



Professional architectural visualizations with Cinema 4D

1. Concept & Modeling

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Munich 2022
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Abbreviations

The following abbreviations are used in this handbook:

ALT:	ALT key	i.e.:	<i>id est</i> , this means
cf.:	confer, compare	LMB:	Left mouse button.
CTRL:	Control/ Command key	MMB:	Middle mouse button
etc.:	<i>et cetera</i>	RMB:	Right mouse button
e.g.:	<i>exempli gratia</i> , for example		

Introduction

MAXON's 3D software **Cinema 4D** allows you to create detailed 3D models and photorealistic visualizations. However, as with other modern 3D applications, the complexity of Cinema 4D is relatively high. Accordingly, getting started with the numerous functions, features and aspects of the program is tedious. A lot of time passes until the beginner has understood the interaction of the various tools and settings and can move from the learning phase to the creative phase.

Most users obtain their knowledge of individual areas of Cinema 4D from online tutorials. With the help of these training materials, the beginner is able, after some practice, to use the tools presented in them and to create similar objects and scenes himself with their help. Due to the media limitations, these tutorials are usually quite short and limited to individual, concrete aspects.

This "atomization" of the functional understanding of Cinema 4D is problematic, especially for beginners, since the linking of the individual functions to an effective overall process does not take place in said tutorials, or only in fragments. What is missing here is the teaching of how an efficient workflow can be formed from all the available options that Cinema 4D provides and how a larger overall project can be organized and implemented in a goal-oriented manner.



The enormous creative freedom that 3D applications offer the user and that make almost everything imaginable feasible can easily become a frustration trap for beginners. This is because there is no predefined ideal way to achieve the desired goal in 3D design. Instead, the same result can often be achieved in very different ways and with a wide variety of methods and techniques. Therefore, newcomers often try to recapitulate the working process of a scene using finished models - a kind of reverse engineering of the rendering. However, the previous use of certain tools and work steps can only be understood to a limited extent on the basis of a finished model prepared for the final rendering.

This is exactly where the introductory series "Professional Architectural Visualizations with Cinema 4D" comes in, taking you through the planning process of the 3D scene "City Villa" and presenting all workflows step by step over the course of two volumes up to the final rendering. The first volume introduces the conceptualization (Chapter 1) of the scene based on design and stylistic criteria. This is followed by the main section on modeling, i.e. the creative implementation of the 3D models used in the scene (Chapter 2). Finally, various aspects of scene management are presented (Chapter 3).

The two volumes are thus intended to be a practical introductory aid for those users who have already gained initial experience with Cinema 4D and are somewhat familiar with the program interface and the structure of Cinema 4D, but who still need guidance in planning and implementing larger projects and scenes. The explanations of certain work steps do not always go into the last detail and some procedures are only roughly touched upon. Here again, we would like to refer you to the numerous video tutorials on the Internet, which help you to understand certain processes in precisely such concrete cases.

The idea for this introductory series came in the course of my consulting sessions with architects and engineers, in which I was regularly asked to outline the process for visualization projects and to prepare and optimize the office infrastructure and workflow for the use of Cinema 4D as well as the exchange of corresponding 3D data and assets. Especially architectural offices and studios that have already gained experience with real-time rendering applications such as Enscape, Lumion or Twinmotion are often put off by the creative freedom and complexity offered by 3D design applications such as Cinema 4D. Behind the many options, finding the ideal path for one's own project is actually the central objective for developing an efficient workflow for oneself and in the team.

The following introduction therefore deals less with specific techniques and more with methodological approaches that play a role in the realization of complex projects and that are repeated in most visualization projects. Therefore, the descriptions of individual procedures are oriented more towards breadth than depth and I hope to offer assistance with this approach to those who are approaching the topic of architectural visualizations with Cinema 4D as beginners or even for the first time. The approaches described here can of course also be used in other branches of 3D design but the field of architectural visualization .

In the running text, key terms and names of tools and functions of the programs and plugins used are **highlighted**. You can click on these terms and you will be redirected to the corresponding entries in the online manuals of the respective applications. In the section "Plugins and Extensions" (p. 6ff.) the link to the web page of the respective application is marked by the icon . In the info boxes, interactive elements are marked by the -icon.



Project files

The methods and workflows presented here are most easily understood using the 3D model of the "Urban Villa" scene.

Scene files

The Cinema 4D scene can be purchased from the GUMROAD platform, the most popular platform for digital educational content: adrom3d.gumroad.com.

The scene downloads, differentiated by render engine (**Chaos Corona**, **Chaos Vray5**), include all 3D elements visible in the final visualizations, as well as all materials and associated textures. The scene is also organized according to the layer and take management principles presented here.

HDRI files

The HDRIs used to illuminate the day and night scene can be downloaded here:

Daytime scenario HDRI "Kloppenheim 03": polyhaven.com/a/kloppenheim_03.

Sunset scenario HDRI "06-14_Sunset_C": noemotionhdrs.net/hdrevening.html.

LUT files

Kim Amland's LUTs are used as lookup table files:

<https://forum.corona-renderer.com/index.php?topic=13398.msg97506#msg97506>.

