Deviant Mobs of the Internet Bots, Trolls, and Misinformation

Nitin Agarwal, Ph.D. (nxagarwal@ualr.edu)
Endowed Chair and Distinguished Professor
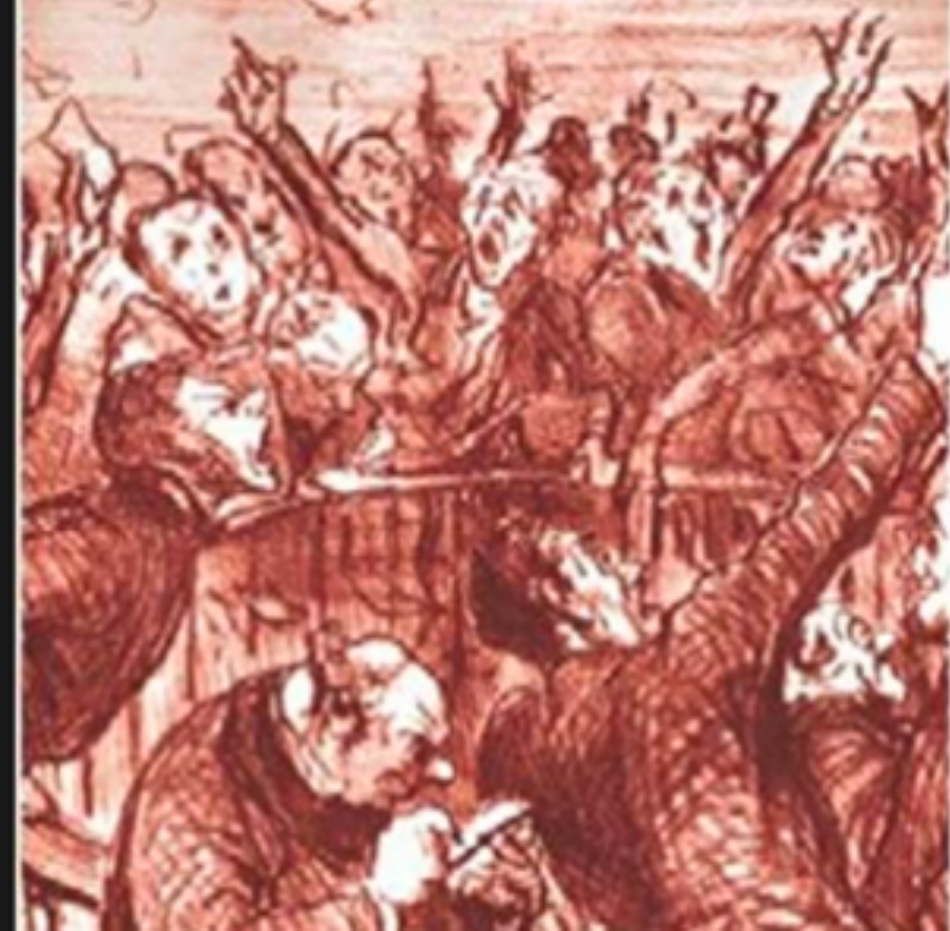Collaboratorium for Social Media and Online Behavioral Studies (COSMOS)
University of Arkansas – Little Rock

The Crowd

- Gustav Le Bon (1895), *The Crowd: A Study of the Popular Mind*

- Expressed skepticism about the shift from an agrarian society to city living. Le Bon wrote, the urban crowd is marked by "impulsiveness, irritability, incapacity to reason" and "the exaggeration of the sentiments." A man on his own "may be a cultivated individual," but "in a crowd, he is a barbarian."

- Now, we have "Twitter mobs"

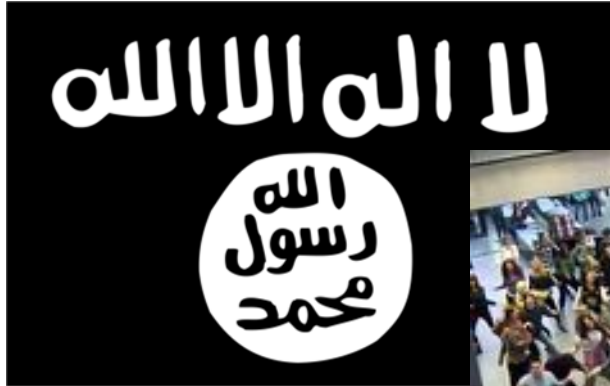# Vicious "Online" Mobs

HOW WHATSAPP FUELS FAKE NEWS AND VIOLENCE IN INDIA

SHARE

BY THE TIME police arrived in the hamlet of Rainpada on July 1, 2018, the village council office was the scene of a massacre.

The New York Times

PLAY THE CROSSWORD Account

THE INTERPRETER

Where Countries Are Tinderboxes and Facebook Is a Match

False rumors set Buddhist against Muslim in Sri Lanka, the most recent in a global spate of violence fanned by social media.

3

Online Deviant Groups

Terrorist & Extremist Gro...

Networks (DHNs)

Anti-NATO Propagandist

Internet Trolls

Worst start to the year for measles in a quarter century

Confirmed measles cases in January and February of each year
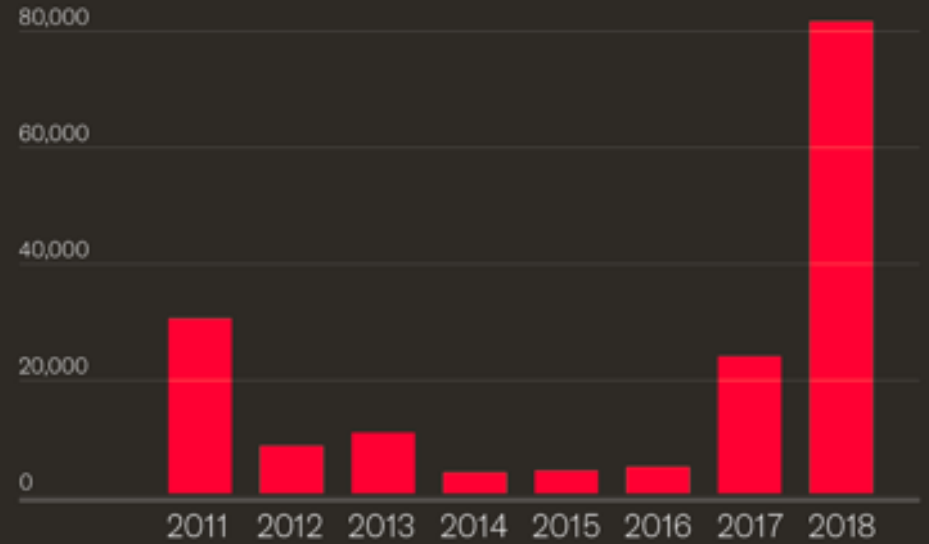
206

Note: Monthly data for 2004 is not available.
Source: Centers for Disease Control

THE WASHINGTON POST

Measles is storming back in Europe

It is **shocking** that people are still dying of measles in Europe in 2019.

SOURCE: ECDC

The 206 cases in January and February already surpass annual totals in the past decade.

IFRC Europe Regional Director, Simon Miss... said "Europe refused to... trend worldwide."

Health & Wellness Misinformation

"Statins cause Cancer!"

Pink salt will "regulate your blood sugar and sleep cycle."

Misinformation in Agriculture

THE WALL STREET JOURNAL.

Russian Trolls Tweeted Disinformation Long Before U.S. Election

Tweets about contaminated water, tainted turkey look to security experts like practice for the political season

By Rob Barry | Graphics by Shane Shifflett
Published Feb. 20, 2018 at 3:30 p.m. ET

Numerous fake reports of contaminated turkey in Walmart before Thanksgiving 2015. Within hours several hundred claims were reported on Twitter. Walmart ignored it as a hoax. Many of the claims came from accounts linked to a pro-Kremlin propaganda agency charged by Special Counsel Robert Mueller's office.

Anti-GMO articles tied to Russian sites, ISU research shows

Donnelle Eller, deller@dmreg.com   Published 8:42 p.m. CT Feb. 25, 2018

OBESITY
TYPE 2 DIABETES
AUTISM
INTESTINAL DISEASES
KIDNEY DISEASES

Genetically engineered crops are safe for humans and animals to eat and have not caused increases in cancer, obesity, gastrointestinal illnesses, kidney disease, autism or allergies, a report finds. USA TODAY

Misinformation in Disasters
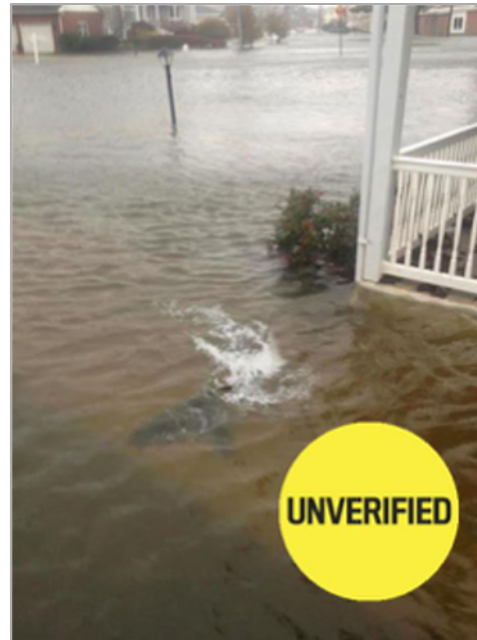
During **Hurricane Sandy in 2012,** the following rumors were floating on social media.
- Sharks swimming through waterlogged suburban neighborhoods,
- Statue of Liberty engulfed in ominous clouds, and
- Floor of the New York Stock Exchange flooded.

Source: http://www.nytimes.com/2012/11/01/technology/on-twitter-sifting-through-falsehoods-in-critical-times.html

During **Hurricane Harvey in 2017**, again the "shark on highway" hoax went viral.
Source: https://www.washingtonpost.com/news/the-intersect/wp/2017/08/28/no-the-shark-picture-isnt-real-a-running-list-of-harveys-viral-hoaxes/

