

# A NOVEL TECHNIQUE TO DETECT COMMERCIAL ADVERTISEMENTS AND TO BLOCK THEM

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## ABSTRACT

*Companies, starting from small to larger, use advertisements as a medium to expose their product among the public. People, who provide this service, charge a considerable amount for their work. Now, when this is considered to be a primary source of income, the end users are the ones to suffer. This often disturbs the users, who are using these mediums, to watch their content, which can be in various forms of blog content (text), audios and videos as well. This system provides a measure to minimize this frustration among the users, by discarding the irrelevant content for them. There exist other advantages – removal of trafficking; no wastage of data in unwanted content; recreation of a business model to enable them to reach to their product properly to the public. With the evolution of the Internet in our country and the illegalities that is occurring around it, advertisement blocking is the need of the hour, since only when there are no viewers, will only then this industry can be persuaded from affecting the people.*

**Keyword:** - DNS Sinkhole, audio fingerprinting, commercial detection, commercial blocking

## 1. INTRODUCTION

The way in which the commercial advertisements are broadcasted depends upon the audience being targeted. In the 90's, it was by the means of posters and nowadays, through media, might it be print media, visual media or even through social media giants. From the normal man's point of view, s/he watches it to entertain or to educate. They are not concerned on these advertisements as they are irrelevant to them and are disturbed by these commercials, even more, when they become frequent. This can be of many forms considering the way in which the user's interface is being provided. One, when the user changes his channel / switch into a different tab watching the content of the changed channel, he might tend to lose the content played in the initial channel, which resumes playing after the commercial. Next, when we consider the user performing actions i.e. interacting with the form controls, the page will automatically get navigated to another one, which has no purpose for the user; but the web page developer generates revenue from it. This is one form of marketing, known to be as the pay-per-click marketing. The third is that, ads that contains sensitive data, which contradicts the Advertising and Marketing Laws' rules should be removed, so as to safeguard both the children and woman from abuse. There are many measures that could be added to this to signify the ill-effects on advertising. However, by no means, are the users can opt out of the system. This is because - advertising is the main way in which the brands and successes ranging from government to entrepreneurs who run the government are being portrayed; for others, who are involved in this system either directly or indirectly, they generate a ton of money. This paper demonstrates the existing system, its drawbacks and provides a solution for the proposed content.

## 2. LITERATURE SURVEY

**2.1. Exploiting Visual-Audio-Textual Characteristics for Automatic TV Commercial Block Detection and Segmentation** - Nan Liu, Yao Zhao, Zhenfeng Zhu, and Hanqing Lu, in IEEE Transactions on Multimedia, October 2011.

Commercial block detection (CBD) is the automatic detection of the TV Commercials from the content that is being broadcasted by the network operators. There is an increasing debate at the metric that is used to identify the transition happening between the commercial and the video content. This is because; it is generally accompanied by the presence of black / silent frames. There exist problems in using this as a unique metric as the content itself has these characters that provide a difficulty in differentiating it with the advertisement. On the basis of the output provided from CBD, Commercial Block Segmentation (CBS) could be done. This is a process of segmenting the commercials into different clips based on the detected ones. It utilizes some diverse multimodal cues which are capable of demonstrating the essential differences between the intra-commercial and inter-commercial. However, it is not trivial to follow these procedures as it is in every country in which it is being adopted. This is due to the fact that different countries use different standards. To determine the boundaries for each individual commercial, two kinds of mid-level descriptors, named Audio Scene Change Indicator (ASCI) and Frame Marked with Product Information (FMPI) are used to extract audio-visual discriminatory characteristics.

**2.2. Automated TV Commercial Tracking-** R.R. Senarath, R.D.C.L. Pathmabandu, K.S.D Kularathna, L. Ranathunga, International Conference on Industrial and Information Systems.

The features used to detect commercials have been discussed here, that includes Video boundary detection and feature extraction component; Frame matching and searching component; Audio matching module and validation. Video boundary detection uses pixel to pixel difference, pixel to neighborhood difference and histogram differences as a metric. Edge change ratio is another method proposed to detect shot boundary detection, which compares edge change ratio neighborhood frames. First frame of a shot will be taken as a keyframe. Then, using the distance between the pixels, images are searched. There are several techniques in OpenCV to perform Image feature matching using Histogram comparison. The Histogram comparison is made by using metrics of Chi-Square, Bhattacharya distance and Correlation. Musical onset detection is one of the most elementary tasks, being used in audio matching and validation. It is being classified into two characters. 1. Using silence points 2. Using neural network. At first, the commercial clips are converted into a standard audio format and digitized using Java Audio format, which is then available in the Java Multimedia Library - PCM. Next, the appropriate chunk size is to be decided based upon the detection of the audio factor obtained from the PCM, when there is a transition between the programme and the commercial advertisement. This, when triggered can be used to detect the area at which a commercial is about to happen. Several metrics can be added to this, such as FFT magnitude variation, to detect the data.

