

Welcome and Project Intro

Discovering the Traces of Disinformation on Instagram

Dr. Michele C. Weigle

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Who Am I?

Dr. Michele Weigle

Professor of Computer Science

Web Science and Digital Libraries Research Group

Research interests: web science, social media, web archiving, information visualization

Wife, and mom of 2 boys



Who Was I?

Small-town Louisiana girl



Computer Science undergrad in Louisiana



Computer Science MS and PhD at UNC-Chapel Hill



Undergrad Experience



- Attended a relatively small CS dept in my home state, no graduate program
- Advisor (and later department chair) was female
- Thought about changing my major my first year
- Summer REU-like internship at GTE Labs in Boston after junior year
- Considered Louisiana-Lafayette, Alabama, NC State, and UNC for graduate school



Grad School Experience



COLLEGE OF ARTS AND SCIENCES
Computer Science

- Chose UNC after campus visits
- Met amazing people from all over the world
- Worked with really smart people on interesting projects
- Got to travel (for free) - Italy, Sweden, Lake Tahoe, Norfolk
- Fellow female CS students helped me through and boosted my confidence



Why Did I Become a Professor?

- Inspired by mentors and undergraduate/graduate faculty
- Love learning new things
- Enjoy teaching
- Flexibility in time and research topics
- I loved being a graduate student, didn't want to leave academia





2006 - Joined as Assistant Professor

2012 - Tenure, promoted to Associate Professor

2018 – Promoted to Full Professor

Research interests (in chronological-ish order): TCP/IP networking, vehicular networks, sensor networks, web archiving, information visualization, social media, web science

Recent Teaching: Web Science, Data Visualization, Information Visualization and Visual Analytics, Research Methods (Intro to PhD)

REU Project: Discovering the Traces of Disinformation on Instagram

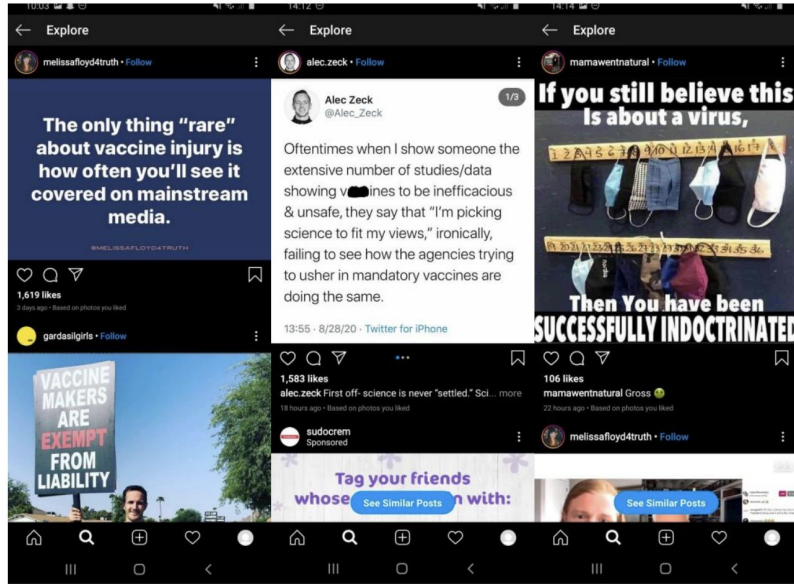


Image credit: Center for Countering Digital Hate (CCDH), "Malgorithm: How Instagram's algorithm publishes misinformation and hate to millions during a pandemic", March 2021, <https://www.counterhate.com/malgorithm>

