

Characterizing and Measuring Misleading and Harmful Online Ads at Scale

Eric Zeng

Postdoctoral Researcher

CyLab Security & Privacy Institute

Carnegie Mellon University

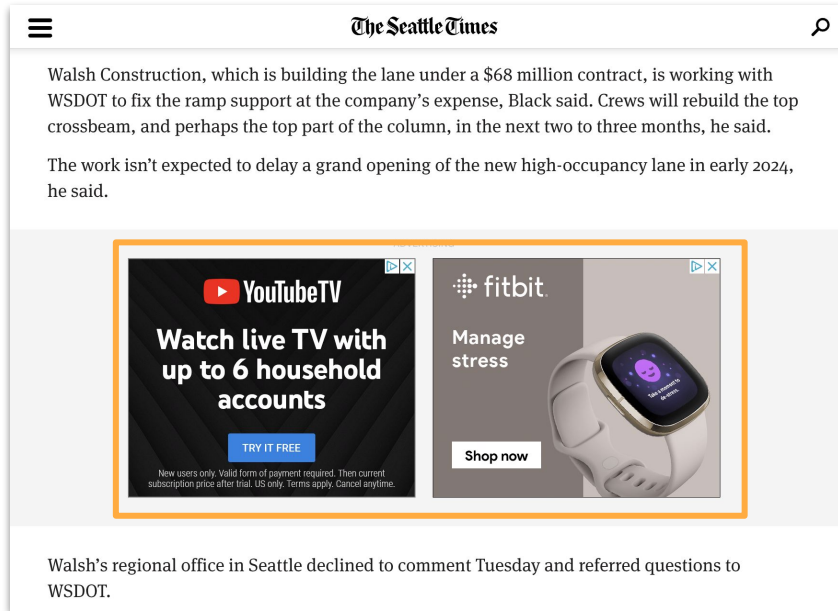


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The web depends on online advertising



The Seattle Times

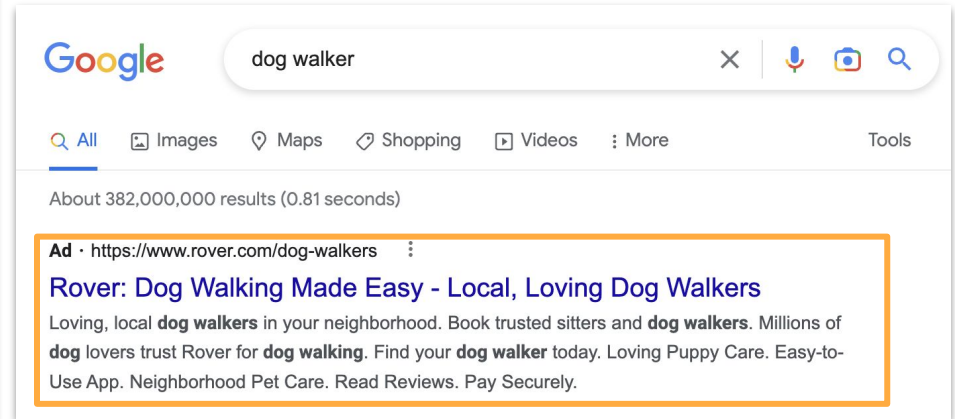
Walsh Construction, which is building the lane under a \$68 million contract, is working with WSDOT to fix the ramp support at the company's expense, Black said. Crews will rebuild the top crossbeam, and perhaps the top part of the column, in the next two to three months, he said.

The work isn't expected to delay a grand opening of the new high-occupancy lane in early 2024, he said.

Walsh's regional office in Seattle declined to comment Tuesday and referred questions to WSDOT.

YouTubeTV
Watch live TV with up to 6 household accounts
TRY IT FREE
New users only. Valid form of payment required. Then current subscription price after trial. US only. Terms apply. Cancel anytime.

fitbit
Manage stress
Shop now



Google

dog walker

All Images Maps Shopping Videos More Tools

About 382,000,000 results (0.81 seconds)

Ad · <https://www.rover.com/dog-walkers>

Rover: Dog Walking Made Easy - Local, Loving Dog Walkers


Loving, local **dog walkers** in your neighborhood. Book trusted sitters and **dog walkers**. Millions of **dog lovers** trust Rover for **dog walking**. Find your **dog walker** today. Loving Puppy Care. Easy-to-Use App. Neighborhood Pet Care. Read Reviews. Pay Securely.