"Shark on Highway" Hoax during Disasters

During crises events, misinformation is rampant. One of the most commonly spread hoaxes is "shark on highways". Timeline below illustrates this hoax as it is propagated during various hurricanes in the U.S.
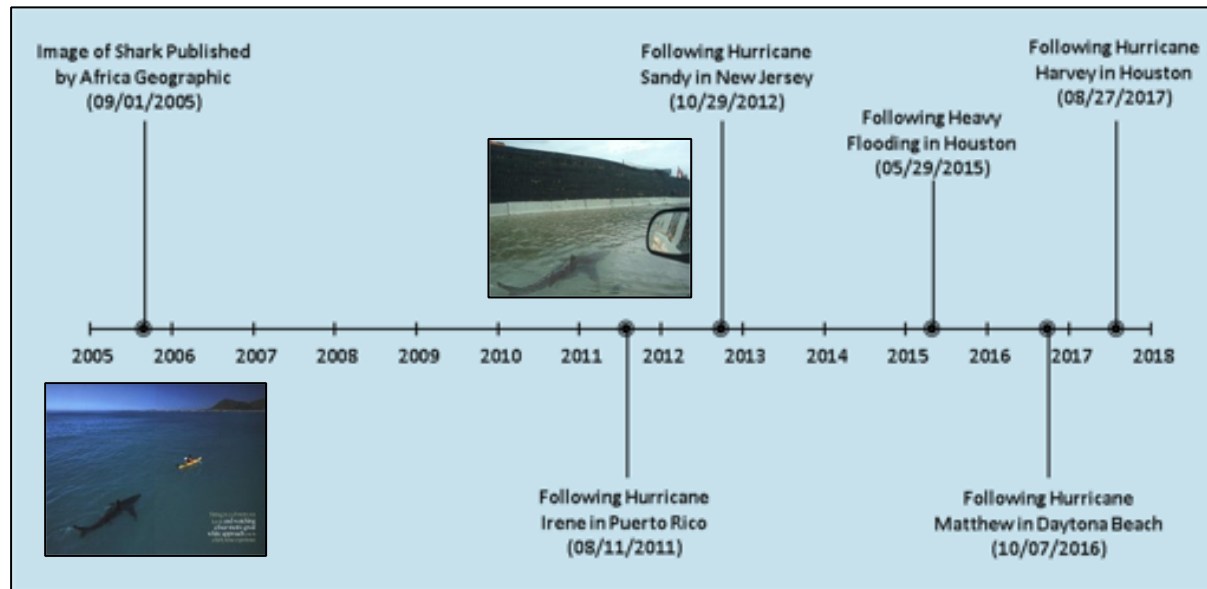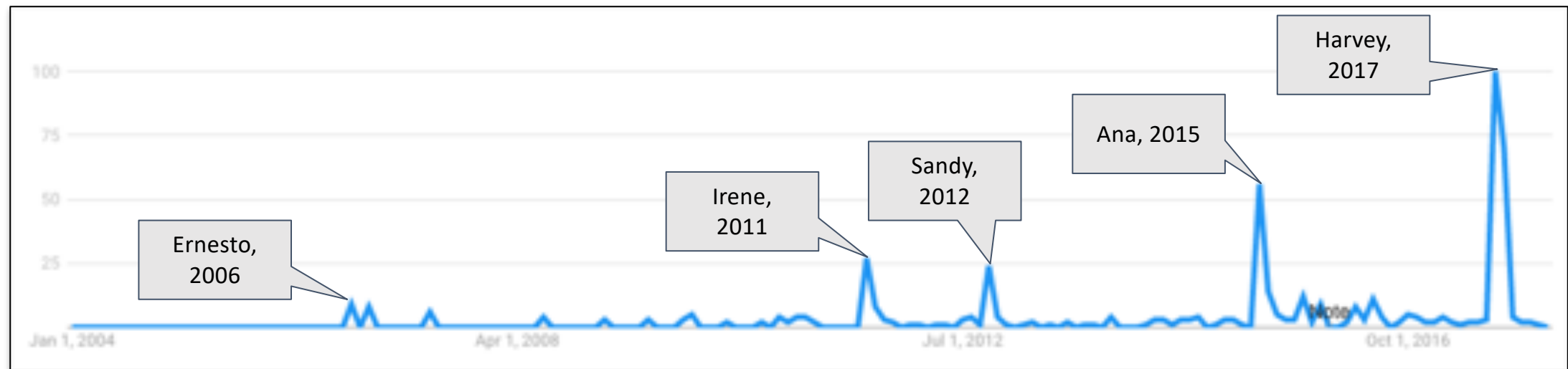

Original image was published in Africa Geographic magazine in September 2005.

Used as hoax during Hurricane Irene in 2011, Hurricane Sandy in 2012, Houston Flood in 2015, Hurricane Matthew in 2016, and finally in our collected datasets for Hurricane Harvey, Hurricane Irma, and Hurricane Maria in 2017.

A simple analysis about "shark on highways" using Google Trends shows the following... (next slide)

Shark Hoax over Time

Interest in the hoax, "shark on highways" has grown significantly over time. Illustrated below is the interest volume in the shark hoax over 2004 - 2017 period. Interestingly, spikes align with weather events, starting from Ernesto (2006) to Harvey (2017). Bigger spikes in the trend are observed in the recent years.

Computational (AI) Propaganda

Fake text:

https://www.youtube.com/watch?v=XMJ8VxgUzTc

Fake images:

https://thispersondoesnotexist.com/

Fake videos:

https://www.youtube.com/watch?v=cQ54GDm1eL0

Manipulation & Monetization

- Many people trust news that comes from their friend circle on social media channels
    - 34% Americans <u>trust the information</u> from social media (Pew Research Center, 2016).
    - 14% Americans consider social media as <u>the most important source of information</u> (the National Bureau of Economic Research (NBER), 2017).

Reputable Sources

Percentage of Americans who trust the information they get from ...

LOCAL NEWS	82%
FRIENDS AND FAMILY	77%
NATIONAL NEWS	76%
SOCIAL MEDIA	34%

SOURCE: PEW RESEARCH CENTER
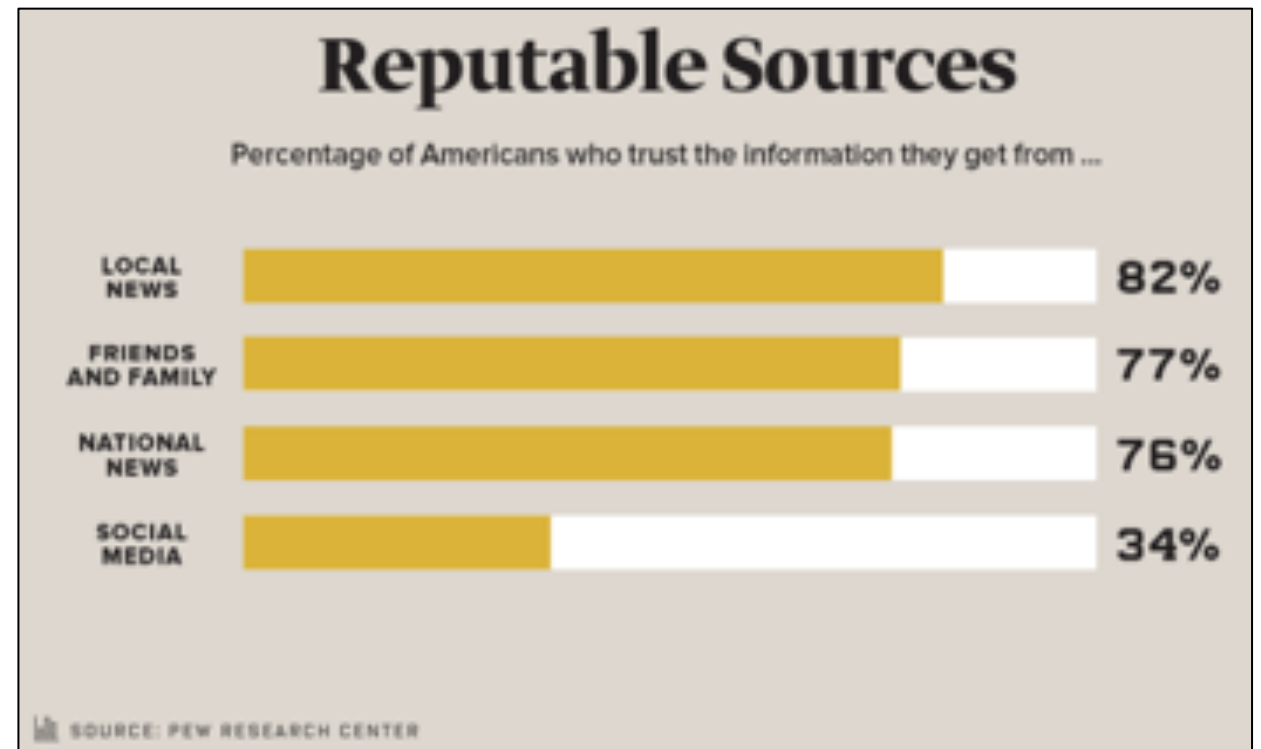
Manipulation & Monetization

- Running a fake-news campaign is cheap:
    - For $55,000 you could discredit a journalist;
    - For $200,000 you might instigate a street protest.
    - For $30 an 800-word fake news article, written by *Chinese* content marketer Xiezuobang
    - For $621 a video appears in YouTube's main page for two minutes, created by *Russian* firm SMOService
    - For $25 to have 2,500 Twitter followers all retweet a link for you

Source : Cyber security firm Trend Micro, 2017
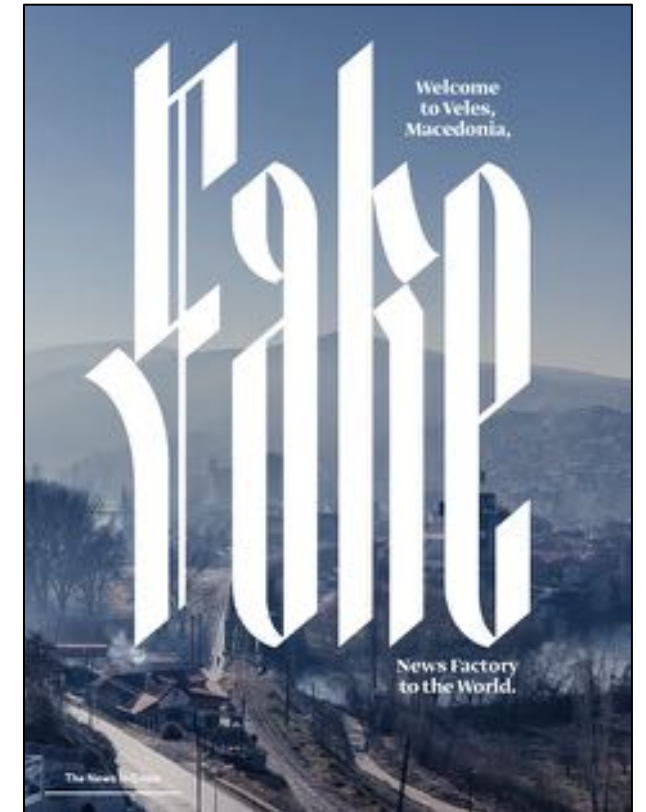
Hysteria Propagation

- Shawn Dawson, a prominent YouTuber released a 104-min documentary with bizarre hypotheses
  - Popular children's TV shows contain subliminal messages urging children to commit suicide
  - Recent string of deadly wildfires in California was set on purpose – to collect insurance or to test "directed energy weapon" by the military
  - Chuck E. Cheese recycles customers' uneaten pizza slices into new pizzas
- Over 30 million views in just one month

YouTube Unleashed a Conspiracy Theory Boom. Can It Be Contained?

Radicalization and Recruitment
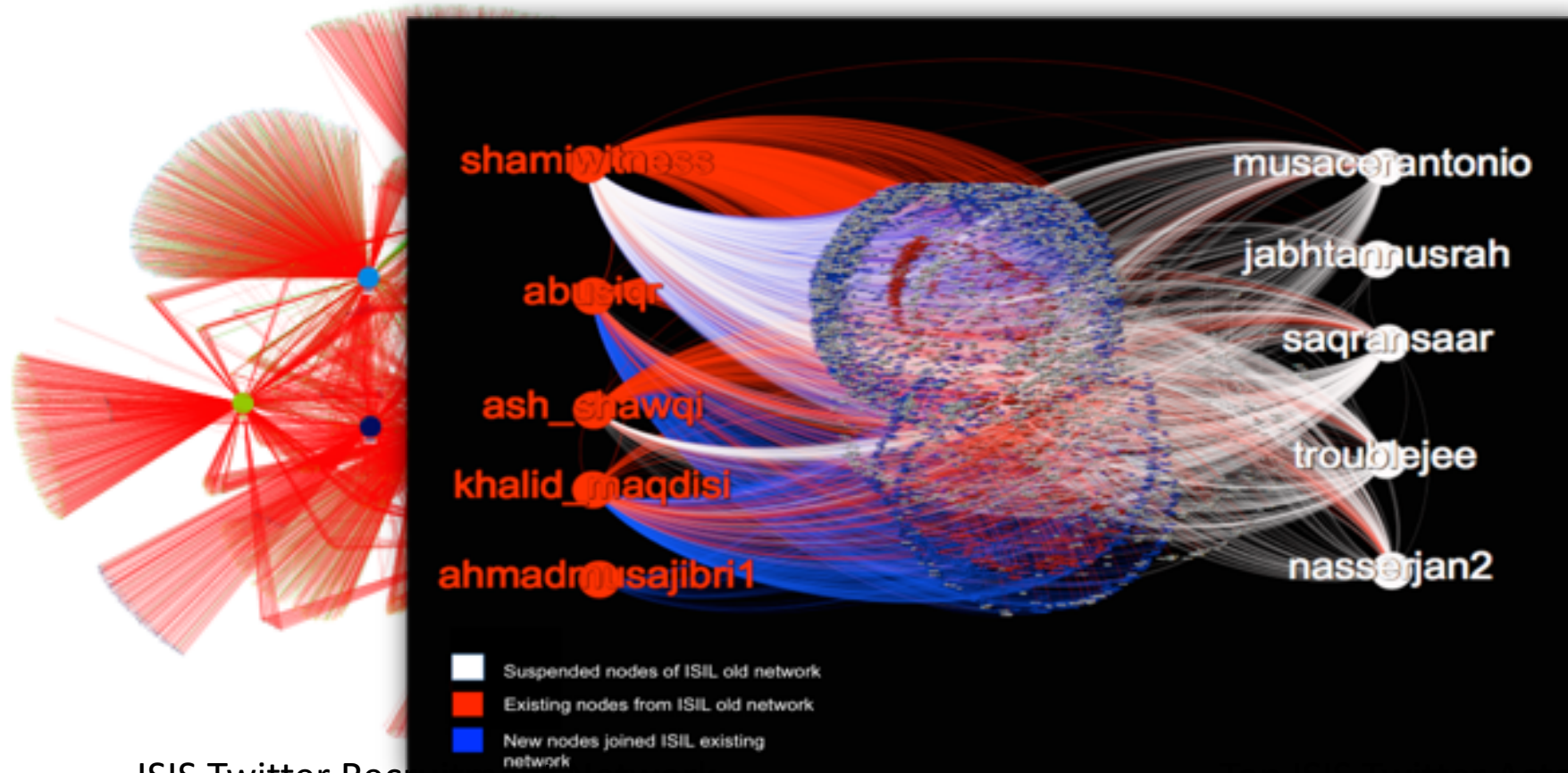
ISIS Twitter Recruitment Network

