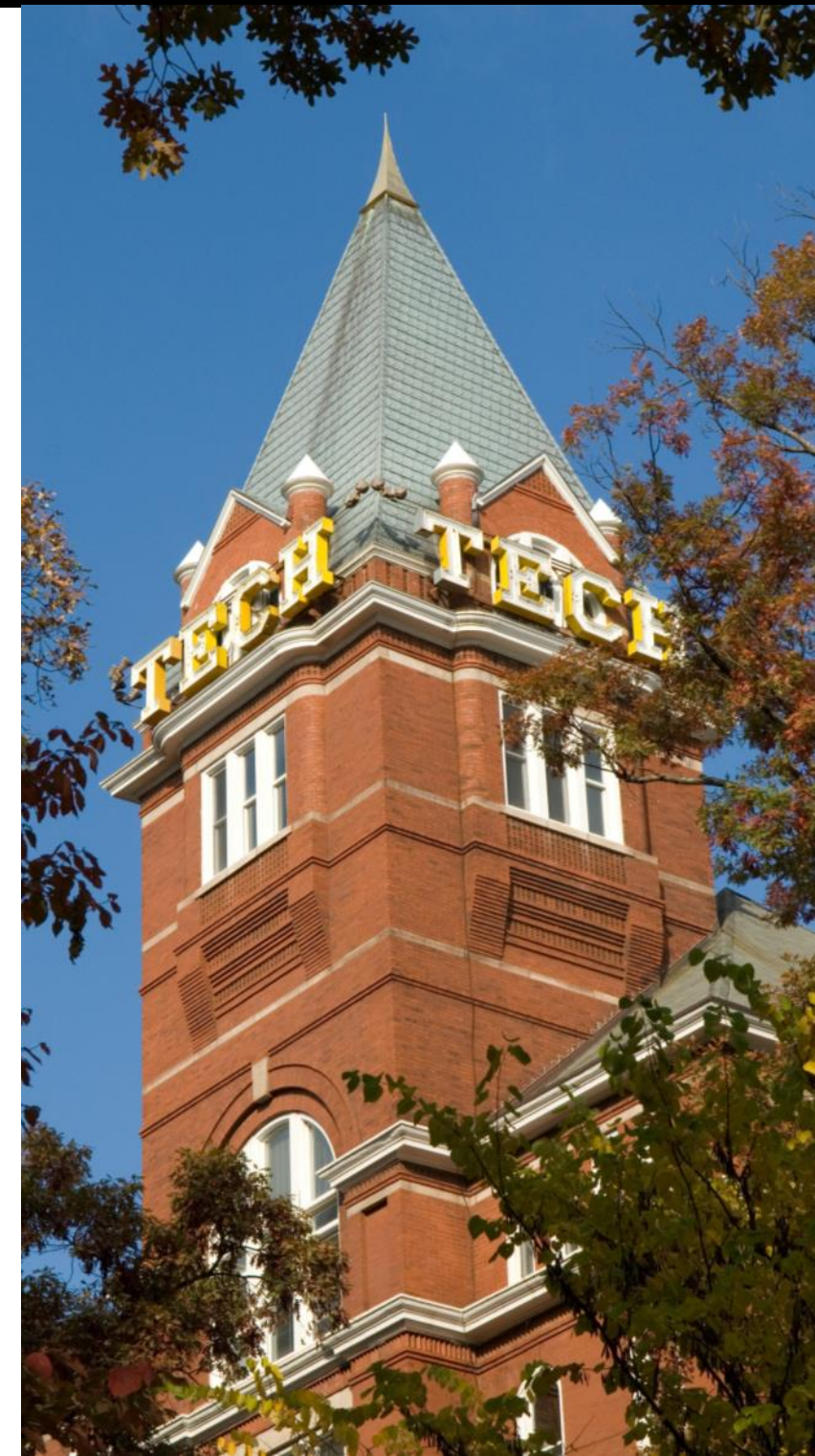


Assessing Credibility in the Global News Media

James Fairbanks, N. Knauf, N. Fitch, C. Herlihy, E. Briscoe

Oct 3, 2017



Fake News and Propaganda

- In a December Pew Research poll, 64% of US adults said that “made-up news” has caused a “great deal of confusion” about the facts of current events [2](#)
- Assessing the veracity of a news story is a complex and cumbersome task

Fake news story prompts Pakistan to issue nuclear warning to Israel

Defence minister reminds Israel on Twitter that 'Pakistan is a nuclear state too' after fake story says Israel had threatened to destroy Pakistan



Pakistan became a nuclear power in 1998. Photograph: Inter Services Public Relations/HO/EPA

Russia Is Winning the Information War

America can learn a thing or two about PR from Putin's pugilistic propaganda

By Ronn Torossian • 05/31/16 10:45am



Inside Putin's Campaign Of Social Media Trolling And Faked Ukrainian Crimes



Paul Roderick Gregory, CONTRIBUTOR

I cover domestic and world economics from a free-market perspective [FULL BIO](#)

Opinions expressed by Forbes Contributors are their own.

Vladimir Putin uses an invisible army of social media propagandists, in addition to conventional media, to support his narrative of an out-of-control Ukraine, to spread fabrications of atrocities by Ukrainian extremists, and to unleash destabilizing rumors on east Ukraine. If Ukraine unmasks the myths of Russia's disinformation war, Putin's target audiences, at home and abroad, must eventually reject his whole narrative.