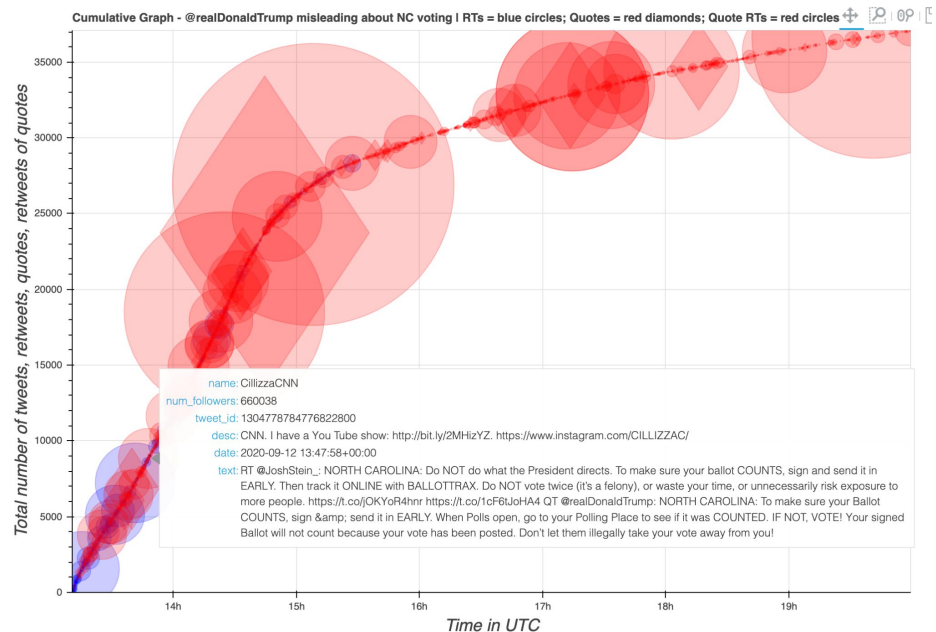
Metadata of users and posts on Twitter has been used to identify potential sources of disinformation

- follower counts
- number of likes, shares, retweets
- retweet networks

Can we do the same with Instagram?

Instagram: 1.21 billion monthly active users
Twitter: 330 million monthly active users

Investigating Spread of Misleading Tweets



@realDonaldTrump tweet about NC voting from 2020

Blue circles - retweets

Red diamonds - quote tweets

Red circles - retweets of quotes

Interactive chart can show the tweet content

Most later red activity are corrections

http://faculty.washington.edu/kstarbi/Trump_Sept12.html, <https://twitter.com/katestarbird/status/1304858772586651648>

Instagram was a significant front in the IRA's influence operation

- Russian Internet Research Agency (IRA)
- Manipulated social media narratives to influence American culture and politics in run-up to 2016 Presidential election
- Employed 1000+ to engage in influence operations, budget of over \$25M
- Analysis commissioned by the US Senate Select Committee on Intelligence

	Facebook	Instagram
Likes	37,627,085	183,246,348
Likes/Post	612	1,568
Comments	3,339,752	4,017,731
Comments/Post	54	34
Reactions	5,188,182	N/A
Shares	30,350,130	N/A
Total Engagements	76,505,149	187,264,079

New Knowledge, "The Tactics & Tropes of the Internet Research Agency", 2018, https://cdn2.hubspot.net/hubfs/4326998/ira-report-rebrand_Final114.pdf

However, Instagram is not as studied as Twitter or Facebook

Twitter	Instagram
450 million monthly active users	2 billion monthly active users
8 million hits in Google Scholar	3 million hits in Google Scholar
Open (for now) API allows for searching and downloading public tweet content	API is focused more on allowing creation of content and monitoring engagement
Sharing based on retweets	No native sharing feature (though there are methods for "regrams")
Public posts and accounts viewable to not logged in users and bots	Public posts and accounts limited for not logged in users and bots

Results from 2022 REU Project

Less than 4% of Archived Instagram Account Pages for the Disinformation Dozen are Replayable

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ABSTRACT

We examined the archived Instagram account pages of the “Disinformation Dozen”, a group of anti-vaccine conspiracy theorists, along with account pages of a set of health authorities. In the Internet Archive, we found that a majority of the archived web pages, or mementos, are actually redirections to the Instagram login page, and of the remaining replayable mementos, many are missing post images. In our combined dataset, over 83% of the archived account pages redirected to the Instagram login page, due to Instagram’s treatment of access by non-logged in users. For the Disinformation Dozen, 96.13% of their account page mementos redirect to the login page, and only 27.16% of the remaining replayable mementos contain every post image that was requested. Combined, these results reveal that merely 1.05% of mementos for the Disinformation Dozen account pages are replayable with complete post images. Furthermore, we found that the percentage of replayable mementos is decreasing over time, with a particular lack of replayable mementos for the years 2021 and 2022.

and creators insight into their own accounts, rather than allowing researchers to study others’ posts. This is in contrast to Twitter’s previously [24] open Developer API [25]. The nature of sharing on Instagram is also different than on other platforms. Instagram has no “retweet” or “share” analog, which changes the nature of how things “go viral”. Analyzing these retweet (Twitter) and share (Facebook) networks is a standard way that researchers study disinformation propagation networks [20, 21, 23], but this does not exist in Instagram. Instead, spread of information is largely controlled by the Instagram feed, which is tailored to an individual based on who they follow [7].