Top ISIS Twitter Actors' Geolocation Map

Trends in Disinformation Campaigns

- Cross platform orchestration
  - Growing use of niche platforms
- Communities and coordination
  - Flash mob style coordination
  - Blogger communities
  - Blog farms (a.k.a. coordinated clickbait)
  - Computational (AI) propaganda – coordinated deep fakes
- Algorithmic manipulation

Ongoing Efforts

- Actively tracking anti-West, anti-EU, anti-NATO propaganda

- Participated in various NATO exercises to assist public affairs and social media monitoring

Dragoon Ride 2015   Trident Juncture 2015   Brilliant Jump 2016   Anakonda 2016   Trident Juncture 2018   Baltic Operations 2019

- Monitored groups like ISIS, deviant hacker networks

- Monitoring disinformation campaigns in the Asia Pacific region

- Monitoring 2019 Canadian Elections

Cross-Media Dissemination

A YouTube channel with several Anti-NATO propaganda videos. The channel is called, "ANTI NATO".

A blog using YouTube video to spread anti-NATO propaganda suggesting NATO's troops obstructing Russian operations in Syria thereby helping ISIS.
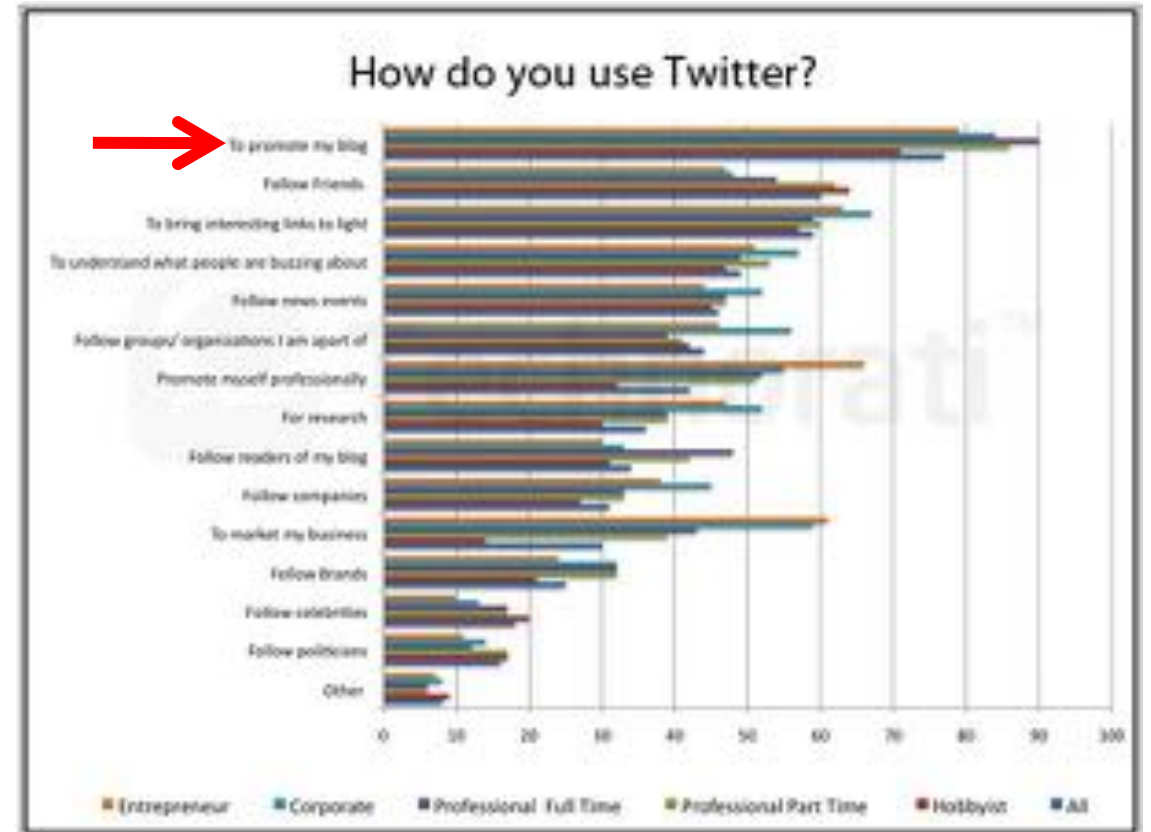

A blog using YouTube video to spread anti-NATO propaganda by suggesting NATO is waging war against Syrian refugees.
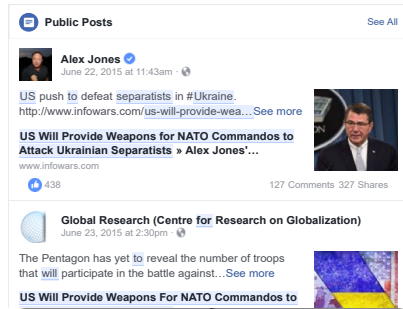
Why Blogs?

- Afford power and freedom to express opinion, frame narratives more effectively than any other social media platform
- No character limit
- No censorship
- Provide digital town halls

How do you use Twitter?

Cross Media Dissemination of Content

"US will provide weapons to NATO Commandos to attack Ukrainian separatists."

Blogs, Fake News, and Influence Operations. *Digital Hydra: False Information Online as a Weapon,* **NATO StratCom COE,** November 2017.

Examining Strategic Integration of Social Media Platforms in Disinformation Campaign Coordination. **NATO StratCom COE,** July 2018
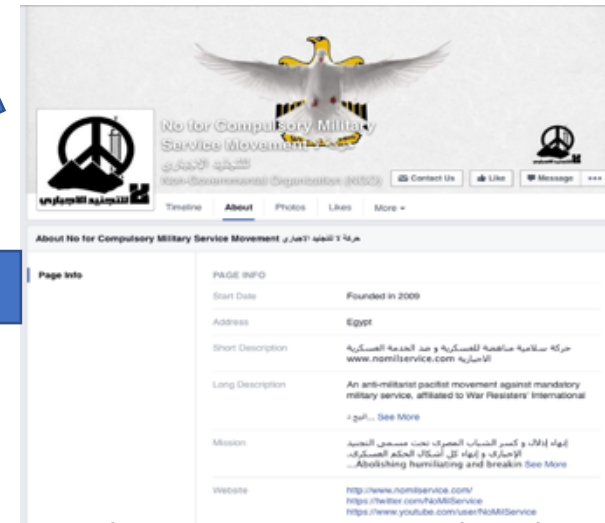
Cross Media Campaign Network

Founder of

@nomilservice

Founder of

affiliated to

@warresistant

No Military Service Facebook page

Social Cyber Forensics

Cyber forensic analysis helps extracting metadata, such as,
- Web traffic tracker codes (Google Analytics IDs)
- Email addresses
- IP address
- Contact details e.g., phone number
- Names under which the domain is registered
- Other digital/social presence e.g., Twitter handles, YouTube links, Facebook profile, other blogs, etc.

Helge Ingstad Collision – Cross Media Integration

Twitter

YouTube

VKontakte

Helge Ingstad Collision – Cross Media Integration

Blog

Other News Media

Cyber Forensic Analysis - The Drive Blog
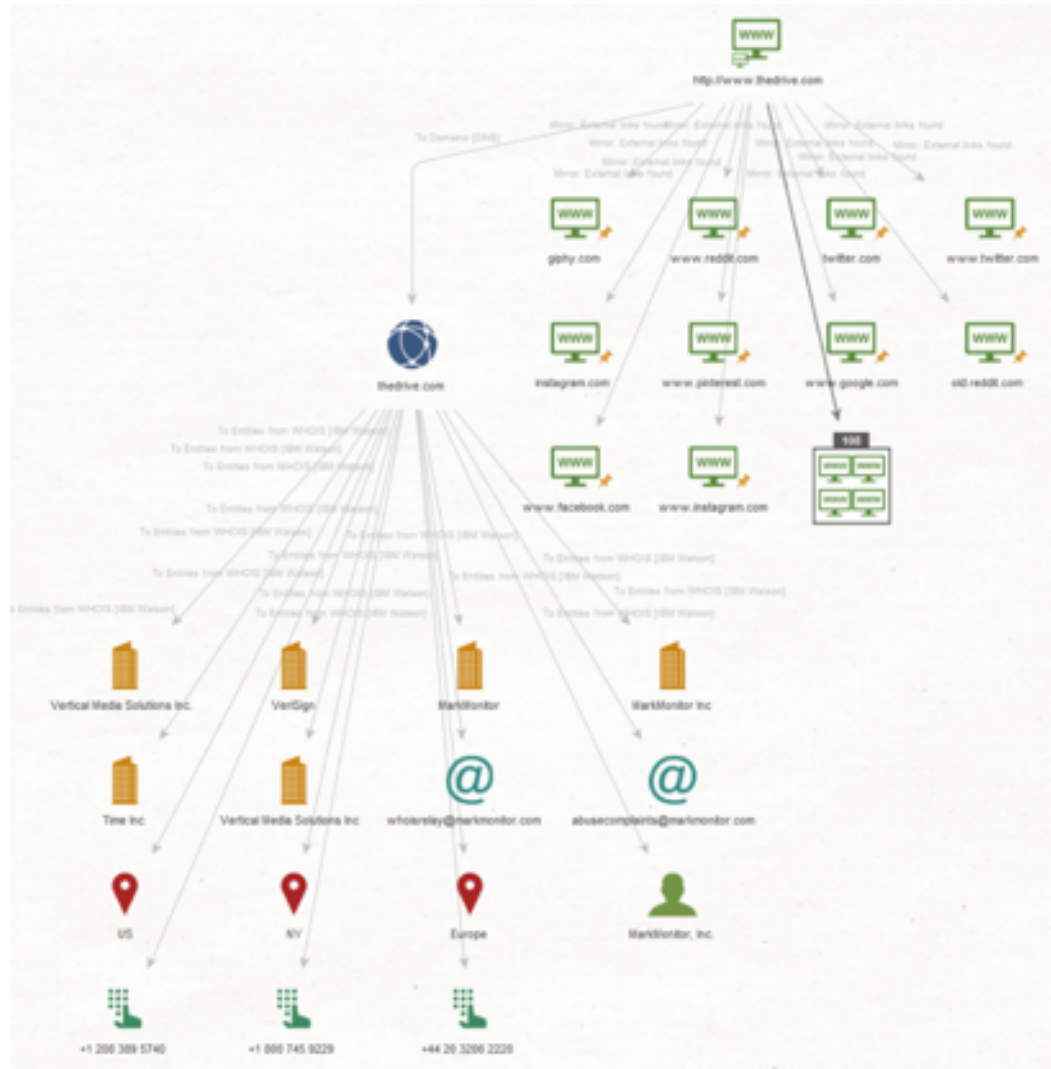
Location	IP address
United States	72.52.10.14
Phone Numbers	Location
+44 20 3206 2220	UK
+1 208 389 5740	USA
+1 800 745 9229	USA

