



# REVERSE ENGINEERING RUSSIAN INTERNET RESEARCH AGENCY TACTICS THROUGH NETWORK ANALYSIS

Charles Kriel  
Alexa Pavliuc

## Abstract

In mid-October of 2018, Twitter released a dataset containing both the contents and information for accounts on their platform related to the Internet Research Agency. These accounts were used to influence the 2016 US Presidential election, as well as elections and referenda in several other countries, including the UK and Venezuela. This article documents a data analysis of these tweets, and through data visualisation demonstrates a rigorous methodology of practice at work in Russia's online interference in foreign democracies, particularly through St. Petersburg's Internet Research Agency (IRA). This research will also show that many previous visualisations of this data have failed to factor for time, and therefore overemphasise certain trends. Finally, we question whether Twitter released the entire Internet Research Agency dataset, as claimed.

**Keywords**—*strategic communications, social media, Russian interference, data visualisation, network analysis, Internet Research Agency*

## About the Authors

**Dr Charles Kriel** is the Founder of Kriel.Agency, a strategic communications, research and policy agency with a portfolio including the Persian Gulf, Northern Asia, the Baltics, Balkans, Caucasus and Caribbean.

He is Special Advisor to the UK House of Commons Select Committees on disinformation, and addictive technologies, and to the Trinidad and Tobago Joint National Security Committee.

**Alexa Pavliuc** is an MSc student in Data Science at City, University of London, following her studies in Professional Communication at Ryerson University, Canada. She has conducted research in human-robot-interaction, and on mal-information in provincial elections on YouTube through the employment of network visualisations at the Canadian Broadcasting Corporation (CBC).

\*\*\*

In mid-October of 2018, Twitter released a dataset containing both the contents and account information of Internet Research Agency-related accounts on their platform, including tweets, images, and account 'bios'. These were accounts that Twitter claimed were used to influence the 2016 US Presidential election, as well as elections and referenda in several other countries, including the UK. According to Twitter, the accounts were also used to influence public sentiment around issues of national importance in other countries, including Ukraine.

Earlier in 2018, the US Congress criticised Twitter, concerned with lack of oversight of the platform. Twitter executives committed to 'provide regular updates and information regarding [their] investigation into foreign interference in political conversations on Twitter'.

The dataset Twitter released in October included '3,841 accounts affiliated with the IRA, originating in Russia, and 770 other accounts, potentially originating in Iran.' This included more than 10 million tweets and more than 2 million images, GIFs,<sup>1</sup> videos, and Periscope broadcasts,<sup>2</sup> including the 'earliest on-Twitter activity from accounts connected with these campaigns, dating back to 2009'.<sup>3</sup> The IRA tweets spanned both English and Russian.

In the press, the Russian troll farm, Internet Research Agency, has become synonymous with influencing global public opinion, interference in foreign elections, and specifically with supporting the campaign of Donald Trump in

.....  
1 GIFs are animated (moving) images that can be shared in tweets in the same way images, videos, and live videos can be.

2 A Periscope broadcast is a live video shared on Twitter.

3 Vijaya Gadde and Yoel Roth, 'Enabling further research of information operations on Twitter', Twitter Blog, 17 October 2018. [Retrieved 16 December 2018]; Natalie Gagliardi, 'Twitter Says 50,000 Russia-linked accounts Tweeted During 2016 US Presidential Election', ZDNet, 19 January 2018. [Retrieved 10 December 2018].

the November 2016 US Presidential election. The agency began targeting the United States in 2014. Based in St. Petersburg, the IRA is funded by a Russian oligarch, Evgeny Prigozhin, who maintains close ties to the Kremlin.<sup>4</sup>

According to Robert Mueller's indictment against the agency (United States of America v. Internet Research Agency LLC A/K/A Mediasintez LLC A/K/A Glavset LLC A/K/A Mixinfo LLC A/K/A Azimut LLC A/K/A Novinfo LLC, et al.) operatives would pose as US citizens, creating US Twitter and Facebook personas, and comment on 'divisive U.S. political and social issues, falsely claim[ing] to be controlled by U.S. activists when, in fact, they were controlled by' the IRA.

Defendant ORGANIZATION<sup>5</sup> had a strategic goal to sow discord in the U.S. political system, including the 2016 U.S. presidential election. Defendants posted derogatory information about a number of candidates, and by early to mid-2016, Defendants' operations included supporting the presidential campaign of then-candidate Donald J. Trump ('Trump Campaign') and disparaging Hillary Clinton. Defendants made various expenditures to carry out those activities, including buying political advertisements on social media in the names of U.S. persons and entities. Defendants also staged political rallies inside the United States, and while posing as U.S. grassroots entities and U.S. persons, and without revealing their Russian identities and ORGANIZATION affiliation, solicited and compensated real U.S. persons to promote or disparage candidates. Some Defendants, posing as U.S. persons and without revealing their Russian association, communicated with unwitting individuals associated with the Trump Campaign and with other political activists to seek to coordinate political activities.<sup>6</sup>

*The Atlantic* magazine called it an operation straight from the Soviet-era playbook, and, quoting Adrian Chen from a 2015 *New York Times Magazine* article, named it 'the biggest trolling operation in history whose target is nothing less than the

.....  
4 Krishnadev Calamur, 'What Is the Internet Research Agency?', *The Atlantic*, 16 February 2018. [Retrieved 22 December 2018].

5 'Defendant ORGANIZATION' refers to the Internet Research Agency in Robert Mueller's 2018 indictment.

6 *Internet Research Agency Indictment*, United States District Court for the District of Columbia Case 1:18-cr-00032-DLF Document 1 Filed 16 February 2018.

utility of the Internet as a democratic space'.<sup>7</sup>

More than two years after the American presidential election, and after much political and legal pressure, Twitter released their IRA dataset, as well as simultaneously releasing a dataset from accounts related to Iran but used to influence the US election. The dataset included tweets in several languages, and as this article will show, covered many topics, encompassing original, copied, and retweeted content.

We undertook an analysis of the IRA dataset, with an emphasis on tracing the Twitter activity timelines, in an attempt to demonstrate working methodologies of the Internet Research Agency related to Twitter bots, online influence campaigns, and Russia's malicious interference in foreign affairs.

The following are timelines of findings on the structure of Internet Research Agency bots deployed between 2014 and 2018 to infiltrate and influence English- and Russian-speaking Twitter communities world-wide. This is an attempt to discern the tactics of the agency, establishing that most account operations begin as bot operations, that accounts are often taken over manually once they gain enough followers, and that a law of survival-of-the-fittest operates amongst the IRA's accounts. We show, using the English-language dataset, that the IRA uses innocuous hashtags to inject themselves into larger Twitter conversations and threads, and that their tactics and methods change over time, often obscuring goals and motivations.

Using the Russian-language dataset, we show that accounts with the most followers posted only retweeted content; accounts with more than 1,000 followers tended to target the same users and hashtags; different groups of hashtags and targets changed over time; and tweeting tapered off at the start of 2016. Furthermore, we show that the most tweeted moment in the Russian-language dataset occurred the day after Malaysia Airlines Flight MH17 was shot down over Ukraine.<sup>8</sup> And finally, through data visualisations, we show that the Russian dataset is highly organised, with distinct patterns of behaviour across time.

.....  
<sup>7</sup> Calamur, 'What Is the Internet Research Agency?'; Adrian Chen, 'The Agency', *New York Times Magazine*, 2 June 2015.

<sup>8</sup> MH17 was a scheduled passenger flight travelling from Amsterdam to Kuala Lumpur and was shot down on 17 July 2014, killing all 283 passengers and 15 crew.

