Should Users Accept Acceptable Ads ?

Measuring the effects of Acceptable Ads on User Experience

Hammas Bin Tanveer
The University of Iowa

Hussam Habib
The University of Iowa

ABSTRACT

The internet is largely monetized by online advertisements. Advertising exchanges and publishers earn revenue by showing ads to online users, however due to the lack of legal regulation publishers and advertisers have started to misuse this power by showing intrusive and annoying ads to their users. In retaliation to this and other privacy concerns user have started adopting the use of ad blockers which as the name suggests outright block all the ads shown on a webpage eventually resulting in lower revenues for the publisher and an arms race between ad blockers and advertisers. One program that aims to help publishers generate a viable source of revenue and also to help user have a less intrusive and annoying online experience. The Acceptable Ads program have designed guidelines and criterias for publishers or advertisers to follow and join a white list which include websites on which ads are not blocked by the ad blockers. The goal of the study is to validate the need of such regulatory. We measure online advertisement from the perspective of users by comparing users who block all ads, block no ads or users who block only non-acceptable. We study the prevalence of acceptable ads, compare the performance and cosmetic features of acceptable ads. Finally we validate the need of such regulatory feature after proving acceptable ads out perform non-acceptable ads in every aspect of user experience.

CCS CONCEPTS

• **Computer systems organization** → **Embedded systems**; *Redundancy*; Robotics; • **Networks** → Network reliability.

KEYWORDS

Advertisements, Acceptable Ads

1 INTRODUCTION

The online economy depends primarily on online advertisements as they help monetize a large chunk of the internet. Because of online

ads users are able to enjoy content and services on the online web for free. Online ads compete with micro payments or pay-per-view business models and it is quite clear to see why online ads are far more ubiquitous compared to the alternative. This business model helps keep the online barrier of entry quite low for users to access the internet and also for them to become a part of the internet. Publishers, no matter how small, are able to monetize their content online by posting ads on their website, this enables small and new creators to join or create their own platform to create and share their content or services. Publishers get revenue from the advertisers through an advertising agency in proportion to the traffic they receive on their website. This further encourages publishers to create content that online users are more likely to engage with. Furthermore, advertisers also benefit from online advertisements in such that it enables them to reach millions of people from across the globe without much logistical effort. Advertisers can use this platform to target ads for a relevant user base that can benefit both the user and advertiser.

Online advertisements have become such an integral part of the online world that it is difficult to imagine the internet without them. However, unfortunately since the past few years we have seen advertisers abuse this system to gain more benefit from the lack of regulations on the advertisers. One key part of the online advertisements is online tracking, to make sure their ads have a higher engagement, click through or influence on the users advertisers make huge efforts to gain as much information about a user as possible to target them with relevant ads that the users is more likely to engage with. This is seen by many researchers as infringement of users privacy, where now user is paying for the content by watching the ad and providing user data on top of that. This imbalance of power between the user and advertisers has resulted in an arms race between them.

Users who are more aware of the infringement of their privacy or are frustrated by the intrusiveness of advertisements have started using ad blockers. Ad blockers enable users to block advertisements to display on the web. Ad blockers make web pages load without ads therefore making them load faster. When an ad is blocked the publisher does not get revenue for that particular user. On the Internet right now, X percentage of users are using a variant of ad blocker. According to reports users enable ad blocker primarily for cosmetic reasons and performance reasons. One counter defense to the ad blocking users enable, publishers display pop ups and block users access to web page until the ad blocker is disabled.

This tension between the advertisers and ad blockers is a result of the lack of regulations that are imposed on the advertisers. Advertisers and publishers have gradually increased the number and size of advertisement that are shown on the web page. We can speculate that this is potentially a result of more number of users using ad blockers. To encourage publishers and advertisers

to provide more non-intrusive advertisements many organizations have started campaigns of good ads or acceptable ads, where the organization designs a criteria and adds the websites to a list which is used by ad blockers as a list of websites on which not to block advertisements. This allows the publishers to reach more users since now users with ad blockers enabled can also view the ads therefore somewhat removing the need for publishers to show large amounts of intrusive ads.

