A New Effective System for Filtering Pornography Videos

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Abstract— Videos are consider in these time an important way to record our life moments. Nowadays and with the widespread of using Internet, videos can be shared easily between different countries and between peoples around the world. Now due the ease of using computer and internet any one easily by pushing a button can download a video from the internet which can evolves good or bad contents (harmful or useful) and this contents may have impact specially on children and minors, so effective filtering of videos is of paramount importance in an video filtering solutions. Videos consists of set of numerous frames (set of images) which are viewed in sequence which result which result video. This paper represent a new effective system for Filtering pornography videos based on skin recognition technique. Nevertheless, the results of our experiments show that this approach is indeed able to provide good recognition rates for pornography detection at the frame level.

Keywords- Skin recognition, pornography detection, Video snapshots, Internet Download Managers.

1. INTRODUCTION

Videos are consider in these time an important way to record our life moments, nowadays and with the widespread of using Internet. Videos can be shared easily between different countries and between peoples around the world. Videos can contribute in the interchange of cultures between countries and between different societies, also in uncovering crimes (using "watching video cameras"), and the most important usage of videos is "remote teaching" that enables different students from different regions to join remote universities and get his lessons across "remote video conferences". However videos can contribute in many useful fields, it also can contribute in many harmful and destructive impacts on societies and organization, as an example of the impact of families is (e.g. pornography) or illegal (e.g. paedophiliac) videos contents.

The pioneer work for identifying adult images by the analysis of image content is proposed by [7], [8], [9], [10]. Their approach combines color and texture properties to obtain a mask for skin regions, which are then fed to a specialized grouper, which attempts to group a human figure using geometric constraints derived from human body structure. Most subsequent proposals on nude detection are also based on this general idea of searching for skin regions and then describing their geometry. In [11], [12], [13], [14], a statistical color model for detecting skin regions is developed.

In [6], a method to classify images into different categories of pornographic content is presented, which is based on what is called a bag-of-visual-words. This is another denomination for BoVF when applied to visual material. Their proposal is similar to [4], but the features used to build the vocabulary are simply patches (gray-level values) around interest points, while [4] applies the more descriptive HueSIFT [5].

In [15], a framework for nude image detection based on skin region information is presented. Their approach extracts color and texture features from arbitrary-shaped segmented regions. Gaussian Mixture Models (GMM) are built for skin and non-skin region classification. To filter objectionable images, [16] proposed an adaptive skin color detection model. The skin-similar pixels are used to train a GMM with several Gaussian kernels using the standard Expectation-Maximization (EM) algorithm. Support Vector Machine (SVM) is then used to identify the skin component using the trained GMM. To overcome the chromatic deviation coming from the unusual lighting conditions, [17] proposed an online skin tone sampling mechanism based on face detection. A similar approach is proposed by [18]. The face detection and skin filter are used to filter out the non-nude images. Then, a nonlinear-SVM is used with shape features to determine whether images are nude or not. In [19], an algorithm based on the face and trunk detection is developed to classify pornographic images. To identify adult images, [20] analyzed the shape of human body trunk.

A naked image detection algorithm is proposed by [21]. A learning-based scheme for matching chromatic distribution is proposed to determine the image skin chroma distribution. Texture features are used to acquire accurate skin segmentation. Low-level geometrical constraints and the mug shot exclusion procedure are employed to further examine the skin regions.

To detect pornographic images, [22] proposed a skin model based on the combination of YIQ, YUV, and HSV color models. A white balance algorithm is applied to better detection of skin areas and a combination of constraints on color, texture, and geometric properties are used as features fed to a SVM classifier.

In [23], the first step of the system proposed is to use content-based image retrieval to determine whether the image contains humans in it. This retrieval step is based on color and shape features. Then a skin color model is performed on the image to judge whether the image is pornographic or benign.

Some attempts at avoiding the need for a fine-tuned skin detector originated color-based approaches (usually combined with shape and/or texture features). In [24], [25], a combination of MPEG-7 visual descriptors are used for adult image identification. Visual features can also be combined with other types of features, as in the framework for recognizing pornographic web pages presented in [26], [27], [28], in which text and image are both analyzed.

In [29], human-skin blobs are used for extracting features representing potentially pornographic images. A two-class cascade SVM is employed for classifying the images in three classes: porno, nude and non-adult. These classes are characterized by their faces content.

