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Automatic Image Detection and Censoring on Web Pages

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Abstract:- AIDC(Automatic Image Detection And Censoring) is a software that utilizes AI and Machine learning to automatically detect and censor the contents on a web page. As we all know ,the internet is a vast space with enormous amount of data and content in it and a large portion of these contents are pornographic and violent images and videos.And the current situation is such that even a child can easily access these contents. So what AIDC aims to provide is a software that can be installed on the computer that will automatically censor these contents and thus keeping the young minds safe on the internet.This feature can controlled by an administrator.Due to limitations,the scope of this project will include only censoring of violent images.

I. INTRODUCTION

The easy access and widespread of the Internet makes it easier than ever to reach content of any kind at any moment, and while that poses several advantages, there is also the fact that sensitive audiences may be inadvertently exposed to violent content they did not ask for.AIDC aims to provide is a software that can be installed on the computer that will automatically censor these contents and thus keeping the young minds safe on the internet.After installing the AIDC plug-in/software the admin of the system or the parent can access the AIDC control panel which allows him/her to turn the censoring system on and off and access other controls. The users/children can now access the internet via the web browser on the computer.All the content they access will now be automatically censored by AIDC. As the control panel of the censoring system is password protected the users cannot make any changes to the settings set by the administrator. The control panel gives the administrator access to various settings such as excluding certain websites from being censored.The administrator can also turn off the censoring when required.The software primarily focuses on blurring of guns to abstract the idea of violent image censoring on online content.Censoring is only done on necessary areas so as to preserve the meaning of the image.This method is far superior to existing methods which completely blurs or hides the image destroying its intended purpose.

II. PROPOSED METHOD

The working of the entire process is as follows:Webscraper extracts images from the web page.The images are then stored in a folder locally.An image detection model then access this folder to retrieve images from it.The images are then processed by the model to detect the relevant object.A masking algorithm generates a mask for the object concurrently.The mask is then placed on the object to generate the censored image.The image is then send back to be viewed bytheuser.

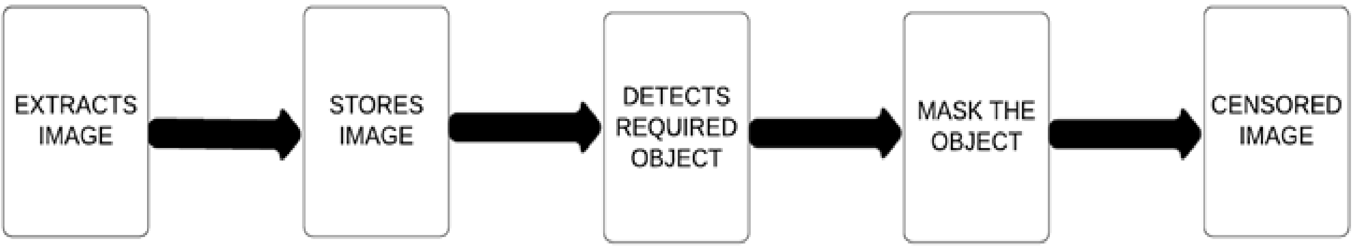


Chart 1:- Overall Design

The entire project can be divided into three sections.

A. *Extraction of Images*

A custom made webscraper is made to extract images from webpages. A web crawler is used to browses the internet to index and search for content by following links and exploring.A web scraper is a specialized tool designed to accurately and quickly extract data from a web page. Web scraper used here collects only images.First, a scraper unique to your project, designed specifically to target and extract the data you want from the websites you want it from.

B. *Detection of Objects*

Here object detection is done using Mask R-CNN.Mask RCNN is a deep neural network aimed to solve instance segmentation problem in machine learning or computer vision. In other words, it can separate different objects in a image or a video. You give it a image, it gives you the object bounding boxes, classes and masks.We use a custom data set of guns to train this model **.**

C. *Masking*

A mask is applied to the object to produce the censored image.

This image is then given back to the browser to be viewed by the user.

III. EXPERIMENTAL ANALYSIS

The image censoring section of the proposed system consists of two parts testing phase and training phase.The image is acquired through web browser.

A. *Training Phase*

In this phase we create a dataset and annotate them.The dataset contains almost 250 images. Validation set contains almost 100 images.