2 BACKGROUND

Around 30% of all internet users now use an Adblocker [4]. This means that 30% of all users do not see any kind of ads (If obviously that Ad has a corresponding filter in Adblock tool they're using), or only acceptable ads. This means that advertisers are constantly loosing out on the 30%, a number which can be expected to increase with time, unless they subscribe to acceptable ads. This leaves the advertiser with choices, if they are not willing to let go on this share; either join the acceptable Ads campaign or perform some form of Ad evasion.

Adblockers work by maintaining a list of rules; it can be whole domains or name of HTML/CSS elements in which these Ads are embedded. Whenever a page generates a request which has one of these domains in the filters or has an element in it which is listed as an element which displays Ads in the filter list, that request is blocked or that page element is hidden. Whitelist works exactly in the same way, by maintaining a list, but anything in that list is permitted; whether it be a network request or a CSS element. To be on the whitelist, however, is a different process.

Firstly, the advertisers who want their Ads to appear on the whitelist, the advertiser contacts the Acceptable Ads committee by filling out a form which will be followed by sending the exact Ads that they want to be displayed under the Acceptable Ad campaign. This will be followed by a mutual agreement between both the parties resulting in a post on the whitelisting forum which later results in the Ad being whitelisted.

This, however, is not the only way that publishers try to reach the 30% of individuals who use Adblockers. Advertisers are known to use a lot of different Adblock evasion techniques which can be as simple as detecting an Adblocker and prompting users to disable it or much more complex as discussed by [2]. These techniques can get really complex, for example the one proposed by Wang et al. [8] in which content and URLs are changed before being served to the client resulting in a changed DOM structure of the page but the same page in appearance, not allowing filter based adblockers to recognize ad signatures. Facebook was found to be one of the main user of this technique. Further techniques include changing the path of the Ad soruce or changing Ad element attributes, but Adblock has deployed rules which can cater to even these anomalies.

2.1 Acceptable Ads Program

In 2011, Eyeo GmbH, the owner of the most popular Adblock extension Adblock plus, came up with the idea of "Acceptable Ads"; Ads which were much less "intrusive" for a regular user. These less intrusive Ads will then be whitlisted by Adblock plus and people using this extension will be able to see these Ads, on default configuration, while browsing the web. In 2017, however, the curation of the whitelist was handed over to three coalitions [1], namely;

- User Advocates Coalition
- For Profit Coalition
- Expert Coalition

By handing over the job of whitelist curation to these coalitions, Eyeo aims at making this decision making process much more free of any sort of conflict of interest of which they have been accused before for [3].

For now, if an an advertiser wants its Ads to be whitelisted, they must:

- Must not disrupt the user's natural reading flow
- Ads should always be recognizable as ads and distinguishable from all other content
- Ads need to follow certain size conditions based on where they are placed on the screen

The acceptable ads program aims to provide criteria for advertisements and regulations for advertisers, an acceptable ads partner advertiser or publisher are not blocked by some adblockers. The criteria for acceptable ads is provided by the Acceptable Ads committee.

The most used and installed filter based ad blockers for Google Chrome and Firefox are:

(1) Ublock Origin
(2) Adblock Plus
(3) Adblock

Out of these three ad blocker extension Adblock Plus and Adblock allow acceptable ads by default. In fact, the Acceptable Ads programs was started by the founder of Adblock Plus.

3 RELATED WORKS

Previously, Walls et al. [7] measured not only the prevalence of acceptable ads, but also their impact on the advertising industry and user's perception of these very ads. The whitelist that started from a mere dozens of filters in 2012 has now grown to a massive 6000 filters (as of 2015) covering a wide array of domains and HTML elements which are known to serve/display ads. Advertising giants like "google.com" have also been included in the list as well as renowned advertising agencies like "pagefair.com". They also find that most of these filters get triggered on the more popular websites. They also conducted a user study trying to deduce whether acceptable ads policies were being followed aptly, finding that a non-trivial number of participants still found these ads attention-grabbing, intrusive and non-distinguishable from page content. Our work differs from this in that it is focused on other aspects of acceptable ads like performance and instead of analyzing what user's think of acceptable ads, we analyze whether the ads, listed as acceptable ads, follow the guidelines set by the Acceptable Ads committee.

Malloy et al. [5] have discussed how prevalent Adblockers have become in countries with the largest digital advertising markets. They analyze that up to 37% of people on average have deployed Adblock of one form or another with the highest prevalence being among people aged 18-37 and individuals with the highest income

levels. They also figure that for every ad seen by a person without an Adblocker installed, a user using an Adblock is likely to see half the number of ads on average, resulting in an average loss to the 10 largest publishers anywhere in the range of $3.9M and $120K.

