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"INFORMATION CORRIDOR"- AN AUGMENTED REALITY BASED SYSTEM

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Abstract: **Augmented reality is view of the physical environment whose components are supplemented by computer-generated input such as graphical elements. The preliminary uptick is usually done in real-time. Keeping this in mind Information Corridor is developed for exploring the video from the images without using internet. Information corridor is useful for the user age group of 4 to 6 years old. With use of this application kids get exposed to limited, observed and quality information. This paper will give brief information about the augmented reality and Information corridor as a standard example of it.**

Keywords: *Augmented reality, Information Corridor, Graphical elements, Real-time.*

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I INTRODUCTION

As name suggests Information Corridor system is intended to process physical world information to get enhanced data. It is corridor between physical world information and enhanced data. Information corridor is augmented reality based application developed for kids. It can be consider as entertainment and educational based application. It scans image from the image book with camera in mobile and play the related video of that image. As image gets change video gets change. Use of this application restricts the access of internet by the kids and results in exposure of quality information. Augmented Reality is a technology that calculates the angle and position of the camera and accordingly adds related images on real world in real time [1]. For developing this application AR SDK named Vuforia is used. Vuforia is an AR SDK for smart phones that allows and executes AR applications into a real time video obtained from devices. This software uses the capabilities of the computer vision technology to recognize and make the individually tracking of the objects captured by the video camera in real time. The capability of Vuforia to image registration enables developers to position and orient in the space, when these are viewed through the camera of a smart phone. The virtual object then can track the position and orientation of the real image in real time, so that the viewer's perspective on the object corresponds with their perspective on the real world target.

II LITERATURE SURVEY

Augmented reality system elevates the real world scene and attempts to maintain the user's sense of being in the real world. The logic behind this concept can be elaborated as first- real environment contains a wealth of information much of which is impossible to reproduce and simulate by computer. Secondly- if the end goal is to enhance the performance of a real-world task, it will be performed spontaneously, if the user still feels engross in the task environment. To maintain the user's immersion in the real world an augmented reality system consolidate the virtual images with a view of the real scene to create the augmented display.

According to the survey in paper [2] AR applications to that point had largely taken the form of technology demonstrations. So, they presented a call for research on usable applications outside the research setting. In paper [3] description of handheld AR system for collaborative design is given which is named as TransVision. With this, author argued that head-mounted displays isolate users from the real world and that a handheld system would allow for a more natural interaction in which the users could observe and use body language while designing. After TransVision the next first standalone handheld mobile augmented reality based system got developed its details are described in paper [4]. In progress of augmented reality based systems next system developed was first video see-through AR system on a consumer cell phone [5]. Paper [6] says that several commercial and open

source systems development kits (SDKs) and applications were introduced. Several technical demonstrations gave rise to the conceptualization and design of AR advertisements. To its progress simple tracking application with embedded 3D content was made available on the Symbian platform.

In Paper [7] author concluded in a survey that only about 10% of AR-related papers between years 1992 and 2007 included any type of user evaluation. In paper [8] author mentioned that Few extensive user studies on AR in general can be found, and even fewer user studies focus on the explicit MAR domain, while still fewer focus on the handheld platform. Author has also added that "despite the appeal and the growing number of services and applications, very few guidelines, design techniques and evaluation methods have been presented in the existing literature". He has finally categorized user and design studies within the domain of mobile augmented reality.