**2.3. High dynamic range video compression by intensity dependent spatial quantization in HEVC** - Y. Zhang, M. Naccari, D. Agrafiotis, M. Mrak, and D. Bull, 2013 Proceedings of Picture Coding Symposium (PCS)

The audio is being monitored, as and when, the video is delivered to the user. This is known as pitch modulation, brought to us by the histogram. From this tracking, we detect that audio tone at the said frequency (500 Hz). The output that synchronizes with the histogram provides us a clear view of the frequency at each interval and at each frame (as shown in Fig. 9). This transition is so minute for the human eye to view and is provided in this paper.

**2.4. The unique Chinese legal approach to online ad blocking: Is it in the right direction?** - Bingbin Lu, Computer Law and Security Review, December 2017

Approach towards various countries on ad-blocking from China to America is provided here. While the Americans haven't taken appropriate actions regarding it, the Chinese have done a considerable job. The Chinese courts held that ad blocking software is anti-competitive and view it as no copyright violations will occur. Also, how the copyright law protects the advertisement industry is also debated.

### 3. EXISTING SYSTEM

Various measures are available that removes the advertisements in different mediums. Let us take the video streaming service of google, "YouTube". They display advertisements, based on the user's likeliness, demographical data and much more. The advertisement might not appear every time, it can occur several times within a video and when videos are navigated. This advertisement has a mandatory time period that every user must watch. Despite this

method being followed, there is another service provided, known to be as “YouTube Premium”, which is ad free. Next, consider the OTT platforms that stream video content. They do not display ads when their content is being viewed. This is because they are being watched as a single episode that can be downloaded to their device. Another means is that, the DTH service providers allow users to download the programme to their devices and then view it. This will mostly be ad free. All the above mentioned ways, have one thing in common; they burden the viewers economically. All of them provide this as an exclusive content, by charging a hefty amount.

### 3.1 DISADVANTAGES

- It is expensive that cannot be afforded by most people.
- Time is spent to watch irrelevant content
- No system, providing exact measures to discard online content

## 4. PROPOSED SYSTEM

In our proposed system, an easy tracking system is being provided, which tracks the network for the advertisements, that are bound to happen, using IOT as the technology. For providing this measure, we are to use the Raspberry Pi device. At first, the user needs to install the Operating System in the Pi. Then additional packages are to be configured by updating, upgrading and installing them. The software “PiHole” is then needed to be installed in the Raspberry Pi, which will transfer the device into a network wide blocker. This now acts as the DNS through which the internet traffic will pass through. When the installation is passed through, we get the “PiHole” being set in the network. A web interface will also be created along with the installation. The Ad blocker now acts as a server. This will now be accessed from the client (the device in the network of the Raspberry Pi, that needs to get rid of advertisements), which logs into the web page by entering the server credentials.

**Blacklist:** The domain at which there must be no advertisements.

**Whitelist:** Even though certain websites contain advertisements, they need not be skipped.

**Tracking:** Statistics of the overall network blockage.

- The advantages to this system are, it is easy to setup; the system blocks malwares; a convenient user interface to input the domains and the monitoring of traffic is done, thereby providing a convenient interface to the user.

### 4.1. ADVANTAGES

- Easy and one time setup over the network
- The system, even blocks malwares
- A convenient user interface to input the domains and the monitoring of traffic is done No need of any staffs for billing.
- Easy to revoke the entered data
- Convenient interface to the user

