EAI Endorsed Transactions
on Internet of Things
Research Article EAI.EU

Age Based Content Controlling System Using AI for Children

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Abstract

Age detection has gotten a lot of attention in recent years because it is being used in more and more sectors. Regulations and norms imposed by the government, security measures, interactions between humans and computers, etc. Facial features and fingerprints are two of the most common human characteristics that may shift or alter throughout time. The nose, on the other hand, maintains a consistent structure that does not alter with the passage of time and possesses the singular capacity to fulfil the prerequisites of biometric attributes. This study gives a comprehensive review of how deep learning algorithms may be used to easily extract aspects of the human nose. In specifically, convolutional neural networks, also known as CNNs, are utilised for the purpose of feature extraction and classification when applied to big datasets that have numerous layers. The proposed methodology collects more private children's datasets, which contributes to a rise in the total number of datasets, which ultimately results in a rise in the 98.83 percent accuracy achieved. The results of this survey may be used to limit the material that is shared on social media by determining the age range of the participants, from under 18 to 18 and older.

Keywords: Deep Learning, Feature extraction, CNN, Smart Age Detection, Children

Received on 09 December 2023, accepted on 28 February 2024, published on 06 March 2024

doi: 10.4108/eetiot.5313

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1. Introduction

One of the greatest innovations in the world is the internet which allows people easily to access an endless source of knowledge and enjoyment. There are many more advantages and some drawbacks to the internet. Even though the internet is a tool that is becoming more and more important for kids and has many benefits for them in a variety of areas, particularly in education, communication, and technology, while using the internet children's go through restricted content and gain their knowledge in it. A black mark will be placed in the host database using the Selenium tool if the person is not authorized to read the specified material, which will restrict their access to the data or job. If not, their access will be unrestricted. This project uses ahaar's cascade algorithm to implement and illustrate face detection. In general, two sophisticated techniques, such as age estimation and facial recognition, are needed to limit internet access to specified age groups. Then, for a content management system, this study has suggested a new unified framework for face recognition and age detection. On the other hand, by creating a plan for computer imaginativeness complexity, children's safety in social networks has emerged as one of the most important necessities today. This technique will only be used to regulate the website's content. The approach used in this research to precisely manage the browser, mobile App [1] makes use of both age identification and content restriction. The basic goals of computer vision are automated extraction, in-depth analysis, and comprehension of relevant information from a single

picture. The number of kids using mobile devices to play games and access the content is rising nowadays. Children used to play outside in open spaces two or three decades ago, but it is now unthinkable that kids would possess gear and be able to use smartphones just like adults. According to some polls, 35% of kids between the ages of 4 and 14 now frequently use their phones for one to two hours straight, while another survey claims that 15.5% of kids in that age range spend 4 hours a day using their phones. Children continue to frequent use these adults' websites, and some may even open many social media profiles that are not solely their own in the future. The results of individuals engaging with these places have more scientific research supporting them now. The study successfully aims to deliver platform-based design solutions to address the quickly spreading issue of exposing kids in schools to unsuitable internet information, which makes it progressive inventive knowledge. Currently, there are conflicting media perspectives throughout the globe on how these platforms effect young people's sustainable development, with some claiming that their removal would ultimately lead to sadness. Some research suggests that young toddlers who use local social media platforms primarily to communicate with others are more likely to exhibit severe gay behaviour. Even more problematic is the rigorous ten-year-old age restriction for receiving a child's first smartphone. According to statistics, the majority of youngsters between the ages of 11 and 14 get their first mobile device. These places have more scientific research supporting them now. The study successfully aims to deliver platform-based design solutions to address the quickly spreading issue of exposing kids in schools to unsuitable internet information [2], which makes it progressive inventive knowledge. Currently, there are conflicting media perspectives throughout the globe on how these platforms effect young people's sustainable development, with some claiming that their removal would ultimately lead to sadness.