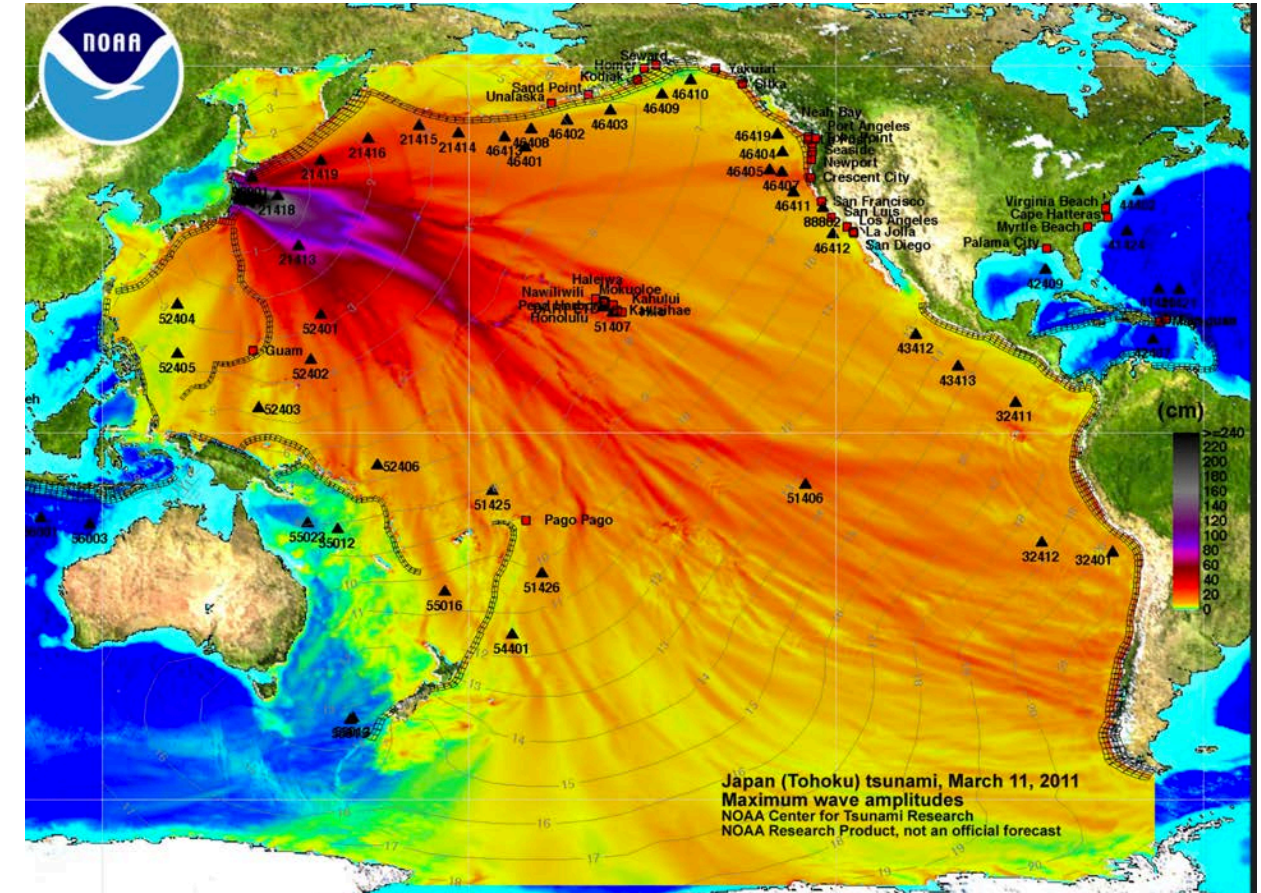
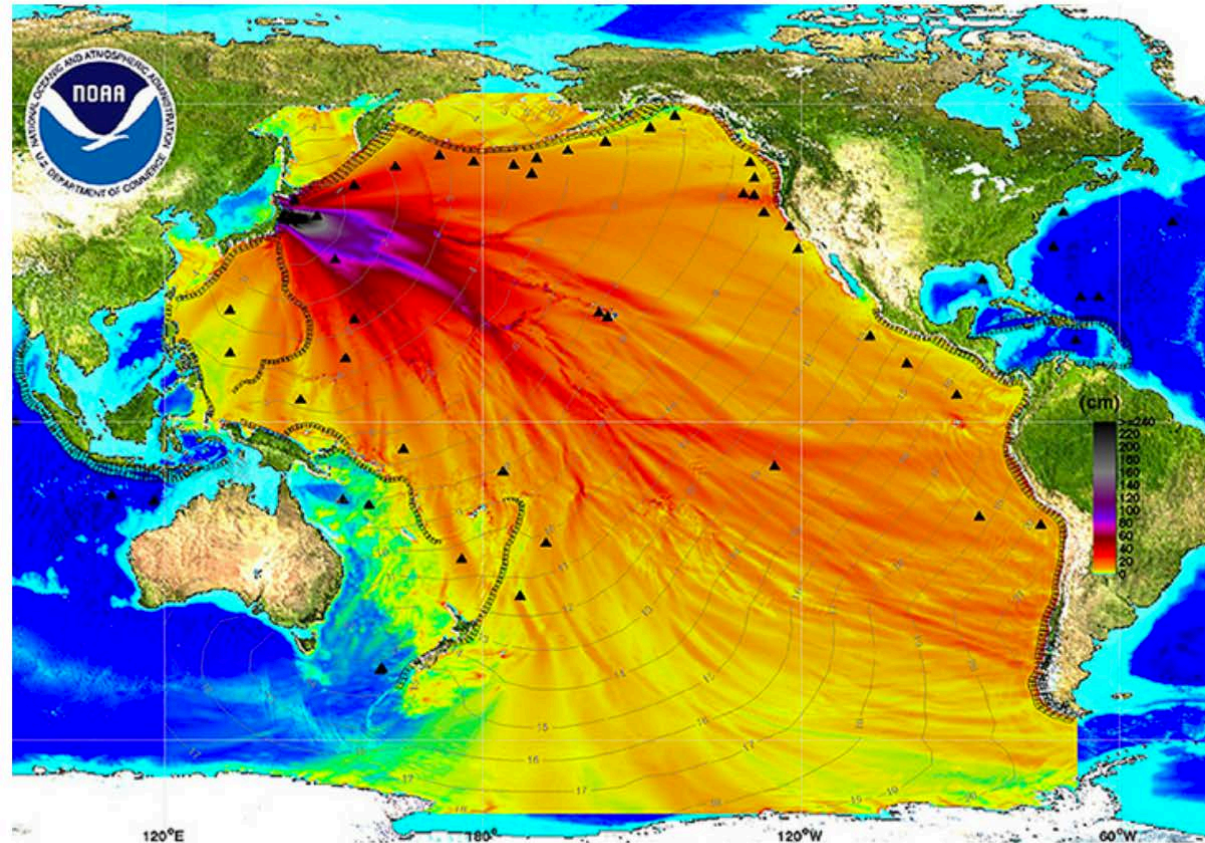