But “bad” ads make using the web worse

The Washington Post
Democracy Dies in Darkness

Advice | Carolyn Hax: Kids prefer Thanksgiving where they don't have to help

Today at 12:00 a.m. EST



PAID PROMOTED STORIES Outbrain

The Best States to Retire in 2022
SmartAsset

Here Are The 31 Coolest Gifts of 2022
Experts predict holiday shortages. Here are 31 gifts you should grab before they're gone.
TheGrommet

Russia's elite begins to ponder a Putinless future
The Economist

Urologist: Plenty of Men With An Enlarged Prostate Do Not Know...
GorillaSecret.com

Read This Before You Renew Amazon Prime Again
Capital One Shopping

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Microsoft Store App Awards Editor's Choice Award Creativity - Graphics and 3D

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Get it now (free download):
[paint.net 4.3.12](#)
English, Belarusian, Catalan, Chinese (Simplified), Chinese (Traditional), Corsican, Czech, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hindi, Hungarian, Italian, Japanese, Korean, Lithuanian, Norwegian, Persian, Polish, Portuguese (Brazil), Portuguese (Portugal), Russian, Slovak, Slovenian, Spanish, Swedish, Thai, Turkish, Ukrainian
Released on August 20th, 2022

"Paint.NET is just about perfect ..." - [Lifehacker](#) (June 2010)

"Impressive." - PC World, [Top 100 Products of 2007](#)

"It raises the quality bar," - Jeff Atwood, [Coding Horror](#)

3 Easy Steps:

1. Click "Continue"
2. Add Extension
3. Access OnlineToolsForBrowser

Continue

OnlineToolsForBrowser

Start Now

2 Easy Steps

1. Click "Start Now"
2. Add Content Grade for Chrome

Donate!
Show your appreciation for Paint.NET and support future development by [donating!](#)

[PayPal](#) Donate

Windows Store
You can also support Paint.NET by purchasing it on the Windows Store:

Get it from **Microsoft**

“Bad” ads...

...commonly use

- Clickbait headlines
- Shocking images
- Deceptive formatting



...and can harm users



FTC: consumers scammed out of \$96 million via online ads and popups in 2021

Fake Google ads used to lure victims to malware-rigged Signal, Telegram websites

By Mayank Sharma published June 22, 2021

Drive-by-download campaigns are poisoning Google's search results, warns experts

We don't know much about bad ads

- Lack of transparency
- Other ads research focuses on privacy

This talk: systematically describing bad ads,
from a qualitative and quantitative perspective

Outline

What makes
a “bad” ad?

[CHI 2021]

How
prevalent are
“bad” ads?

[ConPro 2020]

What
enables bad
ads?

What can we
do about
them?

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Defining "bad" ads

Acceptable Ads



The gray area



Illegal Content

- False advertising
- Discriminatory employment ads

Violates Content Policy

- Hateful content
- Explicit images

Acceptable

Prohibited

What's in the gray area?
What do **people** dislike about these ads?

Research questions

1. What **reasons** do people have for disliking ads?
2. What is the **content** of the ads that people dislike?
3. How does attitude towards ads affect web **usage**?

Survey Methodology

Survey 1: Why do people dislike ads?

Dataset

30 ads
(curated mix of good/bad ads from top sites)

Qualitative Survey

What do you like/dislike about these ads?
($n=60$)

Result

Taxonomy of reasons people like/dislike ads

Survey 2: What kinds of ad content do people dislike (and why?)

Dataset

500 ads
(scraped from top sites)

Crowd Labeling Survey

Why do you like/dislike this ad? (using taxonomy)
($n=1000$)

Result

Labeled dataset of user ratings of ads

Use taxonomy as labels

Reasons people disliked ads

- Boring, Irrelevant
- **Unclear**
- Ugly, poorly designed
- Don't like the product
- Politicized
- **Offensive, uncomfortable, distasteful**
- Clickbait
- **Deceptive, untrustworthy**
- Pushy, manipulative



“Small type, too much information, no clear message. I have no idea what it is about.”

“the words are ok but the image is gross”



“it seems like a scam and does not seem like it is from a reputable source.”