Zambrano et al. [9], in their study, provide moral arguments in favor of using an Adblocker. They argue that it is morally analogous to Ad avoidance, which is deemed morally right by a substantial amount of people. This means that a higher number of people will view Adblocker tools a legitimate tool which they must use if they do not want to see ads which they did not sign up for. This will increase the need for publishers to move over to acceptable Ads if they want to earn revenue using the same advertising model and hence, more of a reason to see if the guidelines are actually being followed.

4 METHODOLOGY

In this study we aim to understand the impact and effectiveness of the Acceptable Ads program. We design experiments to measure whether Acceptable ads provide a better experience to the user and to understand how effective the criteria for acceptable ads provided by the Acceptable Ads committee is and how many of the websites are in compliance with it. Our hypothesis, Acceptable Ads campaign provide a criteria that can improve user experience and is enforced on the websites, if proven to be valid can set the grounds for showing the effectiveness of Acceptable Ads and encourage other regulations (potentially legal regulations) on advertisements. Such acceleration in ad regulations can slow the adoption of ad blockers and even potentially decrease the current number of ad block users.

4.1 Prevalence of Acceptable Ads

The Acceptable Ads program was initiated in 2011 by the founder of Adblock Plus. Since then many websites and ad blockers have partnered with the program to make online advertisements less intrusive. To understand the adoption of this campaign we take the Alexa's top 1 million websites and measure how many of them serve acceptable ads. Furthermore, we measure which category of websites are more likely to have acceptable ads and whether popular websites partner with acceptable ads or not. Since Acceptable Ads is a free open source project, they require some funding for the maintenance other logistics, their business model for acquiring these funds is to charge large entities a license fees to get listed in the whitelist. Finally in addition to measuring how less intrusive the ad experience become after publishers opt in acceptable ads we also measure how the ad blocker and publisher arms race change and speculate how it will change in the future after wide adoption of acceptable ads.

One of the user experience breakages or frustrations that ad blockers experience is the anti-ad block walls that require users to disable ad blockers to get access to the websites, to understand how this can be solved using acceptable ads we compare the prevalence of acceptable ads with the prevalence of anti-ad block walls. Comparing these can show the efforts publishers have been making to gain back the revenue lost because of ad blockers. The acceptable

ads white-list is free and open source and is available for users to view. We use this white list and the Alexa top 100k websites to measure the prevalence of Acceptable ads, furthermore, we utilize Acceptable Ads categorization to categorize different the partnered websites.

4.2 Performance of Acceptable Ads

The aim is to measure the effect of acceptable ads on complying users, specifically observing the performance of web pages load times. We design experiments to measure the performance of web pages when serving acceptable ads and compare their performance to 1) web pages that are serving normal ads (non-acceptable ads) after disabling ad blockers and 2) web pages with no ads by enabling ad blockers enabled for both normal and acceptable ads. To ensure we measure the effect of acceptable ads on users we measure the user perceived load times for a webpage. User perceived load time is the load time it takes to have content ready on the web page, more specifically the DOM's ready time. Since perceived load times are main factors of bounce rate (user leaving the page) it is important to understand whether serving acceptable ads take more time to load or rather do they perform better than normal ads.

We design an experiment to measure user perceived time, we use selenium to load a single web page with different configurations of the Adblock Plus adblocker. We use Adblock Plus as our ad blocker due to its ubiquity and the fact that it supports the ability to allow acceptable ads. We crawl the first page of each of the web site in three ad block configurations: 1) with AdBlock Plus disabled, 2) with AdBlock Plus enabled and allowing acceptable ads and 3) with AdBlock Plus enabled and not allowing acceptable ads. For this experiment we selected the 1000 most popular websites from Alexa top 100K that were serving acceptable ads, for each of the website we load their landing page on Google Chrome using Selenium and record the user perceived time which is defined as the time taken for the page to send the loadEventEnd signal. After crawling each page on the three different configurations we repeat the process 3 times and get the average time it takes to load the page. It should be noted that we are not interested in exactly how much time does it take to load a page rather we are interested in showing the comparison between the ad blocker configurations.