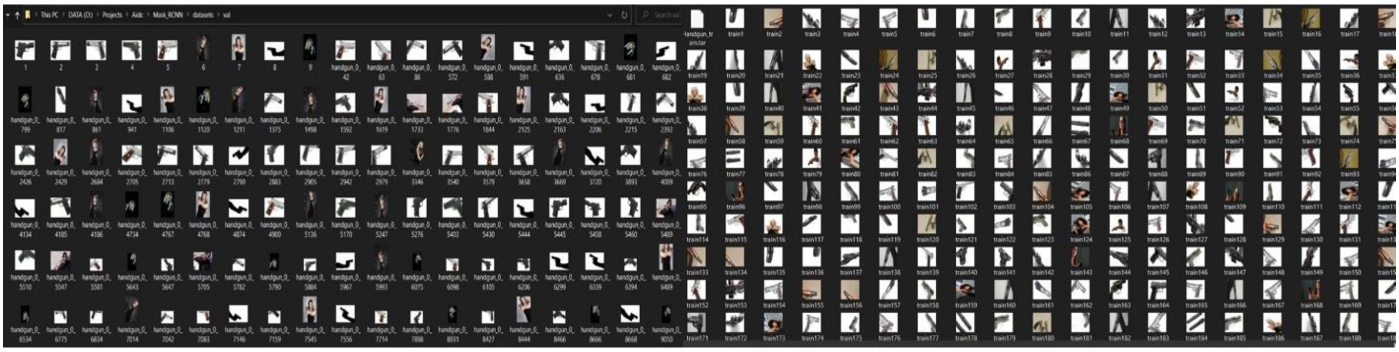


Fig 1:- Dataset

B. *Testing Phase*

In this phase we evaluate the performance of the model. We adopt image-centric training. Images are resized such that their scale (shorter edge) is 800 pixels. Each mini-batch has 2 images per GPU and each image has N sampled RoIs, with a ratio of 1:3 of positive to negatives.

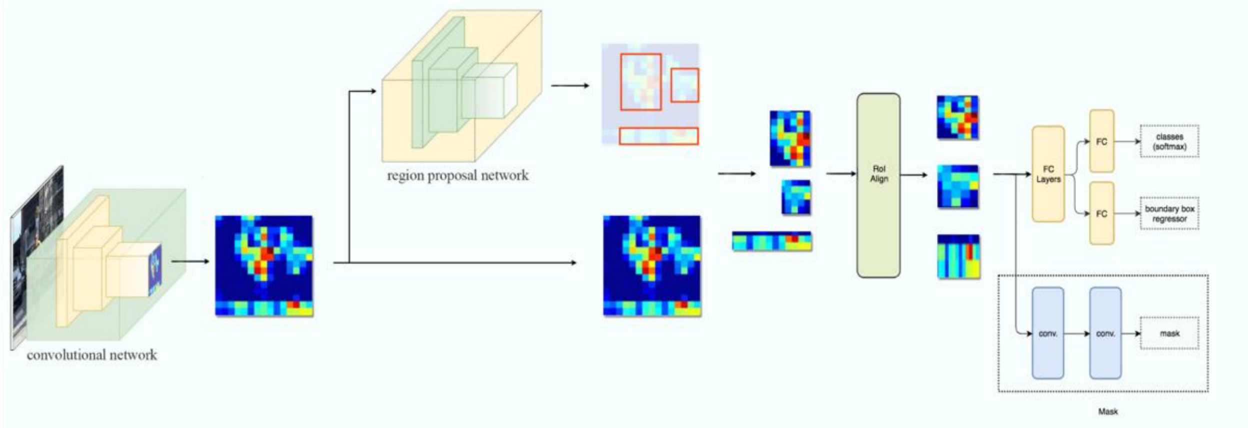


Fig 2:- Test Phase Evaluation

IV. SOFTWARE IMPLEMENTATION

A. *Python*

It used for processing and visualization of the data.It is used for initial segmentation and generation of attribute tables for data processing. It is also used to create webscraper

B. *Tensor flow*

The fetched image is analyzed based on the factors such as slope,NDVI etc and these images are processed for further scanning for predicting the output.

C. *MS COCO Dataset*

It is used for initial segmentation and detection.The pre trained model on MS COCO forms the basis for the later model.

D. *Keras API*

The Keras functional API used create models that is more flexible than other API's. This functional API used to handle non-linear topology, shared layers, and multiple inputs or outputs.

E. *Anaconda*

It is used to set up a platform for creating the object detection model.It is integrates tensorflow and keras api into the training model.