Due to the nature of the malicious content, many posts spreading disinformation are caught by fact-checking software and deleted. Similarly, accounts dedicated to disinformation are banned once they violate guidelines repeatedly. For example, the Center for Countering Digital Hate (CCDH) released a report in 2021 [6] on a group of content creators known as the “Disinformation Dozen,” who were responsible for 65% of anti-vaxx content online, receiving substantial coverage in the news media [3, 11, 17, 19]. Since the



Haley Bragg, CNU
Advisor: Dr. Weigle

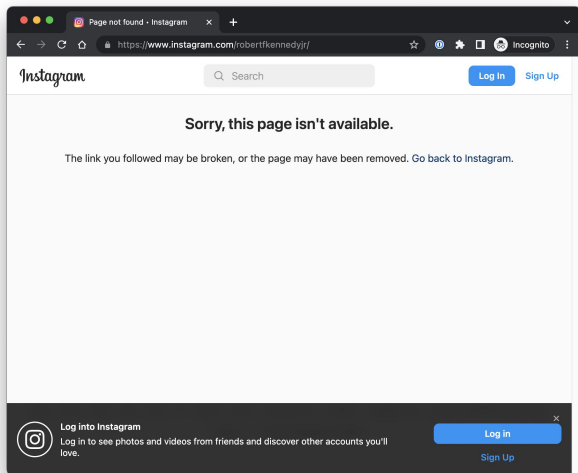
To be published in the
*Proceedings of the
IEEE/ACM Joint Conference
on Digital Libraries (JCDL)
2023, nominated for best
short paper*

Bragg, Jayanetti, Nelson, and Weigle, "Less than 4% of Archived Instagram Account Pages for the Disinformation Dozen are Replayable", JCDL 2023,

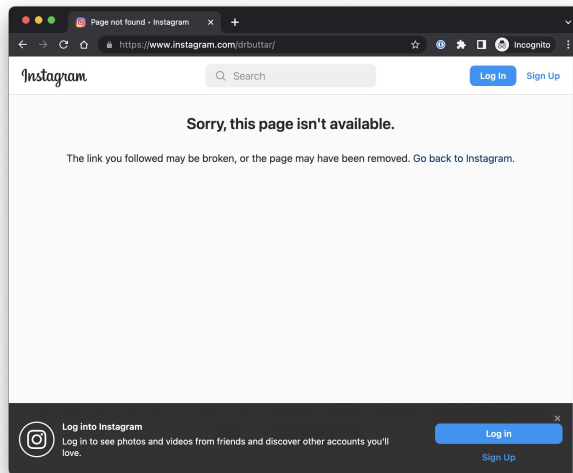
<https://www.cs.odu.edu/~mweigle/papers/bragg-jcdl2023-preprint.pdf>

Source code: <https://github.com/oduwsdl/DisinformationDozen>

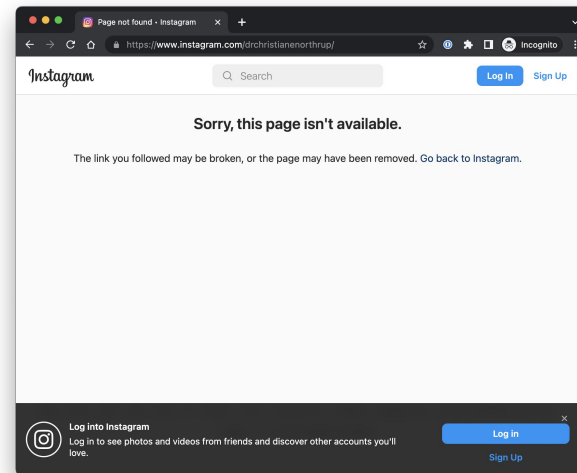
You can't view banned accounts on the live web