Ads perceived as untrustworthy



1 Cup of This Helps Rapid Fat Loss

Metabolic Greens Plus

Dietary Supplements



3 Easy Steps:

1. Click "Download"
2. Download on our website
3. Enjoy

Software Downloads



Man Who Picked Apple in 2003 Says "Genesis" Will Be 32 Times Bigge...

The Legacy Report | Sponsored

Investment Advice

Ads perceived as distasteful



**He Died 15 Years Ago, Now His Family Confirms
The Rumors**

Fresh Edits | Sponsored

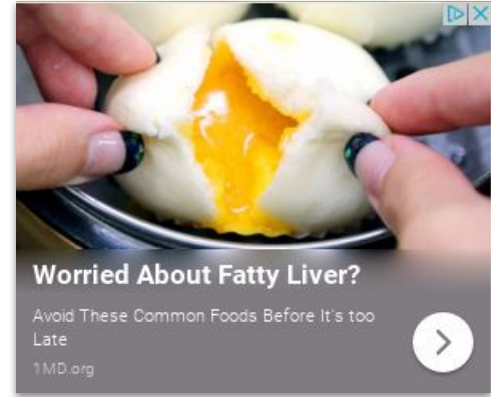
Content Farms



Hollywood Hunks Laid Bare: 1980s-1990s

LATEST FROM PRIDE MEDIA

Suggestive/Explicit
Images



Worried About Fatty Liver?

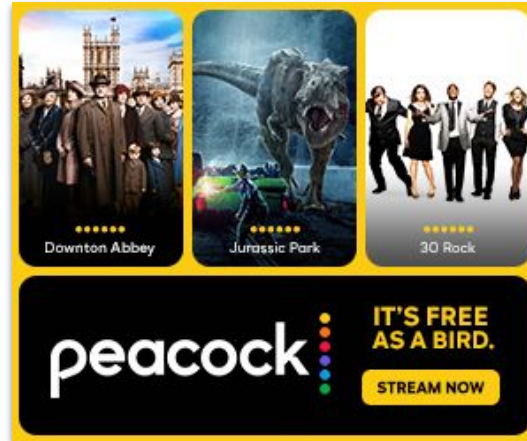
Avoid These Common Foods Before It's too
Late

1MD.org

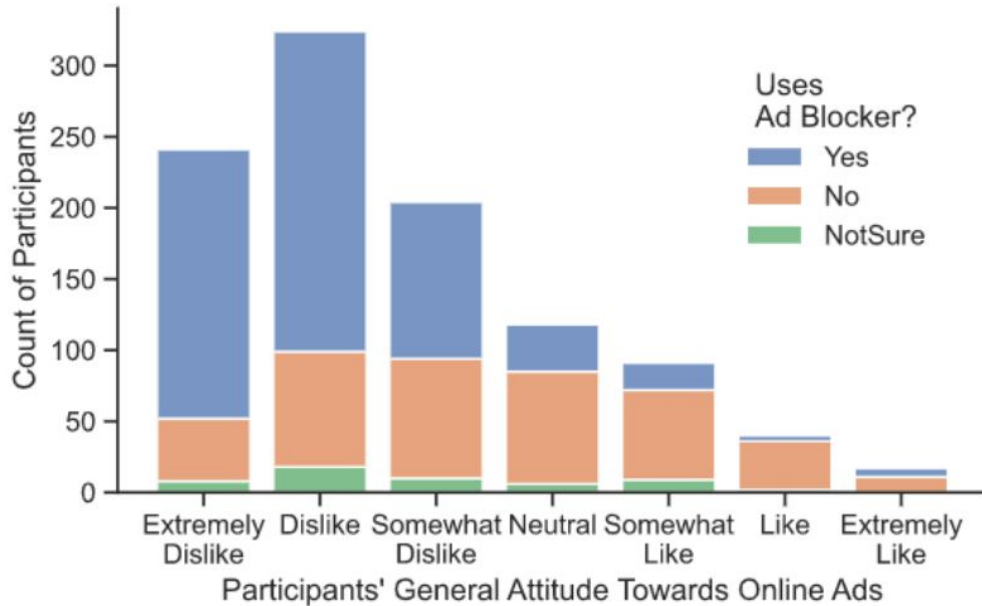
Health-related Ads with
Gross Images

Ads that people liked

- Simple and clean design
- Products that people liked
- From trustworthy brands that people are familiar with



How do perceptions of ads relate to ad blocker usage?



