

Augmented Reality: Social Profile Detection by Face Recognition

Yadav Preeti¹, Shinde Pratiksha², Prof. Mayank Mangal³

^{1,2}BE, Computer, ARMIET, Maharashtra, India

³Professor, Computer, ARMIET, Maharashtra, India.

Abstract - Augmented Reality has the goal of enhancing a person's perception about the surrounding world. It is about overlaying the augmented interface on the physical world. Social media is source of communication and is also the best way to know the person. The person's personal as well as professional life is on this social media platform. In order to know someone's bare fact's the social media platform is preferable. In the proposed approach, face detection and recognition techniques are used. By which it will show the social profile of a person. These social platform details will be shown on the augmented interface with the help of head mounted display.

Keyword: Augmented Reality, Artificial Intelligence, Machine Learning, OpenCV, Face detection.

1. Introduction

AR is within a more general context termed Mixed Reality (MR), which refers to a multi-axis spectrum of areas that cover Virtual Reality (VR), AR, telepresence, and other related technologies. AR has been acquainted with assortment of fields in the most recent decade. Ongoing improvement of convenient gadgets, for example, advanced mobile phone and tablet PC gives the network a considerable measure of conceivable applications in AR frameworks. Indeed, even in the medicinal field, different AR frameworks been proposed: frameworks for training, prearranging, and those in the working room. Augmented Reality is an innovation that figures the position and edge of the camera and includes related pictures to the applicable genuine world continuously. The objective of this innovation is to put the virtual world and genuine world on screen together and make collaboration.

In this system the concept of AR and face recognition is combined to design a device that will display the social profile of a person. In today's era everyone is crazy about social media use and like to connect to peoples knowingly or not. This device will help us to know about persons social media profile just by face recognition.

2. Related Work

2.1 Building an AR based product Promotion system with ARToolkit.[1]

This system includes a graphics data server which keeps AR markers and 3D models, which the advertisers can manipulate, add, delete, and associate them to 1-D

barcode data. The second part of the system is an ARToolkit-based AR application, developed under the MS Windows platform and linked a USB webcam. The AR application first searches for a valid barcode within the video frame and try to decode it. If successful, the application will connect to the graphics data server and attempts to retrieves the AR marker and 3D model associated with the barcode. If the advertiser have already built a link between the barcode with the AR marker and 3D data, then the database server will return them in a package back to the application. Once the application receives the package, it will use the information received to search for the AR marker on the product packaging and to display the 3D model on top of it.

2.2 3d Based Modern Education System Using AR.[2]

AR technology highlights can likewise assist instructors with explaining great and make the understudies effectively comprehend what they are educated. It is Easy to use and interactive. Student can acquire much more knowledge and experience in learning by using this technology in education as compared to the traditional method of learning. This technology has also increased their motivational level and the results indicated that the AR technology provided a fun and engaging environment. All the 3D models can be used again and again without getting damaged. Therefore, it's an effective foundation to use AR technology as an educational tool. AR features are able to engage students in learning processes and help improve their visualization skills. The features can also help teachers to explain well and make the students easily understand what they are taught.

2.3 Pseudo Eye: The Next-Generation Shopping Application Using AR.[3]

This paper puts light on the major part of the application that is the implementation of visual search technology for the retrieval of product details. The product finder in Pseudo Eye is implemented using the Ricoh Visual Search (RVS) technology which connects the information on the physical world with the digital information or services on the digital world bringing a wonderful experience to the users. The recognition technology uses the image characteristics of captured image similar to fingerprint matching recognition.

2.4 Real Time Face Recognition System.[4]

Face recognition called biometric systems that automatically identifies or verifies a person's identity using his/her facial features and expressions. It is widely used to identify passports and driver's licenses carrying individuals even if they are not aware that a face recognition system is autonomously checking their identity. Face recognition software has many application in the modern world such as logging in on to a computer using facial verification as a password, gaming, people tagging, security and so on. The current Face Recognition Systems and applications in the market have deficiencies that range from reliability problems, reduced recognition accuracies in certain environment, complicated feature extraction, high setup costs and performance issues. However, the demand for a robust Face Recognition System (FRS) applicable across various industrial uses, organizations and the public is increasing dramatically.

3. Existing System

In this system two technique is used

3.1 Face Recognition

The face recognition technique that is used in AR are the Adaboost and Multi-class recognition. The AdaBoost is a method to combine a collection of weak classification function to form a stronger classifier. It is an adaptive algorithm to boost a sequence of classifier in which the weights are updated dynamically cording to the errors in previous learning. It is kind of a large margin classifier. AdaBoost is typically used to solve two-class classification problems. In a multi-class Scenario majority voting (MV) strategy to combine all pair-wise classification result is used. The face recognition result can also be shown with the method of probabilistic reasoning models (PRM). Which is an approximation to the Bayesian classifier with the assumption that the covariance matrix is diagonal.