instagram.com/robertfkennedyjr/



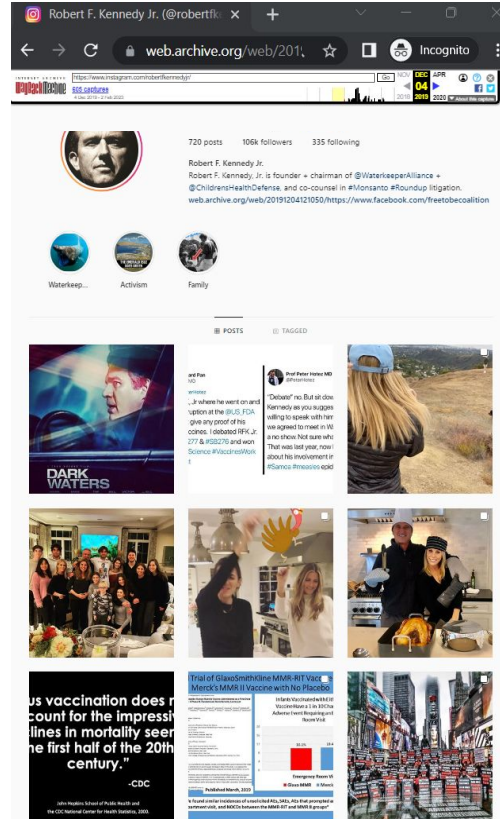
instagram.com/drbuttar/



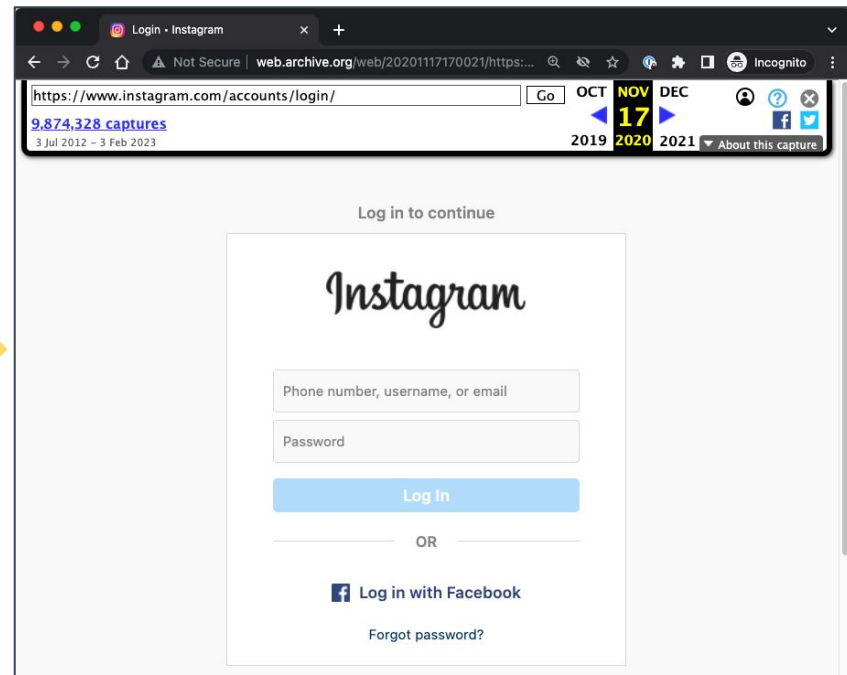
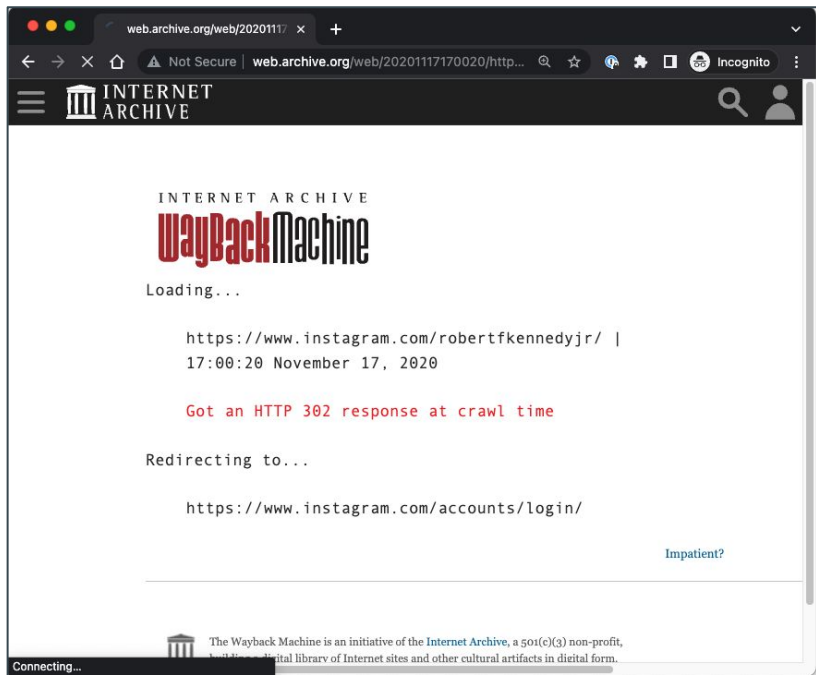
instagram.com/drchristianenorthrup/