4.3 Size and Cosmetics of Acceptable Ads

The Acceptable Ads program aim to make ads less intrusive and don't deteriorate the user experience. To achieve this, Acceptable Ads committee has designed criteria which regulate the appearance and size of advertisements. In our goal to answer whether acceptable ads provide a better experience, we design another experiment to measure the size and understand the content of the advertisements served. We use the same 1000 websites we used before for our performance analysis and crawl them using selenium to capture the advertisements. Once again we run our crawl two times one allowing acceptable ads and the other allowing all ads. This time to capture the advertisements and their meta data we use a perceptual ad detector. The perceptual ad blocker is a browser extension that uses visual cues rather than network features to detect and tag advertisements with a label on the page. We unpacked the
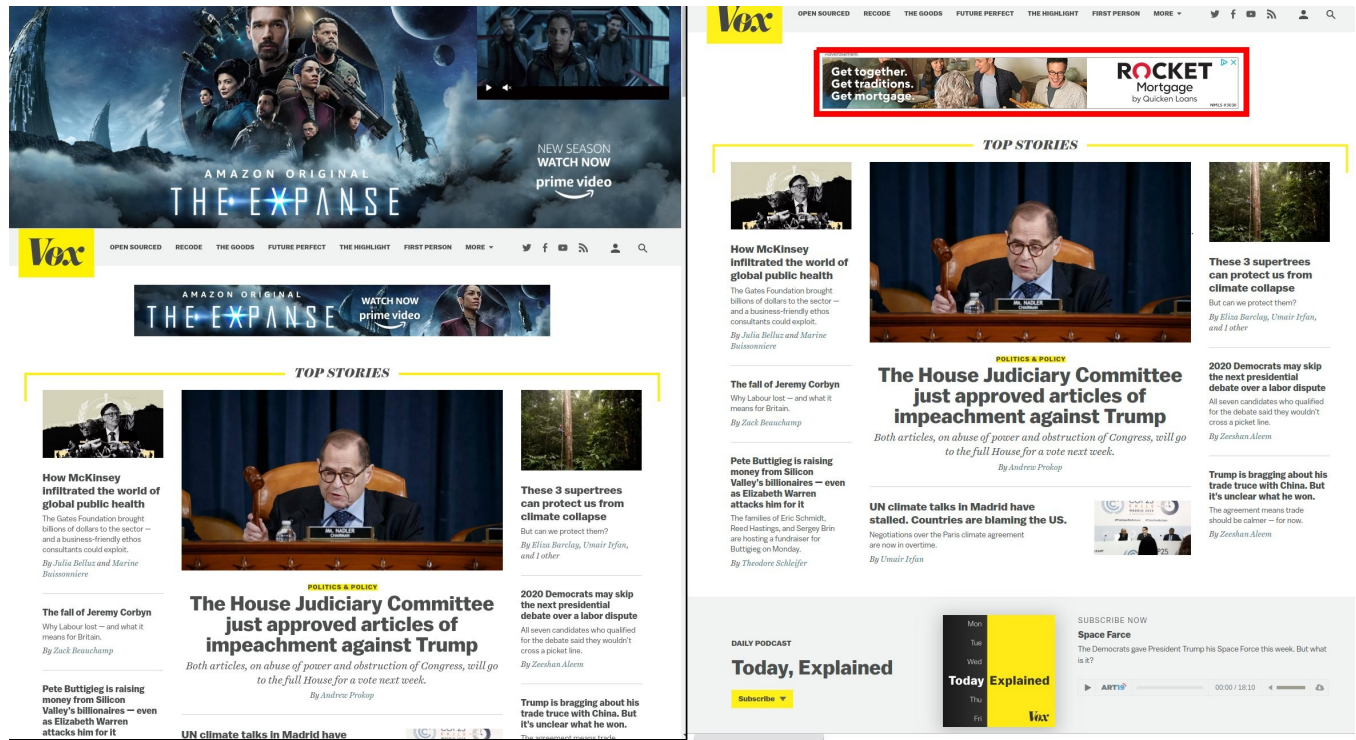
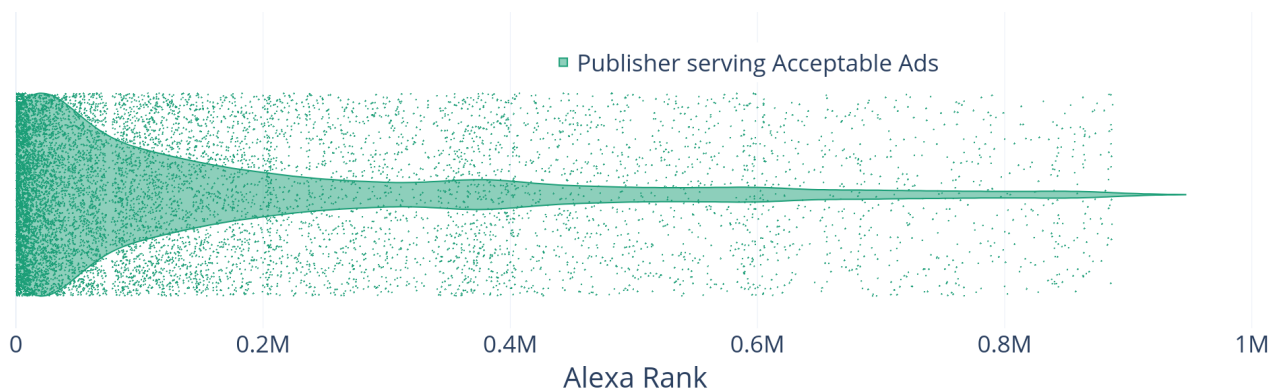Figure 1: Left: Normal Ad, Right: Acceptable Ad