3.2 AR Display

It is the user interface through which the AR output is viewed. The two framework is used earlier one is the screen based AR framework and other is video transparent AR framework. Screen based AR framework depends on the PC screen to display the AR picture. Where as in video transparent AR framework the head mounted display is needed to display. Camcorders record the real data and the video of genuine world is joined with the virtual pictures and after that the consolidated video will appeared on the screen.

4. Algorithm

4.1 Eigenface Algorithm

The problem with the image representation at it's high dimensionality, two dimensional $p \times q$ grayscale images span $am = pq$ dimensional vector space, so an image with 100×100 pixels lies in a 10,000 dimensional image space already. The question is: Are all dimensions equally useful for us? We can only make a decision if there's any variance in data, so what we are looking for are the components that account for most of the information. The Principal Component Analysis (PCA) turn a set of possibly correlated variables into a smaller set of uncorrelated variables. The idea is, that a high-dimensional dataset is often described by correlated variables and therefore only a few meaningful dimensions account for most of the information. The PCA method finds the directions with the greatest variance in the data, called principal components.

4.2 Haar cascade SVM classifier Algorithm

1. Input the image.
2. Convert the input image into different colour space model with the goal of obtaining specific region from the image.
 - a. RGB space
 - b. YCbCr space
 - c. HLS space
3. Convert the image obtained from different colour models into combined binary image. This step would put the value of pixel as 1 if it falls within the specified criteria; otherwise it puts the value as 0.
4. Filter the obtained binary image by applying different morphology
5. Detect blob type region from the binary image and extract those elliptical region of interest.
6. Determine the face features from extracted region by calculating the mouth, eye and nose map.
7. Collect the parameters from above pre-processing stages in the form of support vectors and pass them to the function of linear SVM to classify them into face and non-face region.
8. Highlight the classified face region by using rectangle box in the original image.

Through this paper we want to introduce the idea of combining the AR and face recognition concept. By developing a device that can recognize the social status of a person. Social status of a suspect includes social media records, criminal record, health records, missing person record. This could help the operator to recognize the any of the above record of a particular person even in crowd unknowingly to the suspect.

5. Conclusion

The main aim is to enhance the interface among the user of technology. This technique can have various application in the field of criminal detection, disaster management, entertainment, education, research etc.

References

- [1] Jong-Chih Chien, Hoang-Yang Lu, in-Sen Pon, Yi-Sheng Wu, Li-Chang Liu. "Building an Augmented Reality based Product Promotion System with ARtoolkit Integrated with an Adaboosted Classifier-Assisted 1-D barcode Reader." 2010 IEEE.
- [2] K.Chalapaathi Raju, K.Yugandhar, D.V.N.Bharathi, Nagavalli.Vegesna Assistant Professors S.R.K.R Engineering College "3D Based Modern Education system using Augmented Reality." 2018 IEEE.
- [3] Ananda Kanagaraj S Student, Arjun G Student, Sree Sharmila T " Pseudo Eye: The Next-Generation Shopping Application Using Augmented Reality." 2013 IEEE
- [4] Suad Haji, Asaf Varol " Real Time Face Recognition System (RTFRS)". 2016 IEEE.
- [5] Komal Gangurde, Bhagyashree Pardeshi, Dipika Aher, Trupti Bhabad "Overlaying Virtual Object into Real World by Using Augmented Reality". International Research Journal of Engineering and Technology (IRJET), Volume: 03 Issue: 03 | Mar-2016.
- [6] R. Silva, J. C. Oliveira, G. A. Giraldo, National Laboratory for Scientific Computation, Av. Getulio Vargas, 333 - Quitandinha - Petropolis-RJ Brazil "Introduction to Augmented Reality".
- [7] Guo-Dong Guo and Hong-Jiang Zhang Microsoft Research China 5F, Beijing Sigma Center. "Boosting for Fast Face Recognition".
- [8] Parin M. Shah San Jose State University "Face Detection from Images Using Support Vector Machine". Spring 2012.
- [9] Hu Peng Oxbridge College, Kunming University of Science and Technology, Kunming, china "Application Research on Face Detection Technology based on OpenCV in Mobile Augmented Reality". International Journal of Signal Processing, Image Processing and Pattern Recognition Vol. 8, No. 2 (2015).