Web archives can provide access to past versions of webpages

- If the Instagram account pages were archived before they were banned, we can study the content to learn about their tactics.
- Largest public web archive is the Internet Archive's (IA) Wayback Machine, <https://web.archive.org/>



But most of these just redirect to the Instagram Login Page



Bragg and Weigle, "Discovering the Traces of Disinformation on Instagram in the Internet Archive", <https://arxiv.org/abs/2301.09188>
Bragg, Jayanetti, Nelson, and Weigle, "Less than 4% of Archived Instagram Account Pages for the Disinformation Dozen are Replayable", JCDL 2023, <https://www.cs.odu.edu/~mweigle/papers/bragg-jcdl2023-preprint.pdf>

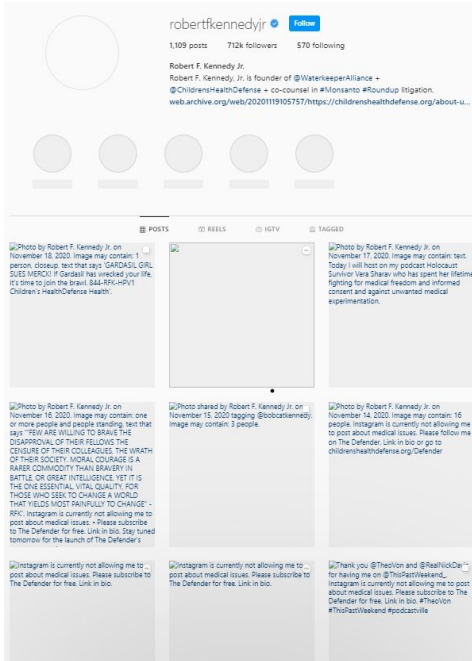
Only 6 successful replays for instagram.com/RobertFKennedyJr

	Mementos	Percentage
Redirects to Login Page	592	99.0%
Replayed Account Pages	6	1.0%
Total Mementos	598	100%

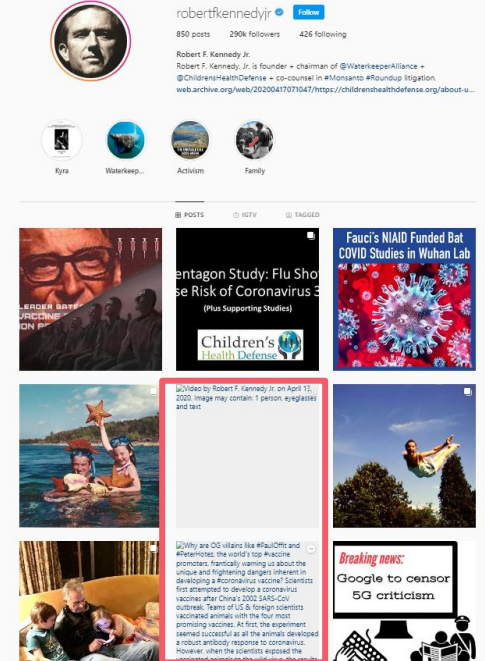
Bragg and Weigle, "Discovering the Traces of Disinformation on Instagram in the Internet Archive", <https://arxiv.org/abs/2301.09188>
Bragg, Jayanetti, Nelson, and Weigle, "Less than 4% of Archived Instagram Account Pages for the Disinformation Dozen are Replayable", JCDL 2023, <https://www.cs.odu.edu/~mweigle/papers/bragg-jcdl2023-preprint.pdf>

