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## Advanced Augmentation Reality Based Game Technique using Unity

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**Abstract:** In the age of massive smartphones, gaming apps have become an undeniable part of our normal little times. And when it comes to the real-life experience of Gaming, Augmented Reality has shown tremendous progress in elevating itself from just a fun idea to one of the foremost runners in today's gaming industry. In this activity, we propose the Augmented Reality (MAR) Smartphone app based on Smart, i.e. "AR Basketball" to make the Flexible changes needed to design a realistic Gaming UI. Augmented Reality (AR) is an emerging form of experience in which Real World (RW) is developed with computer-generated content linked to specific areas and / or activities. In the last few years, AR programs have become portable and widely available on mobile devices. AR is beginning to appear in our visual media sources (e.g., news, entertainment, sports) and is beginning to incorporate other aspects of our lives (e.g., e-commerce, tourism, marketing) in tangible and exciting ways. To make it easier to learn everywhere, AR will give students quick access to specific local information that has been compiled and provided with multiple sources. AR Games give teachers the opportunity to use a new and attractive learning style of learning.

**Keywords - Augmented reality, AR, virtual reality, Mobile Augmented reality (MAR), Mixed reality, AR games.**

### I. INTRODUCTION

Augmented reality is a technique that overlays some form of spatially registered Augmentation onto the physical world. The user can view in real time the world around him, Composed with virtual objects. These virtual objects are embedded into the user's world With the help of wearable devices. The difference between augmented reality (AR) and virtual reality (VR) is that the former is taking use of the real environment and Overlays virtual objects onto it, whereas VR creates a totally artificial environment[1][2].

In Recent years Games have many types, such as education, Puzzle, adventure, action, casual, etc. Casual game is Most easiest game to play, casual game require no long term commitment or special skills to play, a game that Can be played in short session. That is why we propose "AR Basketball" to justify the Flexible adjustments required to design an intrinsic reality-based Gaming UI. The aim to Develop a casual game application on android device, Combining 3D environment and Augmented Reality (AR) Environment[5]. The development of this application aims To help people reduce their stress every day. Meanwhile, this application also aims to make People feel new user experience by playing casual game In Augmented Reality (AR) environment.

### II. EXISTED SYSTEMS

**2.1:** Anders Henrysson on 2005 described how mobile Phones are an ideal platform for augmented reality and How they can also be used to support face to face Collaborative AR gaming.They create a custom port of The ARToolkit library to the Symbian mobile phone Operating system and then developed a sample Collaborative AR game based on this[4].

**2.2:** In 2000, Bruce Thomas from Wearable Computer Lab at the University of South Australia demonstrated the very first outdoor mobile augmented reality video game. The game was the first to allow players to walk around without the use of a joystick or handheld controller.[3]

**2.3:** Cody Watts and Ehud Sharlin on 2008 presented a Photography-based AR game, it's a game that involves Two players, and every player uses a physical handheld Camera device to take pictures of floating virtual Ghosts. Players must creep, sneak, and maneuver Themselves through physical space as to approach Their ghostly subjects and snap a picture using their Paranormal camera.[5]

2.4: Fotis Liarokapis on 2009 presented a pervasive AR Serious game that can be used to make better Entertainment using a multimodal tracking interface. The main purpose of their research is to design and Implement generic pervasive interface that are user friendly and can be used by a side range of users.[5]

### III. LIMITATION EXISTING SYSTEM OR RESEARCH GAP

3.1: Most mobile AR systems Mentioned in this survey are cumbersome, requiring a Heavy backpack to carry the PC, sensors, display, batteries, and everything else.

3.2: AR faces technical challenges regarding for example Binocular (stereo) view, high resolution, colour depth, luminance, contrast, field of view, and focus depth.