Fake News Comes in Many Flavors



Global Voices News Frames, "Our Fabricated News Experiment"

The nuclear disaster has contaminated the world's largest ocean in only five years and it's still leaking 300 tons of radioactive waste every day.



Credit - NOAA

What was the most dangerous nuclear disaster in world history? Most people would say the Chernobyl nuclear disaster in Ukraine, but they'd be wrong. In 2011, an earthquake, believed to be an aftershock of the 2010 earthquake in Chile, created a tsunami that caused a meltdown at the TEPCO nuclear power plant in Fukushima, Japan. Three nuclear reactors melted down and what happened next was the largest release of radiation into the water in the history of the world. Over the next three months, radioactive chemicals, some in even greater quantities than Chernobyl, leaked into the Pacific Ocean. However, the numbers may actually be much higher as Japanese official estimates have been proven by several scientists to be flawed in recent years.

Outline

- Introduction
 - GDELT database
 - Media Bias Fact Check
- Methodology
 - Link Construction
 - Graph Creation
 - Belief Propagation
- Results
- Conclusion

The GDELT Database

- Global Database of Events Language and Tone
 - www.gdeltproject.org
- Contains events extracted from online news sources
- An Event contains:
 - two actors
 - the action
 - source url of a news article
 - geographic information
 - temporal information
- A source of recent news articles on the web
- Commonly used in computational database of society level behavior

Row	SQLDATE	Actor1Code	Actor1Name	Actor2Code	Actor2Name	
1	20170928	PRK	GYEONGSANG	CVL	COMMUNITY	http://news.chosun.com/site/data/html_dir/2017/09/28/20170928032
2	20170928	UKR	DONETSK	null	null	https://news.online.ua/dnipro/355545856/vo-lvovskoy-oblasti-v-prudu
3	20170928	HLH	HOSPITAL	EUR	EUROPE	http://www.20minutos.es/noticia/3147229/0/plataforma-defensa-sani
4	20170928	COP	DEPUTIES	LEG	SENATOR	http://kuban24.tv/item/beketov-poblagodaril-deputatov-zsk-i-guberna
5	20170928	MED	JOURNALIST	HLH	HOSPITAL	http://www.diaridepernambuco.com.br/app/noticia/vida-urbana/201
6	20170928	CVLGOVMED	TOURIST	null	null	http://www.canarias24horas.com/economia/turismo/item/63131-las-c
7	20170928	JUD	LAWYER	MED	JOURNALIST	http://www.cooperativa.cl/noticias/pais/policial/viviana-haeger/caso-h
8	20170928	REL	BELIEVER	null	null	https://www.nnov.kp.ru/online/news/2882544/
9	20170928	URY	URUGUAY	null	null	http://www.apfdigital.com.ar/despachos.asp?cod_des=296916&ID_S
10	20170928	MIL	MILITARY	null	null	http://www.newsnowgr.com/article/1045192/i-kyvernisi-fernei-nomos
11	20170928	POL	LODZ	null	null	http://www.dzienniklodzki.pl/na-sygnale/a/morderstwo-na-prochnika-
12	20170928	RUS	SARATOV	GOV	GOVERNMENT	https://rg.ru/2017/09/28/reg-pfo/saratovskij-gubernator-rasskazal-o-n
13	20170928	AGR	FARMER	idg	INDIGENOUS	http://www.capitalnews.com.br/cotidiano/stf-determina-volta-a-prisao
14	20170928	AGR	FARMER	idg	INDIGENOUS	http://www.capitalnews.com.br/cotidiano/stf-determina-volta-a-prisao
15	20170928	JUD	MAGISTRATE	GOV	MINIST	http://www.rfi.ro/justice-98126-ministrul-justitiei-legi-toader
16	20170928	MOSINS	LASHKAR E TAIBA	MIL	MILITARY OFFICER	http://www.livehindustan.com/national/story-bsf-jawan-shot-dead-by-
17	20170928	COP	CONSTABLE	UAF	TERRORIST	http://www.livehindustan.com/national/story-bsf-jawan-shot-dead-by-
18	20170928	CHR	CHRISTIAN	MOS	ISLAMIC	http://www.notiziaoggivercelli.it/pages/vercelli-doppia-mostravello-in
19	20170928	COP	PRISON	TUR	BRUSA	http://www.unosantafe.com.ar/judiciales/rechazaron-la-prision-domio
20	20170928	JUD	JUDGE	ELI	RETIRED	https://www.opovo.com.br/jornal/cotidiano/2017/09/juiz-aposentado-
21	20170928	POL	POLE	null	null	http://www.dutchcowboys.nl/technology/tu-delft-de-ov-chipkaart-kan-
22	20170928	MILCOP	MILITARY POLICE	null	null	http://surgiu.com.br/2017/09/28/policia-militar-prende-homem-com-d
23	20170928	CHRCTH	CATHOLIC PRIEST	REL	BELIEVER	http://www.index.hr/vijesti/clanak/bbc-brani-papu-franjo-ne-postupa-k
24	20170928	null	null	COP	PRISON	https://www.opovo.com.br/jornal/politica/2017/09/sobrevivencia-de-a
25	20170928	CRM	GANG	null	null	http://www.mdi.gov.py/index.php/component/k2/item/8572-efectivos-
26	20170928	LEG	CONGRESS	LABOPP	TRADE UNION	https://elpais.com/economia/2017/09/28/actualidad/1506599756_12
27	20170928	EDU	STUDENT	CRM	ASSAILANT	http://www.mdi.gov.py/index.php/component/k2/item/8570-eficaz-rea

