Create a Virtual 3D Object of Hotel Building

Hristo Kanevski[1], Stanislav Asenov[2], Anatoly Parushev[2], Slavi Lyubomirov[2] and Daniela Shehova[2]

[1]*Paisii Hilendarski University of Plovdiv, Faculty of Physics and Technology, Department of Mechanical Engineering and Transport, 24 Tsar Asen str., 4000 Plovdiv, Bulgaria*
[2]*Paisii Hilendarski University of Plovdiv, Faculty of Physics and Technology, Department of Power Engineering and Communications, 24 Tsar Asen str., 4000 Plovdiv, Bulgaria*

Abstract. Building 3D objects is a key technique in computer graphics and design. This technique allows creating three-dimensional models and scenes that mimic real objects and environments. The article presents a generated 3D object of the hotel building through the Blender software, which is successfully connected to the virtual reality tools - Oculus Quest 2 and can be applied in the following areas and spheres: education and research; architecture and project visualization; gaming industry and virtual reality, animation and film industry; advertising and marketing etc. The virtualized three-dimensional object is a floor of the existing Vanilex building, which is a guest apartment and is located 200 meters from the lower lift station of the Mechi Chal ski slope in the town of Chepelare. With its powerful tools and capabilities, Blender provides users with the flexibility and creative freedom to create impressive virtual buildings and architectural projects.

Keywords: building 3D objects, Blender, Oculus Quest 2

1. INTRODUCTION

3D models generated by 3D software have revolutionized the way architects and developpers present their designs to clients and market their designs. These realistic and immersive visualizations help clients understand the essence of the design and experience the potential of the building before it is built. This not only improves their commitment but also keeps their expectations for the implemented project more accurate and reduces the likelihood of misunderstandings between expectations and reality (Torta et al., 2018; Kshirsagar, 2021).

The authors of the article propose to discuss the capabilities of the Blender software, which is successfully connected to the virtual reality tools Oculus Quest 2 and their application in various spheres - architecture and project visualization, education and research, advertising and marketing, building simulations and analysis, virtual tour and interactive presentations, etc. (Gebhardt et al., 2018).

The Blender community is supportive and inclusive of developers and educators from around the world. She actively shares knowledge, lessons and resources, fostering an environment for learning and growth (Yang et al., 2021; Naik, 2020).

Blender's virtual reality plug-in is essential for creating 3D objects, offering designers the ability to immerse themselves in their virtual worlds and explore new dimensions of their designs (Jha, 2019; Coward, 2019).

2. GENERATION OF A 3D OBJECT OF A HOTEL BUILDING IN THE BLENDER SOFTWARE ENVIRONMENT

The three-dimensional object is a floor of the Vanilex building, guest apartments, located 200 meters from the lower lift station of the Mechi Chal ski slope in the town of Chepelare.

The architectural floor plan of the hotel building, which will serve to generate the sketch in 3D format, is shown in Fig. 1.

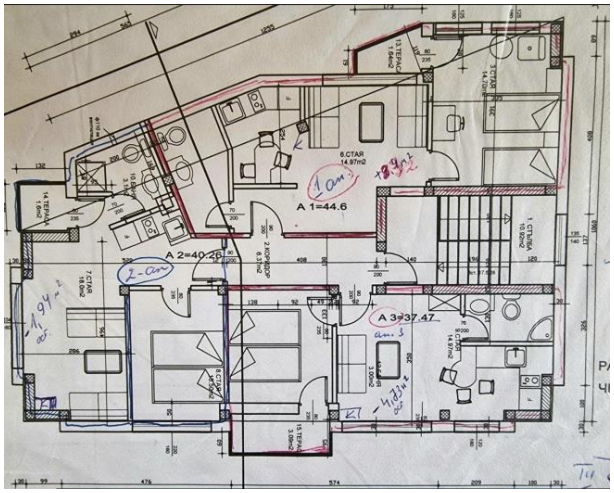

Fig. 1 Architectural sketch of the floor of the hotel building

To generate the three-dimensional object, the following methodology is followed:

- Selecting the wall building function from the "Archipack" library;
- Building the walls, setting their parameters and their manipulation in space;
- Building the floor, adding windows, doors and terraces;
- Adding models to the empty apartment to convey an aesthetic look and to achieve the real-world view. In fig. 2 shows the generated view of apartment 101.

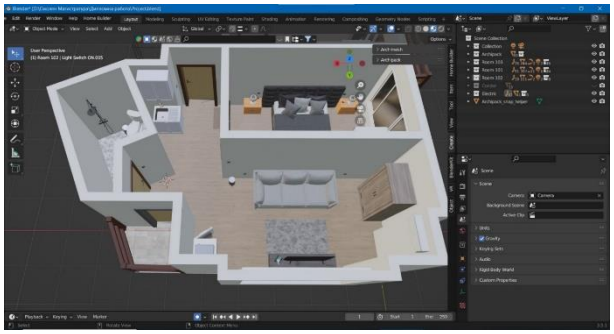

Fig. 2 A view of the generated apartment 101

In a similar way, the construction of the remaining apartments on the first floor, as well as the corridor on the first floor, is started.

The following images show the finished project for creating a three-dimensional object on a floor of a hotel building.

The top view of the already generated object of the hotel building is presented in the following figure.

