Commercial Detector

Title: Commercial (Ad) Detection on a Television Program using Audio Video Patterns

Statement: "Commercial Detector detects the commercial from recorded program and collects useful data based upon various features of commercial block detection and this data collected would be further used by advertisers to serve various purposes."

Abstract: This paper focuses on need or use case and working of automated system through which one could detect the commercial in a TV program. This detection would be based upon both feature and recognition methods. Feature based method includes various features of commercial like increase in audio amplitude, silent frame, aspect ratio, black frame, etc. Recognition based method includes comparing of data with stored features of commercial, such as logo. Proposed system combines both feature based parameter such as aspect ratio for commercial block detection and recognition based parameter such as stored logo for individual commercial detection.

This system would be of great interest to the advertisers where they can use the information of live broadcast of their Ads to take some business actions.

Background:

Advertising is a means to introduce a product, publicize it, explain the working of it and demonstrate the same. There are a lot of practical applications for advertisement detection. Based on the end-user, there are three types of applications of advertisement detection. They are the TV viewer, advertiser and broadcast regulator.

The TV viewer might want to record some programs to view later which they find interesting. In such cases, it will be very irksome to see the advertisements in the recorded video. It also results in wastage of memory space since these advertisements will occupy useful space where programs can be stored. It's tedious to sit over the entire video and remove the advertisements so these requirements make advertisement detection a useful solution for the benefit of viewers.

The advertiser might want data related to the timings when his advertisement is aired. This will help in making an informative decision regarding the ratings of the advertisement, the influence of that advertisement and further ways to improve the advertisement. This will also help the advertising company in optimizing its revenue by deciding the timings in which the advertisement should be aired. It will also help the advertiser in knowing which of its advertisements has the maximum influence among the TV viewers and develop publicity strategies accordingly.

The broadcast regulator wants data about their timings, their quality, their length and decency so as to have an eye on the advertisers whether they are following the various regulations regarding advertisement broadcasting. They will need a full time TV viewer dedicated for the sole purpose of watching the programs and pinpoint the advertisements to check whether they follow the regulations.

Objectives:

The purpose of the project is to detect commercials and use this data for business purpose. Some of the specific objectives addressed in the project are as below:

1. To detect the start and the end of the commercial block by which we could get the information such as total time of the commercial block shown in the specific program. This information could be further used to eliminate the commercial block. This information may also include the program Ads.
2. To calculate the instances of the particular Ad shown in commercial block.

Methodology and methods:

The block diagram below will give the clear picture of working of the commercial detection system. Input to the system will be a recorded TV program. Firstly the system will extract the audio and video (only images without sound) separately. They will be separately processed out, but their ultimate result will be combined one. Frame processing block will work on detection of commercial, by performing pattern matching of incoming frame with logo, text and anchor message stored in database. Sampling audio block will detect the presence of commercial by silence detection and its high amplitude features. The combined result based on the probability will give the confirmation of the presence of the commercial.

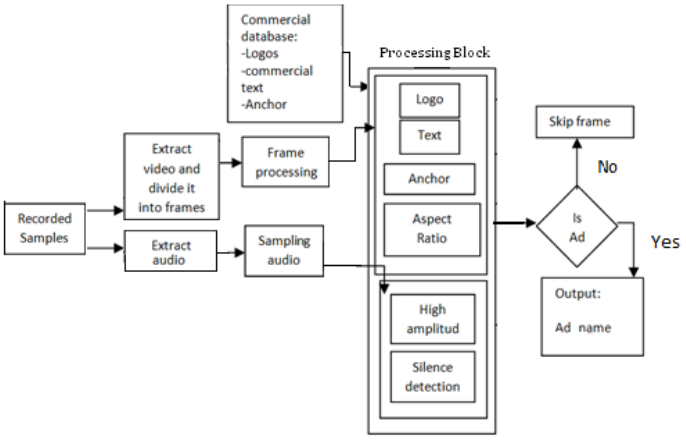

Fig 1: Block Diagram

SURF (Speeded up Robust Features) pattern matching technique is used to match each stored logo and text with the incoming frames to detect the individual commercial. If for particular commercial both text and logo are not present then its result will solely depend on its audio features detection. For audio detection we have just compared it with amplitude.

Observations:

To reach the specific conclusion and to design the algorithm we recorded videos of multiple channels and carried out the observations on them. Below are few of the observations:

Aspect ratio: It is observed that at the time of Ad sometimes the aspect ratio of the frame gets reduced by some specific size. But this feature is not reliable to some extent because it also captures the program promotion.

High Amplitude: Many times it is observed that the pitch of the Ad is high than the preceding and succeeding program.

Logo and Text: Most of the Ads have Text or logo of their product present; this would help us to calculate the number of times the particular Ad is shown. Below are few observation results we have made on few channels:

Sr. No.	AD NAME	TEXT	LOGO
1	BRU	Yes	Yes
2	TUPPERWARE	Yes	Yes
3	MEDIKAR	Yes	No
4	DOCOMO	Yes	Yes
5	FORTUNE	Yes	Yes
6	MESHWAK	Yes	Yes
7	BRITANIA	No	Yes
8	FAIR & LOVELY	Yes	Yes
9	PEPSODENT	Yes	No
10	LAYS	Yes	Yes
11	CLINIC PLUS	Yes	No
12	DOMINOS	Yes	Yes
13	RED LABEL	Yes	Yes
14	BOURBON	No	Yes
15	LOREAL	Yes	Yes
16	KELOGGS	Yes	Yes
17	HONITUS	Yes	Yes
18	PURE IT	Yes	No

Fig 2.1 Ads observed on COLORS channel

Sr. No.	Ad Name	Text	Logo
1.	Diary milk	Yes	Yes
2.	Colgate	Yes	No
3.	Samsung galaxy S3	Yes	Yes
4.	Hipolin	No	Yes
5.	Godrej	Yes	Yes
6.	Badshah	Yes	Yes
7.	Titan	Yes	No
8.	Chaini	Yes	No
9.	Chocolate foundation	Yes	Yes
10.	Goodnight	Yes	Yes
11.	KFC	Yes	Yes
12.	Munch	Yes	No
13.	Mehndi	Yes	No
14.	Odomos	No	No
15.	Godrej no1 soAP	Yes	Yes
16.	Garnier	Yes	No

Fig: 2.2 Fig. 2.3 Ads observed on SAB TV channel l

Conclusion:

Automated commercial detection paper explored the applications of object recognition of algorithms for block and individual commercial detection. Firstly, Ads are studied by making note of maximum commercials and then there key features are identified. Further the designed algorithm is implemented and tested. As a result, it is observed that the implemented algorithms works well in Indian entertainment channels. 83% of Ads are successfully identified using the techniques identified above.