SPECIALISED ARCHITECTURAL FEATURES IN BLENDER 3D

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ABSTRACT

In the design process, engineers and architects use a different set of technological tools enabling the production of a certain type of project. Often the proper execution of the project depends not only on the professional abilities of the designer, but also on what specific software is used at work. This is of great importance both for the design options and the visual aesthetic presentation of the architectural model as well. Blender 3D software provides a fully functional free operating platform for work facilitating the implementation of best architectural projects. Blender's deployment of additional specialized modules to the base of the program contributes to the quality implementation of professional architectural designs.

Key words: *Architecture, design, Blender, 3D, addons*

Introduction

The implementation of quality architectural projects is a challenge faced by all architects, designers and engineers. This is a process that goes through various stages of implementation, and each of them is specific in nature. Especially important is the design stage, which serves as the basis for the future implementation of the project. The choice of the technological means used in design work is based on many factors and personal or team discretion. Referring to computer design, often choosing a software product became the basis of:

- Compatibility of the software with the operating system (OS);
- Capabilities of the software. Functional design and degree of realistic visualization;
- Level of interactivity of the software (connection between interface and timing for the development of architectural design);
- Opportunities for an upgrade of the software product with improved versions;
- Specialized applications to software;
- Price.

Along with high quality software products such as AutoCAD, ArchiCAD, Blender 3D software is a very good choice for the realization of architectural projects fully consistent with modern requirements for quality. Blender's platform has some big advantages and fully meets the requirements for compatibility, features, interactivity, periodical renewal with improved versions specialized architectural and other applications with GNU license.

The aim of this study is to develop an optimized concept based on Blender's software, on special architectural applications compatible with the current version 2.77 (March 2016). The applications which are license free are taken into account and providing them to users is facilitated. This contributes to improving the capabilities of the design and production of quality architectural results.

Materials and methods

In itself 3D software Blender provides a good resource for the development of 3D objects. To save time, it is recommended and necessary the integration of specialized applications add-ons. Applications are consistent with a specific version of Blender. On one side it is good, but it happens in some cases some applications add-ons not to be valid in renewed versions. For version 2.77 of Blender the actual ones are: Archimesh v1.1.2, JARCH, Block wall builder, Basket arch, Stairs, Column, Floor Generator, Dimension, MeasureIt v1.6.5 (Table №1).

Table №1. Current special architectural applications Addons for Blender ver. 2.77

Addon	Purpose	Providing resources
Archimesh v1.1.2	Specialized concept of tools supporting the design of architectural 3D projects	https://github.com/Antonioya/blender/tree/master/archimesh
JARCH	Concept of four main tools supporting the design of architectural 3D projects	http://blenderaddonlist.blogspot.bg/2015/05/addon-jarch-vis.html
Block wall builder	Tool for creating mesh walls	https://developer.blender.org/F19196
Basket arch	Tool for creating mesh archs	http://www.swineworld.org/2014/11/addon-creating-a-basket-arch-in-blender.html
Stair Builder	Tool for creating mesh staircases	https://wiki.blender.org/index.php/Extensions:2.6/Py/Scripts/Add_Mesh/Stair_Builder
Column	Tool for creating mesh columns	https://wiki.blender.org/index.php/Extensions:2.6/Py/Scripts/Add_Mesh/Column
Floor Generator	Tool for creating mesh floor	http://www.swineworld.org/2013/07/generate-floor-boards-quick-and-simple.html
Dimension	Tool to measure distances in real time	https://wiki.blender.org/index.php/Extensions:2.6/Py/Scripts/Curve/Dimension
MeasureIt v1.6.5	Tool for sizing, facilitating the development of diagrams and drawings	https://github.com/Antonioya/blender/tree/master/measureit

Archimesh is a concept combining a number of useful tools and is an application of primary necessity, and preferred mean for the design of architectural projects in Blender's environment. The application Archimesh is periodically renewed, which contributes to increasing the functionality of the underlying instruments in it. Figure №1 shows Archimesh Addon ver. 1.1.2.