Some research suggests that young toddlers who use local social media platforms primarily to communicate with others are more likely to exhibit severe gay behaviour. Even more problematic is the rigorous ten-year-old age restriction for receiving a child's first smartphone. Numerous pupils have usually flocked to this location to use the school platform because to the recent TikTok craze. Observing this negative conduct is frequently the outcome of young toddlers become more intrigued about and interacting informally with strangers. In general, computers and the internet play a significant role in children's education. Because of this, it is important to prevent children from accessing inappropriate content online. To do this, two reliable techniques—age estimation and content control—must be used. In since fraud and scams are indeed on the rise, many study has suggested a novel integrated model for age prediction and content management [3].

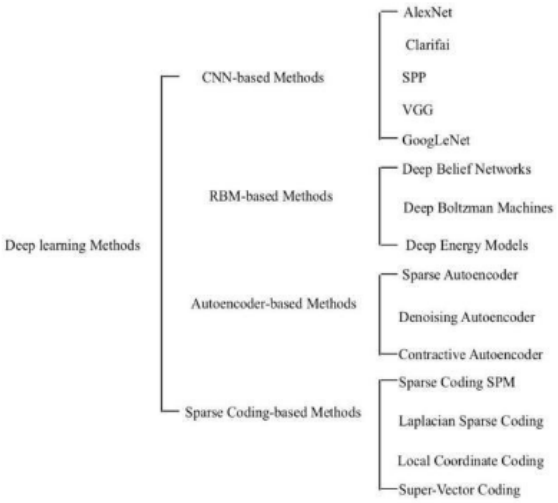

Figure 1. Deep Learning Categories

2. Literature Review

This article recommends creating an Android parental control software to reduce hazards and protect minors from being threatened. The app uses WhatsApp messages [4] sent and received and sends them to a central server which is examined and classified in accordance with the child's communication and threats like physical intimacy, substances, and harassment. It then alerts family members for parental control. This approach analyses natural text using a semantic classification algorithm Hacking is typically derogatory. IT hackers bypass builder or manufacturer security mechanisms. Hacking may also entail extending the functionality of an app or gadget. This post will demonstrate how to remotely operate and monitor a Smart TV by gaining unauthorized access or rooting it. parental authority is mainly restricted to a lock with a PIN. It greatly expanded performance by executing arbitrary code [5]. Even older TVs without upgrades may use this technology. Due to the fast rise of wireless transmission and proximity positioning technology, location- based services (LBS) are developing data services for mobile devices. Mobile phones are strong platforms and essential for daily communication. Developing apps aid emergencies and geolocation tracing. Parents worry about abduction and being lost. Even with their phone nearby, the youngster might have no way to reach their parents. This article proposes a GPS-based parental control and child monitoring app that can collect kid SIMdata. With this suggested approach, parents may access main SIM information from their cell phone to send a Text instruction to their child's phone Resource conservation underpins [11]. The impact of parental upbringing on junior high school pupil's academic burnout is examined using the theories of resource conservation and self-control resource models in order to explore the mediating role of psychological capital and self-control,