Background Information: the GDELT Database

- Contains over 431 million events from 1979-Today, extracted from global broadcast, print, and online news sources in 100+ languages
- Events coded into Conflict and Mediation Event Observations (CAMEO) system, which capturing the world media through machine coding in near real-time
- 2K articles per 15min
- Hierarchical levels of granularity
- Accounts for supranational, state, sub-state, and non-state actors

13	THREATEN
130	Threaten, not specified below
131	Threaten non-force, not specified below
1311	Threaten to reduce or stop aid
1312	Threaten to boycott, embargo, or sanction
1313	Threaten to reduce or break relations
132	Threaten with administrative sanctions, not specified below
1321	Threaten to impose restrictions on political freedoms
1322	Threaten to ban political parties or politicians
1323	Threaten to impose curfew
1324	Threaten to impose state of emergency or martial law
133	Threaten political dissent, protest
134	Threaten to halt negotiations
135	Threaten to halt mediation
136	Threaten to halt international involvement (non-mediation)
137	Threaten with violent repression
138	Threaten to use military force, not specified below
1381	Threaten blockade
1382	Threaten occupation
1383	Threaten unconventional violence
1384	Threaten conventional attack
1385	Threaten attack with WMD
139	Give ultimatum

CAMEO Event Code 13 (THREATEN), with lower-level codes

Media Bias Fact Check

- Volunteer run fact checking site rating websites based on:
 - ideological bias
 - factual reporting quality
- Ratings come from a rubric executed by people
- Left/Right bias on a scale of -2, +2
- Categories of “fake news”
 - Conspiracy/Pseudoscience
 - Satire
 - Questionable Sources

The screenshot shows the Media Bias/Fact Check website interface. At the top, there is a navigation bar with links for HOME, SEARCH, ABOUT, METHODOLOGY, MBFC NEWS, LIVE TV NEWS, APPS/EXTENSIONS, SUBMIT SOURCE, SUBMIT FACT CHECK, SOURCES PENDING, and RSS. Below this is a secondary navigation bar with categories: Left Bias, Left-Center Bias, Least Biased, Right-Center Bias, Right Bias, Pro-Science, Conspiracy-Pseudoscience, Questionable Sources, and Satire. The 'Left Bias' category is selected and highlighted in red.

The main content area for 'Left Bias' includes a 'Donate' button with logos for Visa, Mastercard, and others. Below that is a 'Search Website' section with a Google Custom Search input. The 'News by Bias' section lists various news sources categorized by bias level: Top World News, Least Biased News, Left News, Left-Center News, Right-Center News, and Right News.





The 'Left Bias' description states: "These media sources are moderately to strongly biased toward liberal causes through story selection and/or political affiliation. They may utilize strong loaded words (wording that attempts to influence an audience by using appeal to emotion or stereotypes), publish misleading reports and omit reporting of information that may damage liberal causes. Some sources in this category may be untrustworthy. See Also:"

A list of sources is provided, including: Addicting Info, Advocate, All That's Fab, Alternet, Amandla, AmericaBlog, American Bridge 21st Century, American News X, Americans United for Separation of Church and State, Anti-Fascist News, Backed by Fact, Bay Area Reporter, Being Liberal, Bitch Media, Black Agenda Report, Black Lives Matter, Blue Dot Daily, Blue Nation Review, Boing Boing, Breitbart Unmasked, Bust Magazine, Canadian Dimension, Carbonated TV, and Center For American Progress.

On the right side, there are two sections: 'Recently Added Sources' and 'Political News Feed (Multi-Bias)'. The 'Recently Added Sources' list includes Maine Beacon, Santa Barbara News-Press, Alpha News, Conservative Byte, Noozhawk, Popular Resistance, New England Cable News (NECN), Viral Thread, GOPUSA, and American United for Separation of Church and State. The 'Political News Feed' includes articles like 'White Nationalism Is Now 'State-Sanctioned' Under Trump', 'Vets ride into the wild blue', and 'Pakistan Slams US for Declaring Anti-India Kashmir Group as 'Terrorist''.