- People who dislike ads generally are more likely to use ad blockers
- Implication: higher prevalence of bad ads may increase ad blocker usage

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Case Study: News Websites

Trump sternly **cautioned** Republicans against making a single change to social security or medicare “to help pay for Joe Biden’s reckless spending spree” but enthusiastically endorsed cuts to other spending initiatives, including cutting “hundreds of billions of taxpayer dollars going to corrupt foreign countries,” cutting “the mass releases of illegal aliens that are depleting our social safety net and destroying our country,” ending radical gender programs in the military and nixing funding on “climate extremism.”

“Cut waste, fraud, and abuse everywhere that we can find it, and there’s plenty of it, but do not cut the benefits our seniors worked for and paid for their entire lives. Save social security, don’t destroy it,” he warned.

READ MORE STORIES ABOUT:

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TWEET

AROUND THE WEB



40 Abandoned Disney Attractions That Give Us the Creeps

Taco Relish



The Most Valuable Coins of All-time, Ranked in Order

Money Pop



Diabetes is Not from Sweets! Meet the Number One Enemy

Blood Sugar

Award-Winning
Community
Final Residences
Now Selling

LEARN MORE

All information subject to change. TM-C: Realty and Construction Inc. BRE #01870227

NEW HOME LISTING

advertisement

MOST POPULAR

Lancet Urges Shift Away from Human-Centered Health Care

2,141 comments



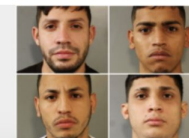
U.S. Health Officials Call for Annual Coronavirus Booster Shots

4,511 comments



Border Crossers Bused to NYC Arrested, Released

2,994 comments

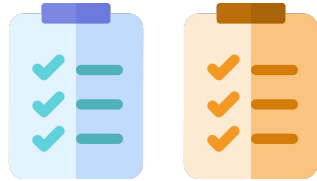


Research questions

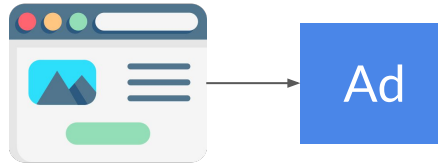
- What **categories** of bad ads are most common?
- Do bad ads appear more on **mainstream** news websites or **fake news** websites?
- Which **ad networks** serve more bad ads?

Measurement Study Methodology

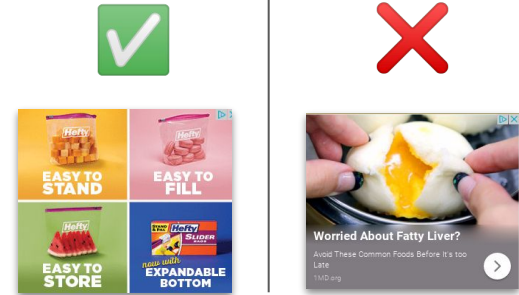
Generated lists of mainstream and fake news websites



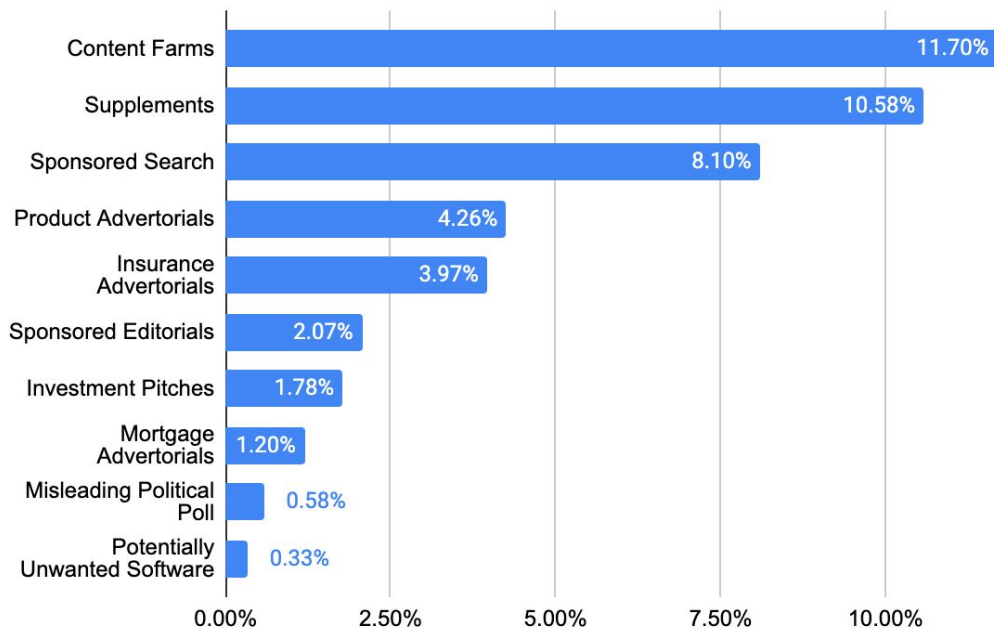
Scraped the ads from each site using a web crawler