Figure 2: Rank of websites which serve acceptable ads on the Alexa top 1M websites

extension and modified the code base to enable the extension to get the size and content of the advertisement and locally store it in a file.

After collecting the meta data and content of the ads we use the meta data to extract the size of the ad then compare the sizes of advertisements we encountered in different ad block configurations. This experiment enables us to measure whether there is a significant enough difference between the size of normal ads and acceptable ads and in answering the question validate the need of advertisement regulatory programs. Furthermore, In cosmetic differences we also try to measure the difference of content in the advertisements. Albeit the Acceptable Ads program do not directly

impose restrictions on the content of the ad, we try to measure whether the criteria designed by acceptable ads also influence the content of the ad or not. After collecting all of the ads, labeling them and dumping them into a set we use an unsupervised learning model to learn the patterns in both types of ads. More specifically we use clustering to cluster the dataset into two clusters. The intuition behind clustering is that the two types of advertisements 1) acceptable ads and 2) normal ads will get separated into two cluster. If the accuracy of clustering is high we can draw the conclusion that the two types of advertisements are significantly different from each other.

5 RESULTS

In this section we discuss the results of our experiments we conducted. To understand the logistics and operations of Acceptable Ads more deeply we explored the white listed websites with and without ad blocker allowing acceptable ads. When visiting a website that was white listed without any ad blocker we would see ads of various sizes that were in violation of the acceptable ads criteria, furthermore it was quite common to find ads not having a distinguishing label. On the other hand when visiting a websites after allowing acceptable ads the website would start to serve more non-intrusive and distinguished ads. The observations from these two experiments led us to conclude that publishers that were white listed only served acceptable ads when users had an ad blocker enabled otherwise for a normal user the publisher displayed regular non-compliant ads. This protocol of switching to acceptable ads only when an adblocker is detected is extremely profitable for the publishers. On the internet right now, 47% of the users have an ad blocker enabled, provided that out of these 47% many of the users use either AdBlockPlus or AdBlock (both allow acceptable ads by default) and that 88% users of ABP allow acceptable ads to show that a publisher that uses the switching protocol has a much higher user base to show their ads to. In the Figure 1, we see a single website vox.com serving both ads based on the configuration of ad blocker. On the left side we can see the ad complying with the criterias including size, placement and distinction.
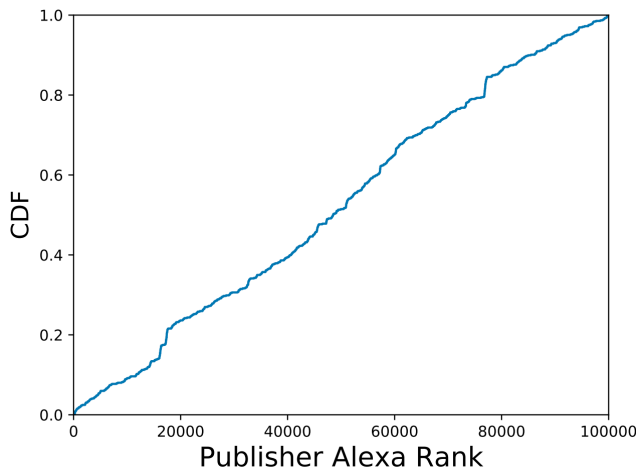