III. PROPOSED SYSTEM ARCHITECTURE

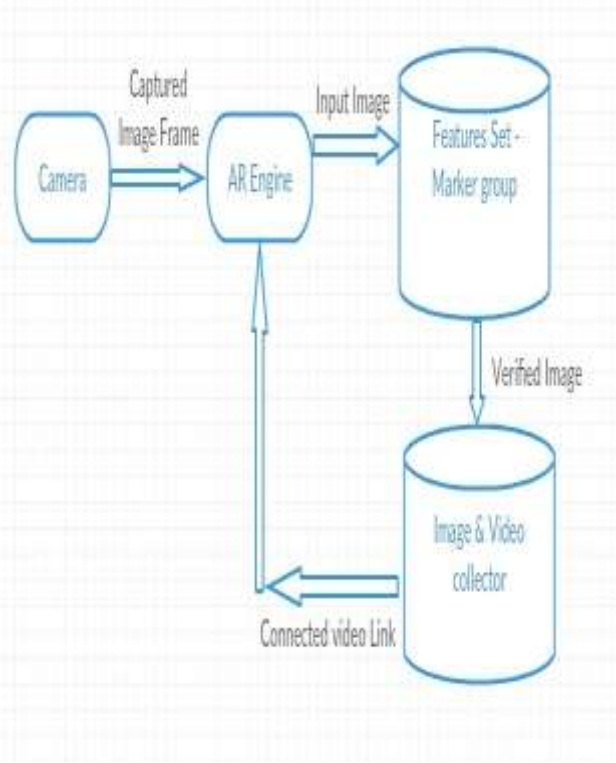


Figure 1: Proposed System Architecture

Architecture of the Information Corridor system is as shown in the figure. Main components of architecture are AR Engine, Feature set marker up group and image and video collector. AR Engine is the actual processing unit in the system. When it gets input from camera it sends it to feature set marker group. Featured set marker group is related to marking the images to create featured image which will be helpful in identifying the video. When certain image is captured by camera and its featured image is there in image and video collector AR engine will play it.

DFD Level 1

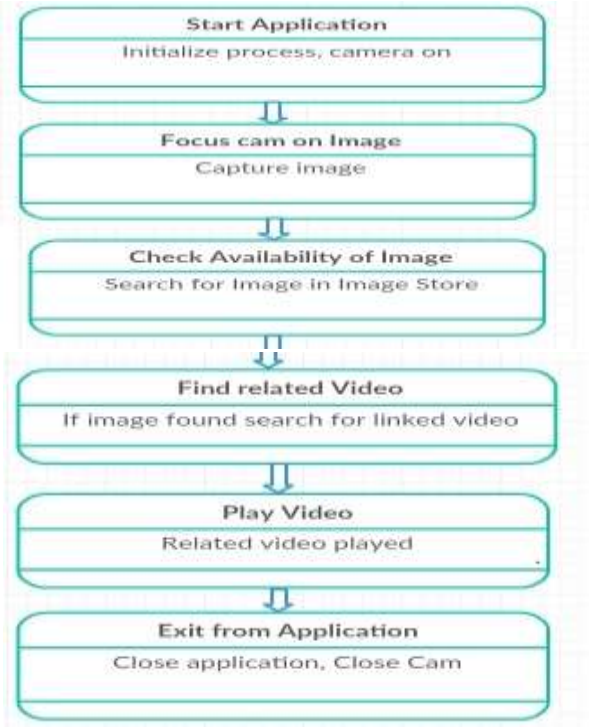


Figure 2: DFD Level 1

IV IMAGE DETECTION AND ALGORITHM PROCESSING

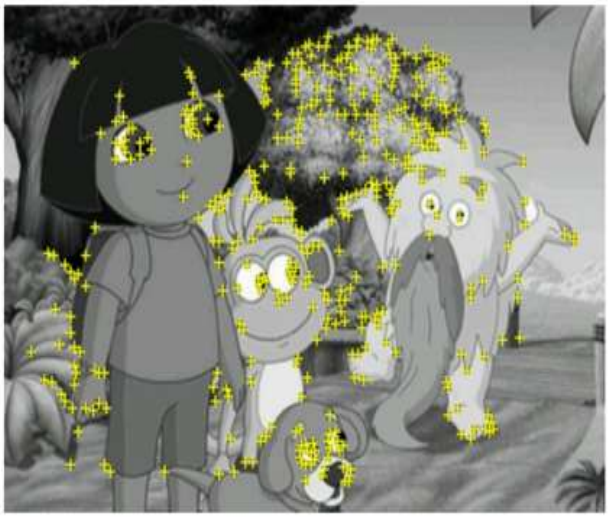
Algorithm in this application works in two important steps, Detection of image and Tracking of image. It detects and tracks the features that are naturally found in the image itself. In detection process application finds the image target, recognize it and perform required action. Tracking action can be performed only when detection is done. As name suggests tracking performs action of following the image taking care that it should not get lost in. All this processing application uses temporal memory hence for any example it is necessary to stop and killed of the memory every time in detection mode. Similarly, 10 seconds focusing time is enough for the first time and after that re tracking can be done in tracking mode.