and to provide a theoretical and practical foundation for reducing academic burnout of junior high school students. Using questionnaires, 197 Beijing City junior high school pupils are evaluated. Descriptive statistics, hierarchical regression analysis, AMOS data analysis, and bootstrapping were used to analyse the data. and other techniques. Through the role of psychological fortitude and discipline as mediators, different aspects of how parents raise their kids can affect how tired students get of school. This research uses smart - phone content control apps to increase child-parent communication. Parents should help youngsters understand the application's information to communicate more effectively. So, kids can ponder and decide. Parental control apps restrict children's smartphone usage. The application's user interface is imperfect. The display of the features restricted by parents and do not engage youths in application selection. Hence, parents may lose the opportunity to assist youngsters grasp the app. In parental control programme design, the user interface is strongly tied to user duties. A user-friendly parental control app is essential. This user interface research considered this. User Centered Design will design the user interface (UCD). UCD emphasises user requirements in the development of user interfaces. This strategy will help researchers gain more reliable data by directly collecting user information from parents and children. Life cycle stage design makes UCD better. In response to parental requests to teach children about app content, this study created user interfaces for parental control applications that let kids select the app's content. Users may access a lot of online stuff, including unpleasant material, thanks to widespread Internet access. Pornographic materials, online bullying, sexual violence, violent behaviour, hate, gambling, and narcotics harm youngsters online. About half of Internet kids have unwittingly accessed inappropriate information. This issue spurred academics and business to create online content screening parental control programmes. Few cyber parental control studies show its importance. This domain's approaches, strategies, and datasets are understudied. This early research examines cyberspace parental control strategies, methodologies, and datasets. It also outlines the best methodologies and tactics, their strengths and weaknesses, the datasets utilised, and future cyber parental control research. Considering such areas of this discipline improves comprehension of its methodology, strategies, and datasets that were previously untested. Eventually, this research suggested numerous cyberspace parental control systems that work. The article addresses Cyber security. The authors have presented a network driver interface-based data stream control approach. A comprehensive parental control system framework with function blocks for in-depth text and visual site review of the literature and my driasis diagnosis [6] was developed. This method tracks kid irritators and sends a desktop snapshot to the parent device. 83 percent of eyes and 85 percent of vascular constriction were correctly recognised. Pupillometry speed investigation indicated that CUDA applications for massively parallel processing allowed the result to be estimated to real-time in 0.03 sec. Intelligent toys worry parents and academics. Youngsters disclose sensitive data without thinking about internet threats. Parental control programmes let parents manage their children's information and safeguard them. Current tools do not fulfil parental demands or toy manufacturer standards. This examines smart toy parental control needs. This article discusses the development and execution of parental control systems that record and prevent children and teens from accessing improper content from the web, Given the shortcomings of the current parental control software and the unique features parents seek. It is initially assessed the state-of-the-art tools' usability, effectiveness, convenience, security, and precision. The exploratory research using a representative sample of parents, kids, and network administrators are surveyed to determine the baseline and primary needs for this kind of software. Using such principles, the application has created, and front-end interface based on relevance and internal consistency. The Object-Oriented Hypermedia Design and Natural Language Processing is used to leverage the Boolean Retrieval Model with string searching methods like Boyer-Moore and fuzzy string search. The findings reveal that not only has unsuitable information been banned, but the idea also allows parents to oversee and measure their children's Internet usage, which is crucial to preventing and raising consciousness among adolescents. The catastrophic COVID-19 pandemic has significantly increased adolescent internet usage. This age group's sudden internet presence and limits on children's social lives have worried parents. Direct parental control reduces trust and bonding between parent and adolescent, according to research. Explaining to youth the probable repercussions of their online activity in a pleasant way helps them realise the need for self-regulation and prudence while participating in online communities. This paper proposes self-regulation. Teen-alyse is a mobile app for self-regulation. This software balances parental rules with adolescent self-regulation. Active mediation fosters parent-teen interaction during the mobile application's set time limit. Its algorithm classifies a teen's Video activity as marked or unflagged, alerting kids and parents. The app approach incorporates parental supervision, consciousness on the part of the adolescent, and active mediation [7]. Parental controls are popular for online kid safety. Digital parental control systems often reveal the child's online activity record to their parents, violating their privacy. Also, not all parents safeguard their children. This study proposes a privacy preserving parental control system using AI technologies to identify dangerous material for kids in 5G networks [8]. Every child is safeguarded by using this method, regardless of whether or not their parents can afford the service. AI intelligently classifies digital information in real time. The employ multiparty Private Set Operation methods for anonymity. This paper explains Android service for sending and receiving e-mail in case speeding has occurred. Client app has been made for changing e-

mail sender, receiver and also for changing speed limits for particular section of road. Evaluation has shown that fetching data from service is quite reliable and safe. This is because OBD II system is used only for reading data and not for writing them on CAN bus. Blockchain has attracted many people from diverse industries since it may solve several computational and storage challenges, especially in decentralised environments. Blockchain technology use in Parental Property Distribution, Academic Systems, Travel Support Tracking Systems, etc. remains unclear. This study proposes block chain-based property allocation that is automat ed, irreversible, and customizable by parents. The suggested method may be used to family assets and power systems. As teen smart phone usage rises, so do internet safety worries. Mobile parental control applications have poor adoption [9]. I did a systematic, qualitative feature study of 75 Android mobile applications promoting teenage internet safety to address this issue. The advisor developed a Teen Online Safety Strategies (TOSS) conceptual framework and matched this feature analysis findings to it. I discovered that most applications favoured parental control via limitation and surveillance over adolescent self-regulation or Active mediation from the parents, which has been proved to be more successful. Next, aim to perform a web survey to validate the assumptions that the values advocated in these applications are subpar and do not meet the demands of parents or teenagers (e.g., Developing trust while maintaining accountability, etc.), which contributes to the low adoption rate [10].