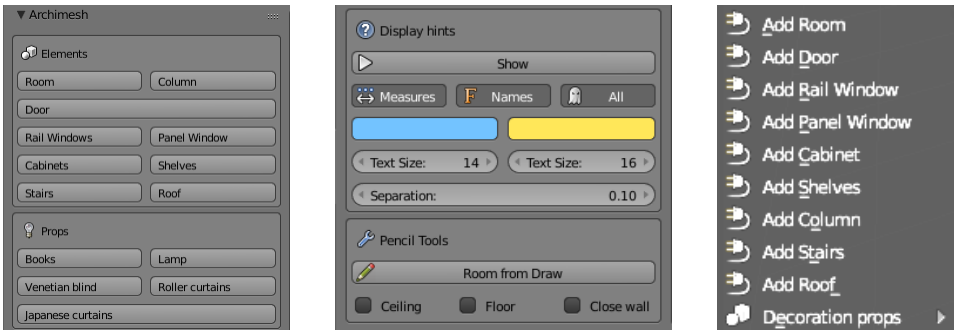

Figure №1. Archimesh Addon ver. 1.1.2

The main innovation in Archimesh ver. 1.1.2 is the ability to create room from draw for Grease Pencil Poly lines. When using ready-made objects main possible operations in their editing are: rooms are editable after creation; "auto hole" function for windows and doors; the kitchen cabinets can be rotated; doors can be rotated during creation; windows can be rotated during creation; display measures for walls, doors and windows; doors are now editable after creation; windows are editable after creation; venetian curtains are editable after creation; different windows shapes; wall covers with boards automatically for creating external walls; autohole controllers are visible for improving usability; changed glass material for avoiding wrong reflections.

JARCH Addon (Figure №2) is a specialized application support for the construction of architectural models that can be subjected to detailed modification. This is possible by the many parametric modifiers.

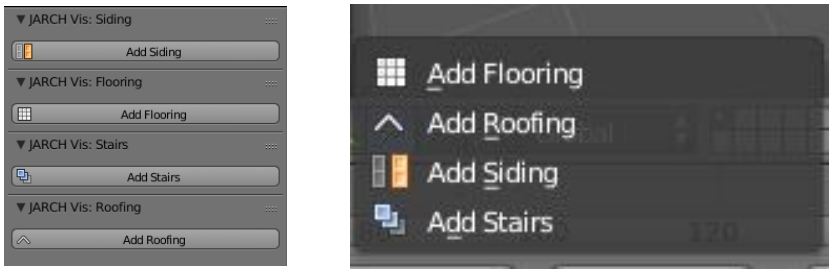

Figure №2. JARCH Addon

Besides the two main concepts Archimesh Addon and JARCH Addon, there are helpful tools to create precise 3D models specialized for specific architectural models and elements: Block Wall Builder enables the automated creation of parametric walls, taking control of several key elements of the design of the basic model; Basket Arch allows to build models of basket arches and respectively the basic architectural requirements relating to this item are taken into account; Stair Builder is a specialized application to create a stair architectural models at a very high level, through parametric great variety at its disposal; Column is a specialized application for the development of architectural columns, in addition to the dimensions of the models, the elements in the object itself may be parametrically modelled without the intervention of standard instruments of Blender software; Floor Generator is a very useful tool which quickly makes the floor of the room or etc., as the main big advantages are generating a certain geometry of the floor and the possibility of high-

quality visualization of texture.

In the implementation of architectural projects very important tools are Dimension and MeasureIt. Dimension is a specialized application that allows measurement of distances in the working area of Blender software. This is a very useful tool especially when it comes to 3D graphics programs, not specialized CAD systems. MeasureIt is a highly specialized application, which allows besides sizing in real-time 3D models but also set sizes to be visualized in the final render. It's an addon, which greatly helps Blender software to be used completely autonomously without the intervention of other software.

Conclusion

Blender 3D software is a great tool for the realization of architectural projects. The GNU license, the comfortable interface and quality of the final render are at very high level, making the system a preferred technical mean in choosing a suitable design computer resource. The quality 3D modeling of architectural models is increased by the integration of additional specialized architectural applications - addons. Basic quality of most of these Addons is the automatic creation of 3D models with subsequent parametric editing, as well as opportunities for distance measuring and sizing. This leads to more rapid and efficient design. Of great importance is addons to be consistent with the version of Blender softwareBuilding a comprehensive 3D design environment creates a powerful set of features that contribute to the realization of successful architectural projects.

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