The feature of target image determines the number of stars. Highest number of stars better for tracking and recognition. These features must have a uniform distribution and high density with high local contrast using no repetitive patterns. As conclusion it can be said that target management system is mainly based on three characteristic of image: shaping, shading and uniform feature distribution. Detection process in algorithm is basically based on shapes with corners and tone changes, been the last one the most important feature. When these conditions are spotted the algorithm puts a marker on it. But when it comes to the pixel, one pixel tone changes does not contain enough information to decide image features. Minimum pitch changes in groups of two pixels are required to mark image features which are randomly set .If the algorithm processes Image Targets composed by a groups in same color

and size 15x15 pixels then feature marks positioning are more clearly identified and predictable at corners. Further in this paper sample featured images are shown under heading featured images and after detecting this featured image how video get played is shown with screen shots under the heading screenshots.

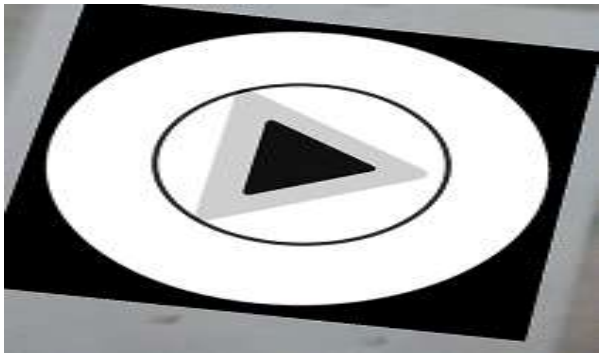
V FEATURED IMAGES

1. Sample Featured image



2. Sample Featured Image 2

Screen Shots:



1. Ready to play video

2. Playing Video

VI RESULTS

Considering distance, detection angle, and angle of tracking as important input for this application tests are conducted and produced results are as follows.

1. Test pretends to determine the minimum detection distance. Using 37x25 centimeters image (925 cm2 of area) the obtained results are the following:

Table 1: Minimum Mean Distance

Device	Mean (in cm)
Samsung Galaxy SI	131,73
HTC	106,8

2. Considering the ideal scenario as direct view from the camera to the target image tests were conducted. But in practical that assumption was not always true. Hence it is necessary to consider an angle of incidence (αi) between camera and target to span image size; otherwise much information is lost or considered not useful to detection. Observation says that only about 30% of image is required to detect it, assuming that camera is focusing image centre and its total dimensions are span which is the minimum required incidence angle to detect.

Table 2: Minimum Detection Angle

Device	Ai
Samsung	43º
HTC	52º

3. Next test is Latest tracking test. It is intended to find the minimum angle of incidence that track the image. This angle determines, the minimum area needed to the smart phone camera to do not lose the AR object.

Table 3: Minimum angle of tracking

Device	Ai
Samsung	2º
HTC	8º

VII CONCLUSION

Augments reality must have the three properties: 1. it should combine the real and the virtual.2. The augmentations should be interactive in real time.3. They should be registered in three dimensions. Considering these properties application "Information Corridor" is developed for kids. It is an augmented reality based entertainment and educational application. . It scans image from the image book with camera in mobile. And play the related video of that image. As image gets change video gets change. Use of this application restricts the access of internet by the kids and results in exposure of quality and observed information. Data flow diagram level 1, architecture of the system and platform related details and certain test results are discussed in this paper. A conclusion can be made that augmented reality has very multiple angles. It has number of application domains some of them are medical, entertainment, military, robotics, manufacturing, engineering design and consumer application. Developed application is under entertainment and education domain. Depending on requirement it can convert into different informative application.

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