This pattern of organisation and strategy extends across both the Russian- and English-language datasets. Related to this, we demonstrate that analysing Twitter datasets while factoring out time leads to false conclusions, particularly when visualising the data. Often small and very short-lived operations appear disproportionately important when visualised without a time axis.

Finally, we ask whether Twitter released the full dataset from the Internet Research Agency, and whether Twitter has also not included all the IRA tweets they are clearly aware of in the IRA dataset released to media organisations, governments, the research community, and the public.

### Literature review

The Digital Forensic Research lab (DFR) has also conducted an analysis of the tweets, with an emphasis on the second wave of accounts, active after 2017—indeed after the actual election itself. DFR’s goal was to ‘promote shared understanding of the vulnerabilities exploited by various types of online influence operations, as well as social media’s role in democracy’. They also maintain that this data archive is unique because it is complete: ‘What sets this archive apart is Twitter’s consolidation and release of all accounts the platform maintains high confidence are associated with the Russian Internet Research Agency and separate Iranian accounts.’<sup>9</sup> As we will show, we question whether the dataset is complete.

The Oxford Internet Institute has conducted an analysis of global organised interference campaigns. They analyse ‘the new trends of organized media manipulation, and the growing capacities, strategies and resources that support this phenomenon’, but do not focus on examining the work of the Internet Research Agency through the lens of the Twitter dataset.<sup>10</sup>

Rizoiu, Graham, Zhang, Zhang, Ackland, and Xie completed a network analysis of tweets during the presidential debates. They defined the influence of the tweets, modelled latent diffusion structures, used partisan hashtag analysis to quantify user political polarisation and engagement, and found that social bots are both 2.5 times more influential than humans on Twitter, and are more

9 @DFRLab, '#TrollTracker: Twitter's Troll Farm Archives', Digital Forensics Research Lab on Medium, 17 October 2018. [Retrieved 20 December 2018].

10 Philip N. Howard and Samantha Bradshaw, 'Challenging Truth and Trust: A Global Inventory of Organized Social Media Manipulation', The Computational Propaganda Project (Oxford Internet Institute, 2018).

politically engaged. However, their study limited itself to tweets around the debates.<sup>11</sup>

Sear and Jensen explored how covert foreign influence operates, specifically in Australia, using the same Twitter dataset.<sup>12</sup>

Howard, Kollanyi, Bradshaw, and Neudert analysed Twitter data over a 10-day period in 2016, and found that ‘nationally, Twitter users got more misinformation, polarizing and conspiratorial content than professionally produced news. Users in some states [...] shared more polarizing political news and information than users in other states. [And] average levels of misinformation were higher in swing states than in uncontested states, even when weighted for the relative size of the user population in each state.’ However, the study focused on swing state data.<sup>13</sup>

Demos’ Alex Krasodomski-Jones conducted an analysis of the same dataset as this study but focussed on the UK.<sup>14</sup>

Stewart, Arif, and Starbird examined the relationship between political homophily and organised trolling efforts through an analysis of Russian troll accounts retweeting the #BlackLivesMatter movement. Their analysis showed that ‘these conversations were divided along political lines, and that the examined trolling accounts systematically took advantage of these divisions’. However, they limited themselves to a single subject, and reached the conclusion that ‘research can help us better understand how to combat systematic trolling’.<sup>15</sup>

## Methodology

Using the IRA dataset released by Twitter on 17 October 2018, we built network visualisations of user-to-user and user-to-hashtag relationships. The original dataset contained 9 million tweets. We made a subset using the three million English-language tweets.

.....  
11 For a network analysis of tweets during the presidential debates see Rizozi, Marian-Andrei, Timothy Graham, Rui Zhang, Yifei Zhang, Robert Ackland, and Lexing Xie, ‘#DebateNight: The Role and Influence of Socialbots on Twitter During the 1st 2016 U.S. Presidential Debate’, *arXiv.org*, 2018.

12 Tom Sear and Michael Jensen, ‘Russian trolls targeted Australian voters on Twitter via #auspol and #MH17’, *The Conversation*, 22 August 2018.

13 Philip N. Howard, Bence Kollanyi, Samantha Bradshaw, and Lisa-Marie Neudert, ‘Social Media, News and Political Information during the US Election: Was Polarizing Content Concentrated in Swing States?’, *arXiv.org*, 2018.

14 ‘New Demos Analysis Finds Russian Influence Operations on Twitter Targeted at UK Were Most Visible When Discussing Islam’, Press Release, *Demos*, 1 November 2018.

15 Leo G. Stewart, Ahmen Arif, and Kate Starbird, ‘Examining Trolls and Polarization with a Retweet Network’, paper presented at *MIS2: Misinformation and Misbehaviour on the Web Workshop 9 February 2018, Los Angeles, CA*, p. 6.

We also analysed 4.6 million (4,583,000) Russian-language tweets posted by 1,534 accounts in the same IRA dataset of 9 million tweets. Countries which may have been targeted by Russian-language tweets include: Russia, Ukraine, Georgia, Kazakhstan, and Belarus.

To visualise the English-language mention network (or networks of retweets), a random subset of 500,000 tweets was created. Multiple subsets were designated and subsequently visualised; the structure of the one shown in this report is representative of the structure of the others. Networks were coloured by account creation date and were run in two-month intervals showing the evolution and growth of the network over time. Metadata was derived from the tweet- and user-data to provide further layers of insight throughout the report. To do this, we used Gephi.

An open-source software package for network and graphing analysis, Gephi utilises a 3D render engine, displaying networks in real time. According to Bastian, Heymann, and Jacomy, the software uses ‘a flexible and multi-task architecture [to] bring new possibilities to work with complex data sets and produce valuable visual results.’<sup>16</sup>

We used Gephi to render graphic temporal animations of the Twitter datasets.

Our visualisation of the English-language mention network, across time, can be seen [here](#)<sup>17</sup>.

Our visualisation of the hashtag network, across time, can be seen [here](#)<sup>18</sup>.

We pursued a similar methodology in the analysis of the larger, Russian-language dataset, with an emphasis on form, distribution, and methodology, excluding analysis of content, which is an area for future exploration.

Our time-based visualisations of the IRA datasets constitute our primary contributions. From these visualisations a number of unique conclusions are drawn when examining the activity of Twitter accounts over time.

.....  
16 Bastian, M., Heymann, S., and Jacomy, M., *Gephi: An Open Source Software for Exploring and Manipulating Networks*, 2009.