3. Proposed System

In this study, the implement a deep learning algorithm on a nose data set to present an age detection system that uses image analysis, feature extraction, and classification across many underlying levels of concealed deep learning. Specifically, the Caffe model data set was used to enhance the wire frame. The resulting categorization provides the algorithm with the intended outcome, namely the age group, whether it be 18 or over or under 18. To better understand the suggested paradigm, please refer to Figure 3 The first step in the implementation is to gather nose photos from various sources (this model uses 2000 nose images, split 80% for training and 20% for testing) and then process the
data using a CSV file. Bring in the required deep learning Python modules, load and process the data, and create the CNN model's architecture and implementation. The algorithm implemented in this study can be seen in
Figure 2

```
Import libraries
Load training images
Read training csv file
Start
for counter to (images range)
train images + labels preprocess images
Stop
Drop (image name, gener) columns from csv file for validation
Randmly validate 10% of training images
Build CNN architecture
Compile CNN model
Load testing images
Start
for counter to (images range)
test images
preprocess images
Stop
Predict age calss
Output accuracy
```

Figure 2. Smart Age Detection Algorithm

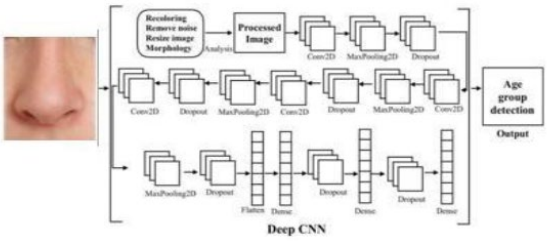

Figure 3. The Proposed Methodology Model

DCNN compares snaps one by one. The parts it seeks are known as features, and they are nothing more than a collection of MxM matrices with numbers. The image is initially recolored, resized, morphology. The image gets processed and passed into different deep convolution2D layer with Maxpooling2D & MinPooling2D.The different layer of convolution used to find out the age group detection.

3.1 Implementation

Age Detection is done by using Deep Learning and Artificial Intelligence in this process it first detects the face as the input by using the integrated webcam and extracts the face and applies the algorithm for determining a user's age uses various factors to make an educated guess about the user's age. Stage 1: Identifying faces based on the data coming from the source. Stage 2: The age of the person can be estimated by first extracting their face and then using an algorithm designed to detect ages. This is used to predict the ages more accurately using neural networks and by giving more data sets and more training to the data models then the accuracy of finding the age of the user is more accurate. In particular, the CNN facial recognition system trains on hundreds of thousands of photos and it trained well and predicts the ages of humans accurately by the eyes in the image. After

detecting the age of the user and if the user is eligible to access the contents in the websites where the user is trying to access then it allows the user to access the resources from the websites or else if the user has restricted to a user the website, then he is not allowed to use the website and the website is blacklisted for that particular user. In this proposed system the more accuracy has achieved in predicting the age of the user by training models with more sample images and restricting the user from accessing the restricted content according to their age.

3.2 Age & Gender Model Training

The graphic depicts tests with different community structures for different age groups and sexes. The community consists of only three layers of convolutional data, followed by two layers of fully connected data, each containing a number of neurons. The decision to utilize a smaller community structure is prompted through this intention to cut down on the possibility of over fitting, as age classification on the audience set requires discriminating among eight classes while gender discrimination only requires discriminating between two.

