

**DEVELOPMENT OF INTERIOR AND EXTERIOR PROJECTS THROUGH
BLENDER SOFTWARE**

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ABSTRACT

Creating quality interior and exterior design projects has always been a challenge for professional designers. The implementation of such projects is possible in solving a number of tasks consistent to a variety of factors. Referring to the part of computer design, it is very important what software is used. This in turn requires good judgment consistent with modern requirements. Deploying Blender software into the workflow combined with specialized applications Addons, as well as whole GNU platforms, support the implementation of successful design projects.

Key words: interior, exterior, design, Blender, Fluid Designer, Pripravto, 3D, addons

Introduction

The design of the interior and exterior is individually specific and at the same time often is in symbiosis. Even in the creation of only interior projects in certain cases they have to conform to objects that are located outside the room environment and lighting, which are located in the visible rendering. For their part exterior projects are located in relative freedom. The realization of interior and exterior projects it is necessary to implement optimal system from suitable basic software and specialized applications supporting the quality realization of projects. The creation of such a system requires compliance with existing hardware resources and actuality of software products. The aim of this study is to make an overview, analysis and selection of appropriate software applications, featuring a free license and accessibility. The survey results will serve as an ensuring systematic information base, whose resources will be used for the realization of high-quality interior and exterior projects.

Materials and methods

The GNU 3D graphics program Blender is undoubtedly updated. Used as a basis it provides the opportunity for modification (introduction of improvements) in various aspects, including the specialized interior and exterior solutions.

Sometimes designers have to implement economical version of software applications whose possibilities are to ensure optimum quality and contemporary design. In developing the interior designs mainly functionality of Blender's and specialized applications are used to automatically generate 3D models.

Table №1 shows the selected specialized applications supporting the development of 3D interior designs: Microvellum Fluid Designer, Pripravto, Archimesh v1.1.2, JARCH, Block wall builder, Basket arch, Stairs, Column, Floor Generator.

Table №1. Specialized applications supporting the development of 3D interior designs

Interior Application	Purpose	Providing resources
Microvellum Fluid Designer	Professionally developed system based on Blender software, which enables the design of high-quality interior designs	http://www.microvellum.com/products/fluid-designer/
Pripravto	Standardized computer-generated 3D models compatible with Blender software	http://pripravto.cz/en/index.html
Archimesh v1.1.2, JARCH, Block wall builder, Basket arch, Stair Builder, Column, Floor Generator	Specialized concepts and individual applications (Addons) of tools supporting the design, using computer-generated 3D models	https://github.com/Antonioya/blender/tree/master/archimesh; http://blenderaddonlist.blogspot.bg/2015/05/addon-jarch-vis.html; https://developer.blender.org/F19196; http://www.swineworld.org/2014/11/addon-creating-a-basket-arch-in-blender.html; https://wiki.blender.org/index.php/Extensions:2.6/Py/Scripts/Add_Mesh/Stair_Builder; https://wiki.blender.org/index.php/Extensions:2.6/Py/Scripts/Add_Mesh/Column; http://www.swineworld.org/2013/07/generate-floor-boards-quick-and-simple.html.

With very high efficiency stands GNU software package Microvellum Fluid Designer. It is built on the basis of Blender engine, being developed a self-sufficient drag & drop concept including different types of libraries with finished 3D models that can be used immediately and can be edited. Figure №1 shows the following libraries:

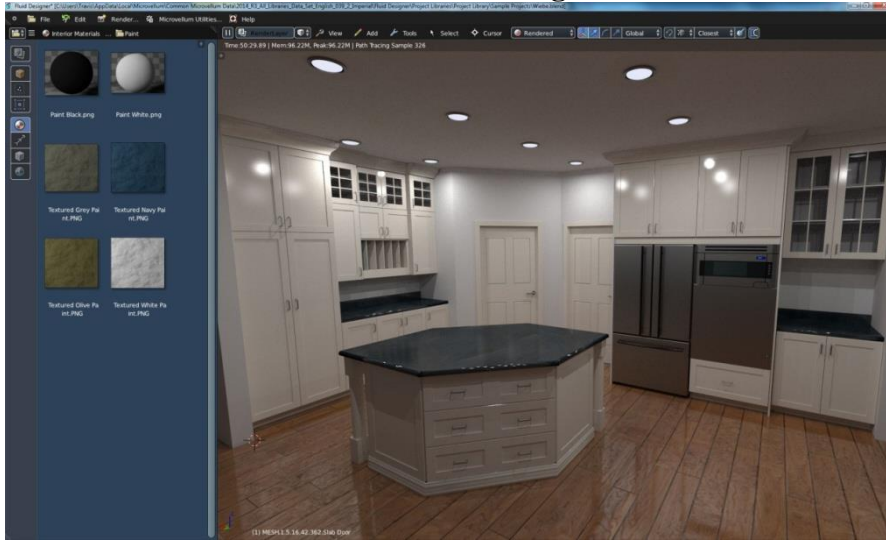


Figure №1. Interface and 3D interior design developed by Microvellum Fluid Designer (<http://www.microvellum.com/products/fluid-designer/>)

Also through Microvellum Fluid Designer construction of scenes (space, additional components and elements), high quality rendered images and animations (incl. live walk-throughs), becomes possible for short periods of greater efficiency.

