



## Virtual Campus Walkthrough

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**Abstract:** Virtual Campus refers to accumulation center that provides information which allows students to access the college campus online. Building a virtual campus acts a s great tool towards providing improvised teaching. . This involves building a virtual tour for the students by combining all kinds of digital campus resources as well as integrating teaching, laboratory services management and other related activities. Virtual campus tour is an effective tool to provide management planning, effective consumption of college resources. We present a three dimensional model to the users of our system. Our project makes use of software tools like Blender, Cinema 4D and Unity 3d to blend fundamental object models and create a three dimensional view for the object constructed during modeling

**General Terms :** Virtual Reality, 3d modeling, walkthrough

**Keywords:** Virtual campus, modeling, cinema 4d, blender, unity 3d

### I. INTRODUCTION

Virtual Reality (VR) technology is an advanced human computer interface .VR (Virtual Reality) technology is a very active research field of IT industry in recent years. It is a collection of a series of high and new technology, including computer graphics, image processing, pattern recognition, intelligent interface technology, artificial intelligence, multi-sensor technology and highly parallel real-time computer technology. Conception mainly emphasizes the imaginable space of the virtual reality technology. It can widen the human knowledge range, not only reproducing the virtual environment, but freely conceiving the environment which did not exist or is impossible. Virtual Campus is a relatively large-scale three-dimensional scene. It shows view of the college through the desktop system. Taking into account the difficulty of large-scale scene modeling is relatively high, each object of the campus is modeled respectively, and then each model is inlined to the interface of the main background with sky and ground, which form the whole campus scene. In the process of developing a virtual campus, the most important task is modeling, including various types of buildings and landscape.

#### 1.1 Objective

To provide the advantage of virtual roaming .Gives the users a professional feel and look. Display correct information about that direction in which the user goes. Provide a collaborative virtual reality environment for virtual tours .Alternative to traditional real Life tours for college campuses.

#### 1.2 Motivation

Allows to take virtual risks and gain real world experience .Potential entertainment value .Example :Immersive films ,video games. Engagement and great potential in e-Learning. Extension of Web into 3 dimension .Example: embedded object models , camera animation..“Learning -as-constructing knowledge”

### II. ADVANTAGES AND REQUIREMENTS

#### 2.1 Advantages

Important application of virtual campus walkthrough technology is that Virtual campus supports the resource management, environmental planning, school development informatization. Unity 3d can better adapt to current network environment .Improves college popularity for example if anyone wants to take a admission in a college and if he/she wants to know about the college campus and all

the related stuff then it can be done by going to the college website and having a virtual view of the college using virtual kit, which will give an amazing experience to the user and by sitting at one place the user can view the college premises. Promote the development of distance education. Good platform for digital campus construction. Enhance visibility. Strengthen interactivity. Active participation mode from passive acceptance mode. It merges the school's teaching, laboratory, management, services and other activities in one.

## 2.2 Requirements

### 2.2.1 Functional Requirements

This project used the way of the virtual characters walking during the virtual objects to make visitors understand the specific image of the object. This provides a unique way to introduce a campus. We used the campus images of actual landscapes in the program. These scenes include roads, buildings, college gates, flowers, plants, trees, and other buildings. And it has certain ability of interacting, for example, visitors can go to any location of the map and click the button to know about the location. To the general public who want to be a part of the college, it can attract plenty of attention. We introduce the history and culture of the object, scenery, set institutional arrangements, and organize activities introduced comprehensively, various ways, and realize the dynamic updating of the information and report. It will be a new window with a lot of social benefits. The walkthrough has a day and night cycle so the user will be able to explore the campus any time of the day. The feature of rainfall provides a realistic feel to the user. We have presented three ways for controlling crowd behavior. First by defining rules for computer simulated agents, second by providing controls to the users as human controlled agents to navigate in the VR campus environment as autonomous agents, and the third by providing controls to the users with a keyboard. The user can find the distance between his/her current location and the place that he/she would like to visit in the campus.