Structural Analysis

Graphs are constructed using:

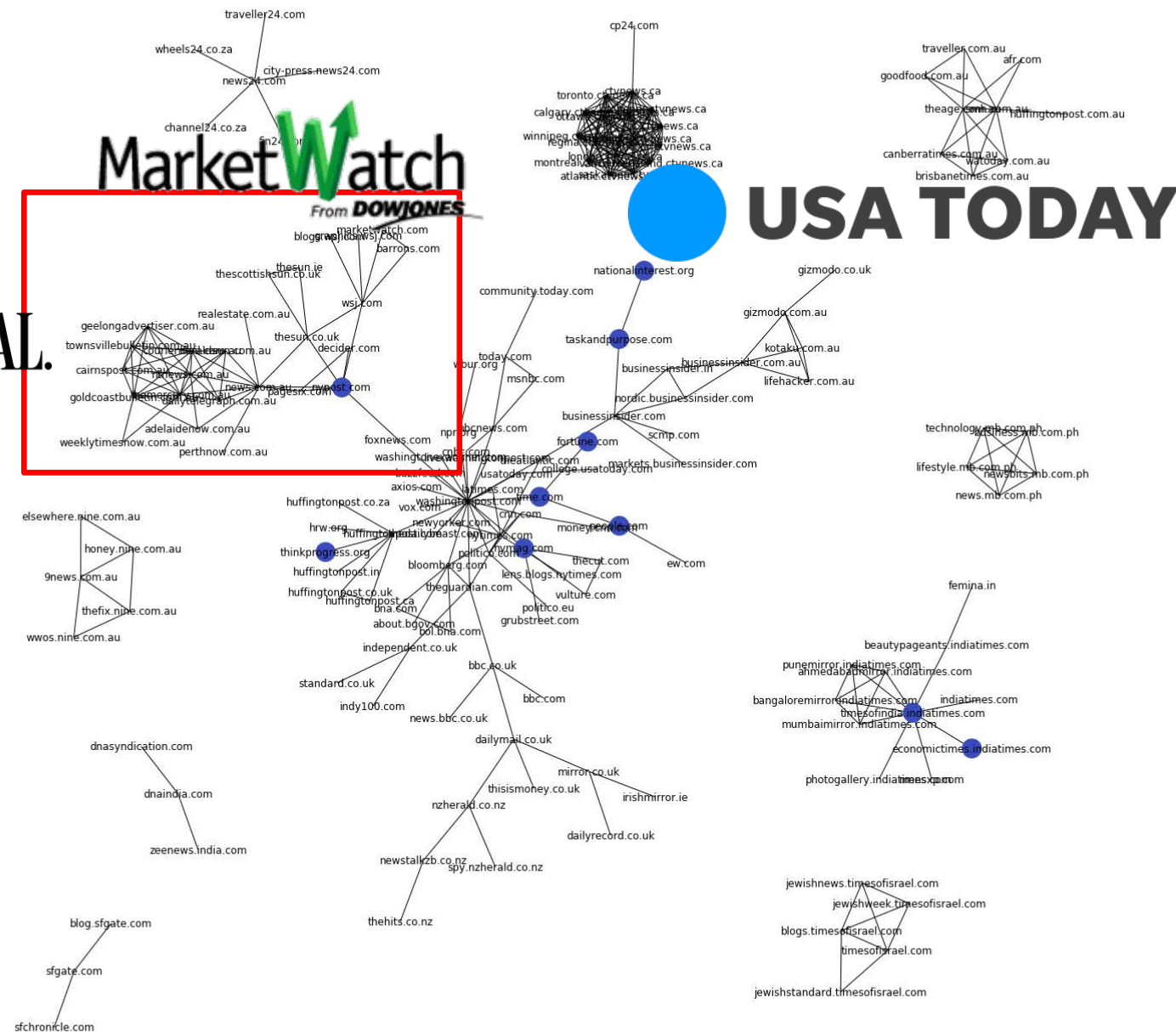
	<code><a></code>	Mutually linked sites
	<code><link></code>	Shared CSS similar visual style
	<code><script></code>	Shared JavaScript files similar user interaction
	<code></code>	Common images repeated logos or icons

Structural Analysis: Mutually Linked Sites

- A large *Mainstream Media* subgraph
- Red Box is News Corp Syndicate
- 10 largest subgraphs
- 20+ mutual links