Pripravto provides an export opportunity to Blender software of finished modern and professionally designed 3D models. Figure №2 shows: (a) main app usage, (b) product creation; (c) to Blender software; (d) developed scene with Pripravto 3D interior models.

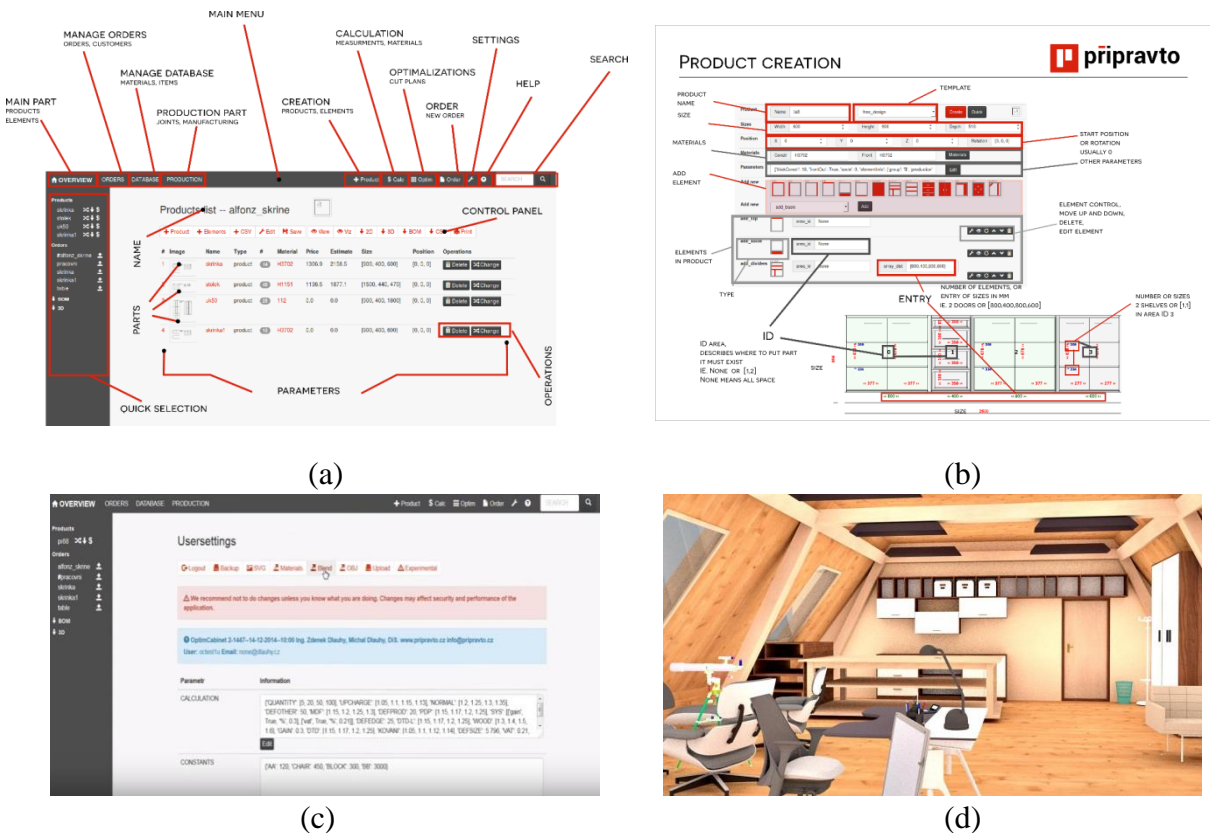


Figure №2. Professionally designed 3D models of furniture compatible with Blender

software (<http://pripravto.cz/en/examples.html>)

Archimesh v1.1.2, JARCH, Block wall builder, Basket arch, Stairs, Column, Floor Generator are specialized concepts and individual applications (Addons) of tools supporting the design, using computer-generated 3D models. Principle of activation of Addon in Blender software is shown in Figure №3.



Figure №3. Activation of Blender Addon

Blender software allows building 3D models of any type and also importing finished models through the file format (*.*). To facilitate and build a complete exterior environment a good solution is to integrate specialized addons developing the construction of computer generated 3D models, Table №2.

Table №2. Specialized applications supporting the development of 3D exterior projects

Exterior Application	Purpose	Providing resources
ANT Landscape	Creates a computer-generated landscape	https://wiki.blender.org/index.php/Extensions:2.6/Py/Scripts/Add_Mesh/ANT_Landscape
Sapling	Creates computer-generated objects - trees	https://wiki.blender.org/index.php/Extensions:2.6/Py/Scripts/Curve/Sapling_Tree
Ivy Generator	Creates a a computer-generated set of data elements (leaves, etc.).	https://wiki.blender.org/index.php/Extensions:2.6/Py/Scripts/Curve/Ivy_Gen
Low Poly Rock	Creates computer-generated rocks and stones	http://blenderaddonlist.blogspot.bg/2013/11/addon-low-poly-rock.html
Cloud Object	Creates computer-generated objects - clouds	https://wiki.blender.org/index.php/Extensions:2.6/Py/Scripts/Object/Cloud_Gen

Figure №4 shows sample models of Addons: (a) ANT Landscape, (b) Sapling, (c) Ivy Generator, (d) (e) Cloud Object.