17 <https://vimeo.com/305925342/d7a66ceb9>

18 <https://vimeo.com/305932857/c9ca929fe0>



Breaking down and analysing the networks, in the context of the visualisations, we find the following:

*English-Language Dataset*

- The Internet Research Agency built and automated bot networks using accounts originally created in 2012 and 2013, but only fully activated sometimes years later.
- Tweets, retweets and mentions were often run automatically— sometimes exclusively automatically—until they were taken over manually. During this automated period, the bots are set to function in a way that will maximise the number of followers. This is often through a process of retweeting popular banal content, or sports, or local news content.
- There is a kind of survival-of-the-fittest at play in the Internet Research Agency’s bot networks. Many bots are used for only a brief period of time; as many bots again are abandoned should they fail to gain enough followers.
- The Internet Research Agency prefers the use of banal, trending hashtags, such as #ifgooglewasagirl, or #myamazonwishlist, to inject themselves into popular conversations.
- The Internet Research Agency also tested spam bots, using them to spread high volumes of URL links in 2015.
- Different bot types and bot behaviours were created in different years:
  - Bots created in 2013 were used to polarise conversations. They were key network tweeters in the US election. We’ve coloured them purple
  - Bots created in 2014 were used to retweet often banal, but always trending, hashtags. We’ve coloured them blue
  - Bots created in 2015 tweeted prolifically, but were short-lived, rarely tweeting more than two months. We’ve coloured them green
  - Very few bots were created in 2016 (navy blue)
  - Bots created in 2017 were used only in August of that year. They posted hashtags but did not try to engage with other Twitter users through mentions. We’ve coloured them orange
- The animated centres of both network visualisations look like magnets with two opposing polarities

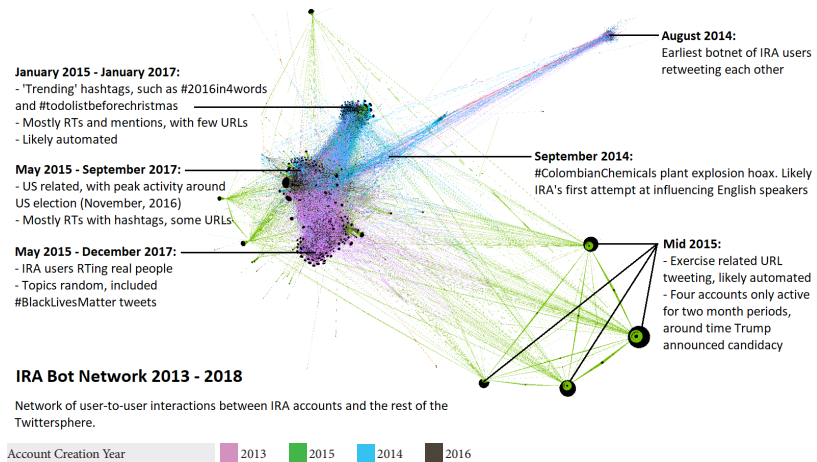
- This means that the IRA bots in each section were retweeting different people and using different hashtags
- One side of these polarities is more related to the US election, and the other side to the IRA's manipulation of #BlackLivesMatter

### Russian-Language Dataset

- The most tweeted moment in the Russian-language dataset occurred the day after Flight MH17 was shot down.
- There was an interesting community of bots directing tweets towards a group of accounts September 2014 – October 2015. They began by retweeting other accounts, then changed strategy, sending original tweets by mid-2015
  - In January 2019, we manually searched a random subset of users in the sub-network who were targeted by tweets. Each of these accounts has been suspended by Twitter
- Russian-language tweeting tapered off at the start of 2016.

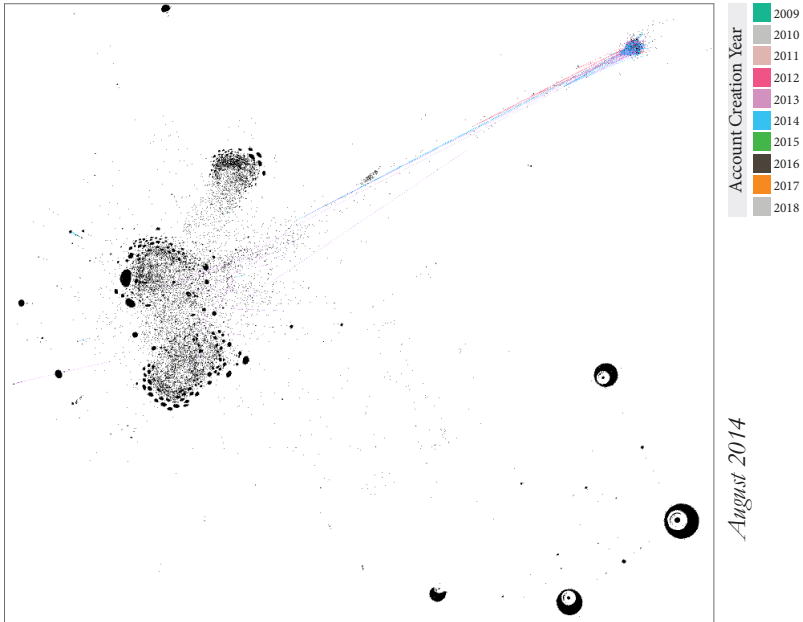
### Maps of the User-to-User and User-to-Hashtag Networks

The following illustrations can be used as a guide to understanding the animated visualisations linked to [here](#)<sup>19</sup>.



<sup>19</sup> <https://vimeo.com/305925342/d7a66ceb6f9>





The explosion was purported to have taken place at the facilities of the Columbian Chemicals Plant, although the company and officials of St. Mary's Parish announced the explosion was a hoax.

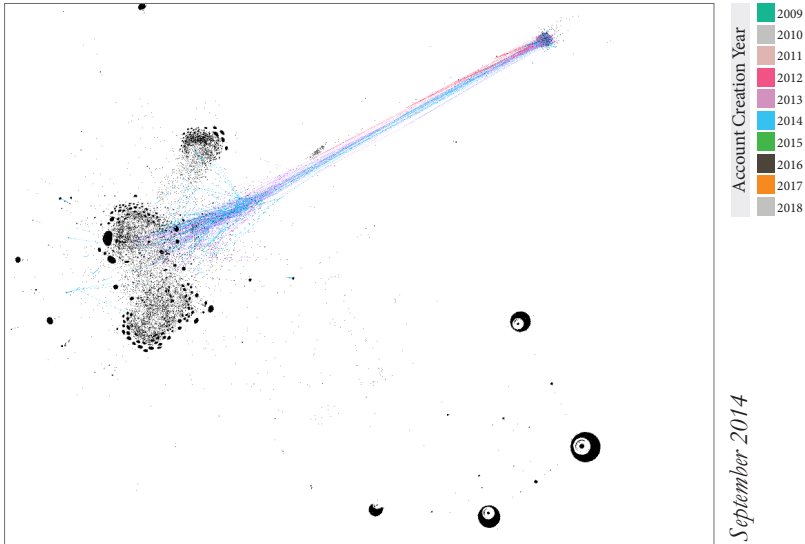
According to an investigation by *NYT Magazine*, among others, the hoax could be traced to a 'coordinated disinformation campaign' by the IRA. '[D]ozens of fake accounts [...] posted hundreds of tweets for hours, targeting a list of figures precisely chosen to generate maximum attention. The perpetrators didn't just doctor screenshots from CNN; they also created fully functional clones of the websites of Louisiana TV stations and newspapers.'<sup>21</sup>

It is worth noting that this was not only an early attempt by a state-sponsored Russian actor at shifting the conversation via social media, it also showed signs of 'faking' local media, which became a hallmark of Internet Research Agency activity.