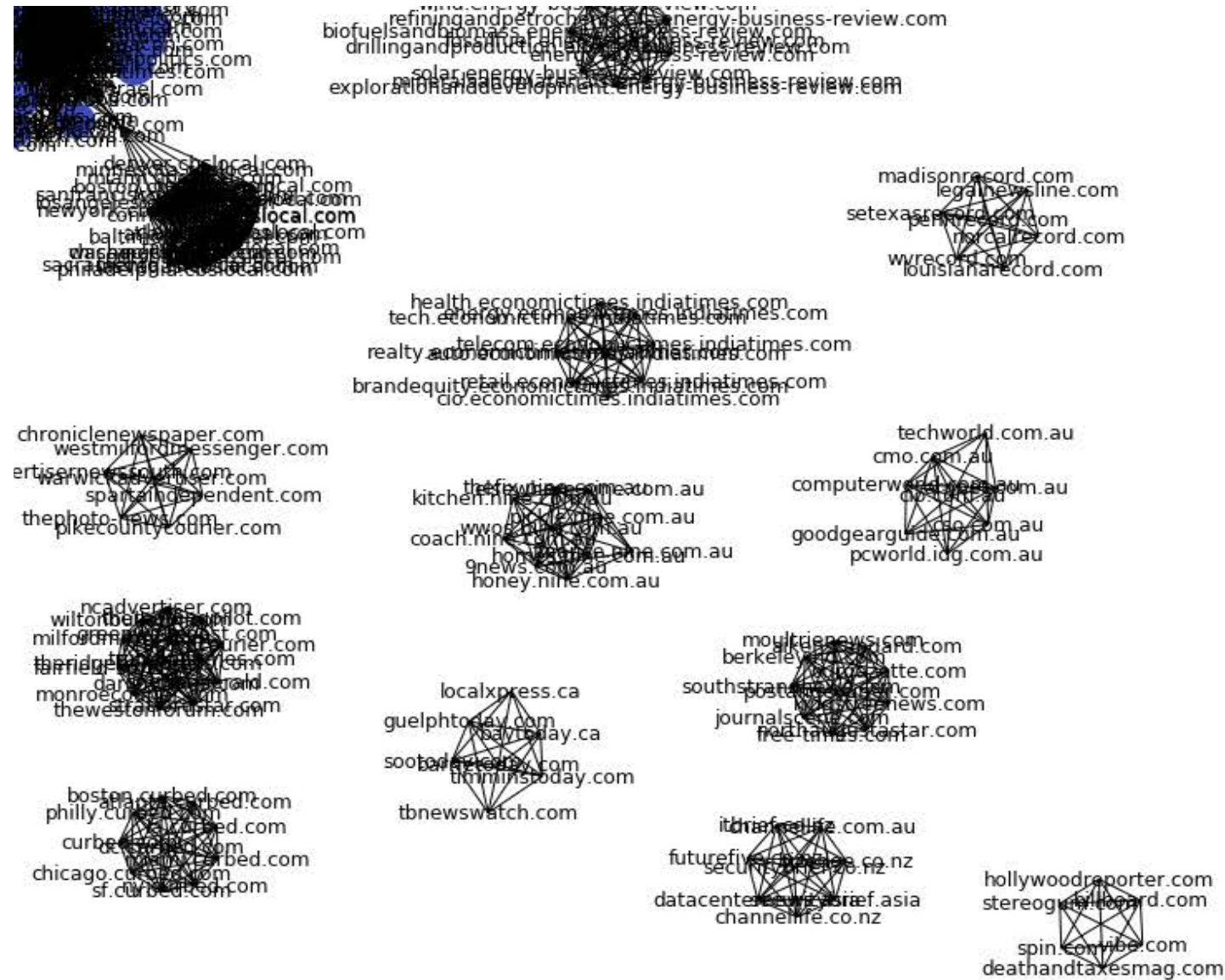
THE WALL STREET JOURNAL.



The New York Times

THE TIMES

Structural Analysis: Cliques



- Conjoined Cliques of Size ≥ 6
- Minimum Threshold of 1 mutual link
- Multiple fronts for one brand
- Often a geographic partition
- Examples
 - *.cbslocal.com
 - *.curbed.com
 - *.indiatimes.com

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Hub of the state of New York

Saturday 1st July, 2017



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VOLUME NO. 2017/2607

New York Statesman News

Section

Scandalised by Trump's Twitter tirade against journalist, Republicans join the rest of the country in criticizing President's actions



International News

Section

Scandalised by Trump's Twitter tirade against journalist, Republicans join the rest of the country in criticizing President's actions



WASHINGTON, U.S. - Trump's latest Twitter tirade has created a stir across the country and has his ow

With Trump's meeting with Putin at G20 drawing eyeballs - Merkel seems to be headed on a collision course with Trump



BERLIN, Germany - As world leaders prepare to participate in what

SACRAMENTO SUN

Serving the Californian capital like its predecessor of 1878



Saturday 1st July, 2017

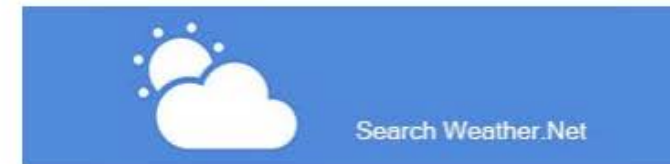
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VOLUME NO. 2017/0182

Sacramento Sun News

Section

Scandalised by Trump's Twitter tirade against journalist, Republicans join the rest of the country in criticizing President's actions



International News

Section

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WASHINGTON, U.S. - Trump's latest Twitter tirade has created a stir across the country and has his ow

With Trump's meeting with Putin at G20 drawing eyeballs - Merkel seems to be headed on a collision course with Trump

Problematic Journalism isn't always political



ACC

<p>Backing The Pack North Carolina State Wolfpack</p> <p>f t</p>	<p>BC Interruption Boston College Eagles</p> <p>f t</p>
<p>Blogger So Dear Wake Forest Demon Deacons</p> <p>f t</p>	<p>Card Chronicle Louisville Cardinals</p> <p>f t</p>
<p>Cardiac Hill Pittsburgh Panthers</p> <p>f t</p>	<p>Duke Basketball Report Duke Blue Devils</p> <p>f t</p>
<p>From The Rumble Seat Georgia Tech Yellow Jackets</p> <p>f t</p>	<p>Gobbler Country Virginia Tech Hokies</p> <p>f t</p>
<p>Shakin The Southland Clemson Tigers</p> <p>f t</p>	<p>State of The U Miami-Florida Hurricanes</p> <p>f t</p>
<p>Streaking The Lawn Virginia Cavaliers</p>	<p>Tar Heel Blog North Carolina Tar Heels</p>

a Virginia Tech Hokies community

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Three Concerns Heading Into the Showdown With Clemson
by Jawhar Ali

Virginia Tech football: A chat with Shakin the Southland to preview Clemson
by Bryan D. Manning

Virginia Tech football: Three Crazy Takes For Clemson
by Roy Hatfield

a Virginia Cavaliers community

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- Virginia Football
- Editorial Opinion
- Virginia Basketball
- Full Archive
- Olympic Sports