In [30], a framework for recognizing pornographic movies by fusing audio and video information together is developed. A one-class GMM is used to recognize porno-sounds and a generalized pornographic image recognition algorithm, based on contours, is used to detect pornographic frames from a video shot. Then, a fusion algorithm based on the Bayes theory is employed to combine the recognition results from audio and video.

In [31], a method and a device for determining obscenities in videos and blocking them is described. By extracting changes in (generic) feature values for each type of video within a lapse of time and comparing changes in those feature values from an input video, obscenities are determined.

In [32], a method and apparatus for generating discriminant functions for distinguishing obscene videos is proposed. Frames of input video data are extracted, and visual features for each frame and each group frame are extracted from the video data to be compared with the generated discriminant function.

Now due the ease of using computer and internet any one easily by pushing a button can download a video from the internet which can evolves good or bad contents (harmful or useful) and this contents may have impact specially on children and minors, so effective filtering of videos is of paramount importance in an video filtering solutions.

The basic formation of a video file is a set of frames which each consists of set of images. Videos consists of set of numerous frames (set of images) which are viewed in sequence which result which result video, so, the main idea here is when we want to make a check on video contents (legal , illegal) we generally mean that we make a check on a set of frames (images).

2 Automatic Online Porn Detection and Tracking (AOPDT)

Distinguishing between an accurate description of reasonable human body exposure and excessive exposure is a contentious issue. Therefore to be reliable, the technology should be able to isolate skin-like pixels from other background colors and provide a reliable measure of how much skin content is in the photo and how much of it should be considered as pornography. Human skin detection technologies have largely been used in image processing and compression, and one of the most promising approach involves the use of color histograms and hue-saturation modeling of the human body colors. The system presented in [10] calculates the percentage of human skin color in each image extracted from web page and produces an assessment that indicates if it is predominantly skin (pornography) or has an acceptable level of skin color content. The percentage of skin content pixels is used as the criterion for judging if the image contains significant human skin pixels to be classified as Pornography or non-Pornography. If skin color pixels dominate the image, the image is ranked as Pornography. The algorithm of this technique can be described as follows:

1. Extract Images found in the web page.
2. Execute the Skin Detection Algorithm.
3. Determine Pornography Decision as follows:

If skin color pixels are up to the level of between 5% and 20% it indicates a human being is most probably in the photo. If the percentage of skin pixels is between 20% and 25%, it is more than likely Pornography image. If the percentage of skin pixels is more than 25%, it is a Pornography image.

3. The Proposed System

Downloading content from internet has become a commonplace activity for all internet users . in the home, in business and in schools. All internet users download content from time to time . typically programs, games, flash video, photos, music, video, podcasts, web pages and documents. Downloading content can be troublesome. Downloads can fail. Downloads can take excessive time. Downloads can be password-protected. Some content cannot be downloaded using your web browser. A download manager is a utility designed to fix all the problems you may be having downloading content from the internet. They have quickly become a must-have utility for all internet users. Download managers can accelerate your downloads, allow you to resume broken downloads and contain numerous features that allow to you get hard-toget files from the internet. Download managers are very popular and are used by millions of internet users. Each week, over one million people install download managers to help them download content from the internet (based on figures from popular internet download sites). In our project we follow these steps to filter the video during it's being downloaded to the user's computer with the INTERNET DOWNLOAD MANAGER :

1. The internet download manager splits the video file up into small parts in order to accelerate the download process and put them in the temp folder then we check the temp

folder's size if it is equal zero, this means that no download process, else there is a download process,

2. We check the files' extensions to determine the downloaded file is a video or not,
3. The proposed system takes a snapshots from those parts, then store them in frames and each frame contains an image,
4. Then we use skin detection color techniques to determine if these images are porno or not,
5. We compute the ratio of the porno images in the downloaded video,
6. if the ratio is greater than "25%" then the video is porno, then we stop all the downloaded processes. Figure 1 shows the steps of the check process. Figure 2 shows the proposed system steps.