Social Media Footprint – The Warzone Blog
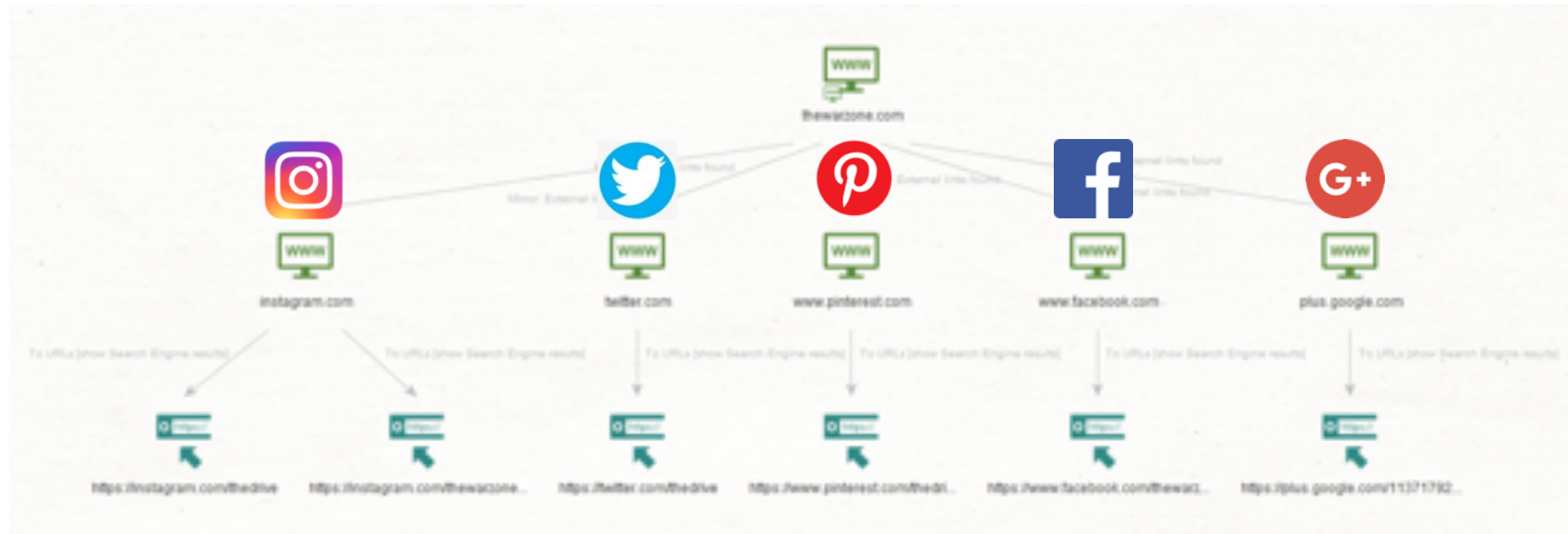
Social Media	URL/Account handle
Twitter	@thewarzonewire [https://twitter.com/thewarzonewire] @thedrive [https://twitter.com/TheDrive]
Facebook	https://www.facebook.com/thedrive https://www.facebook.com/thewarzonewire
Google	https://plus.google.com/+Thedrive-online
Instagram	https://instagram.com/thedrive https://instagram.com/thewarzonewire
Pinterest	https://www.pinterest.com/thedrive0042

Communities and Coordination

Focal Structure Analysis

Bi-level Optimization

Node-level optimization

$$max \sum_{i=1}^{n} \delta_i \qquad (1)$$

Subject to

$$\delta_i = \{d\vec{c}_1 \preceq d\vec{c}_2 \preceq d\vec{c}_3 \preceq \cdots \preceq d\vec{c}_i\} - \overline{dc_j^Q} \qquad \forall i,j \qquad (2)$$

$$d_i^c = \sum_j m_{ij} \qquad \forall i \qquad (3)$$

$$d_i^c \geq 2 \qquad \forall i \qquad (4)$$

$$D_G^L = \frac{1}{n}\sum_{i=1}^{n} d_i^c \qquad (5)$$

$$D_G^L < d_i^c \leq D_G^U \qquad \forall i \qquad (6)$$

$$a_i^c = \frac{(\# \ of \ Triangles) \times 3}{\# \ of \ Connected \ Triples \ of \ Nodes} \qquad \forall i,j,z \qquad (7)$$

$$AC_G^L = \frac{1}{n}\sum_{i=1}^{n} a_i^c \qquad (8)$$

$$AC_G^L < a_i^c \leq AC_G^U \qquad \forall i \qquad (9)$$

$$\vec{C_v} = \{\vec{c_1}, \vec{c_2}, \vec{c_3}, \dots, \vec{c_i}\} - \overline{c_j^Q} \qquad \forall i,j \qquad (10)$$

$$\overline{c\delta_i} = \overline{C_{\delta_i}} \qquad \forall i \qquad (11)$$

$$F = \left\{c_I, \overline{c_j^Q}, \overline{c_{j+1}^Q}, \dots, \overline{c_K^Q}\right\} \qquad \forall j, \kappa \qquad (12)$$

Network-level optimization

$$max \sum_{j=1}^{n} \varrho_j^M \qquad (13)$$

Subject to

$$\varrho_j^M = \{\varrho_1, \varrho_2, \varrho_3, \dots, \varrho_j\} \qquad \forall j \qquad (14)$$

$$\delta_j = \{\vec{c_1}, \vec{c_2}, \vec{c_3}, \dots, \vec{c_n}\} - \overline{c\delta_i} \qquad \forall j \qquad (15)$$

$$B = A_{ij} - \frac{dd^T}{2m} \qquad \forall i,j \qquad (16)$$

$$\xi_j = \{\overrightarrow{c\delta_i} \cup \delta_j | \overline{\delta_i} \neq \delta_j\} \qquad \forall j \qquad (17)$$

$$\varrho_j = \frac{1}{2m} Tr(\xi_j B \xi_j^T) \qquad \forall j \qquad (18)$$

$$\varrho^I \leq \varrho_j \leq \varrho^U \qquad \forall j \qquad (19)$$

Power of Key Coordination Structures

P1.

Importance(Im) → Interest(I)
Interest(I) → Importance(Im)
∴ Importance(Im) ↔ Interest(I)

P2.

Utility(U) → Interest(I)

P3.

Utility(U) → Power(P)

P4.

Power(P) → Importance(Im)
Importance(Im) → Power(P)
∴ Power(P) ↔ Importance(Im)

P5.

Power(P) → Control(C)
Control(C) → Power(P)
∴ Power(P) ↔ Control(C)

Model showing all the factors that help in determining the outcome of a collective action, i.e., Success or Failure.

∵ Power(P) = f(C,Im)
∵ Importance(Im) = f(Interest)
∵ Interest(I) = |$U_{outcome1}$ − $U_{outcome0}$|
∴Power(P)=f(C,|$U_{outcome1}$ −$U_{outcome0}$|)
Or
∴ Power(P) = f(C,I)
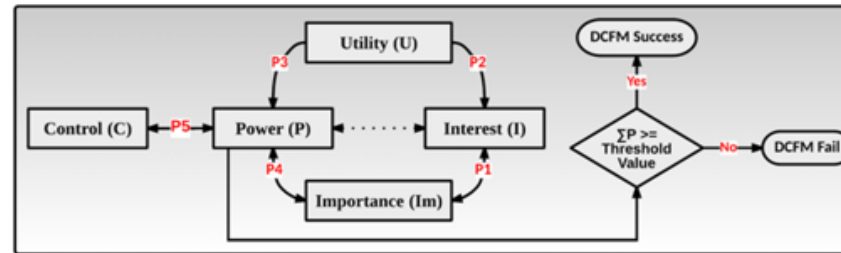
*Published in SBP, SNAM, AAAI, CASON
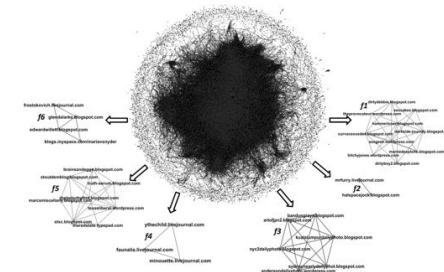
Focal Structure Analysis

- Web-based application

- No installation needed

- Upload network in csv format

- Identifies focal structures and extract/export

http://blogtrackers.host.ualr.edu/fsa/
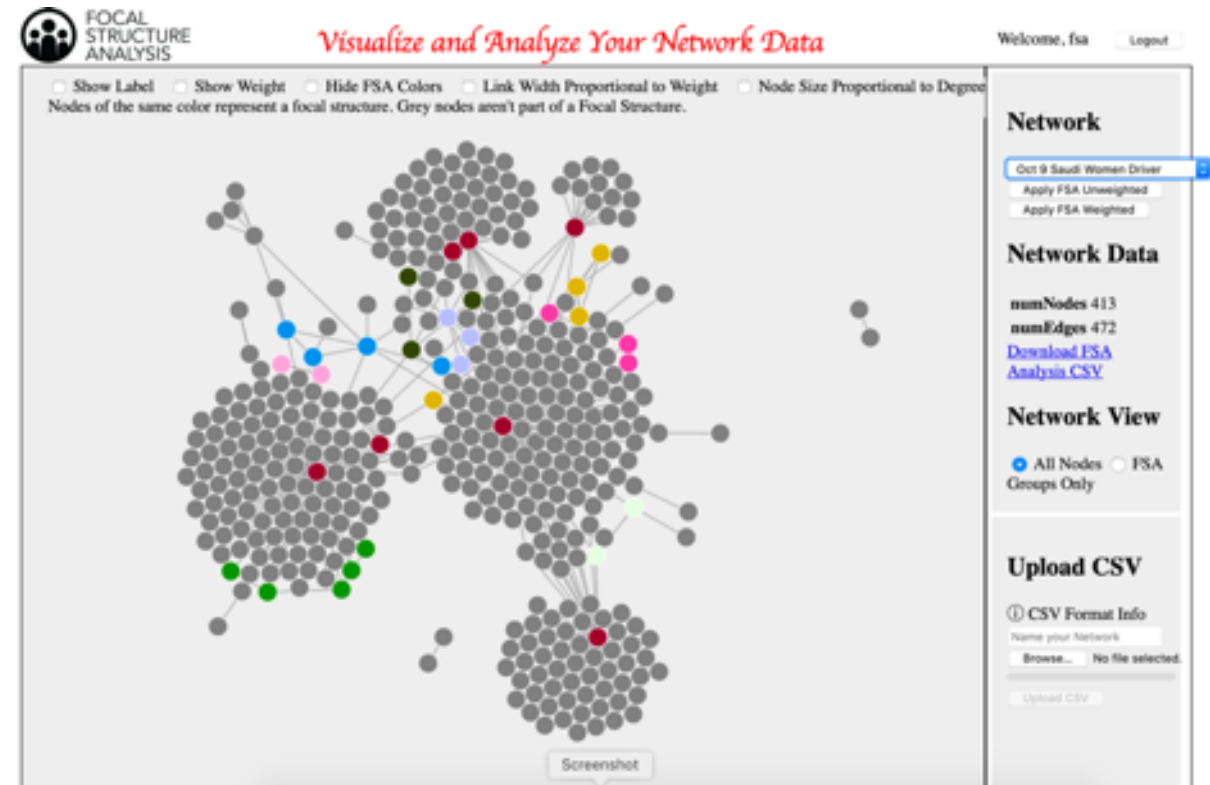
Key Coordinating Group of Actors during Ukraine-Russia Conflict

- Graham W. Phillips is a British journalist and blogger.
- He went to Ukraine to cover the voice of Ukrainians during Euromaidan.
- He reported that Ukrainians are "happy" with the previous pro-Russian government of Ukraine.
- He used Vlogging to cover the events.
- His Vlogs made him an influential blogger & an enemy to the current Ukrainian government so they banned him from entering Ukraine for three years.
- Once he was banned from entering Ukraine he went to Russia instead of going back to England.