### 2.2.2 Non- Functional Requirements

**2.2.2.1 Validation:** Validating the platform independent format before inserting it into the centralized repository (database).

**2.2.2.2 Modifiability:** Requirements about the effort required to make changes in the software. Often, the measurement is personnel effort (person-months).

**2.2.2.3 Security:** One or more requirements about protection of our system and its data. The measurement can be expressed in a variety of ways (effort, skill level, time) to break into the system.

**2.2.2.4 Platform constraints:** Discuss the target platform. Be as specific or general as the user requires. If the user doesn't care, there are still platform constraints.

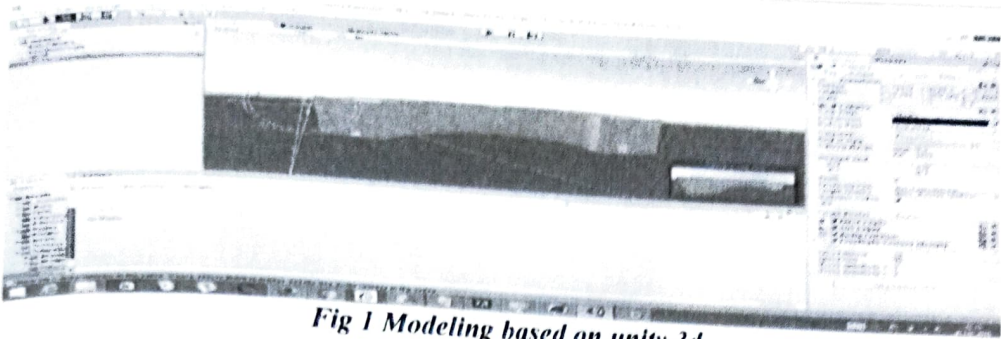
**2.2.2.5 Usability:** Requirements about how difficult it will be to learn and operate the system. The requirements are often expressed in learning time or similar metrics

## III. TOOLS AND TECHNOLOGY

### 3.1 Unity 3D

In Unity 3D we can create any 2D or 3D game. We can make it with ease, we can make it highly-optimized and beautiful, and we can deploy it with a click to more platforms than we have fingers and toes. What's more, we can use Unity's integrated services to speed up our development process, optimize our game, connect with an audience, and achieve success. There are so many platforms we can deploy to with the Unity game engine, and their number is growing all the time. Build our content once and deploy at a click across all major mobile, VR, desktop, console, and TV platforms plus the Web.[2]

In implementation, we have used the models that were prepared in Cinema 4D and Blender are combined together in Unity 3D and we have created a third party viewer's view



*Fig 1 Modeling based on unity 3d*

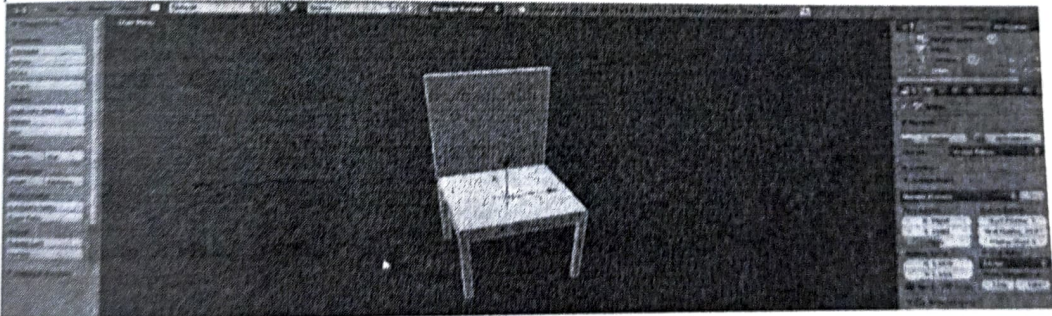


*Fig.2 Creating models using unity 3d*

### 3.2 Blender

Blender is a professional free and open-source 3D computer graphics software product used for creating animated films, visual effects, art, 3D printed models, interactive 3D applications and video games. Blender's features include 3D modeling, UV unwrapping, texturing, raster graphics editing, rigging and skinning, fluid and smoke simulation, particle simulation, soft body simulation, sculpting, animating, match moving, camera tracking, rendering, video editing and compositing. It further features an integrated game engine.[3]

In implementation, we have modelled a chair for classroom.