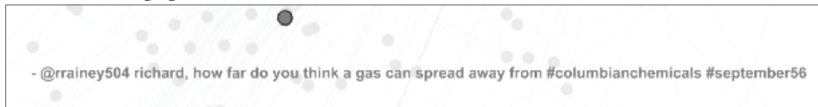
This may have been the Internet Research Agency's first attempt at persuading an English-speaking population to embrace St. Petersburg agency-created

.....  
<sup>21</sup> Chen, 'The Agency'.

disinformation via Twitter, as the organisation had previously focused elsewhere. All mention of #ColumbianChemicals ceased by 15 September 2014, and this network went silent until mid-January 2015.<sup>22</sup>



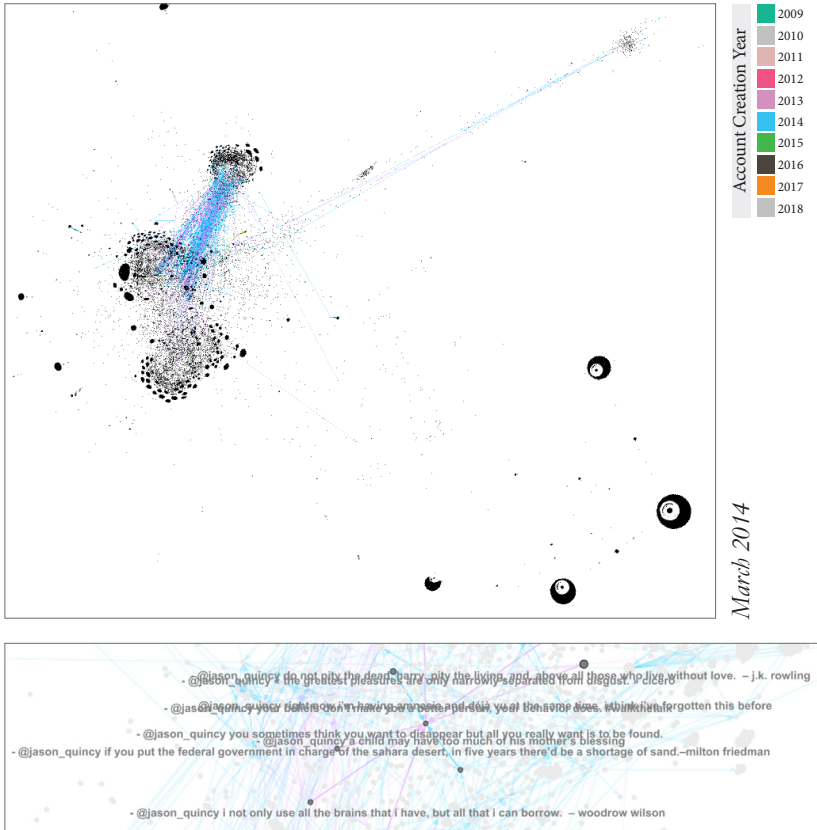
IRA 'user's' tweet to Richard Rainey, a real person and journalist for a New Orleans newspaper:



### January - March 2015

A small burst of tweets appears between January and March 2015. Uncharacteristically, they contain very few hashtags, not many retweets, and few URLs. The tweets are banal; they seem like 'regular' tweets about mundane things, for instance eight accounts all tweet a random sample of inspirational quotes at @jason\_quincy (@jason\_quincy was an account that is not in the IRA user dataset; it has been suspended by Twitter).

<sup>22</sup> We believe the 11 September 2014 Internet Research Agency activity revolving around Centerville, Louisiana, St. Mary Parish, and the Columbian Chemicals Plant explosion hoax was likely a very short-lived experiment in disinformation for an English-language audience, executed as a precursor to more complex operations at a later date.



### Early 2015

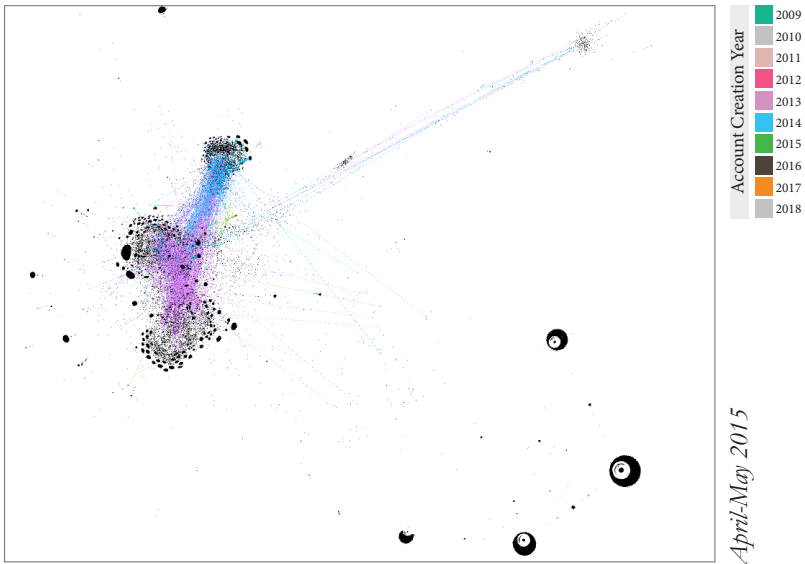
The year begins with a ramping up of activity that would continue through the presidential election. Simultaneously, Trump publicly contemplated his candidacy, finally announcing on 16 June 2015.

### April – May 2015

In the Spring of 2015, the sleeper accounts created in 2013 went live. They joined the 2014 accounts (blue), which had been active since January. Suddenly, there was wide US topic coverage, as well as some UK topic coverage. Notable hashtags included #searchesgoogleisashamedof, #news, #reasonsmymomisbetter, and #sports.

We also begin to see action amongst inauthentic ‘local news’ accounts, which became a hallmark tactic of the Internet Research Agency. These local inauthentic accounts include @todaypittsburgh (included in the Internet Research Agency dataset), @onlinehouston (not included in the dataset, but probably Internet Research Agency, as it falls directly next to @todaypittsburgh), @kcitvnews (again, not in the IRA dataset, but likely because the Twitter account has since been deleted), @detroitpost (not in the IRA dataset, Twitter account deleted), and @norleansdaily (not in the IRA dataset, but also clustered with the other four, Twitter account deleted).

We conclude that these non-inclusions could indicate that Twitter has not released the complete data set from Internet Research Agency operatives. This opinion about the English-language dataset is supported by conclusions following the analysis of the Russian-language dataset, below (and is further qualified near the end of the paper).

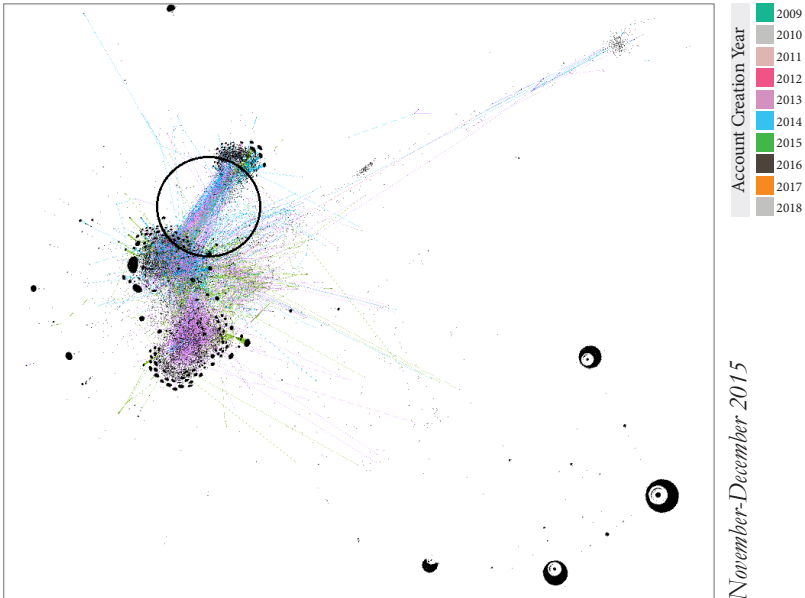


Noticeable in the centre of these clusters are retweets of several Internet Research Agency accounts by @info24us. This is a news aggregation Twitter page. @info24us joined Twitter in 2014, yet has 1.47M tweets—roughly one tweet every two minutes for five solid years. It is not included in the IRA dataset and is still active today.



