Cyber Mom

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ABSTRACT: In this modern era where even small children have email IDs and fake social media accounts, it is quiet easy for young ones to get distracted or fall in traps. Cyber Mom filters and restricts the access to certain sites with unwanted and inappropriate contents for children. By using the picture of the person saved, the face is recognized and determined whether it is the face of a child or an adult. Based on this classification, the contents are filtered. The image from the storage file is processed using Viola Jones algorithm, Linear Binary Pattern and Support Vector Machine and it is categorized into child class and adult class. Then based on the class, the access to internet is given. If the class is adult then unrestricted access is provided. If the class is child, then the access to the sites mentioned will be blocked. By default, the system will be in child lock mode.

1. INTRODUCTION

In this fast moving world, there is no time for parents to monitor what their kids are surfing on the World Wide Web. An internet filter becomes handy in such situations. A Web filter that is often said as Data content management software system is a bit of software system developed and managed to restrict the details of the websites a person can visit on his or her system. Web-filtering computer code package has two main consumer bases: people United Nations agency would like to forestall their children from accessing the content they assume that undesirable or inappropriate, and businesses that require to forestall staff from accessing websites that do not acceptable to their jobs. Internet filters are usually used as interference tool for malware, because the filters can block access to sites that usually host malware. Cyber Mom is software for filtering the web contents. The main objective of this software is to give privacy and security by not allowing the children from accessing unwanted sites such as Face book, Twitter, pornography, sites related to terrorism or gambling. Cyber Mom detects the face of a person from a still image and determines whether the person is a child or an adult. If it is a child’s image then the certain websites that are mentioned are blocked, unless adult unlocks the access. There are several approaches for recognizing a face. The algorithmic procedure can use different statistics, attempt to find a pattern / model / rule which represent a specific user or use a convolution neural network. These different approaches can be observed through the explanations of different algorithms. The traditional image registration techniques are generally costly. So, some modern algorithms are used here for the purpose of face detection. Some commonly found algorithms include KLT algorithm, Viola Jones, PCA, Fisher faces etc. KLT (Kanade- Lucas-Tomasi) feature hunter that makes the simplest of spatial intensity data / knowledge to direct checking out the position that yields the simplest match.

It’s terribly quicker than ancient techniques / methodologies for work such a lot fewer potential matches between the images. Principal Component Analysis (PCA), generates a linear combination of patterns that maximizes the total covariance in data [1] given. While this is also explicitly seen as a strong appreciation of the discovered intelligence, it does not recognize any classes and so many discriminative data can be lost when throwing away components. Fisher faces is a modification of Eigen faces, thus also uses Principal Components Analysis. During the training chapter, eigen faces do not make the between two pictures from different classes. Fisher faces use the Linear Discriminant Analysis method to make the distinction between two different class images. Viola-Jones has many benefits like feature choice that’s subtle Associate in Nursing an invariant detector that locates scales. The features can be scaled instead of scaling the image itself. When compared to Kanade- Lucas-Tomasi (KLT)[2], Viola-Jones has a great detection rate and is better in every scenario. So the better option among the available algorithms is Viola Jones. The Local Binary bit Pattern (LBP) is another technique for face recognition and texture investigation. When paired with the Homeward-bound Gradients (HOG) descriptor bar chart, LBP increases the quality of detection. The Homeward-bound gradient bar chart (HOG) could be a function descriptor used for object detection purposes in the pc vision and image system. This methodology counts all the occurrences of gradient orientation in local least important parts of a picture. So LBP can be considered for refined face recognition. For the classifying the images based on features extracted, SVM (Support Vector machine) is a suitable approach. Square tests ways around web-filtering based software system packages, such as, using a web-based content proxy, using websites in other foreign languages, and building a VPN for a private proxy server. Among them Squid is a fair option to choose. Squid is a caching proxy used in the security phase for the blocking of websites. The operate of interference web site will cope with several problems involved net accessing, like full address of web site block, sensitive words of internet sites, etc. Squid has a provision to restrict users from visiting some websites or can allow users to visit permitted websites only.

2. CYBER MOM DESCRIPTION

This project works in two modules.

