Augmented Reality Based Advertising System for Modern Home Items

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Introduction

The main purpose behind this project concept is take full advantage of the internet and mobile world as a powerful marketing channel for profitable and interactive shopping. The system is capable for the control of the shopping experience is placed firmly in the consumer's hand with the advanced technological experience with Augmented Reality concept.

The basic goals of the research can identified as augmented reality for usable business model (Schwald et al., 2003). The users can experience the virtual 3D object interactively with the real environment. Therefore it allows users to visualize how a certain concept would look like in their home even before buying it using 3D models and video augmented advertising. The system consists with mobile application and a web site. This system will be also useful as an advertising system between consumers and dealers .And also this system is a further step to introduce last technologies in the world of marketing.

As a whole user can provide the image of maker in to the system, which used to identify the position to locate the rendered 3D object. Then the application should launch from the android phone and the focus the camera towards the marker. The system starts recognition process and then rendered the particular 3D view of the selected item on to the marker. After the rendered process completed the system options allowed the user to apply the system co functionalities such as 3D model resizing, rotation and transition based on user preference.

Methodology

Basic foundation of the whole system is augmented reality. Augmented reality, when classified (Milgram et al., 1994) can be placed in between a real environment and a virtual one .The developed system based on Android operating system and developed using java and xml. HTML and java script were used for the web development.

AR Toolkit was the foundation for the system development which is an open source framework. The complex scenarios tracking markers and calculating transformation matrix like complex processes were handled using AR Toolkit. Initially the image marker tracked by the video capture and read the pattern related with the marker and the related capture parameters. Then the system detects the makers and recognized the patterns related with video input. Then calculate the camera transformations and render the 3D model on the detected pattern. In the scenario of the video playing the recognized the images within the video capture and then compared it with the inner storage gray scale images and render the relevant video output on the detected image. The system architecture is shown in the Figure 1.

The system is relies on OpenGL for rendering purpose which is the main role of the whole developed system and GLUT which is responsible for creating OpenGL window. The marker used for3D rendering should be consists of characteristics as follows. It must be square in shape, borders must contrast well and the border must be a solid color. The image used for the video rendering should be gray scale and have identical edges within it. Due to the system performances based rely on the device capabilities the system testing was conducted over number of devices in the development process.

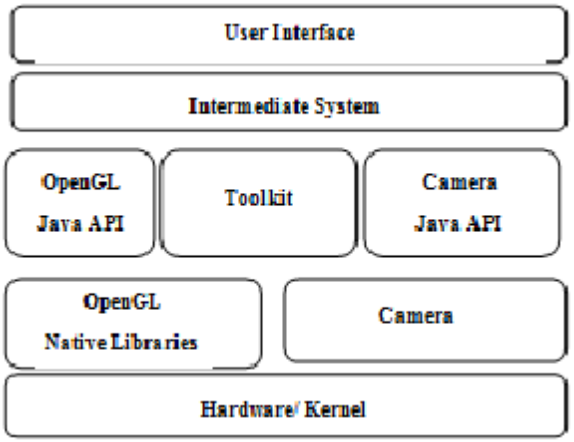

Figure 1. System Architecture.

Result and Discussion

For the developed system android development tools allowed developers to test mobile application inside the tool using android virtual devices (AVDs). And also further testing can be done using hardware devices. Even though emulator can be used to test general application development in this project the emulator capabilities are not clever enough to launch and run the application with the expected performances and output.

I used LG p920 optimums 3D and Samsung S4 mobile and Sony XperiaZ for the testing purpose and those devices were able to generate the acceptable output as system expected. The time duration spent to detect the image and the rendering the 3D model or the video on pattern was differ for each device.

Table1. Proximate comparison of system performance over devicespecifications.

Device	CPU	GPU	Camera	Rendering Time
LG p920	Dual-core,1GHz Cortex-A9	PowerVR SGX540	Dual 5 MP	10s
Samsung S4	Quad core,1900MHz, Krait 300	Adreno 320	13MP	6s
Sony Xperia Z	Quad-core,1.5GHz	Adreno 320	13.1 MP	3s

As indicated by the Table.1, the system performances basically depend upon two features of the used device; processor speed and the camera quality. And also the quality of the image and the marker used as the pattern. When the image used for the video consist identical edges and the accurate gray scale level video rendering time become law. When image has replicated objects and undefined clear edges the detection time is very high and sometimes it was unable to recognize the image. In 3D model rendering when marker borders contrast well and in solid color the marker detection processing speed is very high. Therefore for the best achievements the system should install within a high capable android smart phone and should tested with accurate level markers and images.

Conclusions

The augmented reality technology could be transferred over number of media such as printed media and web sites. As well the system performances totally depend upon the device capabilities and the image or the marker quality. Therefore to achieve the best augmented

experience though the device cost is bit high the high camera and processor speed specified devices are recommended.

References

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