### 29 November – 12 December 2015

A string of accounts created in 2013 were activated, their purple-coloured tweets bridging two areas of the network. This connection was abruptly cut off by 1 February. There are a few tweets containing #BlackLivesMatter here, and many about Christmas. They are mostly retweets containing hashtags and mentions, and almost none of them contain URLs.

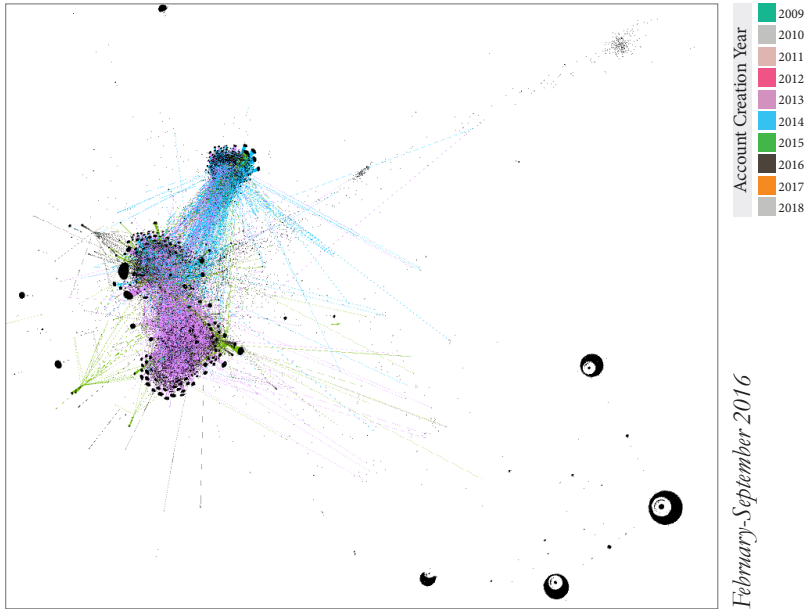


November-December 2015



### 1 February – 25 September 2016

Internet Research Agency account activity stabilised. An ebb and flow of tweets can be seen between the 2013-created (purple, at the bottom) retweeting bots, and the 2014 (blue, at the top) bots, occupied with retweeting and pushing trending hashtags.

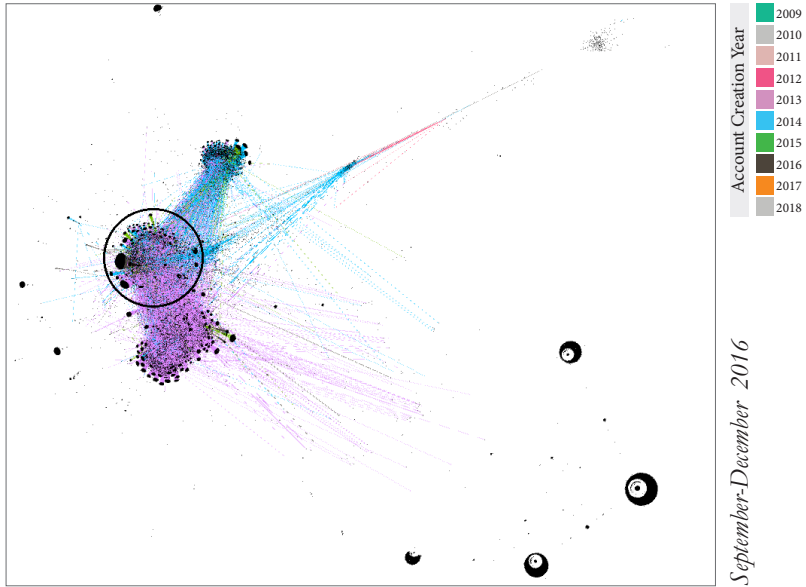


### September – December 2016

This is the US presidential election period, with the election taking place on 8 November. We observe a gradual build-up of tweets across the network with a jump up in October—best observed on the [animated timeline](#)<sup>23</sup>.

This increase continues into November and peaks on election day. Internet Research Agency tweets containing US-related topics were primarily concentrated in the circled area below.

<sup>23</sup> <https://vimeo.com/305925342/d7a66ceb9>



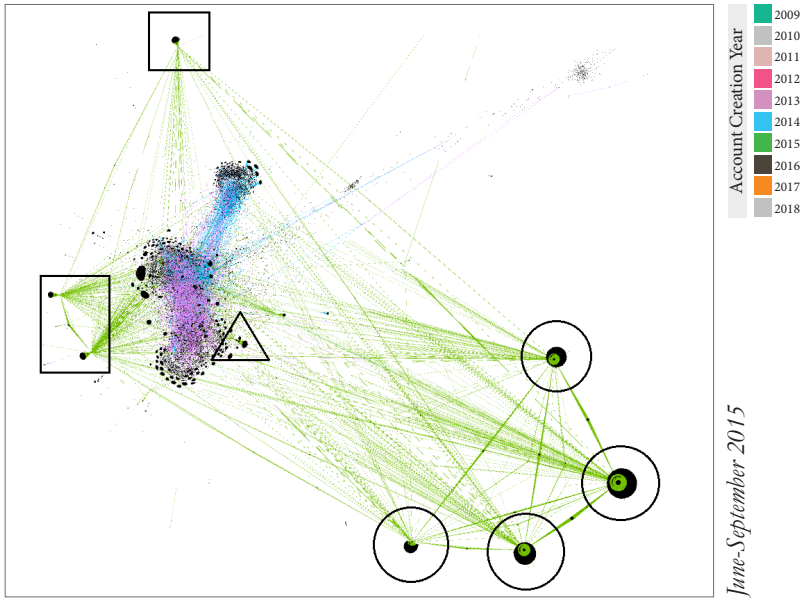
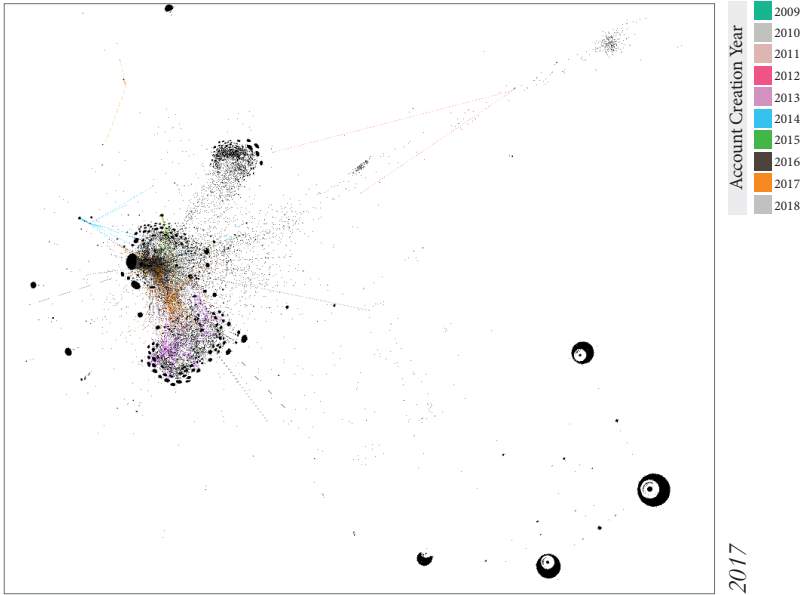
## 2017

Things begin to wind down. The first top-trending hashtag cluster began to die down in April. The US-related cluster toward the centre died down in May. The non-US related clusters near the centre lingers before it stops tweeting around August. A 2016-created account (navy blue), very vocal throughout the election season, takes one figurative last breath—a burst of tweets around 8 November, Trump’s one-year anniversary of being elected—and ‘dies’ late in the month (see next page).

