

Dam Controller System Using Augmented Reality Technology

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Abstract- Imagine a world with a technology that creates the 3 dimensional images of a virtual object around you with which you can interact, see, hear, smell, and even touch it. Technologies such as computer graphics, virtual reality, augmented reality together can be used to implement this in real world. Augmented reality actually superimposes virtual objects into the real environment with the real objects for enriching the viewer's experience. Augmented reality with virtual reality in virtual space, also enhances the audience perception by displaying additional information. In this project we are going to control the doors of dam using AR system.

Keywords- Augmented reality (AR), PIC microcontroller, control the dam gate,

I. INTRODUCTION

Augmented Reality (AR) is an area of research that aims to enhance the real world by overlaying computer-generated data on top of it.[1]

The basic goal of an AR system is to enhance the users perception of and interaction with the real world through supplementing the real world with 3D virtual objects that appear to coexist in the same space as the real world. Many recent papers broaden the definition of AR beyond this vision, but in the spirit of the original survey we define AR systems to share the following properties:

- 1) Blends real and virtual, in a real environment
- 2) Real-time interactive
- 3) Registered in 3D

Registration refers to the accurate alignment of real and virtual objects. Here the illusion of AR image is compromised.[2]

We can use Augmented Reality (AR) system for any model or for any system.

For more comfort we are going to apply Augmented reality (AR) system in the control of gates. It is more safe than

working at electric field. We can simply use the function of dams gate from our Android phones.

Just by making a 3D module of our real module we can interact with each other. For the communication we can use Bluetooth Module or WiFi module.

AR can help us in getting very interactive information about the surroundings. It can help us manipulate devices in a digital manner. A lot of research has been done to enhance the perception of the real world through AR. AR increases the interactivity of the user and enhances his /her desire to control and use such systems. AR based systems are frequently used by marketers and commercial establishments to advertise their product in order to gain consumer attention. AR adds information and meaning to a real object or place. It does not create simulated output. Instead, it takes a real object or space and uses technologies to add contextual data to deepen our understanding of it.[4]

Here we are going to control the gates of dam using AR system. When the water is level is getting above the 80% at that moment the buzzer will be start. That will indicate us to open the gates of dam because of high water level. We can open the gate via Mobile.By just touching on the Android phone where the 3D model of Dam is present. If we forgot to open it then at 90% they will get opened automatically.

II. METHODOLOGY AND IMPLEMENTATION

Here in this system we have used Android application based on unity 3D. This is used for accessing marker based system control. It uses Bluetooth for communication medium for user to system interface. After accessing the system we control the dam gate and pump motor using Android Smartphone and give the Augmented output Smartphone screen when every event that turn on water pump DC motor generate the voltage that generate voltage that generated voltage volume can be seen on Augmented screen of smart phone.

If high volume of water level detected the output automatically control the dam gate.

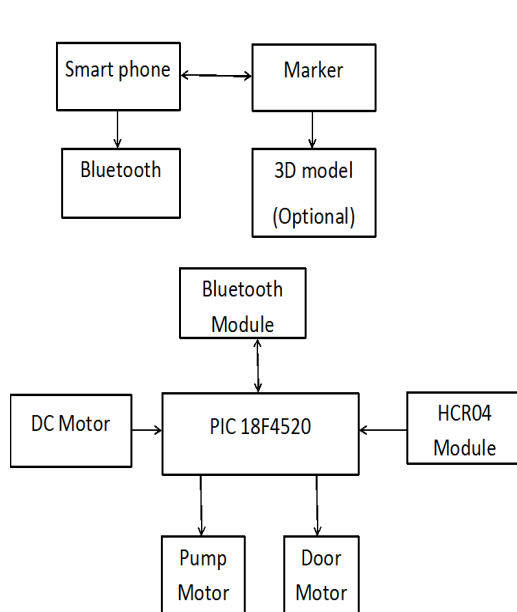


Figure 1. Circuit diagram

System Initialization:

At this step, the entire component will be start. System will check the entire component for its status. If any component fails then system corrects that error or notify the user about component failure. If there is no such failure then system goes online and starts working. Operation like following takes place in this stage

- Start Smartphone app
- Initialize hardware system and marker system
- Find out the Bluetooth service
- Start/open the channel
- If level is >80 then it gives warning of level upload
- If button is pressed then DC motor will be start and pump is on
- Pump motor will be on and gates will be open

