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Augmented Reality for Smart Profile Display Part-2

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Abstract - The Augmented Reality is a breakthrough technology that could considerably ease execution of complex operations .This technology can be used in educational institutes to get the information about the students.

This technology will truly change the way in which we view the world. Augmented reality adds graphics, sounds, haptic and smell to the natural world as it exists. With the help of advanced augmented reality technology.

This paper defines 3 modules: idcard-recognition, voice-detection and face recognition. In idcard recognition, id card of the student is scanned and information is augmented. In voice detection, name of the student is said whose information has to be augmented. If the name is detected correctly, then the information is augmented. In face recognition, student's face is scanned and the information is augmented.

Key Words: **Augmented reality , Visual studio , Face recognition , QR code scanning , Database , Device camera**

1. INTRODUCTION

Augmented reality holds the promise of creating direct, automatic, and actionable links between the physical world and electronic information. To enhance the user interface and make easier to access the information.

By applying augmented reality in education field, students use the portal and credentials to access their information. To avoid this, using augmented reality technology it can be made easy to view their information. Augmented Reality is the direct or indirect live view of the real physical world in which computer-generated objects are placed using image processing. Word "Augment" means to make things large by adding other things.

The AR working process can be classified into a sequence of steps leading to the desired goal achieved as follows (Azuma, 1997): Image Segmentation, Feature Extraction, Marker Detection, Camera Orientation, Rendering, Augmentation.

Augmented reality is technology that superimposes a computer-generated image on a user's view of the real world. This technology allows users to scan in images like student's face or more likely to be a barcode on their id card to create a smart profile.

The information about the person is retrieved from a database like firebase. This system is connected to online database which is helpful to update the scores of any students and also attendance status which can be reflected in the application.

User Interface is one of the primary and crucial aspects of these continual changes (UI). Rich user interfaces are common in a variety of contexts, including web pages, Android, iOS, and Windows user interfaces. Modern technologies like virtual reality and augmented reality (AR) are created to provide consumers a highly rich and authentic experience. A lot of societal fields, including medicine, civil engineering, machine design, entertainment, and others, employ augmented reality.

1.1 Scope

An innovative technology that might greatly simplify the performance of complicated processes is augmented reality. Augmented reality (AR) combines virtual and real worlds, giving the user additional tools to enhance the effectiveness of information transmission for various processes and locations. To learn more about the pupils, educational institutions might employ this technology. In addition to enhancing user interface, augmented reality offers an interactive connection to the outside world. It is possible to scan 2D or 3D objects, and the related data from the database is then retrieved and enhanced on the application interface.

As a result, augmented reality in education enables the efficient and quick retrieval of student information. This paper defines several augmented reality methods.

1.2 Objectives

To provide easy identification of students in the educational institutes. To retrieving student records. To easily retrieve the student attendance status, through QR code scanning. To identify if that particular student belongs to the same institution. To access the academic status of the student.

2. SYSTEM DESIGN

The design phase's goal is to conceptualise a solution to the issue that the requirements document has identified. The initial stage in transitioning from the problem domain to the solution domain is this phase. In other words, design guides us toward how to meet needs by beginning with what is

needed. The quality of the software may be most significantly influenced by the system's design, which also has a significant impact on later stages like testing and maintenance.

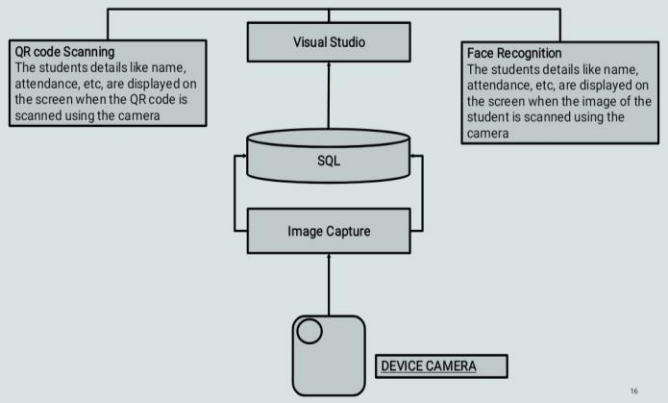

Fig -2.1: System design

Device Camera: The Camera of the Device is opened on the application which can scan a person's face or recognize voice or the bar code present in the ID card.