### **Survival of the fittest**

#### 1 June – 1 September 2015

By June 2015, Trump had announced his candidacy, and over 150 million Americans had seen IRA content on social media. A small group of new accounts was deployed between the beginning of June and the end of August, eight of which can be seen below in green. In their short life-span they made considerable noise, but simultaneously gained few followers. In fact, all seven of those seen to the right were never used again.



The green user that continued to be used was @gloed\_up, a pro #BlackLivesMatter ‘person’ who gained 28,943 followers. @gloed\_up’s footprint is recorded in the little green burst outlined by the triangle in the centre of the network, just beneath the purple area.

The two accounts outlined in squares were active only in June and July, retweeting other accounts’ tweets, which were exclusively about the US, with no hashtags, but sometimes with URL links. These were the only accounts in the network to tweet exclusively about the US. All eight accounts claimed to be located in Washington, DC — two biographies mentioned ‘Free Talk’ (it is possible the Russian creators meant to write ‘free speech’). The accounts followed about two other accounts each and were created on 11, 12, and 13 June. They gained nearly 60 followers during their two-month life span.

Four accounts were active in August and September only (outlined in circles above), and tended to tweet about ‘exercice en masse’.<sup>24</sup> These four accounts alone tweeted huge numbers of original URLs about ‘working out’.<sup>25</sup> They followed around three other accounts each. They managed less than 460 followers each before being shut down by Twitter. These accounts were created between 22 June and 9 July 2015.

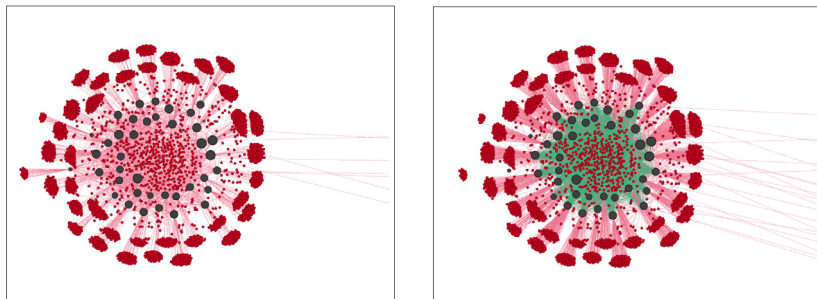
### **Timeline of Russian-language tweets in the IRA dataset**

The Russian-language data we analysed was created from a randomly selected group of 450,000 tweets, a subset of the 4.6 million (4,583,000) Russian-language tweets posted by 1,534 accounts in the same IRA dataset of 9 million tweets provided by Twitter (see illustrations on the next page).

There are 39 IRA trolls (the black dots) in this burst who are very clearly communicating with different users to the rest of the network. (Note: this network was derived from a 450,000-tweet subset of the 5 million Russian-language tweets.) The left burst is from September 2014, and is only retweets (pink). The right burst is from October 2014—October 2015, when users began sending original tweets *only* to Twitter users who were mentioned by more than one IRA account (this is known because there are no green edges—retweets—leading to red nodes in the outer ring).

.....  
24 These circled accounts tweeted a large number of similarly structured tweets (a URL, exercise-related sentence, and multiple account mentions).

25 For example, one tweet from a circled account was <http://t.co/qpl7nbff0sr> abs workout done motivated @\_bigdaddybyrce @\_joneee @buzzzzzzzy11 @boomitzash @wizsnazzy @kaileyking2 @ethan\_regal’.



*The Burst in the Mention Network*

*Left image: September 2014 (the first month of interaction with the red users)*

*Right image: October 2014 – October 2015 (one year of steady interaction – retweeting the outer users, sending original and retweets to the inner users)*

The 39 users were all created on either 2, 3, or 4 September 2014, had an average of 455 followers, and were following about 441 people. These users also had no biographies, reported locations, or links to profile image URLs recorded. This begs the question of how ‘real’ these profiles would have looked due to the lack of personal content.

A deeper look into the mentioned users (red dots) who are not in the IRA dataset in this organised sub-network showed that they are also suspended accounts. Usernames checked ranged from real-sounding names such as @LaurenElliot and @AndrewDevon1 to random letter combinations such as @ahcdbhrjqfsg. Users from the outer edges of the burst and from the middle selection were randomly selected and searched on Twitter by hand, and every single one tested is now a suspended account.

For example, a non-IRA user named @ahcdbhrjqfsg who was mentioned in the burst was searched on Twitter. The account was suspended, but searching their name in the Twitter search bar showed tweets which mentioned them:

These tweets contain no hashtags or URLs, but some are clearly ‘copy and paste’ headlines.<sup>26</sup> This leads us to suspect two things. First, that the suspended

.....  
<sup>26</sup> Lauren Eads, ‘Suntory Acquires Beam in \$16BN Deal’, *The Drinks Business*, 13 January 2014; Staff, ‘Ukraine Ex-minister Injured as Terror Trial Protesters Clash with Riot Police’, RT, 11 January 2014; Slavic Nationalist Forum, [Ukraine Thread](#), October 2013.

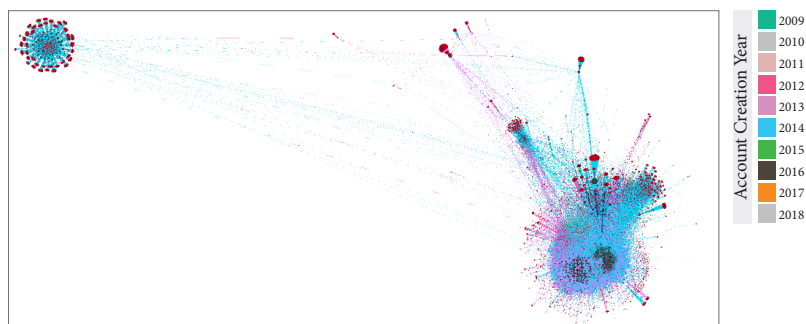


users who were mentioned by the IRA accounts are also part of the IRA (or a related Russian) troll farm. Second, users who are still active on Twitter (like the ones in the above screenshot) may also be IRA or Russian trolls who have not been taken down yet due to the inauthenticity of their tweets (which were all published during the time the organised burst was active), and follow the same format of tweets (without URLs or hashtags).

The detailed planning and execution of this burst exemplifies the organisation and strategy that the IRA puts into their operations.

This screenshot of, presumably, a network of IRA users tweeting to Russian IRA accounts (like @ahcdbhrjqfsg) further underscores our hypothesis that Twitter's work on cleaning up IRA bots is far from complete. Active users who match the profile of an IRA bot are present in the English-language dataset, as we'll also see in the Russian-language dataset.