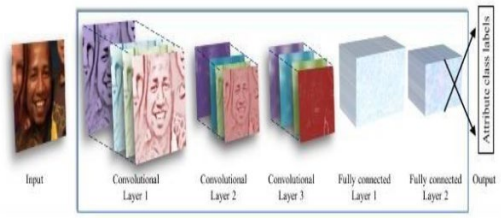

Figure 4. Network Structure

3.3 Testing and Training

Random selections are made from a Gaussian distribution that has a mean of zero and a standard deviation of 0.01, and these random selections are used to determine the initial weights for each layer. To drive home this point, the benchmark's photographs and labels are used exclusively during the network's first training. While starting up the network, no pre trained models are employed. Again, this is in stark contrast to CNN's facial recognition systems, which use tens of thousands of training images. During training, the intended values are represented by sparse binary vectors which correspond to the ground truth classes. The target label vector for each training image contains the same number of elements regardless of the number of classes, with 1 at the ground truth's index and 0 otherwise. To start, the weights of all layers are uniformly distributed according to a Gaussian distribution with a mean of zero and a standard deviation of 0.01. To drive home this point, the network is being trained from the very beginning. With no external data other than the benchmark's photographs and labels. While starting up the network, no pre-trained models are employed. Again, this should be contrasted with CNN's facial recognition systems, which use tens of thousands of images to learn. To facilitate training, the employ sparse, binary vectors that map to the ground truth classes. Target labels for every image in the training set have the same length as the number of classes, have a value of 1 at the ground truth's index, and have a value of 0 everywhere else.

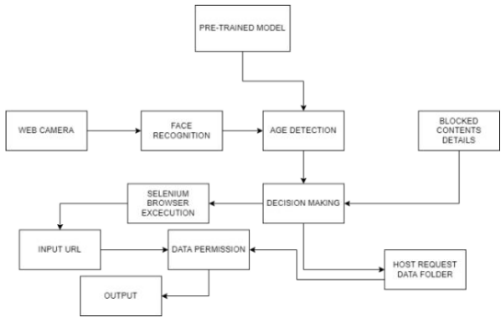

Figure 5. Architecture Diagram

3.4 Network Training

To utilize a lean network architecture so that we can cut down on the possibility of over fitting even further. in conjunction with two other methods. Dropout learning is where we start (i.e. The output value of the network neurons was set to zero in a random fashion). The network has two dropout layers, and each one has a There is a fifty percent chance that the output of a neuron will be set to zero. This gives the network a dropout ratio of 0.5. Second, in each forward-backward training cycle, we randomly reproduce a 227-pixel slice of the 256- pixel input picture. Information is "augmented" in this way. The training procedure makes use of stochastic gradient descent, and each batch of images contains fifty different examples. Ten thousand iterations in, the initial learning rate of e3 is reduced to e4.

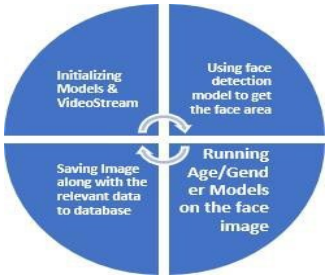

Figure 6. Implementation Process

3.5 Prediction

To determine the best way to use the network to predict the ages and sexes of unknown faces, The two experiments has conducted: Centre Crop: Giving the network a 227 by 227-pixel picture of the face cropped in the centre. Further sampling of four crop sections of 256 by 256 pixels each from the image's four corners and one more from the face's Centre, for a total of five 227 by 227-pixel crop regions. Every one of the five images is shown to the network, along with their reflections in the horizontal plane. The final forecast is the mean of all these estimates. Because of the many obstacles presented by Audience photos (occlusions, motion blur, etc.), even slight misalignments might have a significant effect on the quality of output. By contributing directly to the network [12]. With numerous translated different interpretations of the same face, the second method, over-sampling, is able to adjust for these minor misalignments without resorting to enhancing alignment quality. Putting the Models into Action. The computation demands of this algorithm, which is a multi- model DNN programme, have been minimized. The algorithm here operates on a granular level. The procedure consists of the following steps: First, OpenCV's deep learning-based face detector (res10 300x300 ssditer 140000 caffemodel) is used to recognize faces in the frame. • Using previously developed CAFE models, the ages and sexes of all individuals are also predicted. The everyone a unique identifier and keep tabs on them throughout time. The camera's view for just 5 seconds, still know who they are the next time they pop back into view [13]. The prediction and corresponding photo are then stored in an Excel database, keyed by the individual's ID number.