Qualitatively coded the content of 2419 ads from the top 100 sites



What types of “bad” ads are most common on news websites?



Content Farms

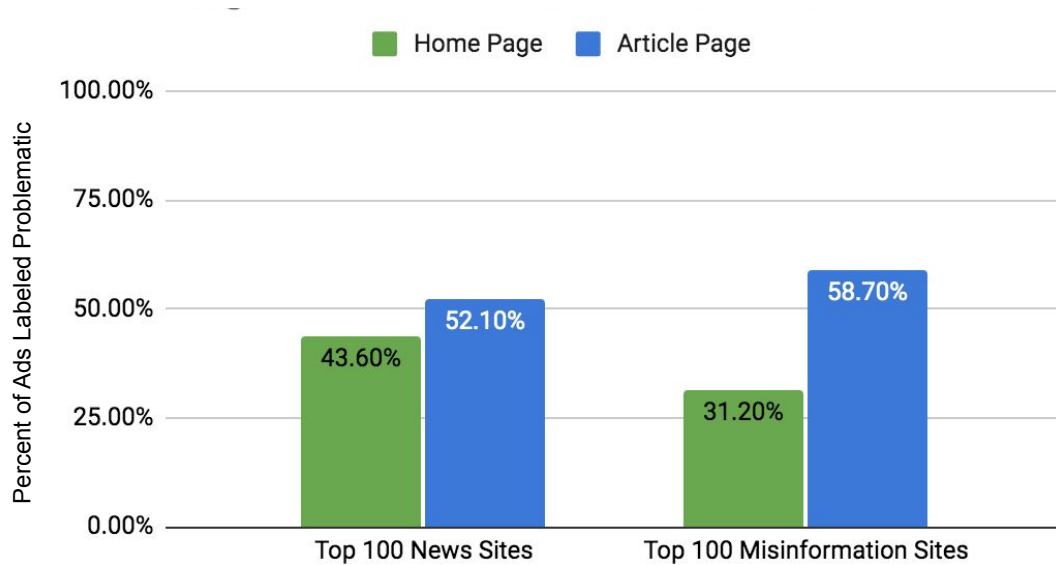


Supplements



Sponsored Search

How prevalent are “bad” ads on mainstream versus fake news websites?



Over 50% of ads shown on articles on **both** sites were categorized as problematic

Which ad networks serve more bad ads?

Display Ad

She co... can
chang... ve
watch...
barga... place
to make sure that we have a voice.”



After the petition was announced, Proletariat leadership [published a blog](#) in which it declined to recognize the Proletariat union, forcing the union to a vote with the National Labor Relations Board. Proletariat leadership described the company as “pro-worker,”

Native Ad

alien... medical
gend...
“Cut... but do
not c...
secur...

READ MORE STORIES ABOUT:

