement revenue, have made fake news a strong influencer in driving discussions. Though often considered innocuous, such influences may have high social cost. For example, Parkinson [2] reported that the sheer inactivity of social media companies might have contributed to the results of the 2016 US presidential election. Most existing research on fake news have considered the origin, the motivations and the impact of fake news, but not the use of bots. Either for spreading an ideology or for making money, the goal of fake news creators is to spread their message rapidly, so the likely use of bots (or human assisted bots) in the process is hard to dismiss. In our investigation, we find social bots that are actively being used on Twitter to fool the content promotion algorithms and promote specific agenda.

## 2 Problem Statement

Most existing work on detecting fake news have taken a machine learning approach to classify news as fake or otherwise. The classification of news as fake or non-fake often does not lead to the motivations behind spreading such news. We take a network analysis based approach to understand the motivations behind spreading of fake news. There are two prime motivations [1], a) pecuniary i.e. be a part of the 'digital gold rush' b) ideological i.e. to seek to advance the stand the spreaders have. We have observed the use of bots in promoting fake news and, given the active monitoring of anti-social activities by social-media companies, it's hard to build and maintain and an army of bots. We argue that the content creators who spread fake-news for money, use their bots for multiple purposes. In contrast, those who use fake-news for ideological reasons, stick to one objective and target a few groups. Thus, with the final goal of understanding the motivations behind spreading of fake-news, we examine the behavior of bots used for the spread of fake-news.

## 3 Methodology and Results

We generate our dataset by collecting Tweets relevant to the Euromaidan movement and the fake-news URLs in the different datasets available on the SBP-BRiMS challenge page. The Euromaidan movement started as a series of protests

in November 2013, where large numbers began to call for the removal of then Ukrainian President Viktor Yanukovych. These protests reached their peak in February 2015, ultimately leading to the removal of many of Ynukovych's senior 98 officials, and were a precursor to Russia's subsequent occupation of Crimea. We download tweets data based on search terms, geo-coordinates based filtered search, and snowball sampling approach. We then filter the tweets that have embedded URLs. Using a known set of fake URLs obtained from experts on Ukranian issues and some available on the SBP-BRiMS challenge page, we divide the entire dataset into fake and non-fake tweets. We then build networks of users, user-tweets, user-mentions and user-hashtags. The visualizations of these networks (e.g. Fig.1) give us an idea of the network structure around fake-news, and how these structures changed over time.

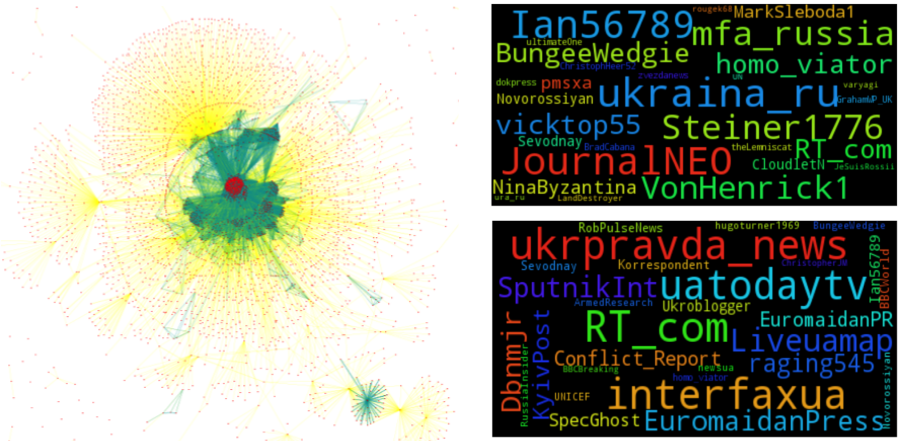


**Figure 1.** Left image shows different Twitter-users (red dots) spreading fake-news and their network in our Ukrainian Tweets dataset. The yellow lines are mention links and the green lines are co-hashtag links. The top plot on right shows the top mentions used in tweets that have embedded URLs related to fake news. The bottom plot on right shows the top mentions used in tweets with non-fake embedded URLs.

Our investigation reveals the use of bot like structures to promote tweets (Fig.1, left) with embedded fake-new URLs. We observe a clear distinction in approaches of spreading fake-news and general news. In particular, the use of a higher number of mentions to get tractions that are clearly distinct for fake and non-fake news (Fig.1, right), and more use of different hashtags that are tailored to attract particular communities.

## References

1. Allcott, H., Gentzkow, M.: Social media and fake news in the 2016 election. Journal of Economic Perspectives 31(2) 211-36. (2017)
2. Parkinson, H.J.: Click and elect: how fake news helped donald trump win a real election. The Guardian (2016)