### *The Russian-language Mention Network*



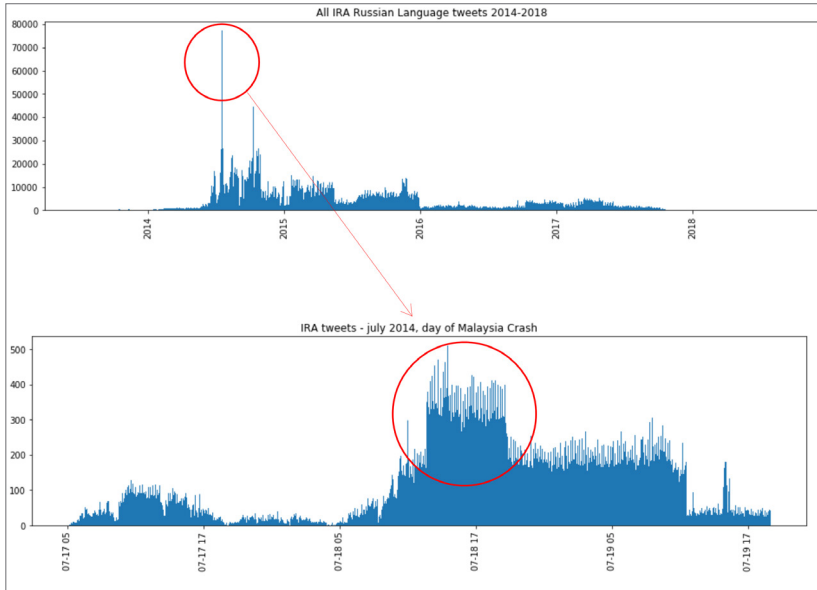
Visualised here is the entire user-to-user (mention) network of Russian-language tweets. The black nodes or dots are IRA bots. The red nodes are not IRA bots and are presumably regular Twitter accounts.

Where an IRA bot or account (often trolls) mentions a non-IRA account using that account's Twitter @handle, a line is drawn between the two. The colour of the line connecting the two denotes the bot account's creation year. We found that ninety-five percent of IRA interactions with Twitter users were undertaken by bots created in 2013 and 2014. The top left visualises an organised burst of IRA trolls mentioning Twitter users. The right side contains the rest of the interactions between IRA accounts and other accounts.

#### *A Closer Look at the Timeline – MH17 tweets*

On 17 July, 2014, during the Battle of Shakhtarsk in the War in Donbass, Malaysia Airlines Flight 17 (MH17) was downed by a Buk surface-to-air missile launched from pro-Russian separatist-controlled territory in Ukraine. MH17 was a passenger plane, scheduled to fly from Amsterdam to Kuala Lumpur. All 283 passengers and 15 crew on board were killed.

The governments of Australia and the Netherlands held Russia responsible for the attack, based on results from an investigation by the Dutch Safety Board and a Dutch-led joint investigation team, who concluded that a missile had been fired at MH17 from a Russian Federation 53rd Anti-Aircraft Missile Brigade Buk, transported from Russia on the day of the crash.



After firing on MH17 from a rebel-controlled area, the launcher was returned to Russia.<sup>27</sup>

The incident, and the pro-Russian separatists presumed responsible, were roundly condemned in the Western press; one Dutch tabloid ran a photo-collage of pro-Russian rebel commanders with a single-word headline: ‘Moordenaars’ (Murderers).<sup>28</sup> Reports in Russia differed, and as early as August 2014, 80% of Russians polled believed the Ukrainian military had downed the plane, with only 3% blaming pro-Russian separatists.<sup>29</sup>

Our analysis and visualisation of Russian-language IRA Twitter data shows that within 48 hours of the attack, Russian-language IRA accounts experienced their highest volume of activity, spiking with hundreds of tweets per hour. This surge of activity continued until 19 July, when it markedly subsided.

27 Crash of Malaysia Airlines Flight MH17 (PDF) (Report). Dutch Safety Board. 13 October 2015. Archived from the original (PDF) on 13 October 2015; Matthew Weaver, ‘MH17 Crash Report: Dutch Investigators Confirm Buk Missile Hit Plane—Live Updates’, *The Guardian*, 13 October 2015. [Retrieved 13 October 2015].

28 Adam Withnall, ‘Malaysia Airlines MH17 Crash: Dutch Newspapers Respond with Anger and Despair as Wait for Return of Bodies continues—Europe—World’, *The Independent*, 21 July 2014. [Retrieved 22 July 2014].

29 Alec Luhn, ‘MH17: Vast Majority of Russians Believe Ukraine Downed Plane, Poll Finds’, *The Guardian*, 30 July 2014. [Retrieved 2 August 2014]



Eventually, all Russian-language tweeting from the IRA dataset released by Twitter tapered off at the start of 2016.

As evidenced earlier, a high level of tactical organisation, planning and coordination between accounts is demonstrated.

### **Patterns and Conclusions**

The aim of this piece of data analysis and visualisation is to glean a few of the tactics of the Internet Research Agency with regard to interference in foreign affairs and elections, using Twitter as a platform. With the English-language dataset, we have focused on the United States presidential election, with the occasional note concerning the United Kingdom. As stated earlier, for the Russian-language dataset, our focus has been on form, format, and distribution, rather than content. We conclude:

- The Internet Research Agency prefers to use trending hashtags like #ifgooglewasagirl, and #myamazonwishlist to get in on conversations. This allows both bot- and manually-operated accounts to gain followers from a broad spectrum of Twitter users.
- The Internet Research Agency tested spam bots (the green ‘exercise’ and US-topic accounts), spreading high volumes of URLs in 2015. They subsequently abandoned this strategy within four months when these accounts failed to gain more than 700 followers (the number is arbitrary; the volume is key).
- The year a Twitter account was created played a significant role in the bot type created:
  - 2013 (purple) bots were in on potentially polarising conversations in the centre of the network, and were the key US election tweeters in the network
  - 2014 (blue) bots were used to retweet trending hashtags
  - Except for a small number of accounts, 2015 (green) bots never tweeted for more than two months. Although they all posted large volumes of content, they never gained sufficient popularity or influence, which perhaps explains why they were never used again
  - There were few 2016 (navy blue) bots, but one continued tweeting long past the first anniversary of Trump’s election, despite not gaining great popularity (> 5,000 followers)

- 2017 (orange) bots were only used in August 2017 and posted hashtags, but did not try to engage with other Twitter users through mentions
- The centre of both English-language networks resembles a magnet with two opposing forces
  - This means that the Internet Research Agency bots in each section were retweeting different accounts, and using different hashtags
  - One side appears to be weighted toward the US election, while the another is more related to #BlackLivesMatter tweets
- It would appear that all Internet Research Agency accounts (released by Twitter) were disposable, and would not be reused if they were unsuccessful accounts
- 2014 (blue) bots appear to be more automated than 2013 (purple) bots (it is possible the 2013 bots have more advanced algorithms for targeting specific content—this bears further research, should the data be made available)
  - The blue trending topic net was non-polarizing, and simply retweeted trending hashtags (this is automatable), and only deployed towards the centre of the network at pivotal times—early 2015 (the time of creation), and the end of 2016 (the US election)
  - The purple centre cluster was polarized by the directions of the bursts, and the accounts seldom interact with one other until the approach of the US election (November 2016)
- There were distinct locations within the visualisations for certain types of tweets, as those accounts tended to form ‘communities’ around their tweeting habits (or algorithms)
- In both the Russian-language mention and hashtag networks, accounts with more than 1,000 followers tended to target the same users and hashtags
- Usage of different groups of hashtags changed over time, as did targeted users over time
- Russian-language tweeting tapered off immediately at the start of 2016
- The most tweeted moment in the entire Russian-language dataset was the day after Flight MH17 was shot down over Ukraine (July 2014)
- The highly organized Russian-language subset:
  - There is an interesting community of bots tweeting at a group of accounts from September 2014 – October 2015.