- Detection Module
- Security Module

Detection Module

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This module gets the input of an image file. From this image, the face recognition and age estimation is done by processing the image using ‘The Viola Jones Algorithm’. An enormous training set is used for the same. Thus the image is put to either the child class or the adult class and given as input to the security module.

**Security Module**

Using squid proxy server, blocking the sites is done, if user is a child. By default itself the system will be in child lock mode. If the user is an adult, then the user has to unlock the system to gain unrestricted access. The working principle of Cyber Mom is shown below in Figure 2.1.

![Fig 2.1 Cyber Mom Working Model](image)

### 2.1 VIOLA JONES ALGORITHM

The Viola Jones object definition and recognition algorithm is the first and basic object detection and recognition conduct determined in the year 2001 by Paul Viola and Michael Jones to provide the best solutions real time. Though it can be trained and tested to find a variety of objects, it was initially used to detect eyes. The following are the features that make an effective detection algorithm of named Viola – Jones. Robust – unpredictably high discovery (genuine positive) low false-positive recurrence. Real time – At least a couple of edges for each second ought to be handled for responsive applications. Simply Face discovery (not acknowledgment) - The objective is to recognize faces from non-faces (in ID). The calculation has four phases:

1. Haar based Feature Selection
2. Creation of an Integral based Image
3. Adaboost Training Module
4. Cascading type of Classifiers

The recognition part's qualities incorporate the aggregates of picture pixels in rectangular regions. Thusly, they bear some likeness to the Haar-based capacities that were usually utilized in the acknowledgment of picture based articles. Both features depend on more than one rectangular region in the Viola and Jones algorithm and are therefore usually more complex. The expense of some random capacity is the expansion of pixels inside straightforward square shapes in concealed square shapes subtracted from the quantity of pixels. This type of fundamental region unit rectangular choices when situated beside options, for example, sensible channels. Albeit delicate to vertical and even choices, their input is impressively progressively muddled.

### 2.2 HAAR FEATURES

There are some comparable properties in every human face. Utilizing hair qualities, these regularities can be adjusted. In the picture of a face, the properties regular in human countenances are characterized and found. The qualities of the square shape are appeared in figure 2.2 beneath. Worth = Σ (pixels in dark region) - Σ (pixels in white territory).

For instance: the distinction between the white and dark square shapes in splendor over a particular space. Each capacity is associated with the sub-window area.

![Fig 2.2 Rectangular features applied on face.](image)

### 2.3 INTEGRAL IMAGE

The fundamental picture at point x, y contains the whole of the pixels above and to one side of x, y, comprehensive:

\[ ii(x, y) = \sum_{x' \leq x, y' \leq y} i(x', y') \]

Utilizing the accompanying pair of repeats:

\[ s(x, y) = s(x, y - 1) + i(x + y) \]
\[ ii(x, y) = ii(x - 1, y) + s(x, y) \]

Where (x, y) is the combined line aggregate, the fundamental picture can be registered in one ignore the first picture. The expansion of the pixels inside square shape zone can be determined with four cluster references: The value of the essential pictures at area one is that the aggregate of the pixels in parallelogram A. The incentive at area a couple might be A + B, at area 3 is A + C, and at area 4 is A + B + C + D. The total inside D can be processed as 4 + 1 − (2 + 3). A two-square shape highlight might be processed in six cluster references for any scale. A very small scope of those choices might be consolidated to make a decent classifier.

### 2.3 THE ADABOOST TRAINING ALGORITHM

The preparation procedure utilizes AdaBoost in the Viola-Jones object identification calculation to pick a subset of highlights and build the classifier. A huge arrangement of pictures is arranged, the length of which relates to the width of the location window. This accumulation should incorporate positive models for the channel characterized (for example just front perspective on appearances), and
negative models (nonfaces). Each image has index \( l \), \( l = 1...L \). For each picture, an analogous value \( y_l \) is entrenched. \( y_l = 1 \) for faces and \( y_l = 0 \) for non faces.

Initialize weights

\[
 w_{1,l} = \frac{1}{2P_-} \frac{1}{2P_+}
\]

for \( y_l = 0,1 \) respectively where \( P_- \) and \( P_+ \) are the number of non facial images and facial images in the image set.

