

ADFILTER

A Firefox plugin to block embarrassing ads



About AdFilter

- AdFilter is a browser plugin which blocks embarrassing image ads belonging to the following categories- dating ads, matrimony ads, nightwear ads, adult site ads.
- The plugin is a modified version of the widely popular Adblock Plus tool (<https://adblockplus.org>).
- Currently, it is available for Firefox browser and blocks embarrassing image ads only.

Motivation

- Current blocking tools like Ad-block Plus (ABP) block all ads
 - ▣ Disadvantage to advertisers, publishers, users.
- People report to be using ABP with the motivation for blocking annoying and embarrassing ads.
- Web-users in India have reported serious concerns regarding the issue of being shown inappropriate online ads.

User Study

Bell Labs, India conducted in-depth interview with 57 web users in India in February, 2013 to understand their perceptions of online ads.

Questionnaire

- Gauged users' overall perception of ads and sensitivity of ad-content
 - View ads? Click on ads?
 - Experienced any embarrassing ad?
 - What kind of ads do they find sensitive?
 - On what kind of websites have they observed such ads?
 - Are these ads more embarrassing at work than at home?

Questionnaire

- Asked them on their requirements of ad-blocking tools.
 - ▣ Aware of Ad-block plus (ABP) or any other ad blocking tool?
 - ▣ Would they like to use ad blocking software? Why or why not?

Demographics

	Females	Males
Gender	29	28
Avg. no. of hours spent online per day	3.2 hours	3.5 hours
Notices ads	89%	55%
Click on ads	67%	37%
Purchased from an ad	17%	11%

Concerns about Embarrassing Ads

- Majority of the participants (42/57, i.e. 74%) had experienced embarrassing/sensitive ads.
- Defined embarrassing ads as graphic ads that either contain sexually explicit content, dating and matrimony ads or else a display of swimwear.