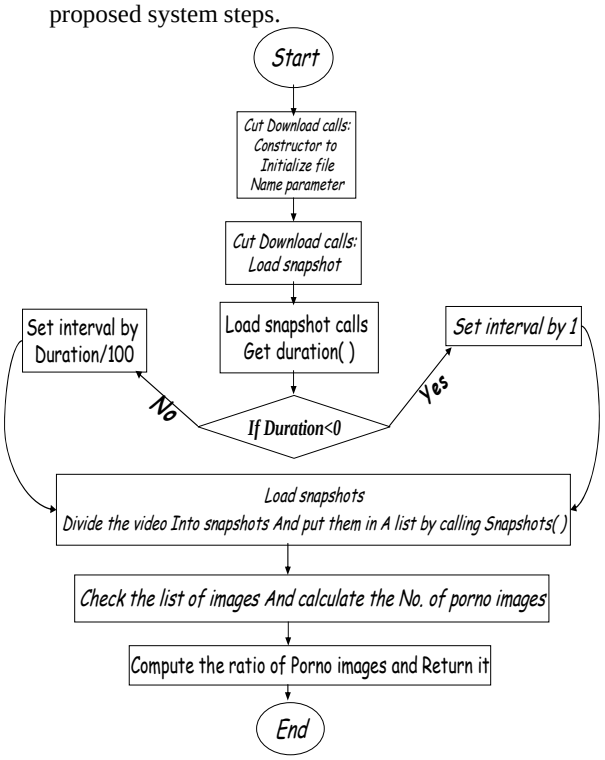


Figure 1: The flow chart of the check process.

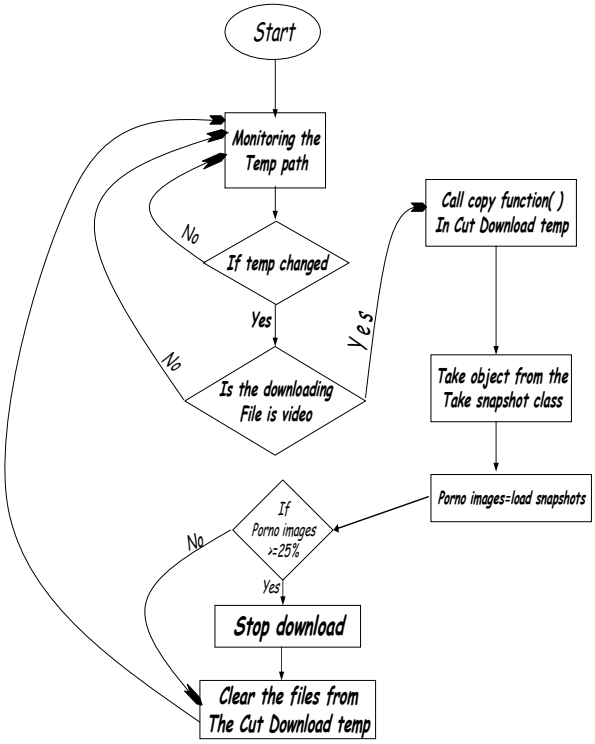


Figure 2: The flow chart for the proposed system.

The Proposed System objectives:

The cut download support many facilities to its users. With cut download, users can prevent undesired videos to be downloaded in their computers from the internet, if the user have a collection of videos and he doesn't know if those videos evolves illegal or undesired content (e.g. pornography or pedophiliac) he can call the "cut download" and make check on those videos our system can also check those videos and exclude the undesirable ones. The following code describes how we take images snapshots from video frames.

```
public double LoadSnapShots()
      {
      double count = 0;
      double  interval = 1;
      double duration = 0;
      duration = this.getDuration();
      if (duration < 101)     interval = 1;
       if (duration > 100)     interval = duration / 100;
       int counter = 0;
       if (fileType == FileType.Video) {
         Bitmap snapshot;
         for (double i = pass; i < duration; i = i + interval) {
                try {
                snapshot = this.SnapShot(i);
                list.Add(new Frames(i, snapshot));
                pass = i;
                   }
               catch
               {
               LoadSnapShots();
                  }
               }
            }

            this.segmentationImages = list;
            c = list.Count;
```

```
        for (int i = 0; i < list.Count; i++)
        {
        detect_porno(list[i].image , i.ToString ());
        return count;
    }

public Bitmap SnapShot(double position)
    {
        int hr;
        IntPtr ip = IntPtr.Zero;
        int iBuffSize;
        hr = this.mediaDet.GetBitmapBits(position, out iBuffSize ip,
this.mediaInfo.MediaWidth, this.mediaInfo.MediaHeight);
        ip = Marshal.AllocCoTaskMem(iBuffSize);
        hr = this.mediaDet.GetBitmapBits(position, out iBuffSize,ip,
this.mediaInfo.MediaWidth, this.mediaInfo.MediaHeight);
        Bitmap bm = new Bitmap(this.mediaInfo.MediaWidth,
this.mediaInfo.MediaHeight);
        try {
          bm = new Bitmap(
            this.mediaInfo.MediaWidth,
            this.mediaInfo.MediaHeight,
            -this.mediaInfo.MediaStride,
            PixelFormat.Format24bppRgb,
            (IntPtr)(ip.ToInt32() + iBuffSize -

          this.mediaInfo.MediaStride)
            );
        }catch(Exception e)
        {
          Console.Out.WriteLine("Could not convert bitmapbits to
bitmap: " + e.Message);
        }
        return bm;
    }
```