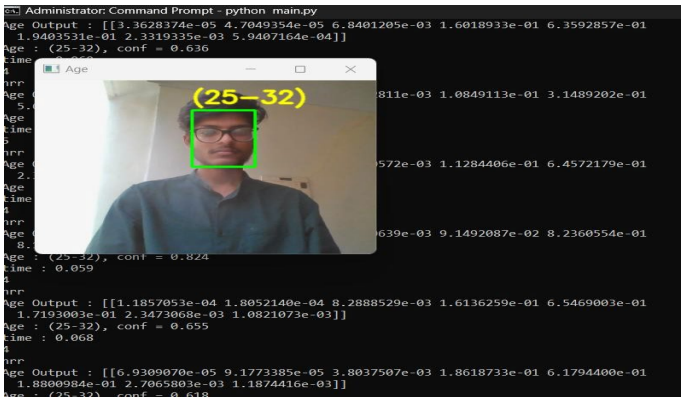

Figure 7. Result

4. Results

Principal results included extremely high accuracy (98.83%) in categorizing photographs into those suitable for users 18+ and those inappropriate for users under 18 on social media [14]. A comparison of the results from this study with those from others is shown in Table I, demonstrating the improved precision of this work.

Table 1. Comparison of proposed method Vs the previous methods

Algorithms	Estimated Accuracy
Random Forest Algorithm with 100 Subjects	64.00%
Deep CNN (1) with Adience database	59.90%
Decision tree J48 classifier Algorithm withFG_NET dataset	89.13%
Deep CNN (2) with UND J ear Database	52.00%
Deep CNN (3) with FERET	60.97%
Deep CNN (4) with AMI, AWE & Private Children datasets	95.75%
Deep CNN (5) with Caffe Model	98.83%

5. Conclusion

It is essential for parents to prioritise their children's protection. Young people's lives are becoming increasingly intertwined with their online communities, activities, and experiences [15]. As technology advances at an ever-quicker clip, new digital and online scenarios emerge. Parents, guardians, and other adults in charge of overseeing children's online activities can play a significant role in influencing their internet use by allowing them access to some sites and restricting them from others. As a result, this problem has a secure solution in the form of the proposed system.

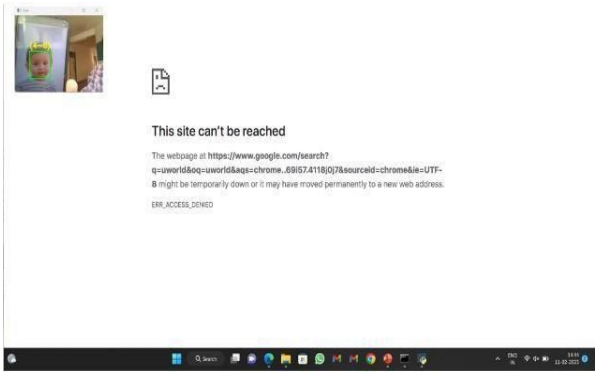

Figure 8. Content access for user below age group

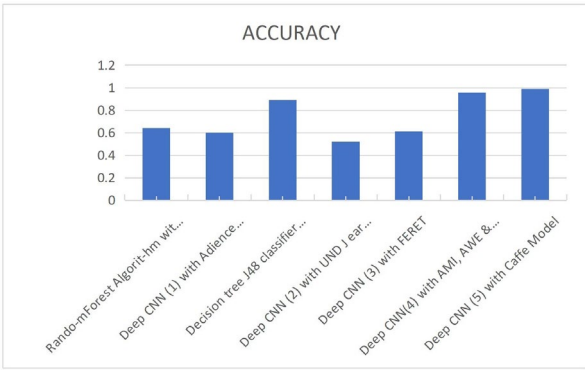

Figure 9. Algorithm comparison

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