## 5. HARDWARE REQUIREMENTS

- Raspberry Pi 4 2GB
- Wi-Fi Router
- Display

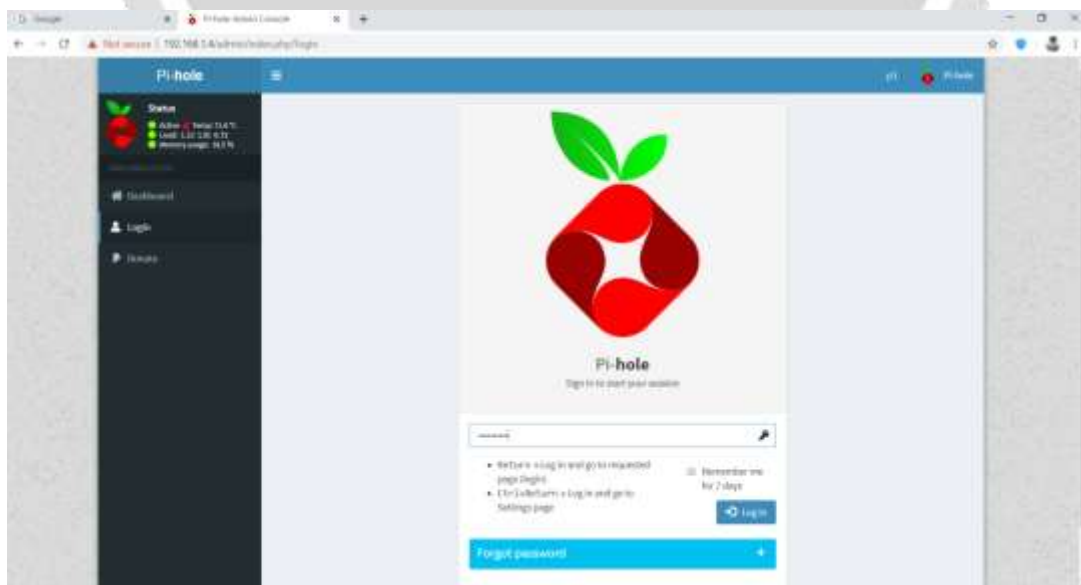
- Micro SD Card
- HDMI Cables
- Card Reader
- Micro HDMI to HDMI converter
- Power supply unit

## 6. SOFTWARE REQUIREMENTS

- PiHole
- SSH connectivity
- P5.js
- M15.js

## 7. IMPLEMENTATION

This model features a Raspberry Pi that acts as the ad-blocker. When configured with the gateway(router), the Pi acts as a DNS Sinkhole server. The devices that the users use to watch their content is configured with the Pi as an alternate DNS server. Hence, instead of the devices, receiving the internet through the router, it gets it through the Pi. Hence, at this level, the router acts as the ad-blocker, blocking ads in the given domains. These domains are brought from the user, through a web interface under a tab known to be as “Blacklist”. There are domains that the user believes that advertisements shouldn’t be blocked, to protect their privacy. Under such circumstances, the domains can be inserted under the “Whitelist” tab. Performance can also be analyzed through this portal.



