Visualization traces the history of design—from charcoal sketches and mechanically drawn perspectives to acetate plans and electronic renderings. Designers don’t create objects as much as they create the visualizations that inspire and instruct the creation of objects.

A visualization serves two purposes. First as an object of contemplation. Here the visualization gives designers a mirror through which to see their designs and the possibilities they present. The other purpose is to communicate the design intent. Here the representation facilities discussions, which in turn sell, inform, and ensure the outcome is as envisioned.

Designers have more options for creating their visualizations than ever before. In this month’s column, we look at some of the options available to Autodesk Revit users and show how designers can get the most from them.

**REVIEW 3D VIEW**

The most obvious way to visualize a design is through Revit’s built-in 3D View. The 3D View is ideal for producing quick-in-process visualizations and can be easily switched to ray tracing mode in order to produce more detailed static renders.

To make the transition from modeling to rendering as smooth as possible, the model should correctly utilize Revit families, categories, and parameters. If you are already producing high-quality, well-structured Revit models, then generally the only additional model preparation is in the setup of the materials. By creating a well-structured model, you’ll make it easier to filter and hide geometry, as well as export the model for downstream applications.

In order to get precise shadows, it is important that the project is accurately located. Make sure the project’s city is correctly set in Revit > Manage > Location. Also ensure the north arrow points in the right direction. It’s a simple mistake to make.

Once your render is set up, save the settings as a View Template (View tab > Graphics Panel > View Templates). View Templates helps maintain consistency by making it easy to reuse the rendering settings pertaining to shadows, lighting, render background, image quality, annotations, and geometry filters. In previous versions of Revit, the View Template locked all the settings, but as of Revit 2014, there is an option to create a temporary View Template, which allows you to override individual settings in the applied View Template.

In terms of hardware, Revit’s 3D View makes use of your computer’s GPU in everything except ray traced renders. A mid-range GPU will suffice unless you are working with large models or models with lots of environmental effects, such as realistic mode, ambient occlusion, surface transparency, and anti-aliasing. Ray tracing is the exception since it employs the CPU instead of the GPU.

To ray trace a drawing, select it from the Visual Display Options menu on the control bar along the bottom of the 3D View. Ray tracing uses every available CPU core. Therefore it benefits from a multi-core processor, and dual processors. Intel Xeon Hyper-Threading Technology gives an additional boost to the ray tracing performance by virtually doubling the number of processing cores.

**AUTODESK 360**

Autodesk 360 allows you to produce multiple high-quality renders without tying up your computer. The downside is that there is a fairly basic set of rendering options, and each render costs Autodesk Cloud Credits to produce.

Any view can be sent to the cloud by choosing Render in Cloud from the View tab. From here you can choose which views to render. By selecting multiple views, you can render multiple images simultaneously. The only control you have over the renderings is a set of basic settings for image size, render quality, and exposure settings. Pressing Render sends all the geometry and materials to the Autodesk 360 cloud. You’ll get an email when the render completes, which is generally fairly quickly.

Besides producing still images, Autodesk 360 can also produce interactive panoramas, sun studies, and illumination renders. These types of renders require multiple exposures. Cloud rendering is ideally suited to these types of visualizations, since multiple renders can be generated simultaneously in the cloud.

**AUTODESK SHOWCASE**

Autodesk Showcase lets you choreograph an interactive presentation. The presentation can consist of preselected perspectives mixed with interactive walkthroughs. A typical presentation might start with a predefined fly-through, transition to an improvised walkthrough, and then finish with a series of preselected viewpoints. Considering that everything is rendered in real-time, the quality is remarkably good.

The Suite Workflow menu connects Revit to Showcase. Export a model to Showcase by selecting the File Menu > Suite Workflows > Showcase Realistic Presentation. This will send the Revit geometry and textures over to Showcase. Once inside Showcase, you can begin setting up the predefined views, background, and textures. Generally you’ll get better results from the built-in Showcase textures than the imported Revit ones.

Showcase is an extremely GPU-intensive application for real-time presentation. An NVIDIA K4000 is recommended if using Showcase to visualize Revit datasets. There is also a ray tracing mode in Showcase for final frame rendering. As with Revit 3D View, Showcase’s ray tracing mode benefits from a multi-core or dual processors, as well as Intel® Xeon® Hyper-Threading Technology.

**3DS MAX DESIGN**

3ds Max Design produces cinematic quality still and animated renderings. It is an enormous program—a program that would take years to master. But don’t let this put you off, since generating a render from Revit doesn’t have to be difficult.

The Suite Workflow menu connects Revit to 3ds Max Design. A dialog box will open when you select Suite Workflows > 3ds Max Design Exterior Render. Most of the settings in the dialog box are self-explanatory, but make sure you look at the Group By settings at the bottom of this dialog box, since the model’s grouping will make it easier to apply materials and manage geometry in 3ds Max Design. A second dialog box will appear and give you the option of keeping the 3ds Max Design model in sync with any subsequent changes to the Revit model.

3ds Max Design’s render options are accessible via the menus bar. One important option is the rendering engine. The mental ray rendering engine uses the CPU. Intel® Xeon® is the best choice for CPU rendering because it is available with many cores and the option of hyper-threading. Mental ray enables batch and satellite renderings, which take advantage of other CPUs in your local area network to speed up the rendering process.

The i-ray rendering engine is a recent addition to 3ds Max Design. It uses both the CPU and Cuda cores in an NVIDIA GPU and can provide a nearly instantaneous view of the final rendering in an AutoCAD view window. This workflow is an ideal way to learn about rendering and tune your rendering in low resolution before committing to a high-resolution version (pre-visualization).

**OPTIMIZING YOUR HARDWARE FOR RENDERING**

To help select the ideal hardware configurations for your preferred rendering option, HP has created a graphics optimization guide. Download the guide at http://3d39195.rev3.2hp.com/s2/GrfDPE/4/AAxX9909EIIIG.pdf

**ABOUT HP**

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