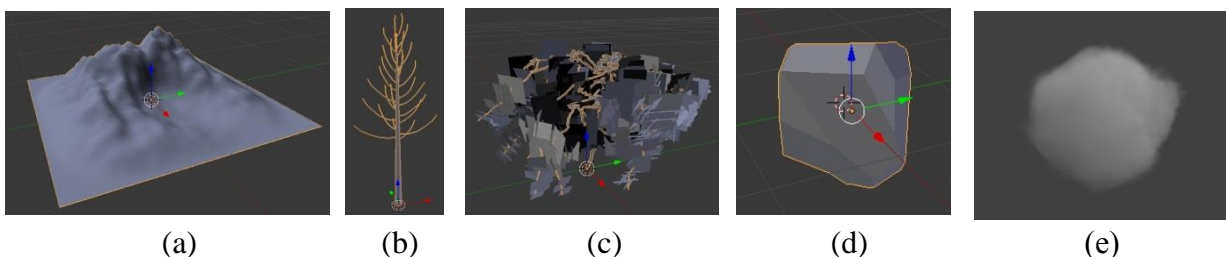


Figure №4. Sample models of: (a) ANT Landscape, (b) Sapling, (c) Ivy Generator, (d) Low Poly Rock, (e) Cloud Object

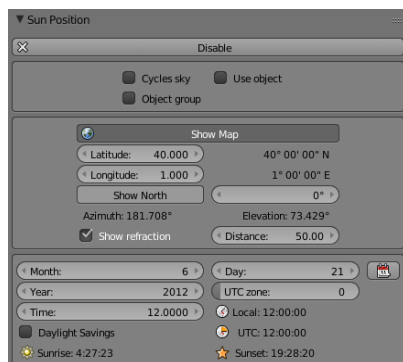
To facilitate the construction of an overall surroundings - urban and environment, it is

better to integrate specialized applications for: improving lighting and maximum reality of the render (Sun Position); Rapid construction of the urban environment through mathematical models (BCGA). The need for sizing and preparation of technical documentation is provided by Addons: Dimension and MeasureIt (Table №3).

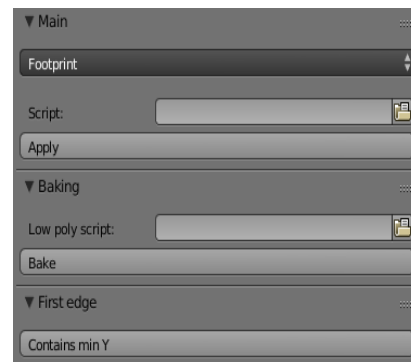
Table №3. Specialized applications supporting the development of 3D exterior projects

Specialized Application	Purpose	Providing resources
Sun Position	Lighting by positioning the sun	https://developer.blender.org/F20492
BCGA	Computer Generated Architecture for Blender	https://github.com/vvoovv/bcga
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 supporting development of schemes and drawings	https://github.com/Antonioya/blender/tree/master/measureit

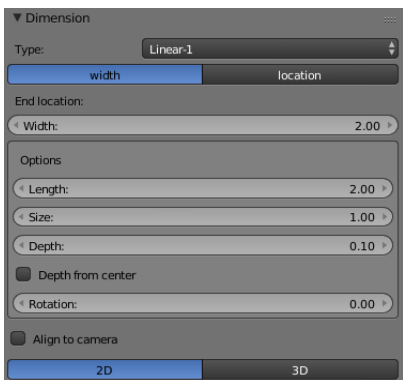
Some of the main features of specialized applications Sun Position, BCGA Addons, Dimension and MeasureIt are shown on Figure №5.



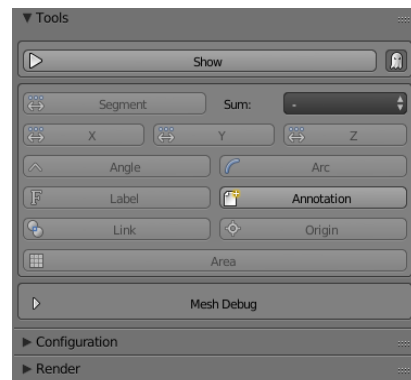
(a)



(b)



(c)



(d)

Figure №5. Some of the main features of specialized applications: (a) Sun Position, (b)

BCGA Addons, (c) Dimension, (d) MeasureIt.

Conclusion

The development of interior and exterior projects using Blender software is a great solution through which realization of the design task becomes possible, quick and efficient. Quality development of the projects is supported through the use of specialized applications Addons, GNU-based software development, as well as whole concepts of platforms offering standardized 3D models compatible with Blender software. The finding of the research contribute to the building of a whole system of freely available resources that complement the free distribution Blender software in a way that offers a vision of a modern and high performance design.

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