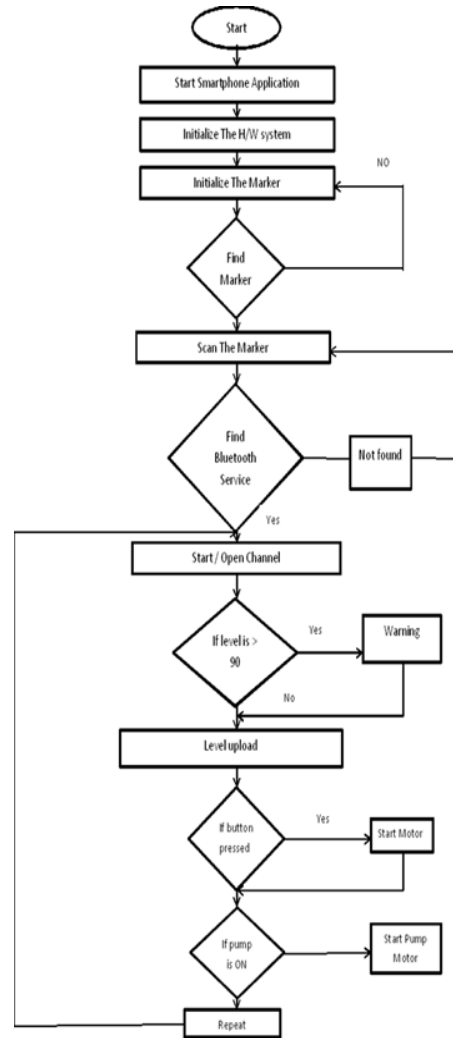


Figure 2. Flowchart

III. SOFTWARE USED

UNITY 3D:

Unity 3D is the game development software. It is used to create high quality #d and 2D games ,which are used across mobile phones , VR/AR , consoles ,etc

For implementing the project via Augmented reality system first we need to generate a 3D model of our real module so we can operate that model from our Android smart phone. We can create the 3D model from Unity 3D software. Where we can create any 3D model. After that they generate an APK file of our 3D model, where our 3D model is ready with program to perform whatever task we have to perform as per the program. That application we can communicate with model via Bluetooth or Wi-Fi.

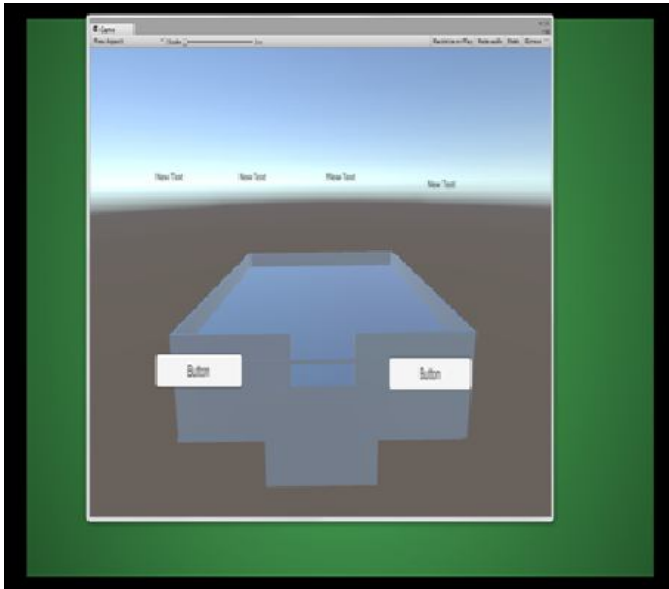


Figure 3. Model after making in Unity 3D software

Ultrasonic HC-SC04

In this we are going to put ultrasonic sensor SC-HR04.

This is used for the level detection of dam. So we can get the indication of water level.

The basic principle of work:

- 1) Using IO trigger for at least 10us high level signal,
- 2) The Module automatically sends eight 40 kHz and detect whether there is a pulse signal back.
- 3) (3)When we send signal to calculate the height or depth of the box or anything using ultrasonic sensor, for that we use

Test distance =

$$(\text{High level time} \times \text{velocity of sound (340M/S)}) / 2 \quad [3]$$

IV. RESULTS AND DISCUSSIONS

The prototype presented in this paper is by using Android app based on unity 3D control the dam gate and generate voltage. In addition, some data are interpreted and generate simple information to be perceived by the observer, as in the case of the water level overload, the prototype represented by control the dam gate and pump motor using android smartphone and give the augmented output on smartphone screen to generate the voltage.



Figure 4.

It also shows how much the dam is filled in percentage.



Figure 5.

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