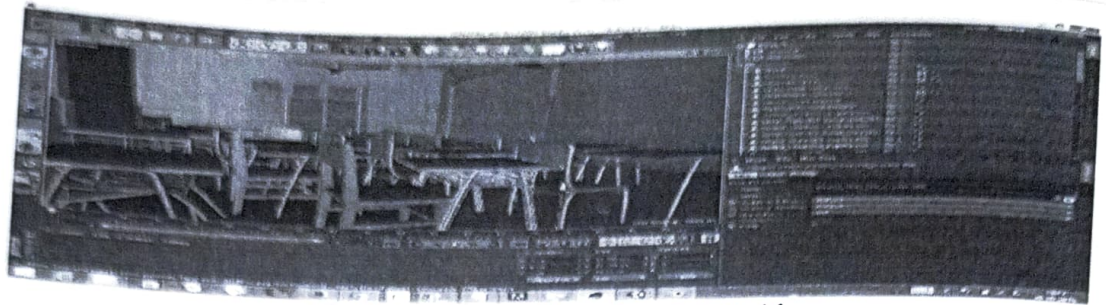


*Fig 3 Creating models using Blender*

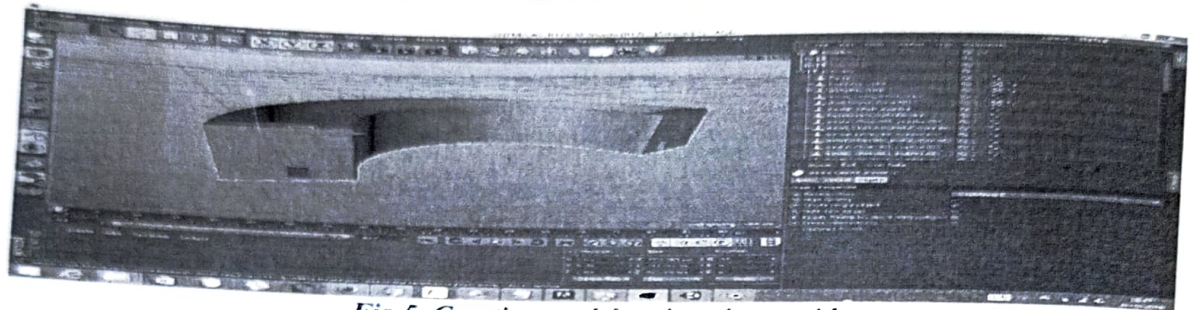
### 3.3 Cinema 4d

Cinema 4D is developed by Maxon. It has awesome motion graphics capabilities. It is capable of procedural and polygonal modelling, animating, lighting, texturing, rendering, and many such common features in 3D modelling. Cinema 4D has become one of the most popular 3D modelling, animation and rendering application. Tools used in Cinema 4D for our project are: Adjusting room parameters, Using the Knife tool, The Slide Tool, Creating Doors and Windows, Using Texture Presets.[2]

In implementation, we have modelled the outer structure of our building.



*Fig 4 Creating models using cinema 4d .*



*Fig 5 Creating models using cinema 4d .*

#### IV. STAKEHOLDERS

##### 4.1 . Students

These are the students that are already in college or those students who wish to take admissions in our college. the students who wish can see the campus and get the idea of campus, while those who are already in college can see the college architecture. Students are the major users.

##### 4.2 Teachers

These are the teachers who teach in our college or those are willing to teach in our college. Newly joining teachers can also have a clear picture of the college, they can walk through the college campus sitting near their desktop in their homes.