WORLD

How A British Blogger Became An Unlikely Star Of The Ukraine Conflict — And Russia Today

Graham Phillips has become a fixture on Kremlin television and a micro-celebrity on the streets of Ukraine.

Posted on May 20, 2014, at 12:00 p.m.

Max Seddon
BuzzFeed News World Correspondent

Graham Phillips has won internet notoriety for his guerilla field reports from eastern Ukraine for Kremlin TV.
Via Facebook: euroMaidan

Blogger Communities

Green – **AsiaPacific Blog (357 Bloggers)**
Blue – **Mondalisation Blog (4320 Bloggers)**
Red – **GlobalResearch Blog (9219 Bloggers)**

Common Bloggers from 3 communities - 98

Some of the APAC bloggers are also members of the GlobalResearch and Mondalisation blogging communities. These communities are known to espouse anti-West, anti-EU, anti-NATO viewpoints.

Asia-Pacific Bloggers

GlobalResearch Bloggers

Mondalisation Bloggers

Communities & Coordination

Pro-Duterte blogging community

Coordination among bloggers detected

Suspicious sources referenced

Coordinated Clickbait (a.k.a. *Blog Farms)*

- Blog farms identified based on web traffic tracker codes
- Fabricate perception of a viral content
- Hypertargeting
- Search engine manipulation by traffic amplification
- Financing the operation
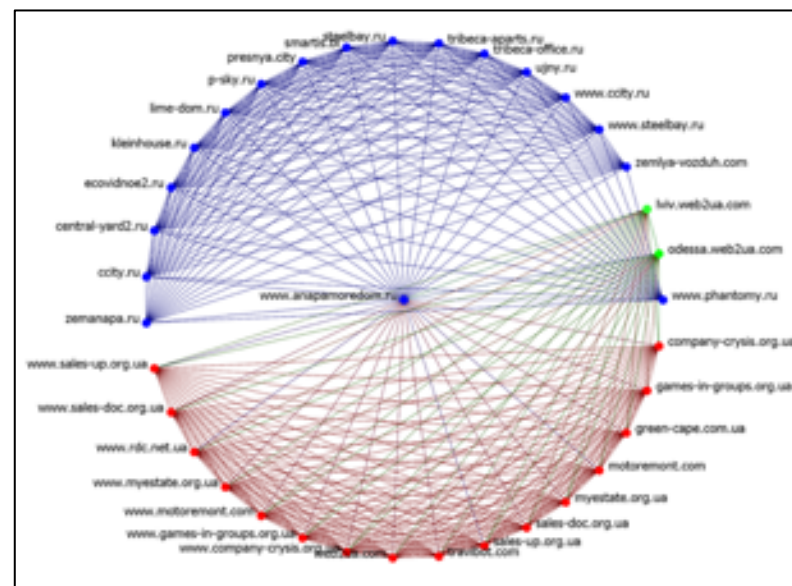
"At least six Swedish sites have received financial backing through advertising revenue from a Russian- and Ukrainian-owned auto-parts business based in Berlin, whose online sales network oddly contains buried digital links to a range of far-right and other socially divisive content."

NYTimes, August 10, 2019

Coordinated 'Fake' Websites

Canadian elections 2019 - 291 fake websites created using "Built with API" service with anti-Trudeau narrative.
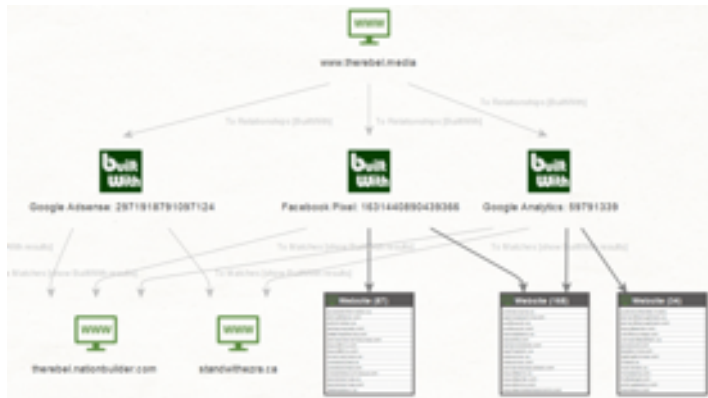
One such fake website "weresorryindia.com" amplifies anti-Trudeau narrative suggesting he is not a friend of the Canadian-Indian community. The website tops the results in search engines.

Coordinated YouTube Campaigns

- These channels have similar/same video content
- Have similar/same robotic voice narration
- Appear in each others subscribed lists
- Suggested by YouTube as related channels

Hot News

US Military

Ultimate US Military

PH TV

DOT COM US

Coordinated YouTube Campaigns

China vs US The War in the South China Sea already Start
714,564 views · 4.7K · 586 · SHARE · SAVE
DOT COM US · Published on Apr 8, 2019 · SUBSCRIBE 43K
https://www.youtube.com/watch?v=OM5vaF2kzPA

China vs US The War in the South China Sea already Start
571,751 views · 2.4K · 295 · SHARE · SAVE
Breaking News TV · Premiered Apr 9, 2019 · SUBSCRIBE 116K
https://www.youtube.com/watch?v=GsCmudyXY2o

China vs. America: How a W.a.r in the South China Sea Could Start
727 views · 7 · 1 · SHARE · SAVE
Hot News · Published on Apr 9, 2019 · SUBSCRIBE
https://www.youtube.com/watch?v=e5WvJHG6aB4

- **Videos belong to different channels**
- Similar/Same titles
- Same/Similar audio
- Same/Similar Robotic narration

Color Theory Based Detection

Channels coordinate content amplification by repurposing portions of a video and producing multiple videos

Video ID: OM5vaF2kzPA
Title: China vs US The War in the South China Sea already Start
Channel: Breaking News TV
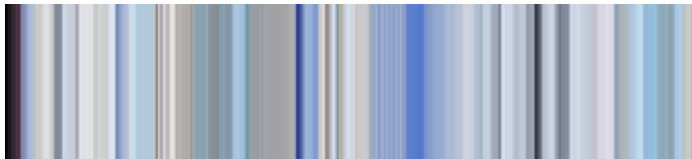
Video ID: GsCmudyXY2o
Title: China vs US The War in the South China Sea already Start
Channel: DOT COM US

YouTube *'Commenter'* Flash Mobs

SBP-BRiMS 2019
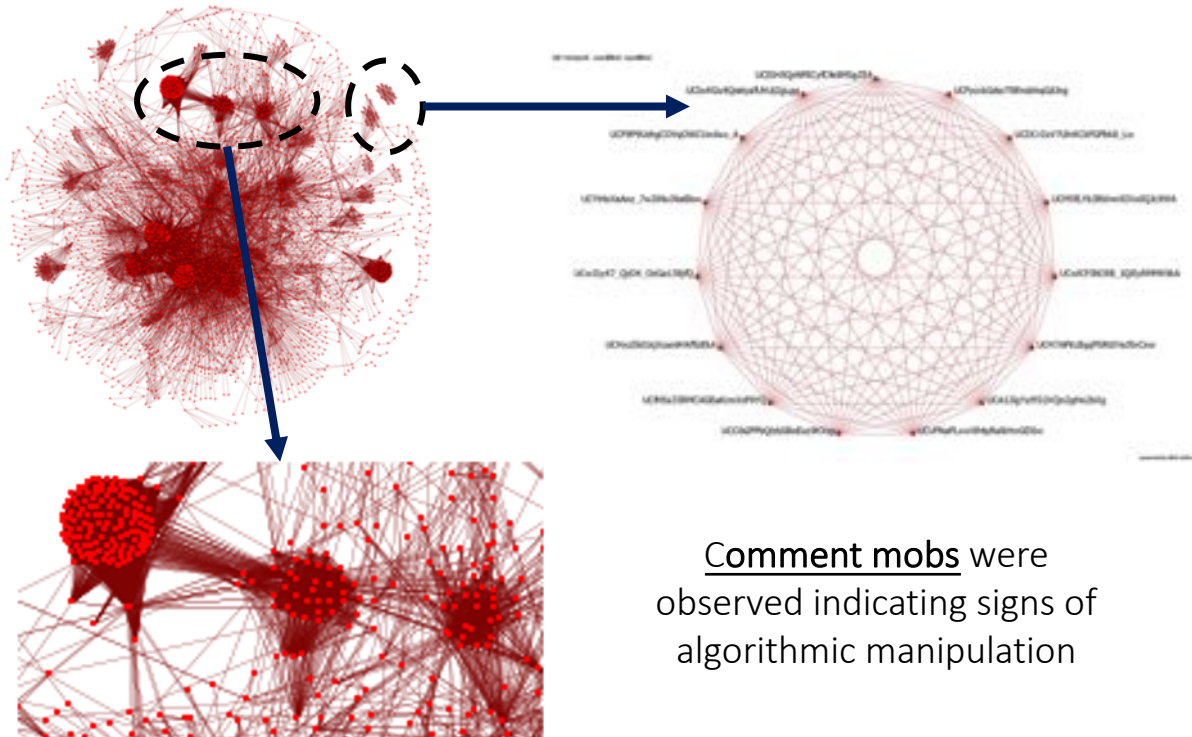
Comment mobs were observed indicating signs of algorithmic manipulation

Exploiting biases of the recommendation algorithms

Commenter Mobs Across Channels

- Hot news – 8,477 commenters
- US Military – 11,817 commenters
- DOT COM US – 2,340 commenters
- PH TV – 14,263 commenters
- Ultimate US Military – 5,369 commenters
- 104 core commenters
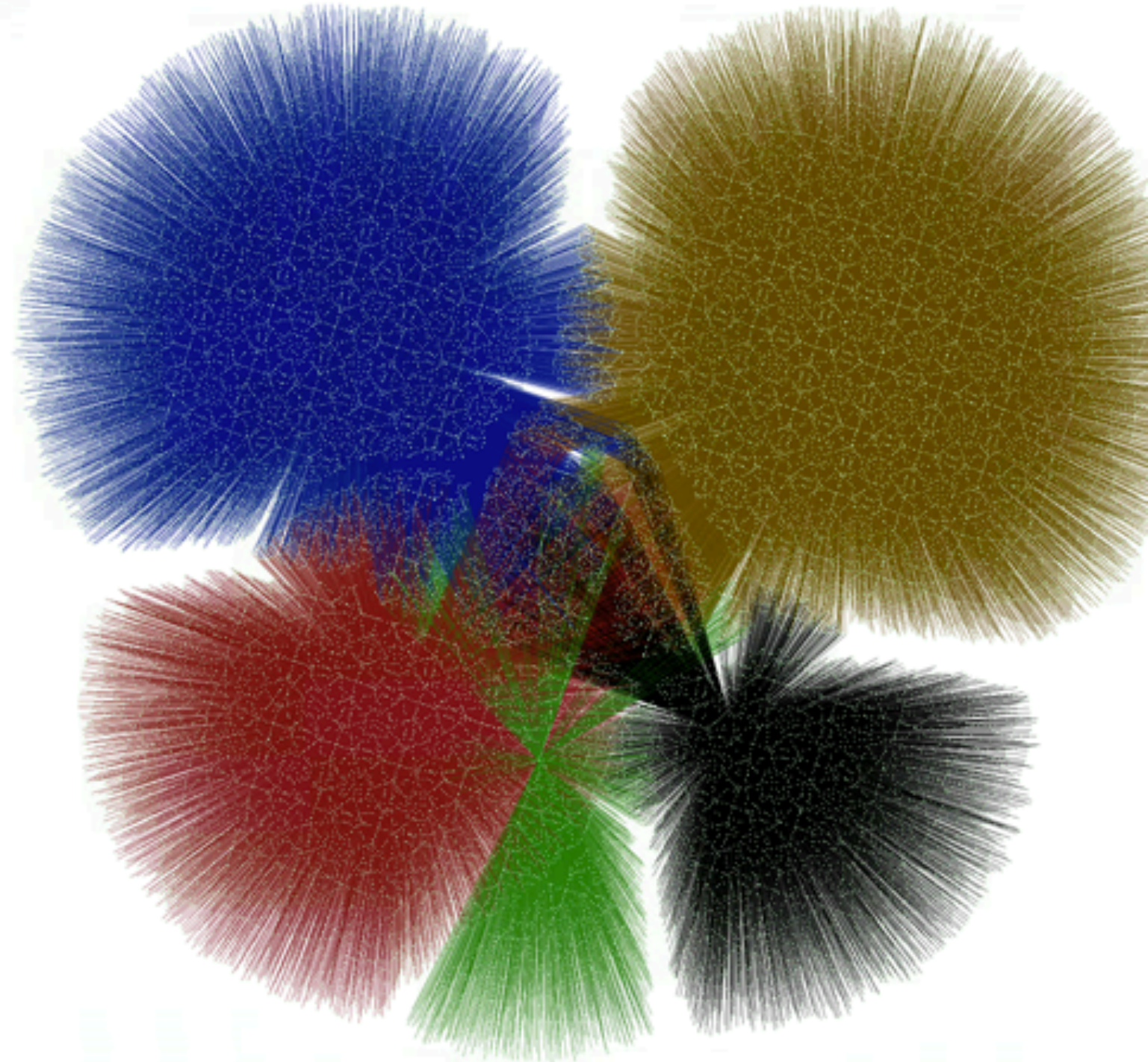
Youtubers Conducting Botnet Operated Twitter Campaigns
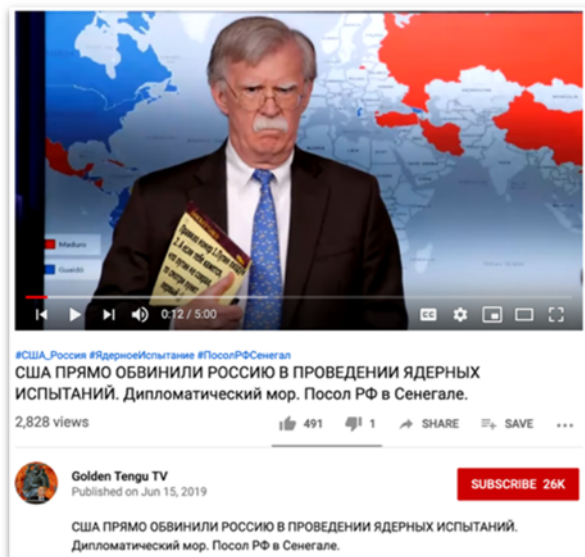
Pro-Russian YouTube channel named "**Golden Tengu TV**" also has a Twitter account.
Tweets from its Twitter account are merely links to its YouTube videos, posted in a robotic style.