The algorithm is executed for an arbitrary number of rounds, \( I \).
For \( i = 1...I \)

1. Normalize the weight components as follows so that \( w_{i,l} \) is a probability density distribution:

\[
 \sum_{j=1}^{n} w_{i,j} \rightarrow w_{i,l}
\]

2. For each element \( j \), train a classifier \( h_j \) which is limited to utilizing a solitary component. The classifier’s blunder rate is assessed regarding \( w_{i,l} \):

\[
 \varepsilon_j = \sum_{l=0}^{l-1} w_{i,l} |h_j(x_l) - y_l|
\]

3. Choose the classifier, \( h_i \), with most minimal blunder \( \varepsilon_i \).

Update the loads:

\[
 w_{i+1,l} = w_{i,l} \beta_i^{1-\varepsilon_i}
\]

\[
 \beta_i = \frac{1}{\varepsilon_i}
\]

The final classifier is:

\[
 h(x) = \left\{ \begin{array}{l}
 1, \sum_{l=0}^{l-1} a_i h_i(x_l) \geq \frac{1}{2} \sum_{l=0}^{l-1} a_i \ 0, a_i = \log \frac{1}{\beta_i} \end{array} \right. \]

Less difficult classifiers are utilized to dismiss most sub-windows and afterward increasingly complex classifiers are required to accomplish low false positive levels. The fell face location classifier has 38 layers and 6060 options. The fell classifier work process is appeared underneath in Figure 2.4.

![Fig 2.4 Cascaded Classifier](image)

2.5 LOCAL BINARY BIT PATTERN

Nearby double examples is a visual descriptor term utilized in PC vision for order purposes. LBP is the particular instance of the 1990 expected Spectrum slant model. It was utilized without precedent for 1994. From that point forward, it has been thoroughly considered to be a solid capacity for surface arrangement; it has been set up that once LBP is joined with the structured presentation of situated slopes (HOG) descriptor, the discovery quality on some datasets will be essentially improved.

![Fig 2.5 Local Binary Bit Pattern](image)

The LBP highlight vector, in its least difficult kind, is shaped inside the accompanying way: The inspected window is apportioned into cells (for example 16x16 pixels per cell). Every one of its 8 neighbors (to its left side top, left-center, left-base, right-top, and so on.) is contrasted with every pixel in a cell. Screen the pixels clockwise and counter-clockwise along a circle. On the off chance that the estimation of the center pixel surpasses the estimation of the neighbor, state “0.” If not, type “1.” It gives a binary number of 8 digits. Cipher the bar chart of the frequency of each “number” appeared over the unit (i.e., each consolidation data of which image element is minimum and maximum than the midpoint). This bar graph is interpreted as a function vector of 256 dimensions. Standardizing the histogram. Combine your standardized things to get the real value. The component vector would now be able to be prepared utilizing the Support vector machine, outrageous learning machines, or some other AI calculation to arrange
pictures. Such classifiers is utilized for face acknowledgment or surface examination.

2.6 SUPPORT LEARNING VECTOR

In AI, reinforce vector machines (SVMs, moreover support vector frameworks) unit of estimation superintended learning models with related learning figurings that separate information used for affiliation and Analytical strategy. Given an aggregation of preparing models, each set apart as joy to at any rate one or something in spite of 2 classes, Associate in Nursing SVM educating formula collects a model that allocates new advisers for one class or the opposite, making it a non-probabilistic matched direct classifier (notwithstanding the way that strategies like Platt scaling exist to use SVM in an incredibly probabilistic course of action setting). A SVM model may be an outline of the models as centers in district, mapped all together that the instances of the various classes zone unit isolated by a direct gap that is as wide as could be normal in light of the current situation. New models locale unit by then mapped into that incredibly same district and expected to have a spot with a class maintained that part of the gap they fall. Even more formally, an assist vector with machining makes a hyperplane or set of hyperplanes in a high-or complete geometric space, which might be used for dissemination, fall away from the faith, or separating tasks like irregularity presentation. Ordinarily, a genuine embarkation is accomplished by the hyperplane that has the best partition to the neighboring getting ready data limit of any arrangement (assumed sensible edge), since generally the greater the edge the lower the legitimization misstep of the classifier.