Image Target: the image target is scanned through the device camera.

QR Code: The QR Code present in the ID card has to be scanned. If the ID card is of a candidate who is of the campus, then the information is augmented on the screen.

Face Recognition: This is one of the important modules of the application where the camera of the android device is used to scan the face of the candidate whose information is required to be accessed. This module can be used only when the person is present.

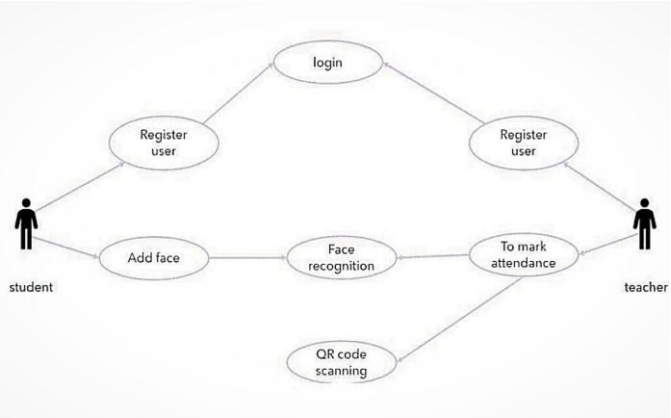

Fig -2.2: Use case diagram

Any software implementation is always preceded by crucial choices on the platform to be utilised, the language to be used, etc. Numerous factors, like the actual environment in which the system operates, the speed that is necessary, security concerns, other implementation specific features, etc., frequently affect these selections. A technical specification or algorithm is realised through computer programming and deployment as a programme, software component, or other computer system. For a certain specification or standard, numerous implementations could exist. For instance, software development tools include implementations of programming languages, and web browsers include implementations of World Wide Web Consortium-recommended specifications.

3. SYSTEM TESTING

Testing achieves a number of goals, but its primary purpose is to gauge the calibre of the program we are creating. This viewpoint, which assumes that there exist software flaws awaiting discovery, is rarely refuted or even contested.

Analysis of QR code Scanning: Once the QR code of person's ID card is scanned using the smart profile display application, the information of that person is augmented on the application screen if the information is present on the online database. If the ID card attribute that is being scanned is not present, the image target which is nothing but the bar code is scanned again.

Analysis of Face Detection: The face of the candidate is the image target which is scanned and compared with the image attribute present in the online database after which the face is recognized if they match and the information is augmented on the screen of the android application.

If the image target scanned when compared with the database does not match then the application tries to scan the face of the candidate again.

Test Case	Description	Expected result	Actual Result	Pass/Fail
1	Register as student	Registered	Registered	Pass
2	Register as teacher	Registered	Registered	Pass
3	Sign in as student	Signed in	Signed in	Pass
4	Sign in as student	Signed in	Error Credentials	Fail
5	Sign in as Teacher	Signed in	Signed in	Pass
6	Sign in as Teacher	Signed in	Error Credentials	Fail
7	Teacher checks attendance	Attendance generated	Attendance generated	Pass
8	Teacher checks attendance	Attendance generated	Attendance generated	Fail
9	Add a face	Face added	Face added	Pass
10	Detect face	Present	Present	Pass
11	Detect face	Present	Not present	Fail
12	Generate QR	QR code generated	QR code generated	Pass
13	Scan QR code	Student present	Student present	Pass
14	Scan QR code	Student not present	Student not present	Pass

Table -3.1: Test cases

4. CONCLUSIONS

The virtual student profile can be enhanced on a computer or smartphone screen using visual studio and an online database. When a student's face is detected, their academic

records as well as common information like their name and other details are digitally shown in a real environment. Any face detection technique or OpenCV assets can be used to detect faces. Using virtual buttons can improve the user interface and interactions. It is simple to create 2D picture targets that can be scanned and have their profiles enhanced. Using speech recognition in the absence of 2D and 3D objects, the project will be further extended so that when the student's name is said to the programme, the correct information will be added. Since the results are based on self-reported data, future work may implement a within-group design and quantitative techniques like in-depth interviews and observations to produce more statistically significant and interesting conclusions.

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