People who like these tweets (such as @Blackdo52395065, @nLqLGPh8F7JiHG9) are also robots.

It is a small botnet.

Botnets – Evolution and Dissemination

URL
User
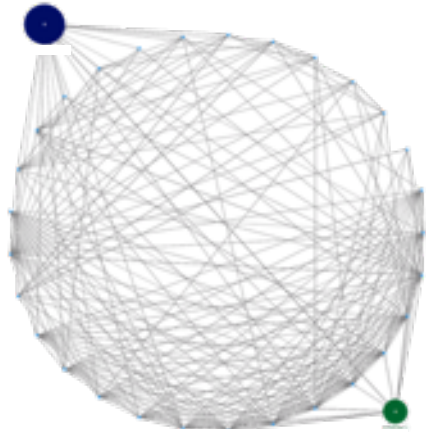
Mutual reciprocity.
IFYFM & *FMIFY*
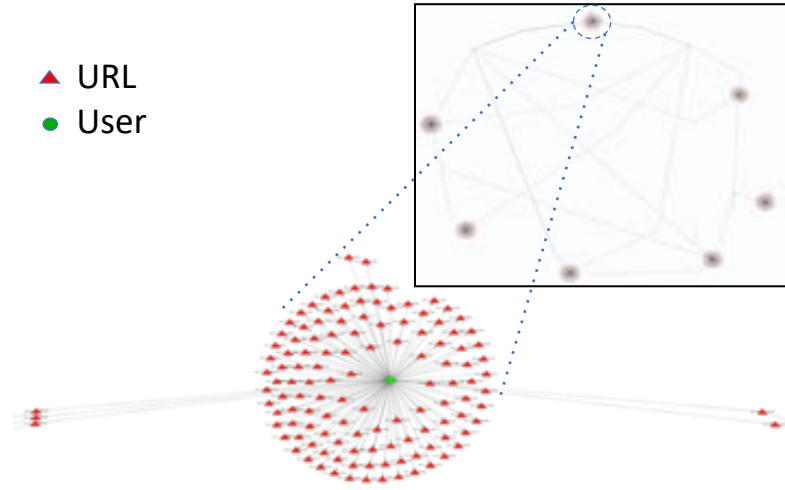
No mutual reciprocity.
Coordination in information network
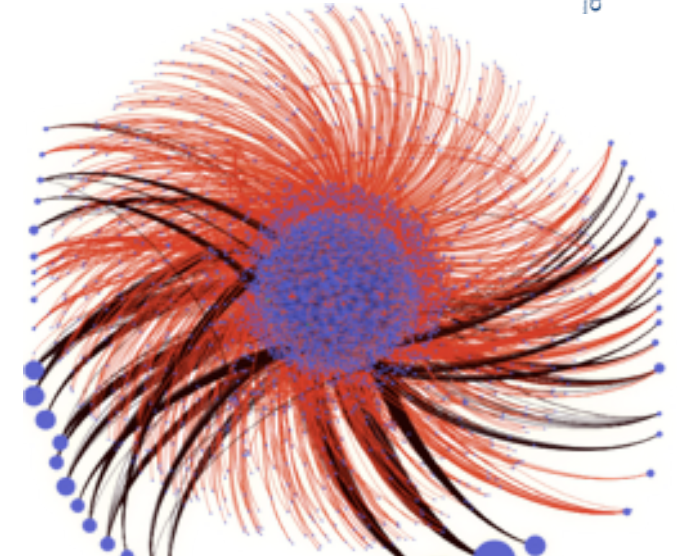
Organizational hierarchy.
Core and peripheral bots

COORDINATION/BEHAVIOR COMPLEXITY

Crimean Invasion 2014

Dragoon Ride 2015

Trident Juncture 2015

ISIS Propaganda 2016

Algorithmic Manipulation

"Hot News" a prominent channel disseminating videos related "South China Sea" conflict.
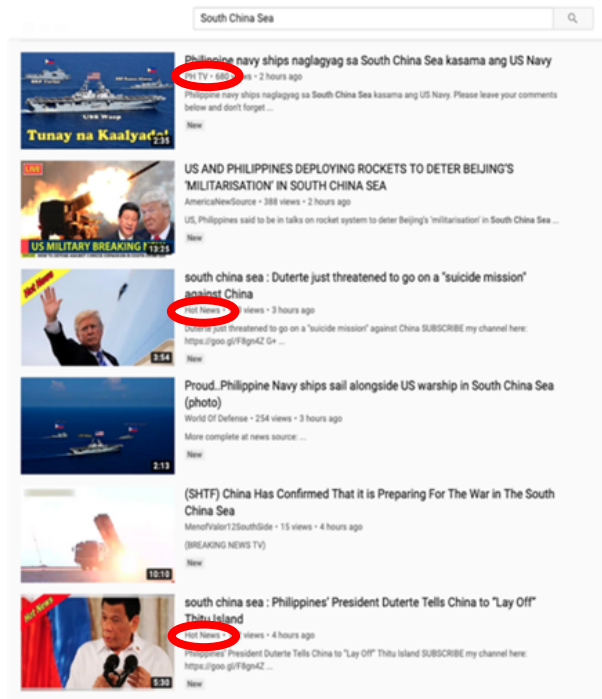
Videos have robotic voice/narration

Top Content

Top 10 most watched videos contain more adversarial content

Comments on most watched video contain anti-NATO sentiments

Boy I hope the Russians don't have any of those advanced Oil Tankers in their navy, or we're doomed.

👍 73 👎   REPLY

The Russians did it. That will be the chorus in the west. LOL

It was so stealth the tanker never saw it

👍 190 👎   REPLY

This is not funny at all. In my expert opinion, this is a very cunning norwegian plot to kill as many Russians as possible... by making them laugh to their deaths.

👍 80 👎   REPLY

Competent NATO.

👍 29 👎   REPLY

Influential Posts

Stop NATO
Against militarization, rehabilitation and Norwegian participation in NATO's terrorist war

actions NATO militarization weapons industry Civil war in Ukraine Worldwide

Home > Events , Militarization , NATO > Opposition to Trident Juncture on May 1st

Resistance to Trident Juncture on May 1st

May 2, 2018 h5332 Go to comments Leave a comment

Rate This

In both Bergen and Oslo, Stop NATO and other peace activists showed resistance to the forthcoming military exercise Trident Juncture 2018.
In Oslo, posters bearing the endorsement "Stop NATO's forthcoming war exercise in Norway" and the "Norway out of NATO" parable were clearly visible.
In Stavanger and Sandnes, NATO stopped spreading notes.
In Bergen, Stop NATO held an appeal on an event organized by the May 1 alliance, where military exercise and Norwegian servility towards the United States and NATO were generally affected.

NATO Exercise Trident Juncture and the Environment

October 6, 2018 h5332 Go to comments Leave a comment

1 Vote

By Steinar Eraker, Stop NATO

In these days, political parties, peace organizations and individuals are in full swing to focus on the forthcoming NATO Trident Juncture exercise (TRJ18). It will find a town in the period from 15 October to 7 November and will cover large parts of the Nordic region with main weight in Norway. A total of 40000 soldiers from all NATO countries and close Allies will participate.

There is resistance to this exercise. People are rightly afraid that, by virtue of their great play, it will increase excitement in our area and lead to additional upgrading.

There are many in the area of peacekeeping slavery that is occupied by the environmental aspect of this kind of military activity.

Our belief is that TRJ18 will lead to extensive damage to land, forests and pastures, and not least to land, air and water. Fredsørsläsia is afraid that the environmental issue will be glimpse of all logistics problems.

What we know is that 40000 soldiers will attend. It is a crowd of great size with Bodø city. 8000 racing animals are going out on the road. From experience, we know that it's mostly lorries and heavy traffic noise that make large wounds in nature and not at least large emissions to air.

8000 kjøyrety is a 92km column, the distance Oslo - Kongsvinger.

So, use of large amounts of loose ammunition, which means heavy metal emissions to nature that nobody is in control of.

In these days, NATO drives what they call deployment - deployment of heavy equipment and machines.

The Alliance is a fuss on the environmental front. And with one state that has terminated the Paris agreement in the driver's seat, it does not promise the best.

Increased militarization will put more pressure on climate and the environment. And we know that the military is unnoticed by the climate forces, because they are responsible for a good

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Military exercises do not make peace

September 19, 2018 h5332 Go to comments Leave a comment

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By Ivar Jørdre, Action Committee against Trident Juncture in Bergen

NATO has long had one policy to fight for its imperialist interests far beyond the NATO area. The out-of-area strategy (newer NATO doctrine of operating outside of its geographical area) came for the first time in practical use in the Kosovo war in 1999. This page then has this NATO's main line. Warriors in Afghanistan, Iraq and Libya are typical deeds of this policy. These are real aggression warriors. Dei has nothing in defense of td Norway to do. But it is this kind of business that is the backbone of Norway's military doctrine. This and more is the "new-NATO" role.

A shocking and robust die on a NATO country such as Norway say participation in NATO's out of area strategy is the bombing of Libya in 2011 (another death is the bombing of Serbia in 1999). From a UN resolution on airbag zone in northern Libya for full bombing and regime change tactics, the road was short. Unhappy cards! When the stormy United States with Norway is changing its intention, "over night" without enough debate in the whole of the Storting, our defense doctrine is hosted: From land defense to suppliers of lesson soldiers in imperialism si teneste.

Great NATO Leia Military Exercises

Nor is there any big debate about the consequences of major military exercises in the mainstream media. In September 2017, the military force Aurora 17 was in Sweden, the largest Swedish military force since 1993. More than 19,000 Swedish soldiers practiced war with 2000 soldiers from the United States, Finland, France, Norway, Denmark, Lithuania and Latvia. Sweden has recently entered into official partner status with the NATO Alliance. Suddenly, Russia had practice Zapad, which had larger dimensions than the Swedish. Zapad (which indicates "West") is a repetitive exercise with years of space.
Here, Russarane simulates defense against a mild undertaking from the West against Russia or border states.