Figure 3: CDF of publishers and anti-adblocker walls [6]

5.1 Prevalence of Acceptable Ads

In our first experiment we measure the prevalence and adoption of acceptable ads in the most popular websites. Figure 2 shows the prevalence and adoption of acceptable ads by the Alexa top 1 million websites. In figure 1 we can observe a correlation of ranking of a website and the likelihood of the website to serve acceptable ads. We see a higher density of websites serving acceptable ads in the high ranks of the list. We can infer using this that since adoption of acceptable ads by websites in high ranking of Alexa ranking is because these websites that are visited more often and therefore are

more likely to be visited by users with ad blocker enabled and using acceptable ads would be a suitable way to gain back the revenue lost to ad blockers.

Furthermore, in a previous study [6] the authors measured the prevalence of anti-adblocking walls on Alexa top 1 Million websites. Since this is another tactic used by publishers to gain back revenue lost to ad blockers, it is reasonable to expect that publishers that were more likely to employ anti ad blocking walls would also be more likely to opt-in acceptable ads. However, in the figure 3 below which shows the CDF of Publisher Alexa Rank along with the publisher deploying an anti ad blocker wall. When we observe Figure 3 along side Figure 2 there is not a significant co relation between the likelihood of both and therefore we can not conclude the hypothesis.

5.2 Performance

We evaluate the performance of each type of advertisement by using the method discussed in section 4. Our findings show that websites with acceptable ads are although slower to load when compared to the same website with no ads, they are quicker to load when compared to the same website with normal ads. We infer that this difference between times might be due to the number and size of ads that are to be loaded, furthermore websites loading normal ads will also sometimes load video ads that then increase the time taken for the website to load significantly.
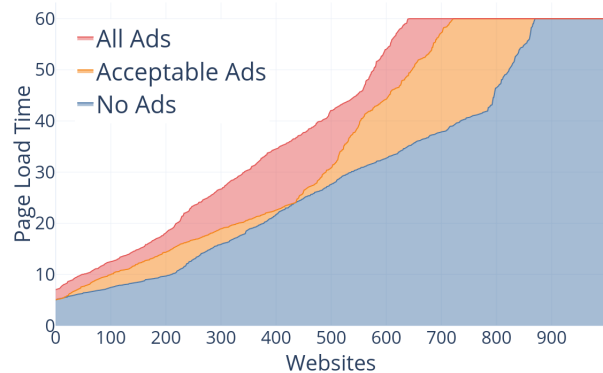

Figure 4: Perceived load time for 1000 websites with different type of ads.

