Virtual Tour of JNU using Minecraft

Invited Paper

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***Abstract*—All eductational instituitions are moving towards more and more virtual classes on internet owing to pandemic and cost of classroom teaching. As a matter of fact, many students having being enrolled in the course virtually are left unexposed to the life and scenery of the university campus. Hence, it becomes important to build a virtul tour of the university not just for the students but also for prospective students who want to consider applying to the university in the future. In this project, an attempt is made to create a virtual world of Jawaharlal Nehru University or JNU using minecraft. In building of his project great care has been taken to include minor details to make it as realistic as possible.**

I. Introduction

Jawaharlal Nehru University has a 1000+ acre sprawling campus. Its various hostels, schools and facilities are spread evenly across the campus interspersed with large forest cover and greenery. The very vastness of it makes it one of the most sought after universities in the country. It caters to all the needs of the staff, faculty and students inside the campus itself. It houses various facilities like a health centre, restaurants, markets and a post office. It is built on the Aravali range which makes the terrain very inconsistent.

In this project, we built a virtual tour of JNU using Minecraft which will strive to include the minor details of the campus and bring it as much closer to real life experience as possible.

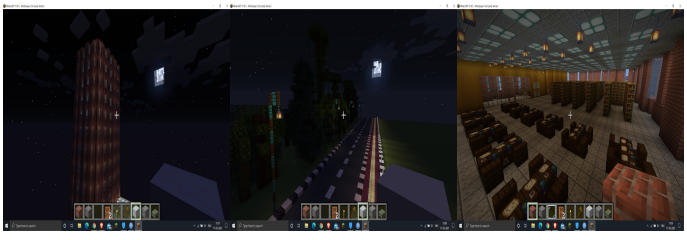

Fig. 1. JNU Campus

II. Project Description

The campus area of JNU is divided into two sections, Academic Area and Hostel Area. In this project, the campus is virtually built with the help of relevant softwares.

A. Motivation

A virtual tour of JNU will be of immense importance to the branding and marketing of the university. It will also help the propective students have a first hand look of the university from the comforts of their homes. In the era of pandemic, this project will serve as a virtual tour for the students who have joined the university but cannot attend physical classes.

B. Challenges

This project will be the first of its kind taken up anywhere in JNU. Undertaking of his project required cross field knowledge of computer science and graphics design along with creative qualitis. Intially detailed research was required to understand the terrain and infrastructure of the university.

C. Comparisons to other works

Many universities have engineered their own minecraft virtual tour with the help of many students contributing to it simultaneously. Three such instances are below.

1. Drexel University[1]
2. MIT, Massachuchetts[2]
3. KREA University, Andhra Pradesh[3]

D. Softwares Used

1) Minecraft: Minecraft is a sandbox video game developed by Mojang. The game was created by Markus "Notch" Persson in the Java programming language. In Minecraft, players explore a blocky, procedurally-generated 3D world with infinite terrain, and may discover and extract raw materials, craft tools and items, and build structures or earthworks. Depending on game mode, players can fight computer-controlled "mobs", as well as cooperate with or compete against other players in the same world. Game modes include a survival mode, in which players must acquire resources to build the world and maintain health, and a creative mode, where players have unlimited resources. Players can modify the game to create new gameplay mechanics, items, and assets.

Minecraft is a software which helps in building a 3D world using various components of graphics. It has a user-friendly interface and gives enormous scope for creativity.

2) Aternos: In the course of the project, Aternos was used extensively. Aternos is a software which helps in creating online servers for connecting various users to contribute to a single minecraft project. Creation and use of online server is completely free of cost.

Aternos is one of the most commonly used portals that provides Minecraft fans with free servers so that they can run their own network. Everything is free, from the Ram to the plugins on offer.

- Full customisation – Users have the chance to adjust anything they want on the server so that the game is exactly the way they want it to
- Mods and plugins - one can add variety of plugins or mods
- Customised worlds

3) TLauncher: TLauncher was used to launch minecraft. . TLauncher PE is an all in one game launcher for Minecraft Pocket Edition, that makes it easier than ever for players to quickly access new mods, skins, and maps.

III. Methodology

A. Pipeline

A top down approach is followed in the building of this project. It is initially planned to encompass the Damodar Hostel in JNU in its 1st phase. To start with, the blueprint of the hostel and its connection with the main road has been laid first. Keeping in mind the scale and ratio, outer walls have been constructed using various functionalities of minecraft. In the next step, interior designs were added. Finally finishing touches have been given to the layout.