3.3: Optical and video see-through displays are usually unsuited for outdoor use due to low brightness, contrast, Resolution, and field of view

### IV. PROPOSED SYSTEM

#### 4.1 Framework/Analysis/Algorithm Analysis

The most important part was actually to find a sufficient number of games to be used for testing in order to allow a more representative representation of the data. The games were found on the Google Play Market, using “Augmented Reality Game” As search keywords. After that, the AR games were installed one by one. But before installation, they had to be separated from the occasionally encountered non-AR games. When installing the game, the installer would ask for the permissions that the game needs an access to. Those permissions had to be noted in the table by setting[3]

a Mark “x”. The game’s genre was taken from the description page

Of the each game and it was recorded into the table as well. The commercial status, specifying if the game is freeware or payware, had to be noted in the “Freeware” column by choosing either “Yes” or “No”. After the installation, the game was run and tested for technical features[6]. First of all, the approach had to be specified. If in order to play the game, a marker had to be used, then the appropriate mark had to be set in the table in the proper column. If the positions of the virtual objects were location-based, or in other words the positions of those objects were correlated to the position of the mobile device then the mark had to be set in another column.

#### 3.3 Algorithm

Input: Packet to send, PKT; default load balance

Algorithm, Alg; number of objects per queue,

Size; number of subflows, QS, vector with

Subflows’s history, P ool

1 Load gameobjrct , AR and XR packages

2 Load ARfoundation in project

3 Load Hoop and place and write script

4 if (isPlaced) return

5 if (Input.touchCount > 0)

{

    Touch touch = Input.GetTouch(0);

    if (touch.phase == TouchPhase.Began)

6 load Ball and write ballcontrol script

7 Applied force on ball in every diarection

8 if(Input.GetMouseButtonDown(0)){ // Works for both Mouse and Touch on Mobile, when we press/touch

    startPosition = Input.mousePosition;

```
startTime = Time.time;
```

```
throwStarted = true;
```

```
directionChosen = false;
```

```
9 if(Input.GetMouseButtonDown(0)){ // Works for both Mouse and Touch on Mobile, when we press/touch
```

```
startPosition = Input.mousePosition;
```

```
startTime = Time.time;
```

```
throwStarted = true;
```

```
directionChosen = false;
```

```
10 Uimanager script
```

```
11 void OnEnable()
```

```
{
```

```
if (m_CameraManager != null)
```

```
m_CameraManager.frameReceived += FrameChanged;
```

```
PlaceHoop.onPlacedObject += PlacedObject;
```

```
}
```

```
12 void OnDisable()
```

```
{
```

```
if (m_CameraManager != null)
```

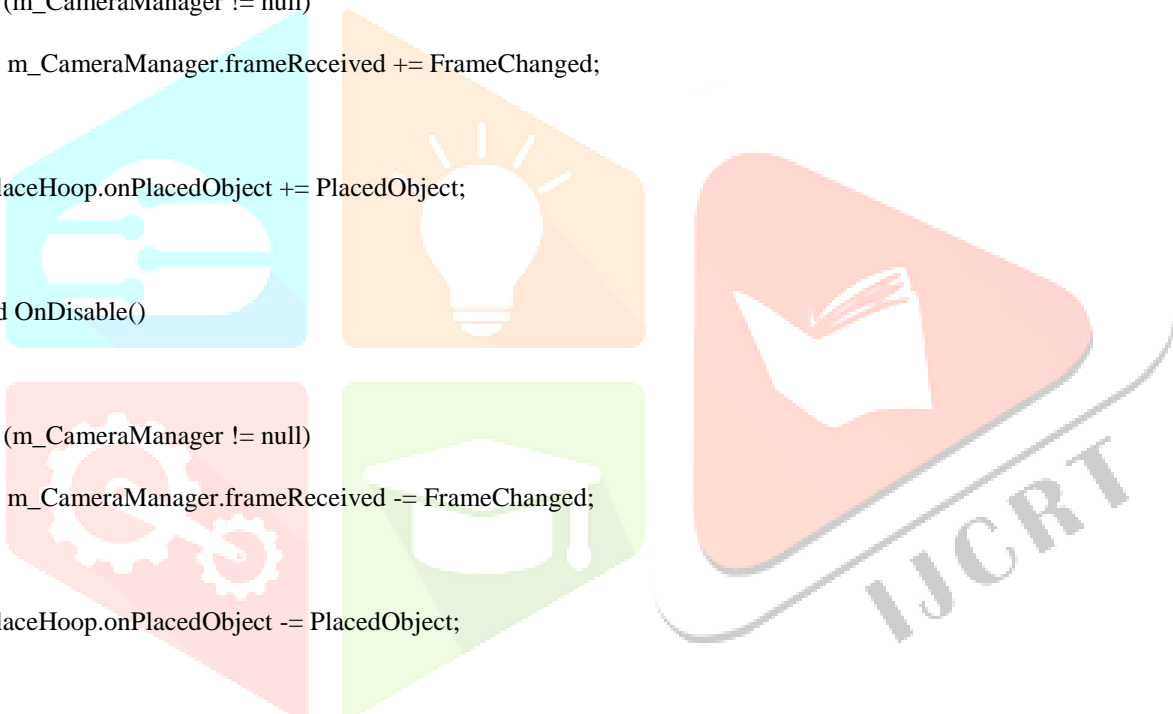
```
m_CameraManager.frameReceived -= FrameChanged;
```

```
PlaceHoop.onPlacedObject -= PlacedObject;
```