5.3 Cosmetic Differences

One of the key criteria for Acceptable ads is the restriction for size. In their guidelines they mention the ad should not take more than 25% or sometimes 30% of the view port. In the figure 1 we can see that on the right, the video banner ad is in violation of this criteria. As mentioned before one of the main reasons users use ad blockers is because of their intrusiveness which is directly proportional to the size of the ad. Bigger ads are more intrusive and annoying since they take up space that could have been used for actual content, on top of that bigger ads would have a larger size
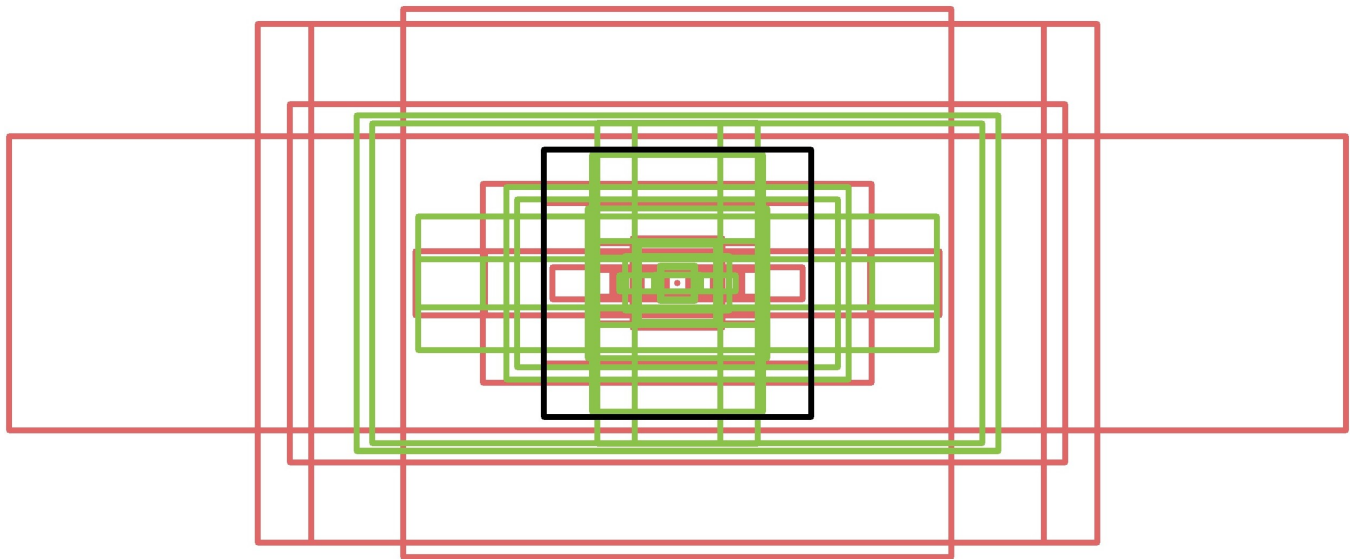
Figure 5: Red: normal ads, Green: Acceptable Ads, Black: 500x500 px reference

as well resulting in longer load times. In our experiment where we visited 1000 websites with the perceptual ad blocker to collect ads we also measured the sizes that they took on the page. All the pages were opened from the same browser on the same setup therefore there is no difference in the overall size of the page and ad between experiments. In figure 5 we can observe normal ads being much larger than acceptable ads. Furthermore, we also see a few ads that are large enough to violate the standards of acceptable ads. Since the compliance with acceptable ads is verified manually, there are cases where maliciously or not publishers or advertisers can deliver ads that do not comply with acceptable ad standards.

After extracting the content of the advertisement we then use our methodology of unsupervised learning described in the section 4 where we determine whether there exist a significant enough difference between the content of acceptable ads and normal ads. We discover that given a single set created by the mixture of acceptable and normal ad, unsupervised learning when used to split the data into 2 clusters with the accuracy of 72%. This suggests that there is a slight difference between the content of the ads. However, this difference can be attributed to other factors such as acceptable ads and normal ads having different advertising exchanges and therefore different ads to serve.

5.4 Other observations

During the browsing of white listed websites and the experiments we observed a few caveats that need to be addressed. Foremost, for many of the whitelisted websites we visited during our ad collection process with ABP allowing acceptable ads, the acceptable ads were not loading rather the page would only load a placeholder container for the ad. On subsequent refreshes of the page an ad would load in the container successfully.

6 CONCLUSION

In our study we try to validate the need of regulatory programs such as Acceptable Ads programs from the perspective of users by comparing the user experience when browsing the web with acceptable ads, the user experience when browsing the web with normal ads the user experience when browsing the web with a complete ad blocker. Comparing the two extremes of blocking no ads and blocking all ads we find that both can encounter frustating experiences, the ad block user can face an anti-adblocking wall and as suggested by our results in section 5.2 non ad block user can encounter a plethora of ads that take up a sizeable section of the screen. Furthermore, as shown by our experiments non-ad block user will also experience significantly longer load times. In conclusion we can validate the need of regulatory bodies such as Acceptable Ads which can provide the standards for advertisers to follow, however verifying the compliance of these regulations is still a problem. We do provide a methodology that can automate validating the size of the ad.

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A   CONTRIBUTIONS

Both of the authors contributed equally in design, implementation and writing of the project.

A.1   Hammas

Instrumented the perceptual ad blocker to capture ads. Captured the size and meta data of the ads. Wrote crawlers to capture ads. Literature Review. Designed other techniques that did not end up in the project.

A.2   Hussam

Evaluated performance and prevalence of acceptable ads. Wrote crawlers to measure performance. Designed the unsupervised learning technique. Design graphs.