Louisville Basketball head coach Rick Pitino reportedly fired in midst of FBI investigation
by Caroline Darney

2017 VIRGINIA FOOTBALL SEASON Comparing UVA to the last time the Hoos were Top 10
by Danny Neckel

Report Card: Boise State
by Paul Guttman

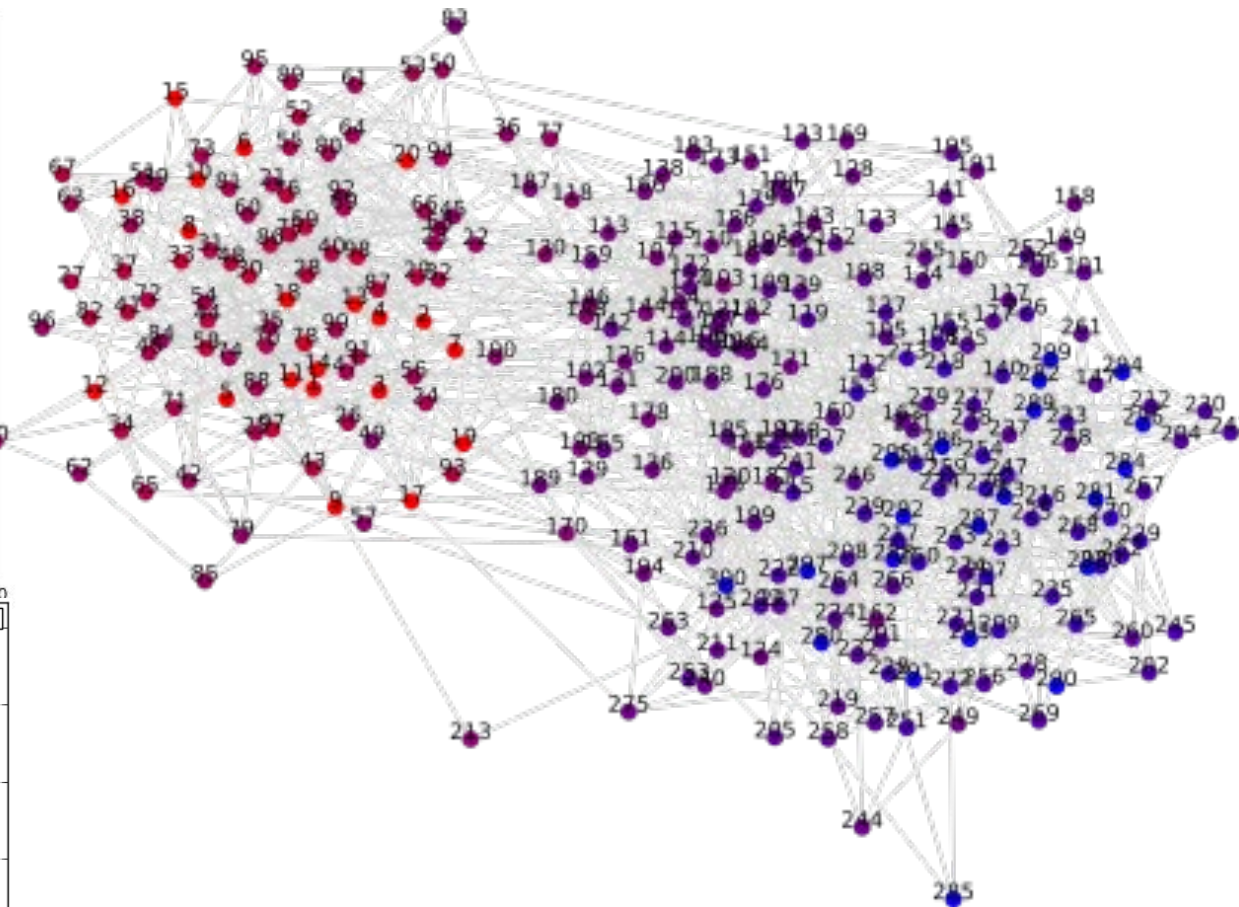
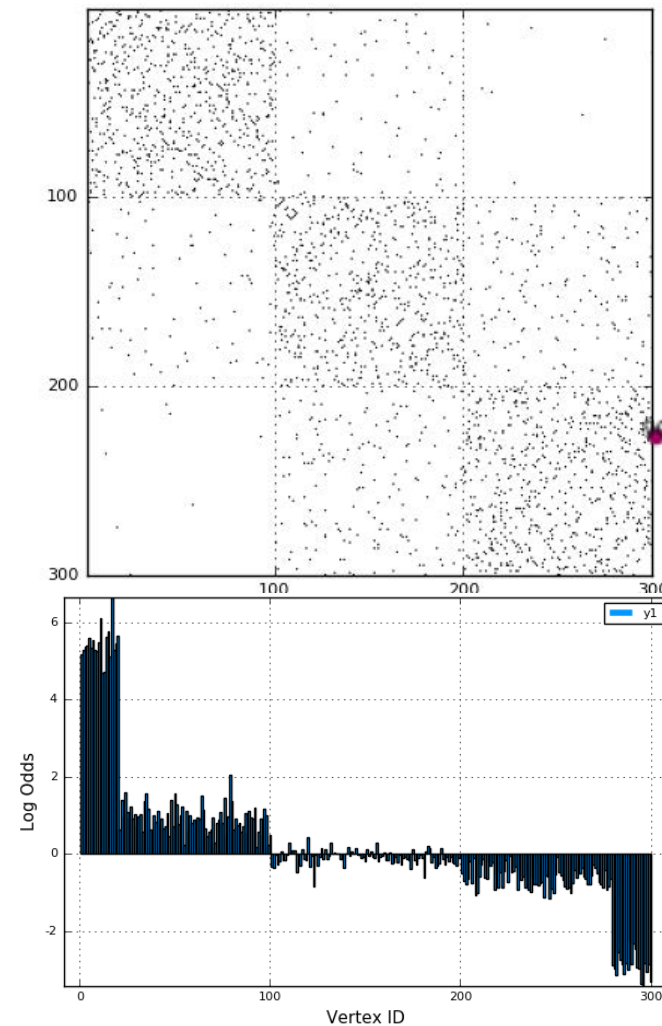
College basketball's bribery scandal, and how it affects Virginia
by Paul Wiley