![Image](image_url)

**Fig 2.6: Hyperplane**

While the primary downside in a limited dimensional field is additionally verifiable, it is ordinarily the situation that the sets to segregate in this district are not directly severable. Thus, the primary limited dimensional locale was proposed to be mapped into an a lot higher-dimensional region, making the partition around there most likely less complex. So as to keep the heap of the gadget low, the mappings utilized by the SVM plans zone unit are intended to guarantee that the dab item is additionally estimated essentially as far as the factors inside the first space by characterizing them as a part capacity picked to fit the issue. The hyper planes inside the higher-dimensional region unit delineated in light of the fact that the arrangement of focuses whose scalar item with a vector in this district is consistent taking into consideration further developed separation between sets that are not at any rate gibbous inside the firstrand.

2.7 SQUID

Squid can be a web help convention storing intermediary, HTTPS, FTP, and the sky is the limit from there. Through sparing and reusing every now and again mentioned pages, it diminishes data transfer capacity and expands reaction times. Squid approaches controls in detail and makes an incredible quickening agent for the database. It runs on most working frameworks, including Windows, and under the GNU GPL is authorized. The actual designers of the protocol realized timely that there was a target of exponential content growth and introduced strong caching primitives, concerned with delivery mechanisms. These natives enable substance engineers and wholesalers to recommend servers and end-client applications yet substance ought to be legitimate, revalidated and stored. This brought about a critical decrease in the quantity of information pointers expected to serve content and improved reaction times for clients. Squid is one of the things that developed out of the underlying conveyance of substance and acquaint the mid-90s with storing. It has developed to incorporate extra choices, for example, effective access control, endorsement, checking, appropriation/replication of information, traffic the executives and molding, and the sky is the limit from there. When deal with incomplete or wrong HTTP implementations, it has many, many new and old work-arounds. Squid allows web providers to save lots of information by caching content on their measurement. Cached content suggests that knowledge is served regionally, and this can be seen by users through faster transfer speeds with frequently used content. Just by advancing TCP streams can a very much tuned intermediary server (even without caching)[5] increment customer speeds. It's anything but difficult to tune servers to affect the web's wide determination of latencies—one thing versatile frameworks are unmistakably not tuned to. Squid helps ISPs to escape the desire to pay massive amounts of cash to update core instrumentality and transit connections in order to address the ever-demanding growth of content.

1. Pros of using file listed with restricted websites
2. All people can easily manage and search the website in a file

We can write in the file a lot of website names. Therefore, our squid configuration file is readable and easily understandable (As a computer user, always try to keep the configuration file of the database clean and understandable). Precautions during Squid database setup are as follows:

1. Please write to your relevant chapter the specification. For examples. It shouldn't be written in another section if you're writing act.
2. The parameters for configuration are case sensitive

3. EXISTING ALTERNATIVES
The parental control network filters that are available for the users currently are Qustodio, openDNS Family Shield, KidLogger, Spyrix Key Logger, Zoodles, Net Nanny etc. There is no such system to monitor kids. There are softwares that are already there that detect age, gender etc. It is also used in most of the modern cameras, mobiles etc. There are systems to detect age, to apply securities etc. But there is no such software that does both the functionalities. Cyber mom is a project that integrates all these modules into one unit. Also the software is extensible.

4. CONCLUSION
In this era of Internet, Parental controls and firewall mechanisms can be termed as “child’s play” as the children know how to remove them or manipulate them. Cyber Mom becomes handy in such situations as it acts as a filter or a barrier for the children users who are exposed to various sites containing inappropriate sites, videos, advertisements etc. There are systems to detect age. There is also various software to filter web contents. But currently there is no such system that integrates both these functionalities to monitor kids. Cyber Mom detects whether the person in loaded image is child or adult and takes actions accordingly. The algorithms for the face detection and feature extraction used here worked efficiently compared to alternatives in this field.

5 REFERENCES