Economy, Politics, corporations, Debt ceiling, Donald Trump, Joe Biden, lobbying

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AROUND THE WEB



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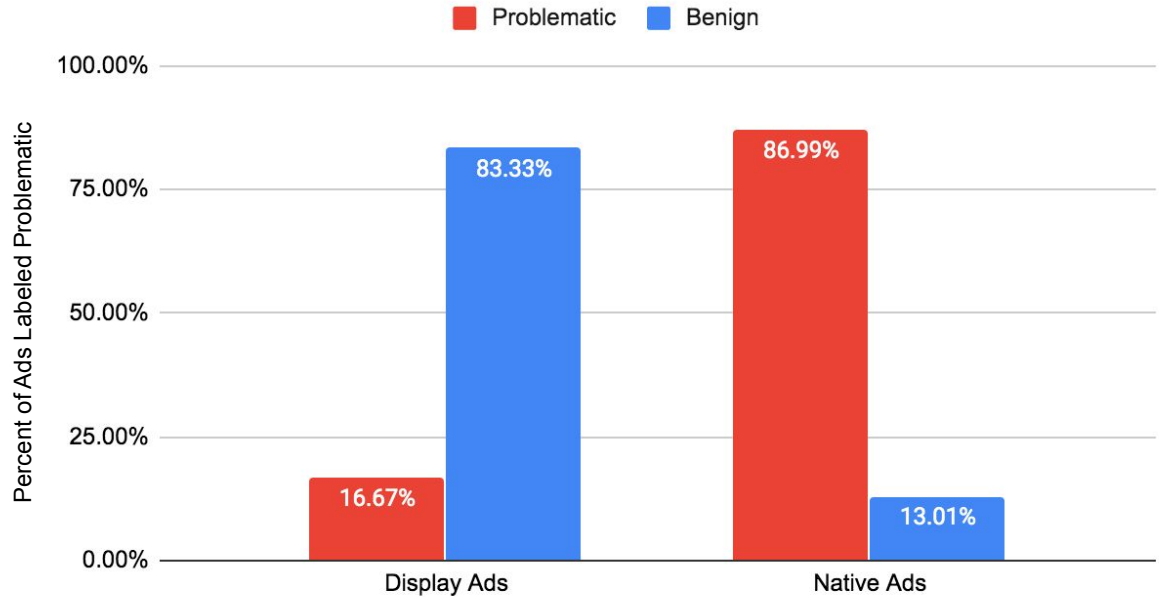
Diabetes is Not from Sweets! Meet the Number One Enemy

Blood Sugar

Which ad networks serve more bad ads?

Native ad networks serve **more** bad ads than **display ad** networks

- Taboola
- Outbrain
- RevContent



Outline

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[CHI 2021]

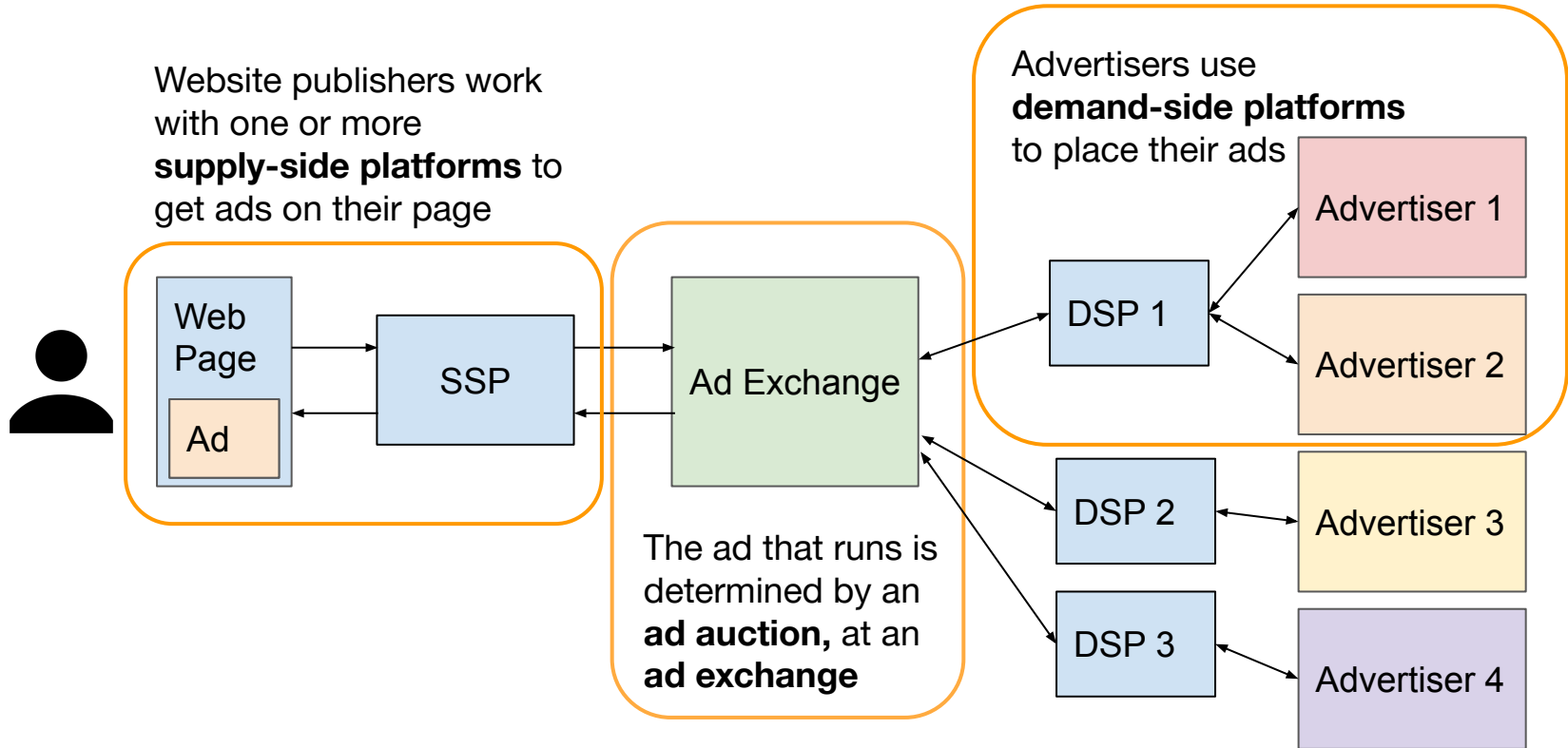
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Ads are served through a distributed ecosystem