**Fig -1:** Web interface of PiHole

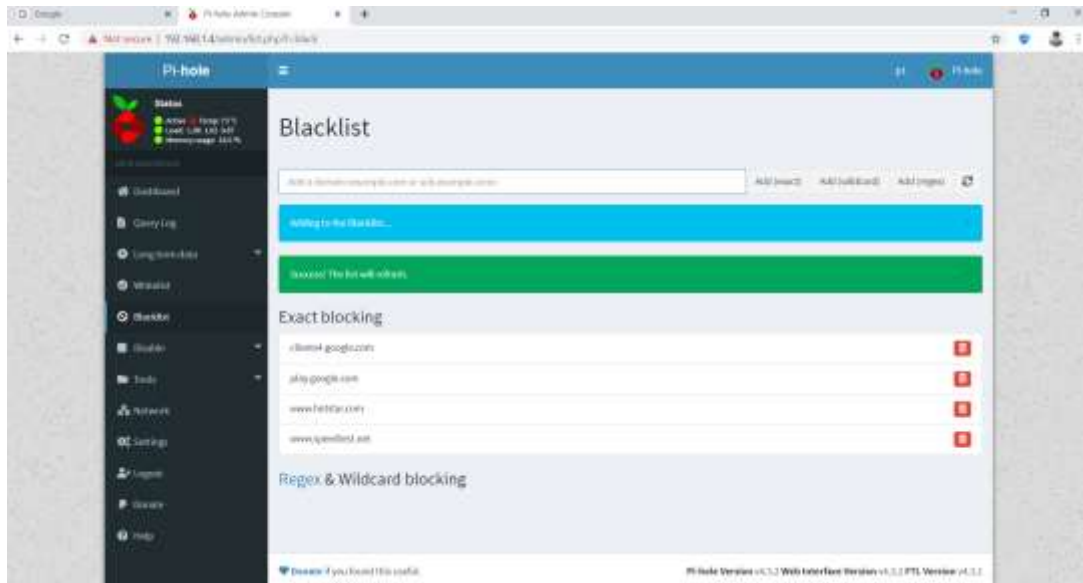


Fig -2: Adding Blacklist websites

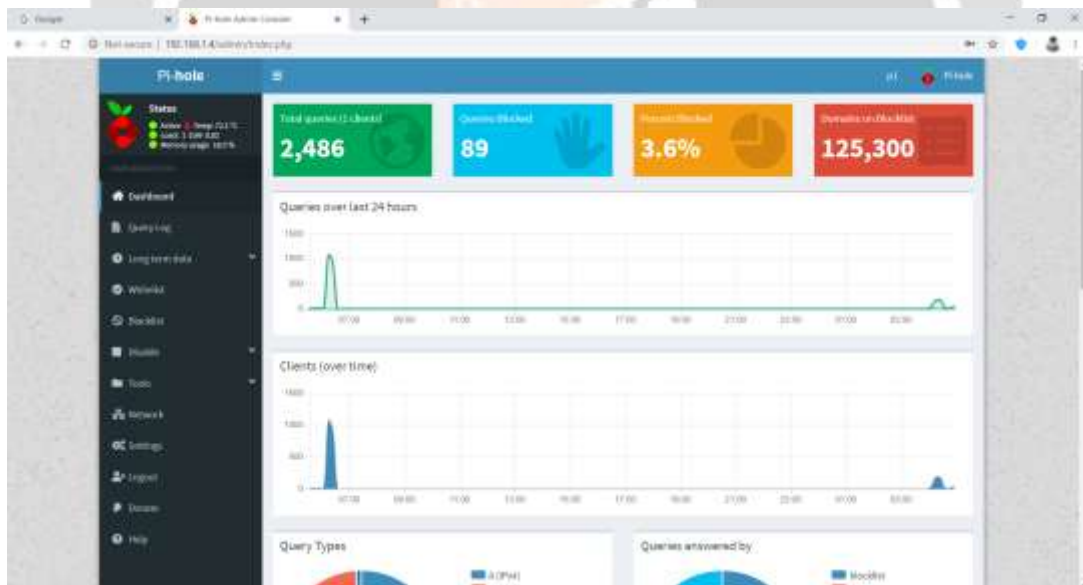


Fig -3: Generated Report

### 8. CONCLUSION

The Detection of Commercials and eliminating them automatically provides numerous advantages as it discards the entire commercial contents, and saves the users from unnecessary frustrations. Once, when those who are watching the content are prevented from using them, the one who publishes it, automatically gets reduced. So, those who indulge in illegal activities for the sake of advertisements, like trafficking children and abuse of individuals are ultimately reduced. Audio modulation is the main characteristic being observed, followed by the techniques of video shot boundary detection as mentioned to detect them.



**REFERENCES**

- [1] Nan Liu, Yao Zhao, Zhenfeng Zhu, and Hanqing Lu, "Exploiting Visual-Audio-Textual Characteristics for Automatic TV Commercial Block Detection and Segmentation", *IEEE TRANSACTIONS ON MULTIMEDIA*, Vol. 13, Issue. 5, pp. 961 – 973, October 2011.
- [2] R.R. Senarath, R.D.C.L. Pathmabandu, K.S.D Kularathna, L. Ranathunga, "Automated TV Commercial Tracking", *International Conference on Industrial and Information Systems*, pp. 1 – 6, 2017.
- [3] Y. Zhang, M. Naccari, D. Agrafiotis, M. Mrak, and D. Bull, "High dynamic range video compression by intensity dependent spatial quantization in HEVC", in *Proceedings of Picture Coding Symposium (PCS)*, pp. 353–356, 2013.
- [4] Bingbin Lu, "The unique Chinese legal approach to online ad blocking: Is it in the right direction?" *Computer Law and Security Review*, Vol.33, Issue.6, December 2017
- [5] G. W. Larson, H. Rushmeier, and C. Piatko, "A visibility matching tone reproduction operator for high dynamic range scenes," *IEEE Transactions on Visualization and Computer Graphics*, vol. 3, no. 4, pp. 291–306, 1997.
- [6] P. Korshunov and T. Ebrahimi, "Context-dependent JPEG backward compatible high-dynamic range image compression," *Optical Engineering*, vol. 52, no. 10, pp. 102 006.1–102 006.11, 2013.
- [7] Y. Zhang, D. Agrafiotis, M. Naccari, M. Mrak, and D. Bull, "Visual masking phenomena with high dynamic range content," in *IEEE International Conference on Image Processing (ICIP)*, pp. 2284–2288, 2013.
- [8] B. Satterwhite and O. Marques, "Automatic detection of TV commercials", *IEEE Potentials*, vol. 23, no. 2, pp. 9-12, 2004.