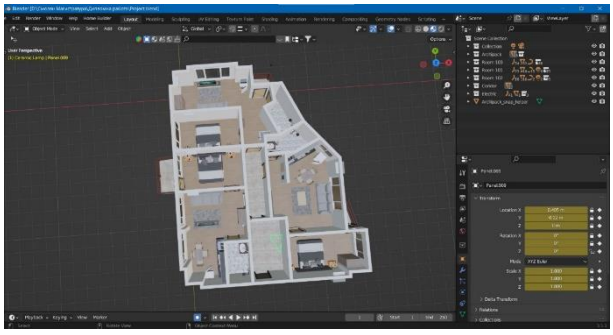

Fig. 3 Top view of the generated hotel building object

The alternative view of the floor from the hotel building is presented in fig. 4, and in fig. 5 the side view of the 3D object is visualized.

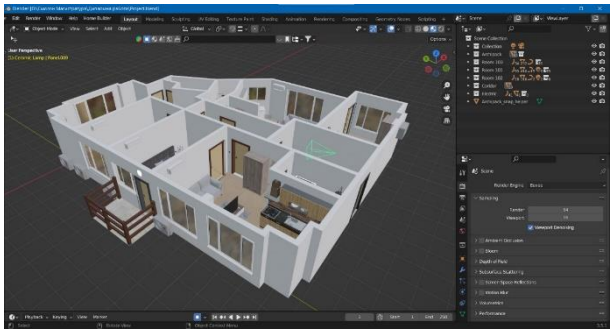

Fig. 4 Alternative floor view of the hotel building

3. MAKING THE CONNECTION BETWEEN THE GENERATED 3D OBJECT IN THE BLENDER ENVIRONMENT AND THE OCULUS QUEST 2 VIRTUAL REALITY TOOLS

The results of connecting the virtual reality tools with the Blender software, as well as the visual presentation of the ways and methods of making the connection between the generated three-dimensional object in the Blender environment and the Oculus Quest 2 are expressed as follows:

- Turn on of the 3D View: VR Scene Inspection add-on.

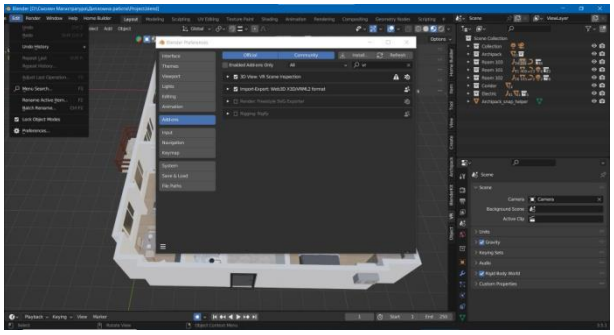

Fig. 5 Turn on of the 3D View: VR Scene Inspection add-on

▪ installing and configuring the Oculus Quest 2 app - fig. 6.

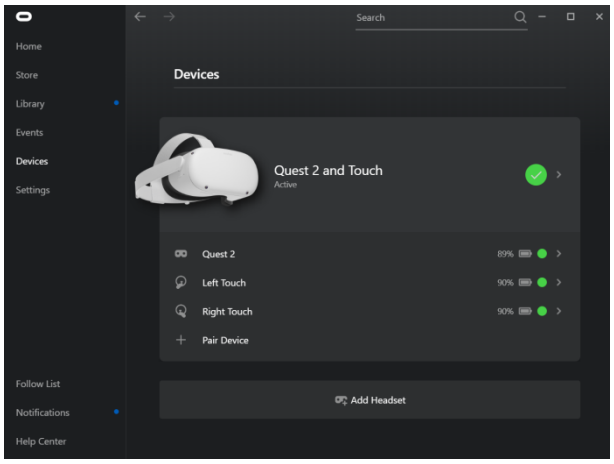

Fig. 6 Successfully flashed Oculus Quest 2 controllers

▪ Place the glasses and further configuration from the Oculus Oculus Quest 2 menu.

The preview of the project in the virtual environment of the Oculus Quest glasses is visualized in Fig. 7

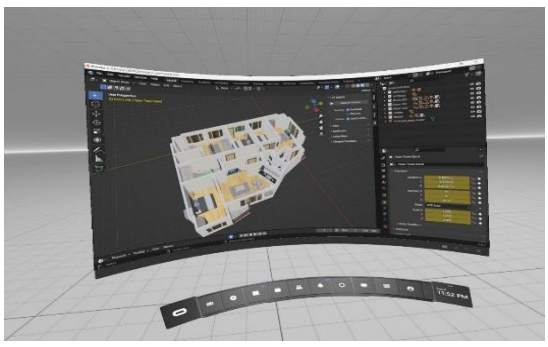

Fig. 7 A preview of the project in the virtual environment of the Oculus Quest glasses

4. THE VIRTUAL REALITY OF THE GENERATED THREE-DIMENSIONAL OBJECT OF A HOTEL BUILDING

The virtual reality of the generated 3D object of a hotel building is visualized in the following features.

Fig. 7 View of apartment 101 in a virtual environment

Fig. 8 View of the kitchen area of apartment 101 in a virtual environment

5. CONCLUSIONS

The generated 3D object of the hotel building through the Blender software is successfully connected to the virtual reality tools - Oculus Quest 2, and the project realized in this way can be used in various areas and spheres of application:

Buildings generated in Blender can be used to create virtual tours and interactive presentations. This allows users to explore the buildings in a virtual environment. Various points of interest can be created for visitors to explore the interior spaces, gardens or environment. This provides a more realistic representation of buildings and allows users to

familiarize themselves with their features and functions.

Creating 3D building models in Blender allows students and researchers to study architectural concepts, principles and techniques. They can analyze and research various aspects of buildings such as energy efficiency, lighting, etc. Blender provides visualization and interactivity that supports the educational and scientific process.

ACKNOWLEDGMENTS

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