Ads are served through a distributed ecosystem

Websites can run ads from many different **SSPs** or ad networks



AppNexus



Google Ads



rubicon
PROJECT



Taboola



Advertisers can buy ads through many different **DSPs**



CRITEO



Verizon Media
DSP



Google Display
& Video 360



Each can have its own standards and content policies

Structure of ad ecosystem distributes responsibility for content moderation

Some ad platforms have **less stringent standards** than others

(e.g. native ad networks like Taboola, RevContent, Outbrain)

Some websites are **willing to accept low quality ads** that pay well

(e.g. news websites and content farms)

Creates spaces for bad ads to exist

Summary

- There exists a gray area of “bad” ads that don’t violate laws or policies, but people dislike
- Bad ads are prevalent on the web, e.g. even on reputable news websites
- Decentralized nature of advertising ecosystem and economic factors create a space for bad ads and ad networks
- Bad ads harm trust in the web, driving people to use ad blockers or to other platforms - threatening the web platform

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Build user trust in the web

Ad tech industry

- Adopt more user-centric content policies
- Standardize content policies across ad networks
- Provide transparency on advertisers, targeting, and tracking

Browsers

- Enforce standards for ad quality in the browser
 - e.g. an “Acceptable Ads” standard for content, not just web performance

Regulators

- Strengthen enforcement against deceptive techniques in online advertising

Address the structural factors

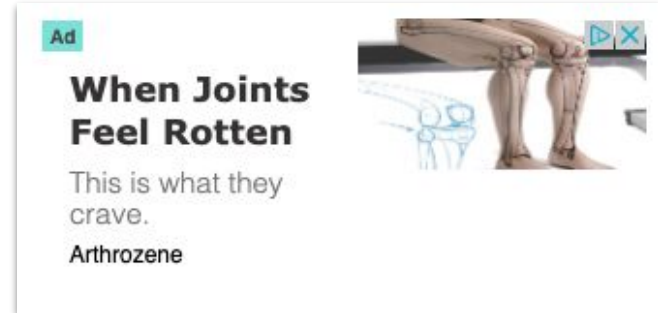
- Create alternative revenue models for the web
- Reduce incentives for sites to run bad ads and compromise user privacy

Future directions for research

Are bad ads being used in sensitive contexts? Are vulnerable populations targeted?

Previously: misleading political ads targeted at partisan websites during the 2020 US Elections [IMC '21]

Ongoing: are health-related ads targeted at people with health conditions?



Thanks for listening!

Eric Zeng

Postdoctoral Researcher
Carnegie Mellon University

Contact

✉ ericzeng@cmu.edu

🌐 ericwzeng.com



Miranda Wei



Theo Gregersen



Rachel McAmis



Yoshi Kohno



Franzi Roesner



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