In October-November this year, a great practice, this middle-eastern gambler, may have as many as 40,000 soldiers and thousands of lyricets and will operate 150 aircraft and 70 ships, land and water. This giant call called Trident Juncture 18 hosts the largest exercise in Central Norway in at least 15-20 years. One minor part of the exercise will be in Sweden, Finland, Iceland and in the Baltic Sea.

Leading Anti-NATO Narratives

Environmental Impact	**Disturbs Local Economy**	**Mistreatment by NATO Troops**
Mocking/ridiculing NATO	**NATO is a joke – Not a real threat**	**'Stop NATO' Protests/Astroturfing**
Threatening Stability	**NATO poking 'Russian Bear'**	**NATO is aggressive**

Anti-NATO Imagery

Technologies Used
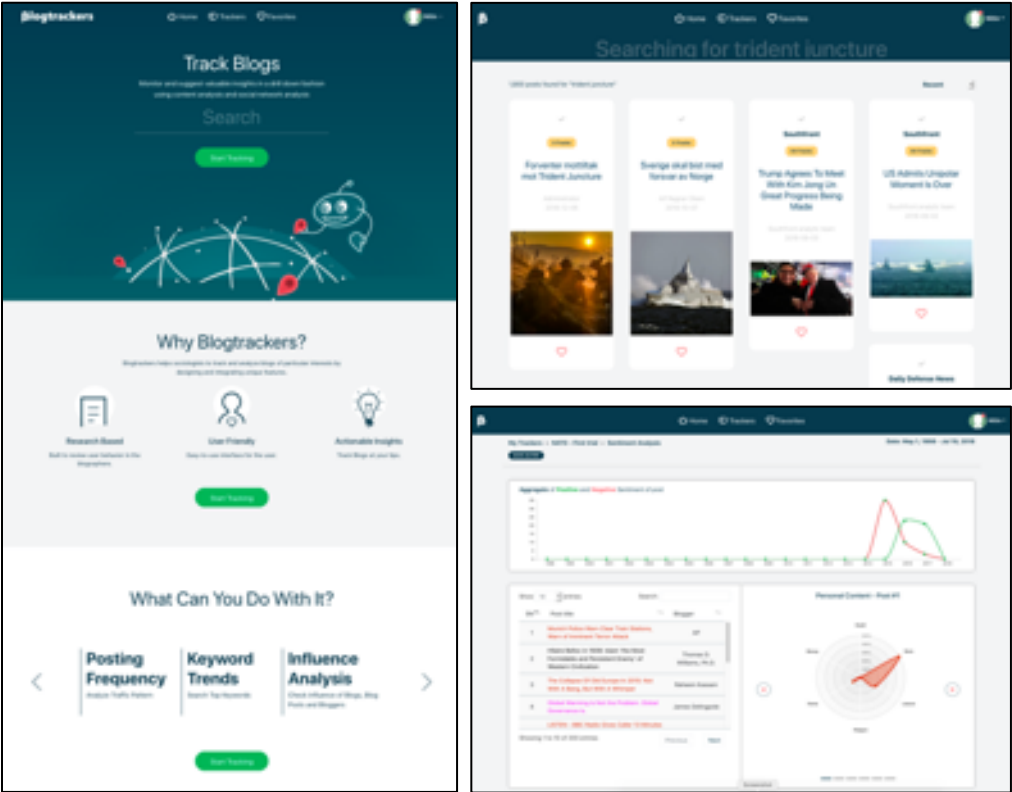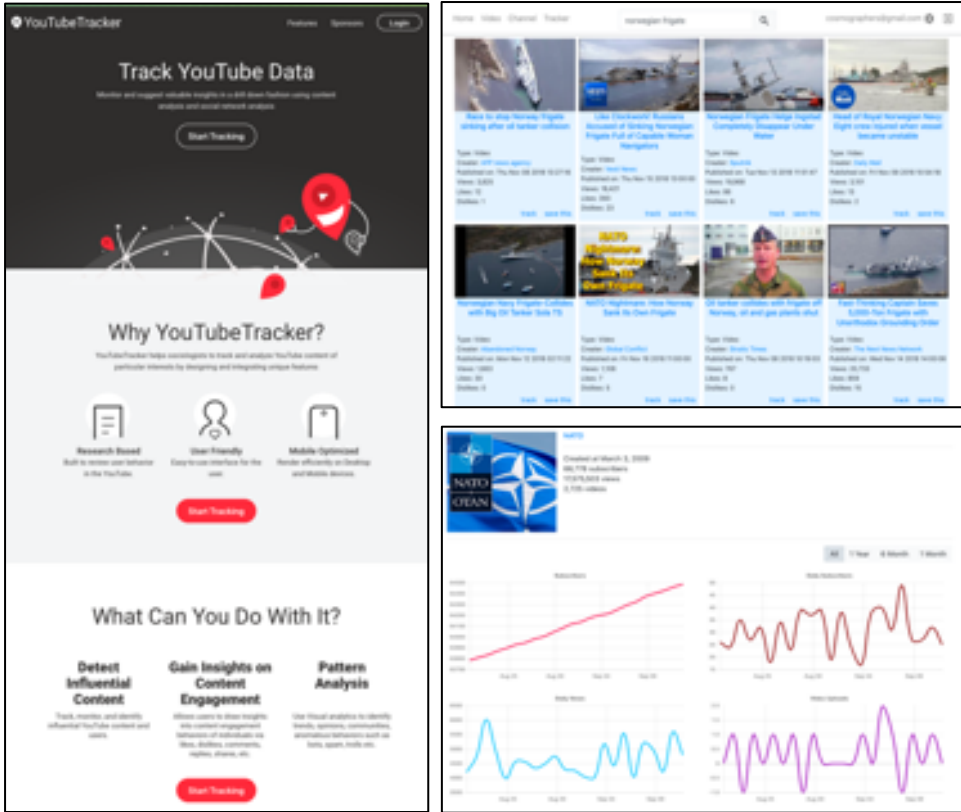
YouTube Content – Location Analysis

- Most of the content was published from the United States

- Russian hosted content was mostly hostile.

Location

Category
Earned
Hostile
Owned
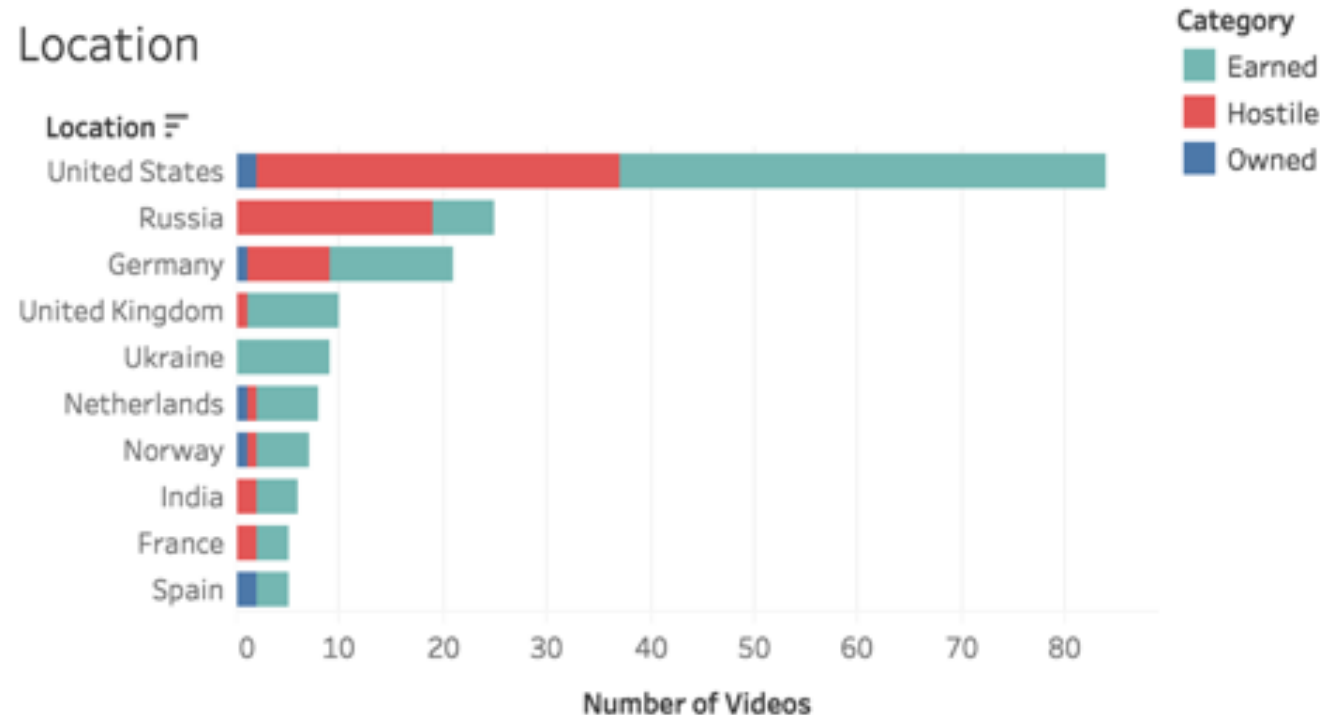
YouTube Content – Target Audience