Examples of Embarrassing ads



DATING ADS

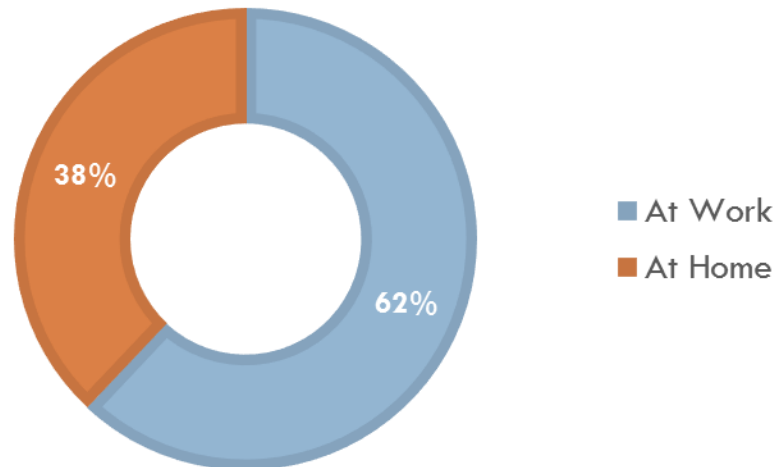


MATRIMONY ADS

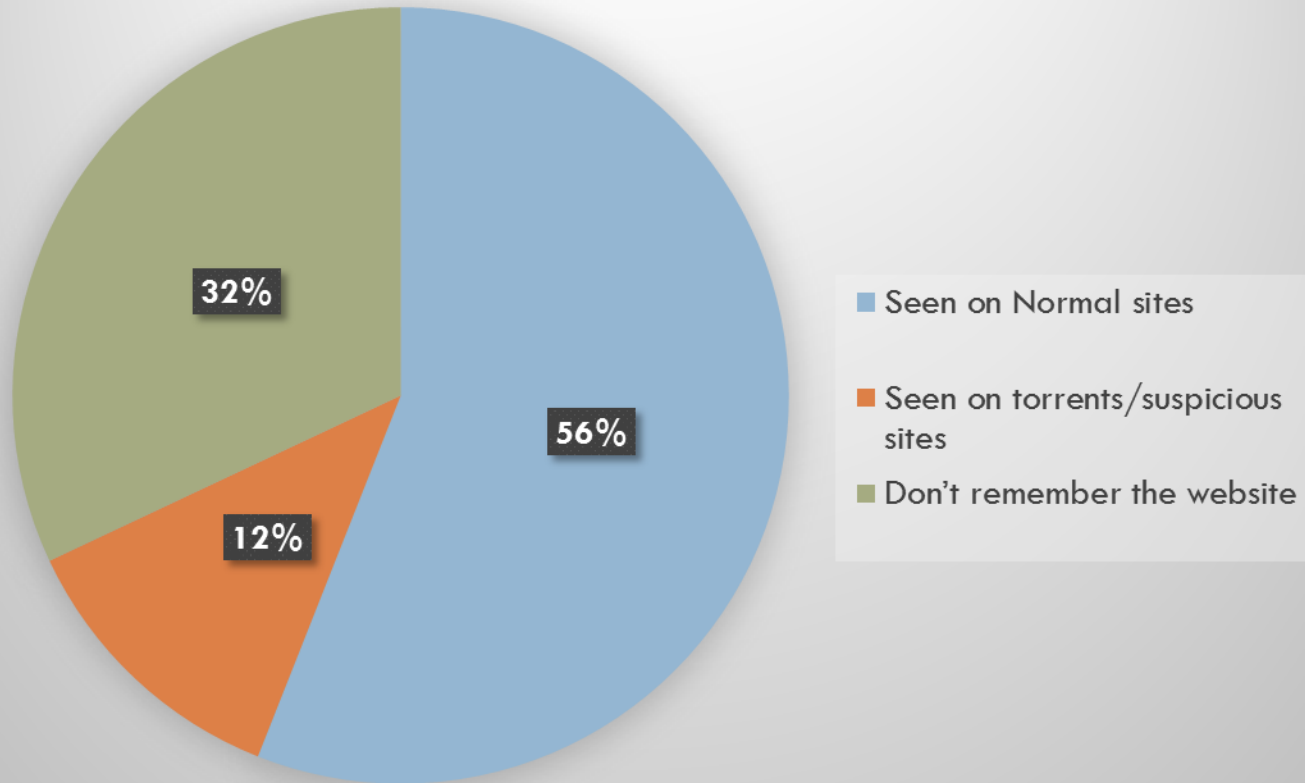
Embarrassment via social context

- Majority reported instances in which the embarrassment was caused by being in the vicinity of other people.

SOCIAL CONTEXT



Type of website on which embarrassing ads were seen.



Perceptions regarding Ad-Block Plus

- Majority (62%) expressed an interest in using a tool like Ad-block Plus but with a feature which also allows selective blocking of ads.
- 2 participants were explicit in stating that their main motivation to use the tool was to eliminate embarrassing ads.
- Some wanted to use it only in some situations (e.g., only at work) but not others.

Ad-Filter Tool

A modified version of the Ad-block plus tool blocking only embarrassing ads.



Creating our own filter list

- The first step was to create a filter list to block ads belonging to the following categories-
 - Dating
 - Matrimony
 - Nightwear
 - Adult sites
- Referred to alexa.com, ranker.com and other websites on the web to create a comprehensive lists of such websites.

Modifying Ad-block plus code

- ABP blocks an ad without looking at the content of the ad.
- Modification required to block the ad based on its category.
- Used the filter list created to identify such ads.

How does ABP work?

- ABP intercepts the HTTP requests being sent to the server by the browser.
- It matches the source address of the HTTP request to a list of filters to decide if it should be blocked or not.

Flat Rs 600 Off on Flight

goibibo.com/Cheap-Flight-Tickets - Use Code-"goret" & Get Rs 600 Off.

Ads by Google

THE TIMES OF INDIA

Mon, Apr 22, 2013 | Updated 11:55AM IST

Home City India World Business Tech Sports Entertainment Life & Style Women Hotklix Spirituality NRI Real Estate Photos Times Now Videos LIVE TV

Opinion Blogs Auto Polls Speak Out Sci

2G: DMK ready with dissent note to dra

Mukesh Ambani to get 24/7 'Z' security

'Jobless growth' during UPA-1, admits

Google celebrates Earth Day with a doc

Afghan Taliban hold 9 after helicopter

Digvijaya questions dual leadership

All military farms to shut shop by 2017

India's milk pouch model appeals to Eu

8 years on, toxic French breast implant

Terror groups luring tech-savvy youth

3 women buy baby for Rs 50,000, sell

Indian IT sector: Why recovery remains unclear

News: All in one-minute @ 10am

Rajesh Kalra's blog: At gunpoint cycle

ET: 'India a market for comp cars? Think again'

```

<iframe allowtransparency="true" title="Advertisement" align="center" scrolling="
"no" frameborder="0" vspace="0" hspace="0" marginheight="0" marginwidth="0"
height="60" width="150" src="http://netspiderads2.indiatimes.com/ads.dll/getad?
slotid=36441" id="fr36441" name="fr36441">
  #document
  <html>
  <head>...</head>
  <body leftmargin="0" topmargin="0" marginwidth="0" marginheight="0"
  bottommargin="0">
  <a href="http://netspiderads2.indiatimes.com/ads.dll/clickthrough?
  msid=19031243&cid=43294&slotid=36441&nsRndNo=1648309066" target="blank">
    
  </a>
  </body>
  </html>
</iframe>