Software used

With its thematic focus, this series is primarily oriented towards the needs of architectural visualizers and architects. Many studios use **real-time renderers** (e.g. **Enscape**, **Lumion**, **Twinmotion** or **Vantage**). The 3D model to be visualized is transferred via file import or live link from a **2D/3D CAD application** (e.g. **AutoCAD**, **Revit**, **ArchiCAD**, **SketchUp**, **Rhino**) to the real-time renderer, where it is equipped with lighting setups, staffage objects and materials using the extensive asset libraries of those real-time renderers.

With their direct render feedback, the pre-defined lighting and scene presets, and the straight and linear workflow, these real-time renderers are ideal for quick animations, internal visualizations, and basic presentations for clients or colleagues.

However, the options for adapting the 3D architectural model or the scene components as well as the quality level of the final renderings are quite limited.

For photorealistic visualizations and at the same time full creative freedom in modeling and designing, the combination of a professional **3D design application** (e.g. **Cinema 4D**, **3DS Max**, **Maya**, **Blender**, **Modo**) and a render engine (e.g. **Redshift**, **Chaos Vray5**, **Chaos Corona**, **Autodesk Arnold**, **Octane Renderer** or **Maxwell**) is therefore recommended here.

While the 3D design tools can be used to create and animate even highly complex and organic surfaces or objects while generating clean topology and correct UVW maps, the aforementioned render engines allow physically correct ray tracing calculations to simulate light and material properties in a physically correct way and to display even sophisticated optical calculations such as caustics or metallic reflections in a photorealistic way.

The "Urban Villa" project was created using **MAXON Cinema 4D R24** as well as various extensions for Cinema 4D (cf. chap. "Plugins and Extensions"). The scene can (with appropriate adjustments) also be implemented with earlier or later versions of Cinema 4D. The range of functions of the modeling tools of Cinema 4D, which is mainly relevant for this volume, was only slightly extended in Release 25 and Release 26, so that there are hardly any significant changes in the modeling process compared to more recent versions of Cinema 4D.

The procedure presented here and the methods and tools used are, of course, also available in other 3D programs. In this respect, the steps of the "Urban Villa" project described below should also be of interest to users of these applications.

Regarding the lighting setup, materials and render elements, the "Urban Villa" scene was prepared for different render engines (**Chaos Vray5** and **Chaos Corona 9**). These different versions can be acquired separately (cf. p. 4 Scene files).

Marvelous Designer was used to create the textiles while individual vegetation models were created and customized with **XFrog** and **Forester**. Techniques on how the respective plant and fabric models can be implemented in Cinema 4D without these extensions are discussed in the relevant context. Of course, users of the **Chaos Corona** and **Vray5** render engines who do not have Marvelous Designer or Forester at their disposal can also draw on the extensive **Chaos Cosmos** asset library to add plants and other staffage objects to the scene.

Cinema 4D provides you with a professional tool, long proven in the 3D industry, to implement any 3D scenario imaginable. The following chapters will help you to use this tool efficiently and purposefully to create stunning architectural visualizations.

Plugins and extensions

Cinema 4D offers an enormously wide range of tools and modules for modeling and animation workflows out of the box. Nevertheless, plugins and extensions can significantly simplify and accelerate the work process. The following overview lists such plugins that I have used in the course of my previous projects with Cinema 4D. Some of the described tools have been included as tools in the latest Cinema 4D versions (currently: R26). This is specifically pointed out at the relevant place.

Modeling (General)

Drop2Floor

Developer: Alpha Pixels



An absolute must in your modeling toolbox. With one click, a selected object is lowered with its lowest point onto the work surface.

HB Modeling (v2.34)

Developer: HB Studio (Holger Bierbrach)



In my eyes, the most valuable and useful tool package currently available for Cinema 4D, which significantly speeds up modeling with its range of functions. Many of the tools are simplifications and one-click solutions for processes that otherwise involve several individual steps in Cinema 4D. But also some new tools are included in the bundle, such as the "Relax Tool" (cf. the new **Even Spacing** Tool R26).

NitroCap

Developer: Nitro4D



With NitroCap, openings can be closed with quads with a single click, and they can also be stretched to form an arc at the same time.

NitroCircle

Provider: Nitro4D



Cutting round holes in a surface consisting of quads is a tedious and time-consuming procedure before Cinema 4D R26 (now integrated as a new **tool**). NitroCircle offers a variety of possible options for this.

NitroRelax

Developer: Nitro4D



A relaxed and clean topology is not only helpful for animations. The Nitro-Relax plugin allows you to redistribute even completely distorted edges and relax their spacing evenly. Particularly noteworthy is the option to keep the surface shape and redistribute the edges on the surface "floating" - something that is almost impossible to do manually (cf. the new **Equal Spacing tool** in R26).

Modeling (ArchViz)

Architecture Pack

Developer: Caleidos4D



Salvatore Maesano's plugin bundle is a powerful set of tools tailored for modeling architectural models in Cinema 4D. All individual plugins of the Architecture Pack bundle can be acquired separately as well: (1) Draw+ offers several useful tools to align and position objects; (2) Win4Doors allows the quick creation of complex windows in any polygon surface. (3) WfP (Windows from Polygons) also offers the possibility to create windows, but here the approach is different, since here you create the windows from a previously created surface or polygon selection. WfP shows its strengths especially with fancy shapes.