Even if archived, not all post images may be replayable

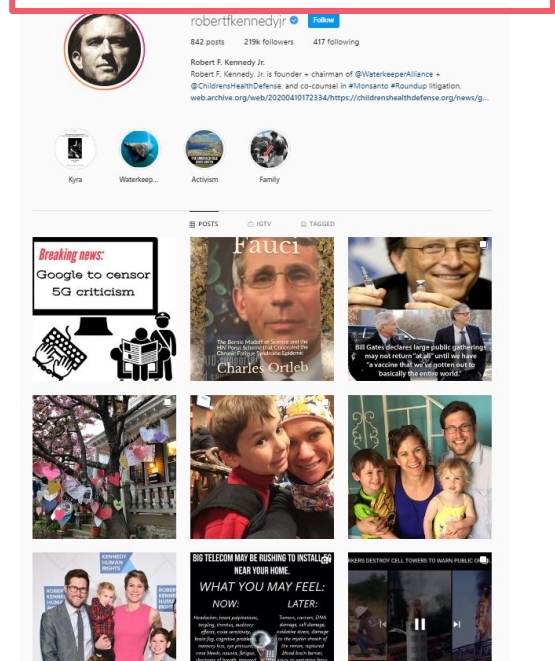
No loaded post images: 3



Partial loaded post images: 1



Complete loaded post images: 2

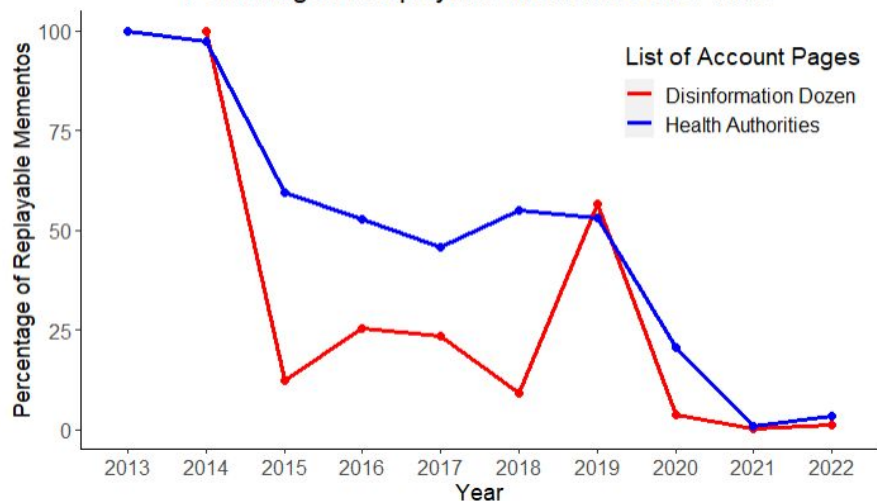


Bragg and Weigle, "Discovering the Traces of Disinformation on Instagram in the Internet Archive", <https://arxiv.org/abs/2301.09188>
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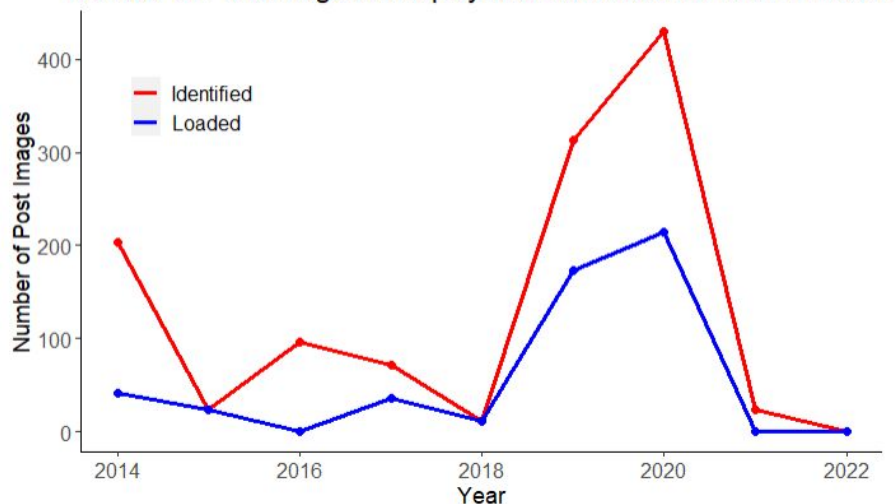
Instagram has made it even harder to archive pages

2021, 2022: Low percentages of replayable mementos and number post images available in those replayable mementos

Percentage of Replayable Mementos Over Time



Number of Post Images in Replayable Mementos for Disinfo Dozen



Bragg and Weigle, "Discovering the Traces of Disinformation on Instagram in the Internet Archive", <https://arxiv.org/abs/2301.09188>