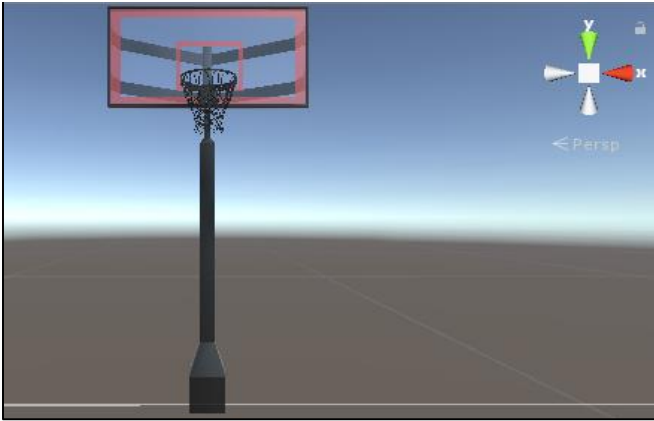
```
}
```

```
13 end
```

```
14 end
```



## 5. Results and outputs:



[fig:5.1] basketball



[fig:5.2] Basketball and hoop

Those figures are the results of the system testing, by doing system testing, the application can achieve the expected results. In Figure 5.1, it's testing for the detection the ground and placement of the basketball hoop. Next Figure(fig:5.2) which is Level 1 Scene, the test are, swiping up the ball, to see whether the basketball drifting towards the ring or not, also, if the basketball hit the board or ring, will it bounce back or not.

## 6. Comparison:

Comparison of our design system is done with existed one and following remarks has been obtained which indicates our system is mostly usable and providing reality platform for gaming

parameters	Anders Henrysson (collaberative AR )	Bruce Thomas (first outdoor AR)	- Cody Watts and Ehud Sharlin (Photography -based AR game)	Fotis Liarokapis (pervasive AR Serious game)	<b>AR BASED (Throw based MAR game)</b>	<b>Remarks</b>
<b>platform</b>	symbian	handheld controller	handheld camera device	multimodal interface	<b>Android Smartphone</b>	<b>ADVANCED</b>
<b>SPEED</b>	84%	60%	72%	78%	<b>96%</b>	<b>GOOD</b>
<b>ACCURACY</b>	82%	72%	84%	76%	<b>100%</b>	<b>VERY GOOD</b>
<b>Availability</b>	discontinued	less	high	less	<b>very high</b>	<b>VERY GOOD</b>

## VII. FUTURE SCOPE AND ADVANCES

-AR based games has replaced all the traditional gaming system like Xbox, Nintendo, and PlayStation with new techniques and trends.

-The apps are written in special 3D programs which allow users to play level up animation and provides with transforming transactions and hence new levels and features can be added as per our requirements.

## VIII. CONCLUSION

-The studied games varied in terms of genre and AR approach that was used in them. The approaches were determined by how the virtual objects were positioned in real world.

-Simple AR Based application has managed to achieve the objectives of the research, such as developing a 3D casual game by using Unity 3D and C# as the programming language which successfully run on mobile devices with minimal Android OS version 7.0 or higher installed.

-Runnable on Android devices makes this application is easy to install in entire platform that contain Android OS inside, because most of portable devices contain Android OS inside.

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