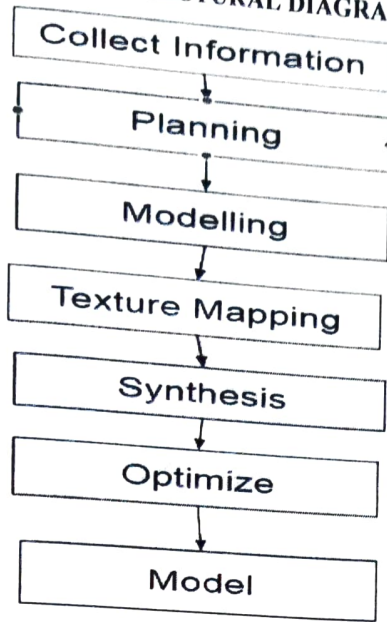
##### 4.3 Other college institutions

These are the people that are from different institutions and wish to see the college's architectural design in virtual real world.

##### 4.4 .Parents

Some of the parents who stay far away from his/her child's college can also have a chance to see the college. They can have a clear picture of how college looks like also the total number of floors, classrooms and labs on each floor of building. Parents can see feel the view of campus as of real world.

## V. ARCHITECTURAL DIAGRAM



### 5.1 Collect Information

Firstly we are going to collect information about the whole campus which includes the information about the campus surroundings and also the information about the interior of the college premises for example the number of classrooms per floor, the location of the canteen, library, staff room etc. and most importantly the outer structure of the college.

### 5.2 Planning

After gathering the information we will do planning based on the information collected and decide about how the tasks are going to be performed sequentially in order to achieve the best possible outcome. Feasibility and budget of the project will also be decided and most importantly time management will be done accordingly.

### 5.3 Modeling

Based on the information collected about the campus, modeling will be done of the gathered parameters so that the user could feel the environment while walking through the campus. For modeling purpose software tools like blender, unity 3d and cinema 4d are going to be used.

### 5.4 Texture Mapping

Texture mapping is a method for defining high frequency detail, surface texture, or color information on a computer-generated graphic or 3D.model. So, whatever modeling we had done so far will go through texture mapping in order to provide a realistic view of the environment to the user.

### 5.5 Synthesis

Synthesis means the combining of separate elements or substances to form a coherent whole. [4] Therefore what all individual modeling that has been done will be combined together to build the project as a whole. This all will be done by using unity3d. All the object files will be imported in unity 3d and then will be combine

### 5.6 Optimize

Optimizing means increasing the efficiency and making the best and effective use. Optimization implies manage intentional change and continuous improvement. After the synthesis process is completed optimization process will begin.

### 5.7 Model

Therefore after optimizing all the work that we have done, the final model will be saved and displayed to the user of the system which is nothing but a virtual campus. By using the keyboard

the user can walk through the campus or the user can also have virtual reality view of the campus through google cardboard or also can use oculus instrument.

Use of Unity3d game engine in addition with Cinema 4D Modeling software will give us a complex modeling of the object. Quality of web based Unity3d depends on resources of RAM and video card. Secondary modeling objects are created by Blender to simplify and optimize the model. Tools used to implement during stage 1 (initial stage):Boole Tool, to remove the overlapping part which hides the object behind. Bend Tool, to bend a cube so as to give a circular structure to our front facing side of V.E.S.I.T building. Part to be implemented is the structure of the college which includes interior as well as the exterior of the building.

## VI. CONCLUSION

The paper studied the main technical processes and key technologies like cinema4d, unity3d and blender used in three-dimensional modelling of the campus and the process of system construction. Through the creation of a virtual campus the user can walkthrough the campus by sitting at one place in reality. In future we can add more features to our project with respect to security and can be uploaded on any college/school website who want their users to have a look of their campus virtually. Thus, we learned about various tools and technologies that is used for modelling and walking through a virtual campus and making the user feel like as the virtual world is in the reality

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