Hoos in the NFL: Week 3 Recap
by Danny Neckel

Model Problem for Method Validation

On a model problem:

1. Recover the partisan propaganda news with
2. 96% True Positive Rate for Red Fake News
3. 100% True Positive Rate for Blue Fake News
4. 10% of the data labeled

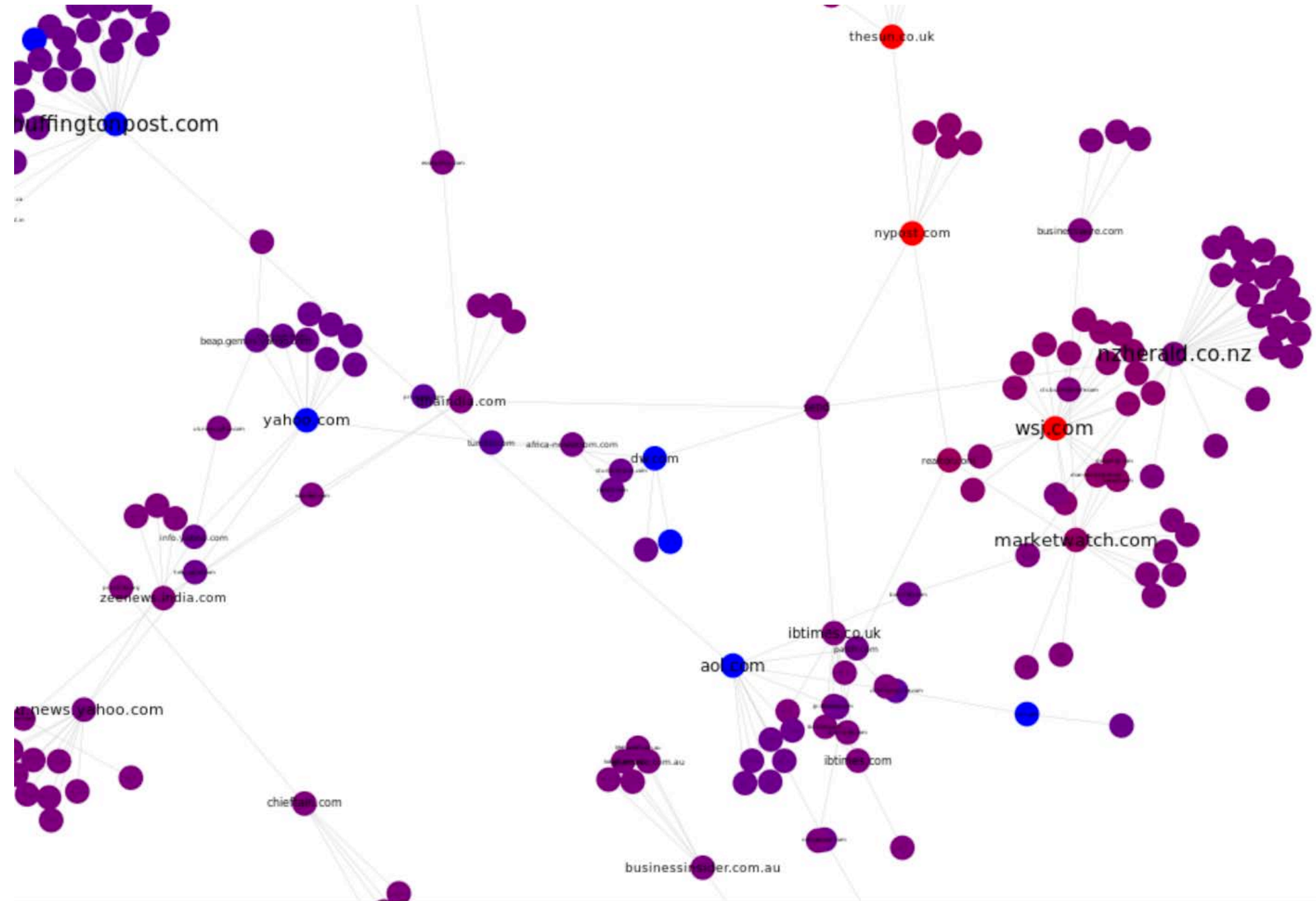


Bright red and blue are labeled examples and dark red and blue are learned examples fake news.

Purple indicates mainstream articles.

Belief Propagation: Real world data

- Red: Conservative
- Blue: Liberal
- Area under ROC: 70% for ideology, 75% for real/fake



Results

Model Type	Bias	Credibility
Text	0.718	0.625
Structure	0.708	0.669

Conclusions

- Online Propaganda and Fake News is an economics problem, **its about money**
- Problematic Journalism creates and feeds on **hyperpartisan echo chambers**
- We can discover and combat propaganda with **structural analysis of the web**

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