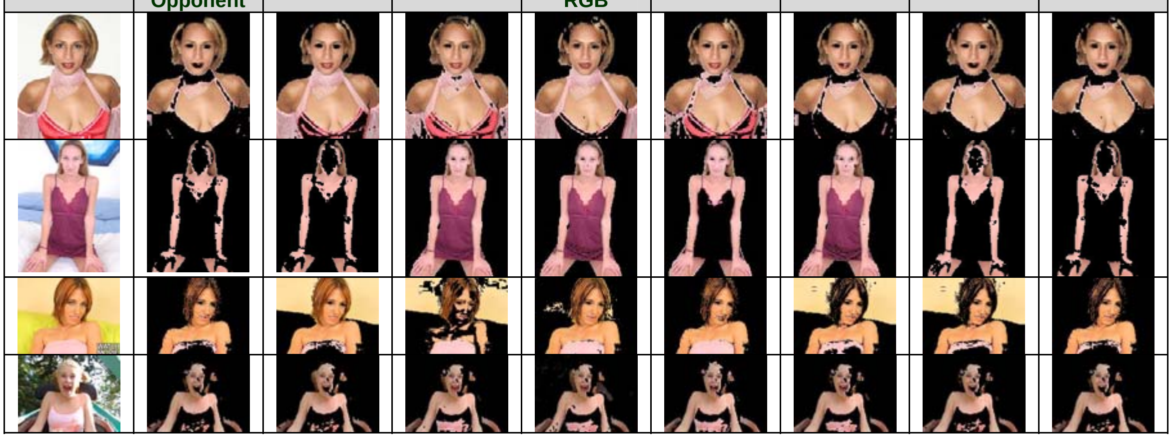
4. EXPERIMENTAL RESULTS

4.1 SKIN RECOGNITION RESULTS

We implemented some algorithms for detecting and extracting skin regions from images. This step is essential for building the proposed filtering system because the proposed system will depend on the image content to prevent undesirable images from displaying. Table 4.1 shows sample results of the implemented techniques. The first column shows the original images, and the next 8 columns show the skin regions obtained using log opponent technique, YUV-YIQ technique, HSI technique, normalized RGB technique, YC_rC_b technique, RGB technique, HSV technique, and hybrid technique, respectively.

Table 4.1: Sample results of the implemented techniques.

Original	Log Opponent	YUV – YIQ	HSI	Normal RGB	YCrCb	RGB	HSV	Hybird



The hybrid technique that combines the HSI, HSV, RGB, and log opponent techniques together obtains more accurate results and overcome the complex backgrounds problem. Accordingly, we employed the hybrid technique for skin color detection in our proposed filtering system.

4.2 Video Classification Experiments

We have tested about 200 Video files that contain a variety of Videos on sports and some TV movies and others contain pornographic movies. Figure 3 shows the classification of images that extracted from the video's frames.

Figure 3: Classification of images that extracted from the video's frames.

As can be seen in Figure 3, The proposed system has a very high performance in classifying videos because we take at least 100 frames for each video. So, the percentage of the extracted skin are very high in the pornographic type of videos.

5.Concultion and Future Work

Now due the ease of using computer and internet any one easily by pushing a button can download a video from the internet which can evolves good or bad contents (harmful or useful) and this contents may have impact specially on children and minors, so effective filtering of videos is of paramount importance in an video filtering solutions. Videos consists of set of numerous frames (set of images) which are viewed in sequence which result which result video. This paper represent a new effective system for Filtering pornography videos based on skin recognition technique. Nevertheless, the results of our experiments show that this approach is indeed able to provide good recognition rates for pornography detection at the frame level. Future extension of this work includes more studies on allowing the proposed system to support more video formats and reduce the check process time. Another extension of this work consists of using the proposed system to allow to exclude any porno scenes from entire video if the ratio of the number of porno images detected is less 25% from the video under test. Finally we study the ability of the system to allow the user to choose from variety setting of the filtering technique.

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