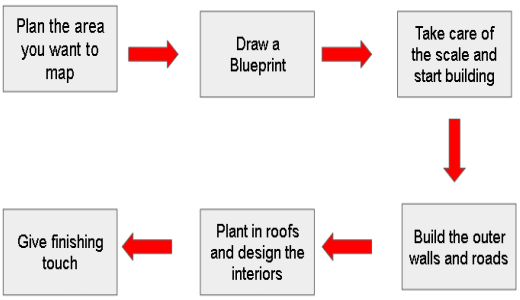

Fig. 2. Pipeline

B. Workplace Setup

The team of five worked simultaneously on the project by connecting to the minecraft server. It was achieved by making an online server and adding all team members to that server.

C. Gameplay

Gameplay includes a 1st person view of a character trying to traverse through the world. It builds the world through the tools from an inventory. In making of this project, various types of building materials were used like bricks, marbles and carpets. While building this project, the team also made use of various functionalities like mirroring, stacking, expanding and contracting.

S. No	Command	Description
1	/copy	Copies a region.
2	/decend	Go down/decend a floor/layer
3	/walls	Sets a wall
4	/jumpto	teleport to a selection
5	/hpyramid	Make a pyramid
6	/paste	Paste a selection
7	/thru	Passthrough walls
8	//fillr	Fills a hole recursively.
9	/ceil	Go to the top of the ceiling.

TABLE I
Commands Used

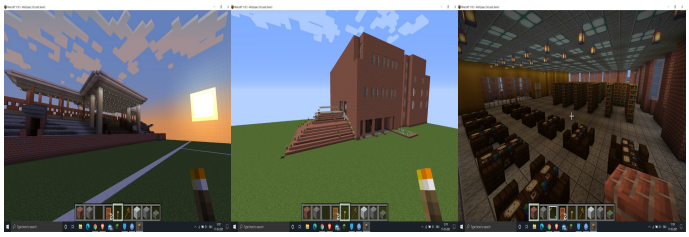

Fig. 3. JNU Campus

D. Mods for Minecraft

Mods are all sorts of add-ons that can either change the game slightly or out of all recognition. For example: add new models to the game world, formulate new objectives, change dialogues, add new maps, modify certain features, add hitherto unknown characters, installing world edit and fabric api allows the user to make and use predefined schematics.

Fig. 4. Schematics

The schematics can be accessed using the "%appdata% / .minecraft" directory in case of single player. In case of using a server like aternos one can go to files > plugins > worldedit > schematics. A copy of schematics can be made into any using the command "//schematic load filename".

E. Schematics

The schematic file format was created by the community to store sections of a Minecraft world for use with third-party programs (including MCEdit, Minecraft Note Block Studio, Redstone Simulator, WorldEdit, and Schematica). Schematics are in NBT format and are loosely based on the Indev level

format. Indices for the Blocks and Data arrays are ordered YZX - that is, the X coordinate varies the fastest. This is similar to block ordering for Classic, Indev, and Anvil levels. This format cannot store or distinguish air blocks that should overwrite existing blocks from those that shouldn't.

WorldEdit describes itself as an easy-to-use, in-game map editor, and that's exactly what it is. It allows for easy world manipulation, terraforming, sculpting and much more, and it's easy to use to boot.

The main functions of WorldEdit include:

- Manipulate large areas of blocks Copy and paste areas between locations, worlds, even servers
- Use brushes to build and carve large areas with your mouse
- Easily spawn large shapes, like circles, spheres and cylinders

IV. Results

Fig. 5. JNU Campus

The expected result enables the viewer to experience the university's premises virtually. The color combinations and scaling were implemented such that it mimics the real world so that the user experience is at its maximum.

V. Conclusion

Finally, a virtual tour of JNU is built using Minecraft. In building this project, the team encountered numerous challenges which included questions like detailing, terrain and scale of the building and roads. While planning the project, the team also undertook a field trip to understand the nature of the problem and its implementation. This project, therefore, paves way for many such virtual tours that can be developed on the foundation of this first of its kind undertaking in the university premises.

Acknowlegment

We give our gratitude to Dr. Prerna Mukherjee who allowed us to opt for this exciting project. We hope that she will guide us further to achieve the expected future results.

References

[1] Drexel University
[2] MIT
[3] KREA University, Andhra Pradesh