BalusterC4D and Stairs4D help to create railings and stairs, while Dimension is useful for exact dimensioning, where the dimension chains are created as parametric objects and can therefore also be rendered or visualized. Surface Aligner was until the release of Cinema 4D S24 the easiest way to place objects on other surfaces or objects and to manually distribute (scatter) them in a simple way. For those still working with earlier Cinema 4D versions, this tool is highly recommended.

LWCAD 2020 (2022)/Architron R25



Developer: LWCAD

As the name suggests, Victor Veličko's toolbox LWCAD (current version: Architron) is oriented towards CAD mechanisms and parametric objects, which should transfer the handling of a CAD software to Cinema 4D.

In the version I use, LWCAD 2022, both simple parametric bodies (boxes, cylinders, cones, etc.) can be created and precisely adjusted in size and shape, and elements for architectural visualizations can be modeled. For this purpose, there are many object categories (walls, ceilings/floors, windows, doors, handles, roofs and tiles, stairs, railings and fences), which, with the numerous setting options, allow the rapid creation of building and staffage elements.

The level of detail of the objects is not very high and is reminiscent of classic CAD object libraries, yet the use of such parametric objects speeds up the workflow considerably. However, the price of the plug-in package is quite high, so that it really has to be weighed up whether the purchase is worthwhile for one's own needs.

Q-GEOTexture



Developer: 3Dtools

Q-GEOTexture from the well known Cinema 4D plugin-forge of Stefan Laub (developer of Vray4C4D) is based on a complex interplay of cloner and deformer tools, and allows the user to project or map mesh objects in Cinema 4D like textures onto surfaces. This allows the creation of organic as well as small-scale structures and surfaces, reminiscent of Rhino's parametric modeling techniques.

Modeling (floors, roofs)

Floor generator



Developer: C4DZone

In just a few steps, the "Floor Generator" can be used to create both simple and complex parquet, tile and tiling models. This easy to use plugin is therefore not only suitable for floor coverings, but also for the creation of wall tiles, coverings or panels.

Tuile generator

Developer: C4DZone



TuileGen, which is already somewhat old, can provide any roof shape with tiles. It uses a predefined set of basic tile shapes but it is also possible to create your own tile types and save them as a basic shape for future projects. Since the tiles can be provided with random selection tags, it is easy to avoid tiling effects, when you assign textures to the tile-geometry.

Scattering

Chaos Corona Scatter

Developer: Chaos Group



With Release 8, the Chaos Corona render engine finally got its own scatter functionality. The Corona Scatter object can now be used to distribute any objects like trees, bushes or grass on a any surface. Thanks to numerous setting options, the distribution, alignment and coloring of the scatter clobe can be adjusted. Splines can be used to define free areas that are excluded from the distribution of scatter clones. For example, paths, shore zones, etc. can be simulated.

Forester Multicloner

Developer: 3DQuakers



Forester Multicloner is functionally similarly broadly positioned as SurfaceSpread (see below). However, the scatter tool is not offered separately, but is only available as part of the comprehensive Forester base package.

GrassKit 5.1

Developer: Bosco



With Boscos fantastic Grasskit you can transform any surface into a green meadow with different grass-types and flowers. The appropriate materials for Vray 5, Redshift, Corona or C4D are created on th fly and with all editing options of standard materials. GrassKit is a great help if you don't want to handle cloners and random generators in Cinema 4D yourself and just want to generate a meadow quickly and without frills. The materials can be post-processed as desired, so that color variations are possible.

ScatterIt



Developer: Darstellungsart

This fantastic plugin turns a simple spline into a naturalistic meadow with naturalistic grass and flower elements. A wide range of settings allows for a variety of distribution patterns and vegetation shapes. The tool automatically creates high-quality Corona and Vray5 materials.

SurfaceSpread v2



Developer: Laubwerk

SurfaceSpread is distributed - like the Laubwerk Player (see below) - by Laubwerk and is, besides the Multicloner by Forester (3DQuakers) and Corona Scatter, the most powerful scatter tool for Cinema 4D and the general standard when it comes to generating lawns and forests.

Plant generators

Darstellungsart GrowIt



Developer: Darstellungsart

An easy to use grass generator from Darstellungsart which allows you to create blades and patches of grass as well as freely customize the level of detail, shape and texture of the grass meshes.

Laubwerk Player



Developer: Laubwerk

Laubwerk from Berlin is a provider of high quality plant models that can be selected via their own interface, the Laubwerk Player. After installation, each plant model is available in 3 seasonal variants. Depending on the distance to the camera, 3 different levels of detail (LODs) can be selected. Laubwerk currently supports (as of July 2022): Active Renderer, Standard Renderer, Corona, V-Ray 3.6/3.7 (no Vray5 support) and Redshift.

Forester Packs



Developer: 3DQuakers

When you purchase the Forester Basic package you get 4 different modules: (1) Forester Trees, which can be used to generate any type of tree; (2) Multi-