V. HARDWARE IMPLEMENTATION

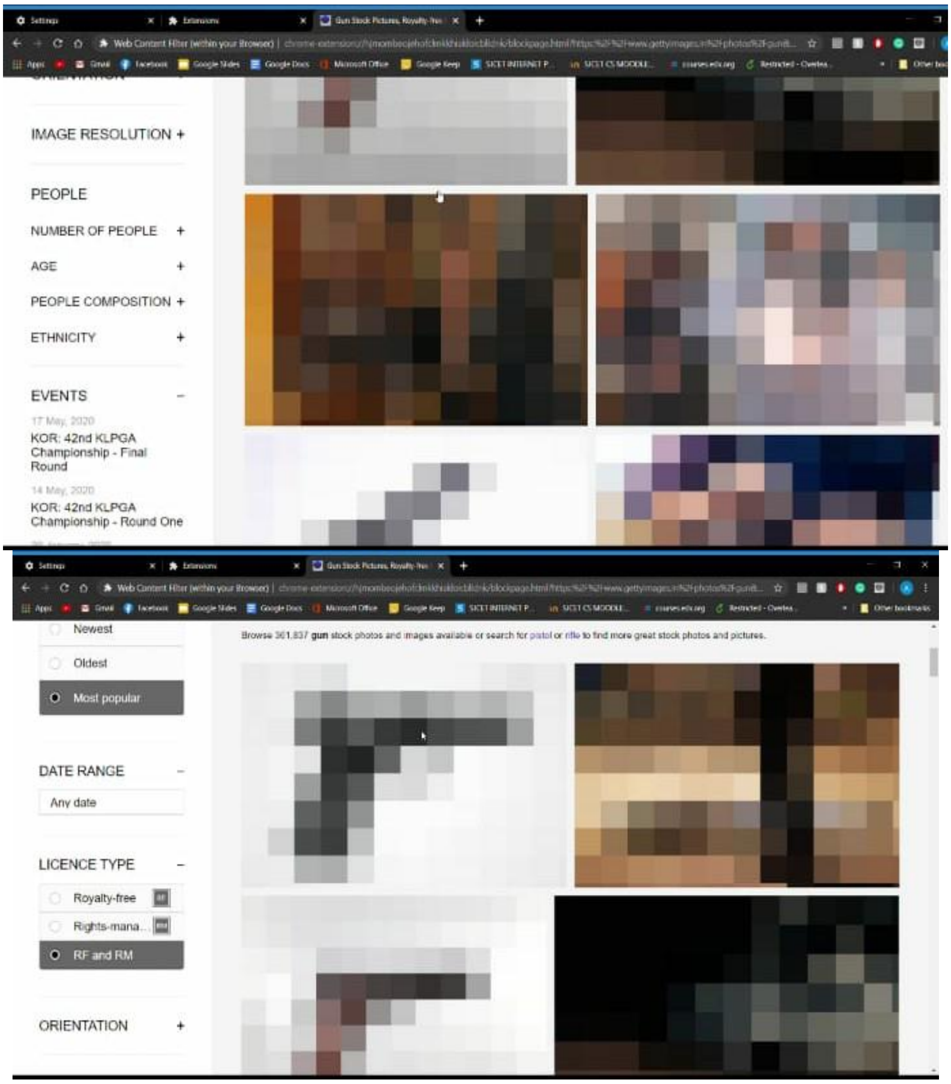
- 1 TB Hard disk
- 8 GB RAM minimum
- Processor intel i5 or above
- GPU gtx 1050 or above
- 3 GB minimum vram

VI. FUTURE SCOPE

The project in the future, can be further expanded by improving the detection accuracyand reducing load times.Few ways it could be achieved is by Improving model accuracy by adding more images to data set,reducing the dependency on on board hardware,Implementing the software entirely on a SaaS platform to make it more flexible, adding more user friendly features.Much more polishing and performance improvement can be done in future to make it more appealing to general public.

VII. RESULT

The model shows almost 80% accuracy in test performed. We used cross validation for training dataset.This software provides a more advanced to deal with explicit images in webpages. The webpage with this software running in background is shown below.



Browse 361,837 gun stock photos and images available or search for pistol or rifle to find more great stock photos and pictures.

Fig 3:- Webpages after censoring.

VIII. CONCLUSION

The proposed system helps to censor violent and explicit images on webpages.This provides an efficient and easy way to protect children from this type of content in internet.Also this project provides a platform for further development of automatic censoring of unwanted content on internet.

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