Target audience
- English
- Norwegian
- Russian
- Spanish
- German

speaking populations

Engagement broken down by Language of Videos
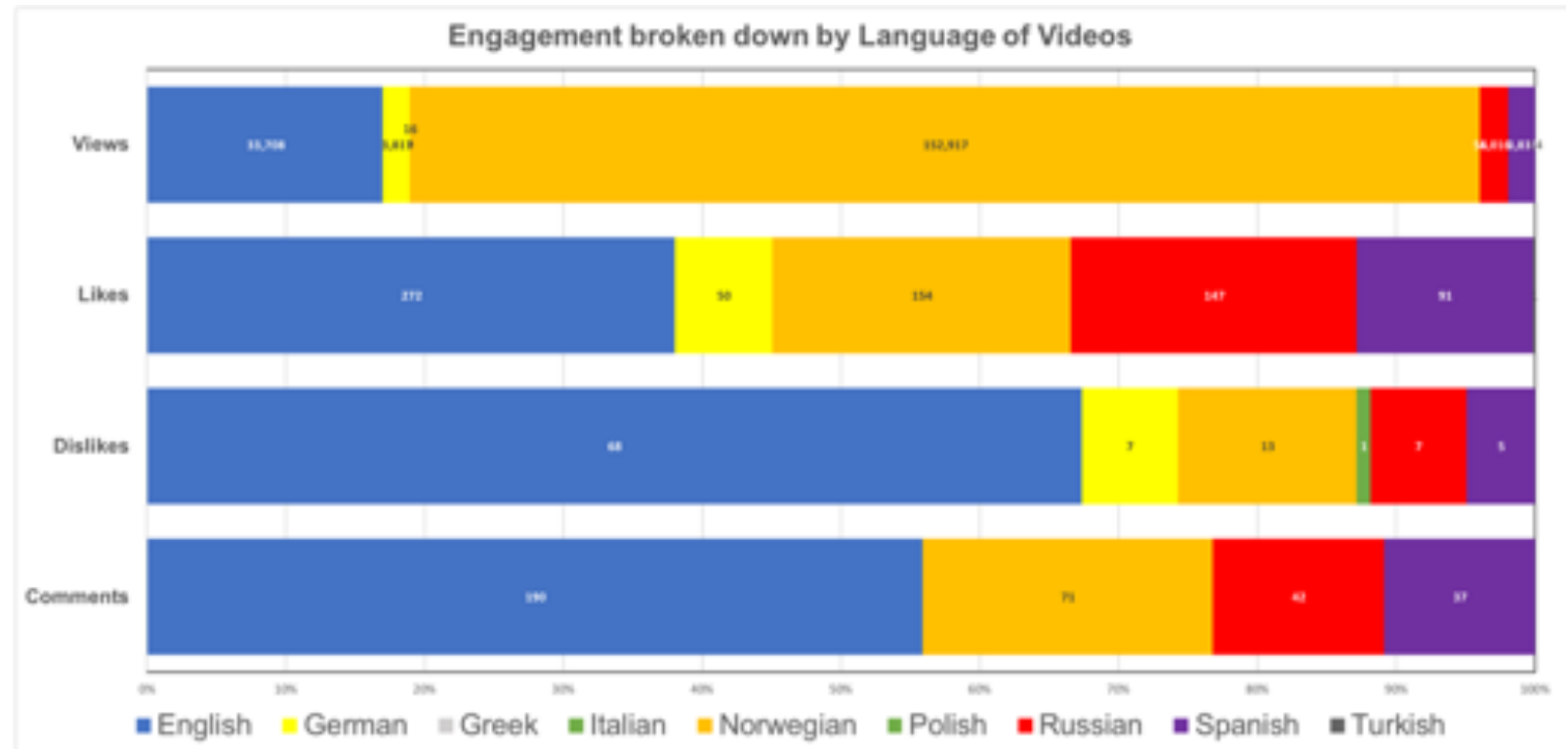
Blog Analysis – Posting Trend
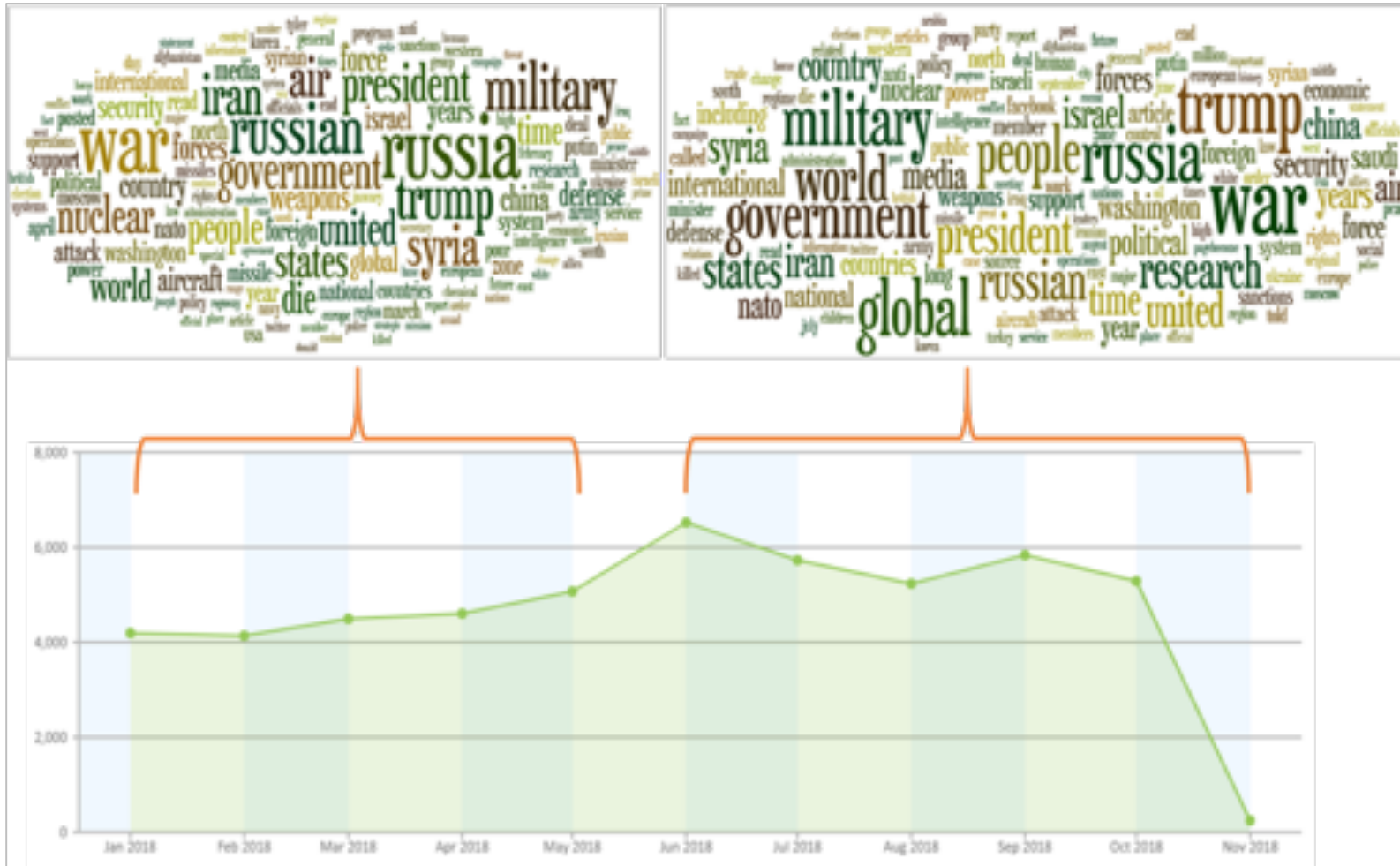
Blog Analysis – Keyword Trend
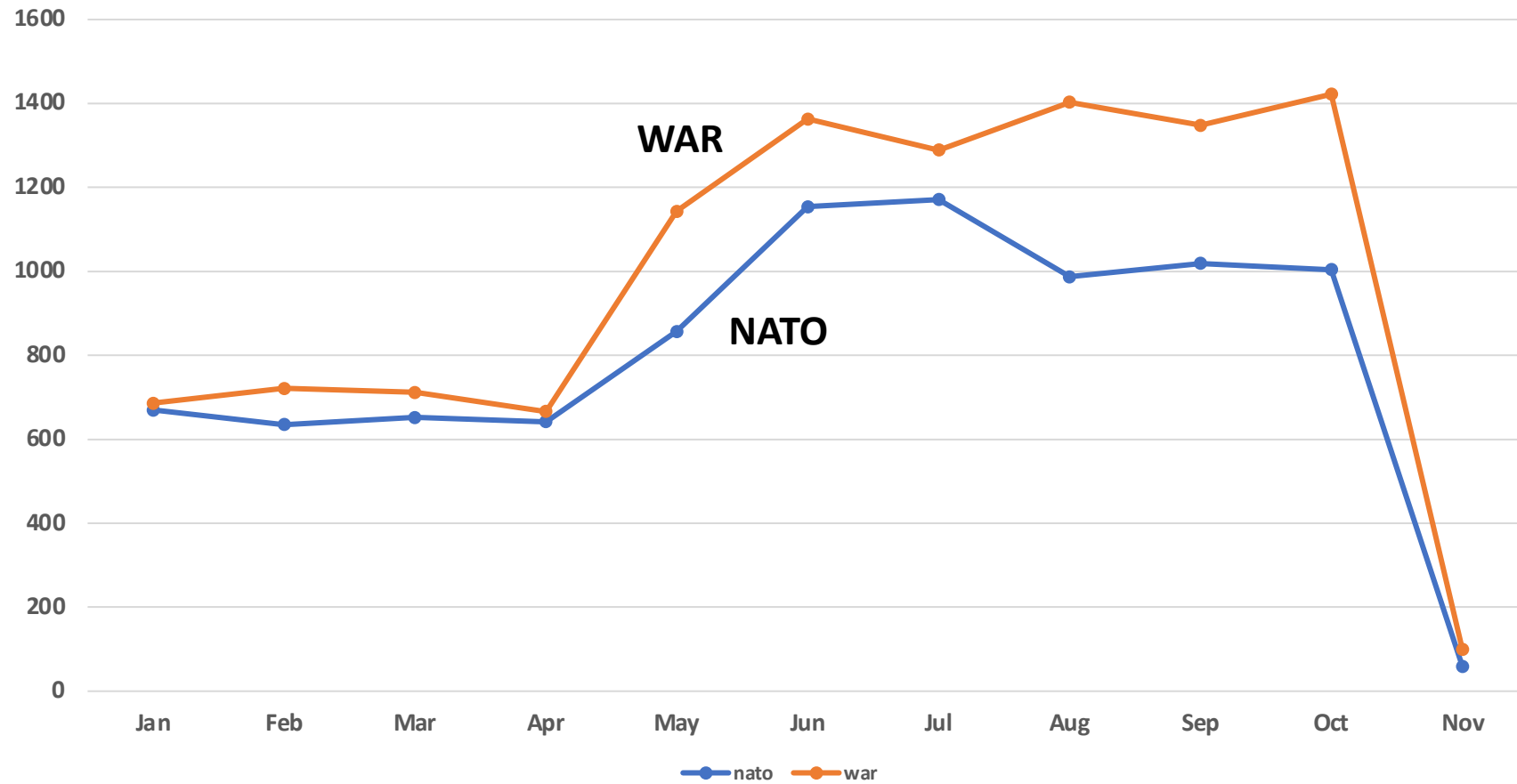
Resources

Botnet research published by Army University Press, in 7 volume book set on *Large-Scale Combat Operations*, in the book titled "Perceptions are Reality: Information Operations" (2018)

Resources

Samer Al-khateeb, Nitin Agarwal, Rick Galeano, and Rebecca Goolsby. Examining the Use of Botnets and their Evolution in Propaganda Dissemination. *Journal of NATO Defence Strategic Communications*, Vol. 2, pp. 87-112. 2017.

Nitin Agarwal and Kiran Kumar Bandeli. Blogs, Fake News, and Influence Operations. *Digital Hydra: False Information Online as a Weapon,* **NATO StratCom COE,** November 2017.

Resources
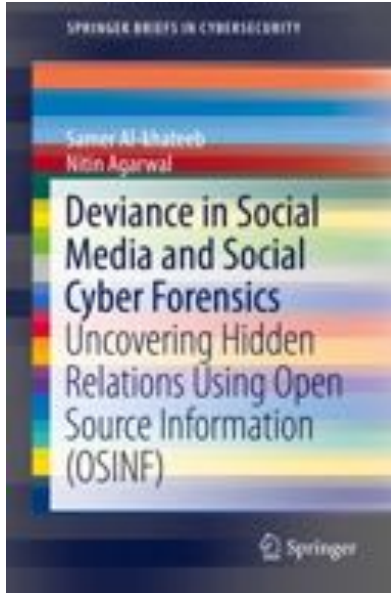
Samer Al-khateeb and Nitin Agarwal. **Deviance in Social Media and Social Cyber Forensics**. Springer Briefs in Computer Science. Spring 2019.

Nitin Agarwal, Nima Dokoohaki, Serpil Tokdemir. Emerging Research Challenges and Opportunities in **Computational Social Network Analysis and Mining.** Lecture Notes in Social Networks. Fall 2018.

Social Media Training Course

- NATO Strategic Communications Center of Excellence. 25-29 March 2019.

- Marine Expeditionary Forces (2MEF). 28-31 August 2018 in CMU, Pittsburgh.

- NATO Strategic Communications Center of Excellence. 20-25 March 2017 in Riga, Latvia.

- US CyberCommand's CyberSchool, 3-6 August 2016.

Social Cyber Security Research Infrastructure Development

- US Dept. of State (Global Engagement Center – GO2Tech Fighting Foreign Disinformation)
- American Cyber Alliance (AR-based)

AR Gov. Asa Hutchinson

US Senator John Boozman

Little Rock Mayor Frank Scott Jr.

Social Computing Conference, Washington D.C.

- Social Computing, Behavioral-Cultural Modeling and Prediction Conference, Washington D.C., July 9-12, 2019.

- Supported by several other federal agencies.

- http://sbp-brims.org/

Social Cyber Security Working Group

- Supported by NSF Big Data program

- Over 30 member institutions worldwide including researchers, policy makers, journalists, cyber security professionals

- Outcomes of the working group include

  - Policy briefs laying out the research agenda

  - Collective catalog of resources to spark innovation among researchers

Looking Ahead

- Develop publicly available technologies and solutions
- Social media companies need to be more proactive, Algotransparency.org
- Emerging technologies like blockchain for content validation, decentralized social media platforms
- Build collaborative networks of practitioners, researchers, policy makers to address this problem together
- Strengthen media literacy programs
- Need to advance the dialog on cyber security and cyber diplomacy

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- National Science Foundation (NSF)
- NATO
- Office of Naval Research (ONR)

Thank You!

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