```

- Why singers are left out in films' opening credits
- Mauli Dave opts out of Band Baja Barbaad
- Chevrolet Enjoy: First Drive

All Headlines »

MIDNIGHT SALE
SHOP NOW

832 Get Your **FREE Credit Score Now** **LEARN MORE**
Get **UNLIMITED Access After** **TransUnion.**

Ads by Google

Bride | 18 - 24
Search Now
shaadi.com

SPORTS

- Miller, Mandeep achieve the impossible**
- IPL: Super Kings face Rajasthan Royals in crucial tie
- How Virender Sehwag 'bluffed' his way back into form
- Luis Suarez apologises for biting Branislav Ivanovic

CITY

Select your city

- Cop stabs parents to death, held**
- Auto driver rescues 12 kids in Delhi
- Fined Rs 200, biker attacks traffic cop
- Nagpur: Child rape victim still critical

More from Cities »

ENTERTAINMENT

Salman's romantic walks with Daisy



- Saif in political thriller
- Ameesha to play villain
- Sonakshi cares for her staff

How does ABP work?



1) HTTP Request to
<http://adscontent2.indiatimes.com/photo/19031.cms>
to load the image



Server- indiatimes.com

How does ABP work?



2) ABP checks if
<http://adscontent2.indiatimes.com/photo/19031.cms>
matches the list of filters.

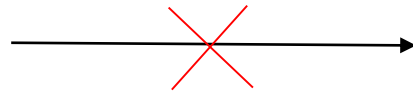


Server- indiatimes.com

How does ABP work?



3) ABP blocks the request if a match occurs



Server- indiatiimes.com

The screenshot shows the homepage of the Times of India website. At the top, there is a navigation bar with various categories like Home, City, India, World, Business, Tech, Sports, Entertainment, etc. Below the navigation bar, there are several news articles and sections. A red box highlights a specific advertisement for a credit score service, which includes the text: "Get Your FREE Credit Score Now LEARN MORE Get UNLIMITED Access After". Below the advertisement, there are sections for "SPORTS", "CITY", and "ENTERTAINMENT".

Modifications done to ABP code

- For image ads, added a module to fetch the landing (final) page of the ad using XMLHttpRequest API.
- Allowed iframes to load.
- Performed a matching on the landing page of the ad using the filter list created.

Flat Rs 600 Off on Flight

goibibo.com/Cheap-Flight-Tickets - Use Code-"goret" & Get Rs 600 Off.

Ads by Google

THE TIMES OF INDIA

Mon, Apr 22, 2013 | Updated 11:55AM IST

Home City India World Business Tech Sports Entertainment Life & Style Women Hotklix Spirituality NRI Real Estate Photos Times Now Videos LIVE TV

Opinion Blogs Auto Polls Speak Out Sci

2G: DMK ready with dissent note to dra

Mukesh Ambani to get 24/7 'Z' security

'Jobless growth' during UPA-1, admits

Google celebrates Earth Day with a doc

Afghan Taliban hold 9 after helicopter

Digvijaya questions dual leadership

All military farms to shut shop by 2017

India's milk pouch model appeals to Eu

8 years on, toxic French breast implant

Terror groups luring tech-savvy youth

3 women buy baby for Rs 50,000, sell

Indian IT sector: Why recovery remains unclear

News: All in one-minute @ 10am

Rajesh Kalra's blog: At gunpoint cycle

ET: 'India a market for comp cars? Think again'

```

<iframe allowtransparency="true" title="Advertisement" align="center" scrolling="
"no" frameborder="0" vspace="0" hspace="0" marginheight="0" marginwidth="0"
height="60" width="150" src="http://netspiderads2.indiatimes.com/ads.dll/getad?
slotid=36441" id="fr36441" name="fr36441">
  #document
  <html>
  <head>...</head>
  <body leftmargin="0" topmargin="0" marginwidth="0" marginheight="0"
  bottommargin="0">
  <a href="http://netspiderads2.indiatimes.com/ads.dll/clickthrough?
  msid=19031243&cid=43294&slotid=36441&nsRndNo=1648309066" target="blank">
    
  </a>
  </body>
  </html>
</iframe>

```

- Why singers are left out in films' opening credits
- Mauli Dave opts out of Band Baja Barbaad
- Chevrolet Enjoy: First Drive

All Headlines »

MIDNIGHT SALE
SHOP NOW

832 Get Your **FREE Credit Score Now** **LEARN MORE**
Get **UNLIMITED Access After** **TransUnion.**

Ads by Google

Bride 18 - 24
Search Now
shaadi.com

SPORTS

- Miller, Mandeep achieve the impossible**
- IPL: Super Kings face Rajasthan Royals in crucial tie
- How Virender Sehwag 'bluffed' his way back into form
- Luis Suarez apologises for biting Branislav Ivanovic

CITY

Select your city

- Cop stabs parents to death, held**
- Auto driver rescues 12 kids in Delhi
- Fined Rs 200, biker attacks traffic cop
- Nagpur: Child rape victim still critical

More from Cities »

ENTERTAINMENT

Salman's romantic walks with Daisy



- Saif in political thriller
- Ameesha to play villain
- Sonakshi cares for her staff

How does Ad-Filter work?