Bragg, Jayanetti, Nelson, and Weigle, "Less than 4% of Archived Instagram Account Pages for the Disinformation Dozen are Replayable", JCDL 2023, <https://www.cs.odu.edu/~mweigle/papers/bragg-jcdl2023-preprint.pdf>

Possible Directions for Summer 2023

- Pinpoint when redirects to the Instagram login page became prominent
- Investigate the quality of archived posts
- Investigate the use of backup accounts to get around account bans
- Investigate tagging networks (what accounts are using similar hashtags) for spreading disinformation
- Investigate the role of specific hashtags over time in spreading disinformation

Graduate Student Helpers



Himarsha Jayanetti



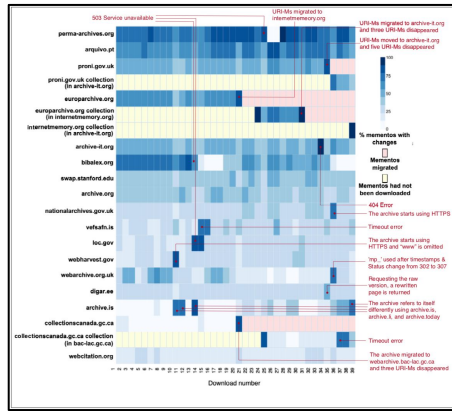
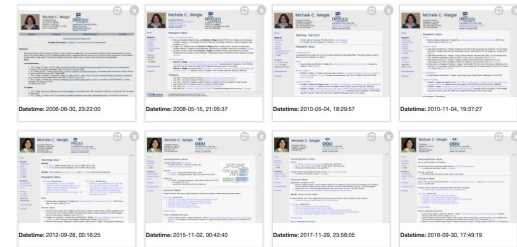
Kritika Garg



David Calano

Backups

Web Science and Digital Libraries



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A bit about me:
 This PhD student in the Department of Computer Science at UNC in Chapel Hill. These are the research projects I'm involved in at UNC:

- **DRIFT** (Distributed and Real Time Forecast)
- **RealTimeLogic Project**
- **Collaborative Content Collaboration Data Project**

Here are some other research-related links:

- **Faculty** (participating in my research & advice classes)
- **My research** (PUBLISHED RESEARCH)

Last year (2019), I was in charge of recording up info to help with **DisInfo**, which covers during the Fall and Spring semesters on Fridays at 5pm to 7PM.

UNC Featured my BS in **computer science** at **Northwest Louisiana University** in Monroe. While there, I was a member of UNC's **commuting** **Traveler** **Boyscout**.

My **mentors** to **Dr. Francis (Bob) Lounsbury**, a thoughtful, great boss on the basis of the right **University** **Blog**, **lessons** for his **webinar** **presentation** **lessons** and **conferences** (the **old** **site** **took** **a** **look** **at** **one** **of** **C.C. Lounsbury's** **gitHub** **on** **the** **MyPy** **Algorithm**).

This is a member of the **United Methodist Church**, specifically, the **St. Mark's** **in** **UNC**. Community. This **sheltering** **University** **Boyscout** in Chapel Hill.