They begin with retweeting the non-IRA accounts, then begin sending original tweets mid-2015

- This sub-network was active for 13 months. The first month showed distinct interaction patterns (only retweets), then the following twelve months showed a different pattern (retweets of some accounts, original tweets being sent to other accounts). This is another example of the IRA testing one idea (in the first month), then changing it (the subsequent 12 months), and keeping it active if it meets certain criteria.
- A random subset of accounts being tweeted at in the sub-network was manually searched on Twitter in January 2019, and each of these accounts has been suspended by Twitter.
- The work resulting from Russian Twitter influence strategy is highly organised. We observed this when IRA trolls faked the #ColumbianChemicals explosion in English, and when the trolls engaged in organized communication in the subset of Russian-language retweets and original tweets to targeted accounts.
- The Russian-language tweet analysis underpins a finding in the English-language analysis—that Twitter has not yet shut down all IRA accounts (some are still active, see screenshot of tweets to @ahcdbhjrjfqfsg below). Twitter has likely also not included all IRA tweets of which they are aware in the IRA dataset, as some suspect accounts tweeted to by IRA bots are currently suspended by Twitter, but not in the dataset.

We have learned through analysis of the English-language dataset that flattening the time component of a network visualization omits important details; this dataset has adopted a time-based analysis:

- Flattening gives regions that were active over a short time period the same level of visual importance as regions that were only active for a long period of time (like the green exercise URL sharers on the right of the user-to-user network).
- Viewing region growth over time allows for new patterns to be spotted, and makes it clear that highly-active, short-lived campaigns are typically of a different order of importance than longer-lived campaigns.

The dataset provided contained 9 million tweets from just under 4000 suspected-IRA accounts. Based on what we have seen, we must call into question whether

Twitter has successfully shut down all related accounts, and whether they have provided the public with all of the IRA accounts of which they are aware of. We have observed accounts that are currently active on Twitter that are connected to IRA accounts through one degree of separation (IRA tweeted to @ahcdbhrjqfsg, and so did accounts which are active today), which have themselves tweeted according to similar inauthentic tactics (copy-pasted news headlines) during the same time that IRA accounts were active (mid-2015). We have also noted accounts which are currently deleted who were tweeted to by IRA accounts, and whose usernames follow similar patterns to IRA tactics such as names of realistic-sounding local news sources: @kcitynews and @detroitpost, for example.

First widely exposed in the West in 2014,<sup>30</sup> the Internet Research Agency has proven formidable in Middle East, Ukrainian, post-Soviet, European, and American elections, and affairs of national importance. Although we examine only Twitter here, in nearly every exposure of the IRA's activities the common element of each campaign is social media amplification. As we've shown, the IRA's work is highly organised, sophisticated, and well-resourced, with as many as 1,000 employees working for them in 2015.<sup>31</sup> Whether the agency has been instrumental in swinging elections or shifting public opinion is a subject for further research, but the tactics and strategies of the IRA and other Russian troll farms are without doubt well worth the attention of Western civil society.

\*\*\*

## Bibliography

Bastian, M., Heymann, S., and Jacomy, M., Gephi: An Open Source Software for Exploring and Manipulating Networks, 2009, p. 2.

Calamur, Krishnadev, 'What Is the Internet Research Agency?', *The Atlantic*, 16 February 2018. [Retrieved 22 December 2018].

Chen, Adrian, 'The Agency', *New York Times Magazine*, 2 June 2015.

Collins, Damien, Clive Efford, Julie Elliott, Paul Farrelly, Simon Hart, Julian Knight, et al., Disinformation and 'fake news': Final Report (House of Commons: Digital, Culture, Media and Sport Committee, 2018), p. 89.

.....  
30 Max Seddon, 'Documents Show How Russia's Troll Army Hit America', *BuzzFeed*, 2 June 2014. [Retrieved 12 June 2016]. Russian reprint: Документы показали, как армия российских троллей атакует Америку (InoPressa).

31 [https://en.wikipedia.org/wiki/Internet\\_Research\\_Agency#cite\\_note-BuzzFeed\\_02.06.2014-3](https://en.wikipedia.org/wiki/Internet_Research_Agency#cite_note-BuzzFeed_02.06.2014-3)

@DFRLab, [#TrollTracker: Twitter's Troll Farm Archives](#), Digital Forensics Research Lab on Medium, 17 October 2018. [Retrieved 20 December 2018].

Gadde, Vijaya and Yoel Roth, [Enabling further research of information operations on Twitter](#), Twitter Blog, 17 October 2018. [Retrieved 16 December 2018].

Gagliardi, Natalie, [Twitter Says 50,000 Russia-linked accounts Tweeted During 2016 US Presidential Election](#), ZDNet, 19 January 2018. [Retrieved 10 December 2018].

Grandjean, Martin, [GEPHI – Introduction to Network Analysis and Visualization](#), 14 October 2015, p. 12.

Groch, Sherryn, [Twitter Bots More Influential than People in US Election: Research](#), *The Sydney Morning Herald*, 14 September 2018. [Retrieved 10 December 2018].

Howard, Philip N., Bence Kollanyi, Samantha Bradshaw, and Lisa-Marie Neudert, [Social Media, News and Political Information during the US Election: Was Polarizing Content Concentrated in Swing States?](#), *arXiv.org*, 2018.

Howard, Philip N. and Samantha Bradshaw, [Challenging Truth and Trust: A Global Inventory of Organized Social Media Manipulation](#), The Computational Propaganda Project (Oxford Internet Institute, 2018).

[Internet Research Agency Indictment](#), Case 1:18-cr-00032-DLF, United States District Court for the District of Columbia, Document 1, Filed 16 February 2018.

Krasodonski-Jones, Alex, Carl Miller, Jamie Bartlett, Josh Smith, Agnes Chauvet, Elliot Jones, [Russian Influence Operations on Twitter](#), Demos, 1 November 2018.

Luhn, Alec, [MH17: Vast Majority of Russians Believe Ukraine Downed Plane, Poll Finds](#), *The Guardian*, 30 July 2014. [Retrieved 2 August 2014].

Maynes, Charles, [Inside the Internet Research Agency: a Mole Among Trolls](#), *Voice of America*, 17 April 2018. [Retrieved 11 December 2018].

Rizoïu, Marian-Andrei, Timothy Graham, Rui Zhang, Yifei Zhang, Robert Ackland, and Lexing Xie, [#DebateNight: The Role and Influence of Socialbots on Twitter During the 1st 2016 U.S. Presidential Debate](#), *arXiv.org*, 2018.

Sear, Tom and Michael Jensen, 'Russian trolls targeted Australian voters on Twitter via #auspol and #MH17', *The Conversation*, 22 August 2018.

Silver, Nate, 'How Much Did Russian Interference Affect The 2016 Election?', *FiveThirtyEight*, 16 February 2018. Retrieved 10 December 2018].

Steinbach, Michael, George Karypis, and Vipin Kumar, 'A Comparison of Document Clustering Techniques. *KDD Workshop on Text Mining*', 2000, p. 2.

Stewart, Leo G., Ahmen Arif, and Kate Starbird, 'Examining Trolls and Polarization with a Retweet Network', paper presented at *MIS2: Misinformation and Misbehaviour on the Web Workshop 9 February 2018, Los Angeles, CA*, p. 6.

Weaver, Matthew, 'MH17 Crash Report: Dutch Investigators Confirm Buk Missile Hit Plane—Live Updates', *The Guardian*, 13 October 2015. [Retrieved 13 October 2015].

Withnall, Adam, 'Malaysia Airlines MH17 Crash: Dutch Newspapers Respond with Anger and Despair as Wait for Return of Bodies continues—Europe—World', *The Independent*, 21 July 2104. [Retrieved 22 July 2014].