1) HTTP Request to
<http://adscontent2.indiatimes.com/photo/19031.cms>
to load the image



Server- indiatimes.com

How does Ad-Filter work?



2) ABP checks if the request is to load an image.
If yes, sends a HTTP Request to
`http://adscontent2.indiatimes.com/photo/19031.cms`
to fetch the landing page of the ad.



Server- indiatimes.com



How does Ad-Filter work?



3) HTTP Response from the server containing the final URL in the response header.

```
HTTP/1.1 302 Moved Temporarily
Date: Wed, 30 May 2012 04:58:22 GMT
Server: Apache-Coyote/1.1
Location: http://192.168.56.102/redirect.php?lang=en
Content-Type: text/html; charset=ISO-8859-1
```



Server- indiatimes.com



How does Ad-Filter work?



4) ABP fetches the final URL from Location field in the response header and matches with the list of filters.



Server- indiatimes.com

How does Ad-Filter work?



5) ABP doesn't block the request if no match occurs



Server- indiatimes.com

How does Ad-Filter work?



6) HTTP Response from the server to load the image.



Server- indiatiimes.com

Results

www.goibibo.com

Book Now

Get Flat Up to ₹ 800 off goibibo.com

on all domestic flights

*Conditions Apply

LIVE A BETTER LIFE **MENSXP**.com

[IPL Live on YouTube](#)

shaadi.com Let love find you too...
10,000 new members joining everyday! **Join Free**

LIC Life Insurance Plans
Invest Rs.543/Month & Get Rs. 1 Cr. Life Cover+Medical Benefit. Buy Now
LIC.TermInsuranceIndia.co.in

Tata Nano Special Edition
Swipe Your Credit Card this month & Drive Home Nano at 0% Interest.
www.BookaNano.in

Ads by Google

www.goibibo.com

Book Now

Get Flat Up to ₹ 800 off goibibo.com

on all domestic flights

*Conditions Apply

LIVE A BETTER LIFE **MENSXP**.com

[IPL Live on YouTube](#)

LIC Life Insurance Plans
Invest Rs.543/Month & Get Rs. 1 Cr. Life Cover+Medical Benefit. Buy Now
LIC.TermInsuranceIndia.co.in

Tata Nano Special Edition
Swipe Your Credit Card this month & Drive Home Nano at 0% Interest.
www.BookaNano.in

Ads by Google

Features of the tool

- Allows blocking sensitive image ads.
- Prevents tracking of user's online behavior on sensitive sites by setting a Do-Not-Tracker field in HTTP request header.
- Allows users to disable/enable the tool according to their needs.
- Allows users to block an ad which is not already present in the list by adding it to the list.

Limitations of the tool

- The tool only blocks image ads. It does not work for flash and text ads.
- The tool contains a predefined list of URLs. There still could be some embarrassing ads which may not be included in the list.
 - In such a case, the user will have to manually add that filter to the list using the tool.

Future Work

- Extend the category list to wider range of topics which also include sensitive categories like health, religion etc.
- Plan to give topical preferences to the users where they can choose the categories from a list for which they want ads to be blocked.
- Use clustering algorithm to block ads based on topics instead of a filter list.

Acknowledgement



I would like to thank Dr. Saurabh Panjwani, Dr. Sharad Jaiswal and Dr. Nisheeth Shrivastava (Bell Labs, India) for their constant feedback. The tool would not have been possible without their guidance and support.

References

[1] “Do not Embarrass: Re-Examining User Concerns for Online Tracking and Advertising”, SOUPS 2013, July 24–26, 2013, Newcastle, UK.
Lalit Agarwal, Nisheeth Shrivastava, Sharad Jaiswal, Saurabh Panjwani, Bell Labs Research, Bangalore, India

http://cups.cs.cmu.edu/soups/2013/proceedings/a8_Agarwal.pdf

[2] J. Mayer and J. Mitchell. Third-party web tracking: Policy and technology. In Proc. of IEEE Symposium on Security and Privacy, 2012.

[3] B. Ur, P. G. Leon, L. F. Cranor, R. Shay, and Y. Wang. Smart, useful, scary, creepy: Perceptions of online behavioral advertising. In Proc. SOUPS, 2012.

[4] Context Aware Do-Not-Track.
<http://www.context-aware-dnt.com/>.

[5] <http://adblockplus.org>