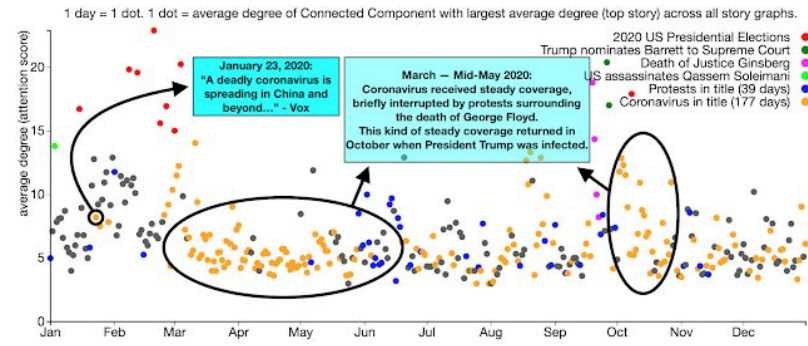
1997-06-28, 17:52:42

<https://ws-dl.blogspot.com/2020/05/2020-05-21-visualizing-webpage-changes.html>



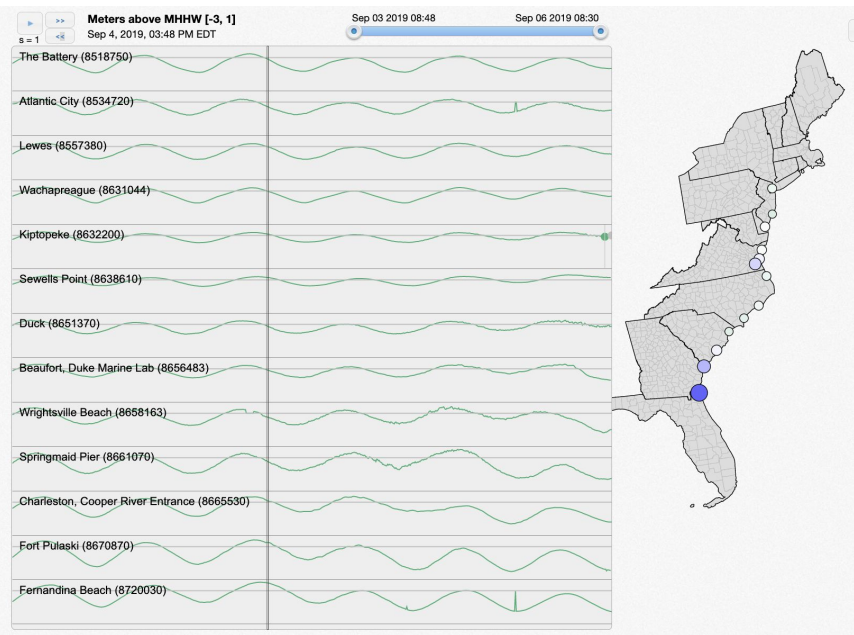
<https://oduwsdl.github.io/> @WebSciDL

Aturban et al., "Where Did the Web Archive Go?", <https://arxiv.org/abs/2108.05939>



<https://ws-dl.blogspot.com/2021/01/2020-01-20-366-dots-in-2020-top-news.html>

Information Visualization



<https://www.cs.odu.edu/~mweigle/research/atlantic-vis/>

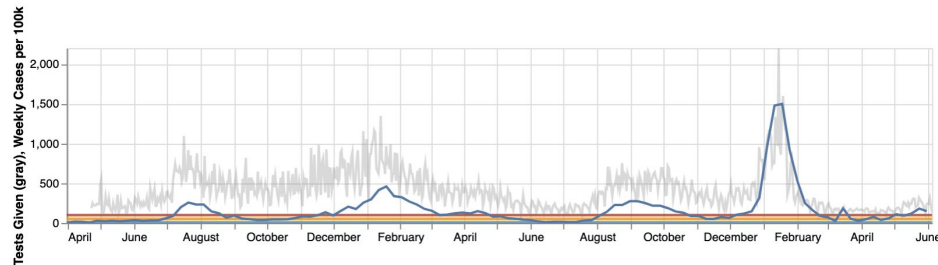
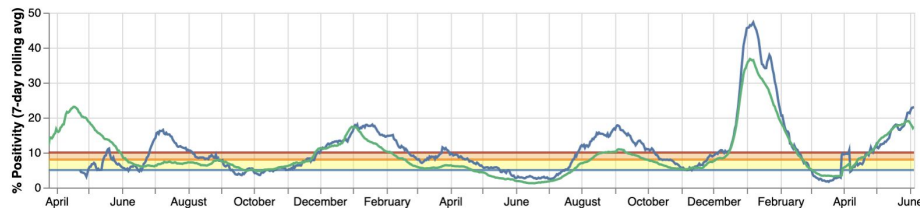
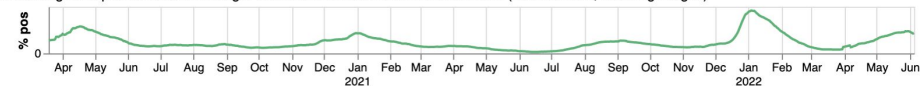
Virginia at 18.59% positivity (rolling avg: 17.48%) on 6/4/2022

Norfolk at 27.61% positivity (rolling avg: 23.16%) on 6/4/2022

148.72 weekly cases/100k on 5/31/2022

Green: State Avg, Blue: Norfolk

Select range in top chart to zoom in larger charts or use radio buttons under charts (Source: VDH, data.virginia.gov)



<https://observablehq.com/@weiglemc/virginia-covid-status-pcr-pos-cases>