Virtual Reality Based Virtual Tour of College Using Unity 3D

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Abstract: **We propose a system "Virtual Tour of College Infrastructure", which provides a virtual college tour for the college visitors which includes students, parents and guests. They might wish to discover the college infrastructure and facilities provided. For this, they need to actually come and visit the college campus, which will take their lots of time as well as efforts and also charge an expense who are at distant locations. To deal with this issue, the proposed system provides virtual view of college infrastructure using VR headset. This helps visitors to visit particular department and lab from remote location. Also it can be installed at the entrance of the College, which will help visitor to search the location of particular student, staff or lab by showing the exact path through "Search" module. This system basically works on virtual reality and requires VR headset.**

Keywords: **A* Algorithm, Augmented reality, Unity 3D, Virtual reality, Virtual tour.**

1. Introduction

The virtual tour is a prominent and challenging topic in virtual reality research. A virtual tour is a simulation technique in the field of virtual reality and computer vision that has long been introduced. Even so, until now the virtual tour is still an interesting study of researchers and continues to evolve in accordance with existing problems. The virtual tour trend is in great demand because it is never obsolete and allows integration with other fields, such as human-computer interaction and artificial intelligence. So we propose a system which develops a web-based application to view a virtual tour of our college (K. K. Wagh Institute of Engineering Education and Research center) using unity 3D tool. Also provide a facility for searching a location of lab, student, staff etc.

2. Literature Survey

Below table 1 shows the existing work in virtual reality.

Table 1
Literature Survey

S. No.	Title	Description
1.	Adaptive Campus Virtual Tour Using Location Based Services	"Adaptive Campus Virtual Tour Application" using location based services. KNN algorithm is used to map nearest location.[1]
2.	Campus Virtual Tour	Focuses on implementation of virtual interactive tour of VIT from remote locations. Technique used is photo stitching and software Kolor panotour.[2]
3.	Design and Implementation of Three-dimensional Virtual Tour Guide Training System Based on Unity3D	"Virtual Tour Guide Training System", using Unity3d and max 3d modelling technology. It provides the trainers with high simulation scenario and a good training environment of interactivity.[3]

3. Proposed System

A. Functionalities

Proposed system provides the following functionalities:

- This system will provide virtual view of college from any remote location.
- This system provides a path searching functionality.
- This system can find location and provide a path to reach a particular student in college infrastructure based on timetable.
- This system shows the static virtual view of college.
- The functionality of path searching is predefined and it doesn't use any location based services.
- This System provide scan module in which by scanning the image or nameplate of teacher using phone's camera automatically plays the video lectures of that teacher using augmented reality on the image target.

B. Architecture

Fig. 1. shows architecture of proposed system which includes software tool, interfaces, algorithm and different modules.

- *Software tool:* Unity 3D is a software tool used to process the images. 360 images of college (K. K. Wagh Institute of Engineering and Research Education) is given as input to Unity 3D software tool to create scenes of different areas of college.
- *User Interface:* It consists of two modules, one is Virtual Tour and another is Search Module.
- *Virtual Tour:* Virtual tour is created by combining scenes of college in Unity 3D. This module displays the virtual tour of college specifically the computer department of KKWIEER.
- *Search Module:* This module has two sub modules one is Search Student and Search Staff.
- *Search Student:* This module shows the location of student that is the classroom number of student and virtual view of path to reach to that classroom.
- *Search Staff:* This module shows the location of staff, shows the virtual view of that location and also consists of scan module to display video lectures of respected staff using augmented reality.
- *Database:* It consists of time table of student and location of staff which is used in Search module.
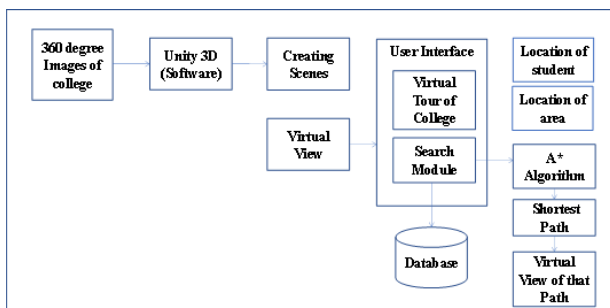

Fig. 1. Architecture of proposed system

4. Result

- *Virtual view of college*: Main module of the system shows virtual view of college specifically computer department. Virtual view is shown from entrance of the college. Virtual views also have the virtual buttons which shows the directions.
- *Search student*: By entering the information of student (branch name, standard, division and time) system shows the location of student.
- *Search staff*: By entering staff name, user is able to see the location and department of staff.
- *Virtual Path*: It shows the virtual view of path to reach to that classroom and also you can hear the audio giving information about the directions.
- *Viewing the teaching videos of faculty:* This is the outcome of scan module where by scanning the image of faculty's name plate, teaching video of that faculty is displayed.

5. Advantages

- Provides an accessible way for students to view the college and its facilities.
- Helps to promote the college.
- Efficient path searching.

6. Disadvantages

- User must have VR Headset.
- Specific to our college only.

7. Conclusion

The proposed system virtual tour of college specifically computer department is based on Unity3D which provides virtual view of college infrastructure. It helps the visitors to visit particular department and lab from remote location and showing the virtual view of path to reach the destination by using efficient path searching A* algorithm. It will provide the facility of identifying the classroom of students as per the time table.

8. Future Scope

This web-based system namely "Virtual Tour of college infrastructure" is restricted to particular college so the generalized framework can be made for different infrastructure. The system provides a static virtual view thus it can be extended to real time view.

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