modo® 501

This document lists new features and improvements in modo 501

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RENDERING >>

Ray-tracing speed has been heavily optimized in modo 501, generally resulting in a significant rendering speed increase. Speed improvements of 2.5x over modo 401 are common, though the increase can vary from zero to over 3x depending on scene and settings.

There are two new anti-aliasing options (512 and 1024 samples). One major benefit of these new options is improved Depth of Field blur quality.

Motion blur computation speed has been improved.

The new View Frustum Culling option in Fur Material rendering reduces memory usage by only what is in the camera frame and delivers a speed improvement in Fur rendering.

The new Displacement as Bump rendering option makes it possible to use a higher displacement rate (meaning less polygons) while maintaining the same or better visual quality. This delivers a small rendering speed improvement as well.

The enhanced Depth of Field delivers higher quality Bokeh Effects, and new control is provided over iris blades, iris rotation and edge weighting for more photorealistic results in shallow depth of field situations.

A large set of Enhance: modo textures are provided. This is an extensive library which includes geometric textures, plus organic, noise, panel, process, skin, space tile, water and even display counter textures like a 24 hour clock.

You can now restrict the amount of memory that a large texture is allowed to use. The Image Size Limit option is useful when you have a large texture applied in your scene but do not actually need to use all of the detail.

The amount by which each light source affects subsurface scattering (SSS) can now be specified as a percentage in the light's material. This lets you create more realistic results for things like candle wax, skin or milk. You can also use this setting to exclude the impact of a light source that is present in the scene for other purposes.

RGBA layer effect provides control of color and stenciling using a single image map with an alpha channel.

A new Dissolve Amount setting in Materials provides a way to fade surfaces from view on a texture basis. The Dissolve Amount is different from transparency as it is a convenient way to fade all aspects of a surface simultaneously.

The new Vertex Illumination Baking function provides a means to bake or burn-in the illumination colors of the scene directly to the vertices of the geometry as a Vertex Color Map.

Bump mapping is improved, as it is now based on a new algorithm which makes it more general and accurate. It also makes bumps behave like displacement, thus making it possible to use gradients as bumps. Bump amplitude is now expressed (like displacement amplitude) as a distance.

modo 501 can save stereo pairs in a side-by-side format which is popular for creating stereo video streams.

modo 501 can save Anaglyph stereo images, meaning you can now directly save stereo images ready for viewing with red/blue glasses out of modo.

Gradients can now take 'Back Facing' as an input, which is 0 normally, but has a value of 1 for the back sides of double-sided polygons. When set to 'Back Facing,' the gradient will color both the front and rear sides of a polygon on double sided materials.

First and Last irradiance cache pre-pass spacing options can now be set in the Render channels to provide more control over GI quality.

Falloff Type control has been added to area, cylinder lights, point lights, and spotlights; offering you the choice of inverse distance or inverse distance squared.

A new Linear Fog type lets you set the fog distance manually (linear or exponential).

modo now offers the ability to work with huge disk-based, tiled images using the folder-based storage method for Zoomify images, where the tiles are stored as individual JPEG files, and an index file (with the extension ".xml") is used to look up the tiles. This enables working with images that are much larger than available system memory. Useful for working with large terrain images, for example.

Occlusion shading is added as a new Shader Tree item layer. The Occlusion material offers options for various types including concavity, convexity, up/down slope. The variance noise can be stretched along the Y axis for effects that depend on that direction, namely: up/down slope. There is also control over spread angle, as well as parameters that control how and in what quantity the rays are "shot." One example use is in simulating how a metal object looks highly polished in some areas, while darker oxidation remains in nooks and crannies.

Indirect bump mapping is a new render option that enables bump mapping evaluation on indirect rays (the ones used to compute global illumination). This is disabled by default since it is usually not necessary but it can be enabled for specific GI cases like caustics on bumpy surfaces.

The new Match Specular option makes the amount, Fresnel, and color settings be identical (roughness and anisotropy are already shared). In the real world there is no distinction between specularity and mirror/blurry reflection – it's all the same thing. So in physically-based rendering, materials should have identical specular and reflection settings, which this option facilitates this.

Edge Contour rendering is now supported. Options include surface and segment rendering, plus control over contour color and width. The option to fade over distance is also provided. Especially useful for visualizations of CAD data.

A new rendering option called Indirect LOD can save memory and increase rendering speed in certain situations. When checked on, a lower level of detail copy is made of a displaced surface when it is hit by an indirect illumination ray. This means the high resolution surface can sometimes be flushed from memory thus saving memory.

There is a new customer-provided image for the default environment that is used for the reflection shading mode in OpenGL.

There is a new system preference to control the size of network rendering jobs. The number of buckets per job is now a multiple of the number of render threads on the slave machine. For example, a job size preference of 200% would cause quad core slaves to receive jobs of eight buckets each.

PREVIEW RENDERER »

The Preview Renderer is noticeably faster.

Preview will now iteratively render scenes exceeding quality settings determined by the user - the longer it "cooks" the higher the quality of the image.   Preview progressively refines all noise in the scene, such as depth of field, blurry reflections, monte carlo global illumination, etc., exceeding the quality specified by the user; the longer it runs, the higher quality the image will be.

The Preview Renderer now updates in randomized tiles rather than scan-lines, providing users quicker viewport feedback. Preview Renderer image quality is also enhanced as modo now uses an improved sampling method for anti-aliasing and respects color clamping.

Interactive Preview refinement. You can direct the Preview Renderer to work on any desired area first by "scrubbing" a region with the mouse. This results in the area of interest under the mouse being updated faster. This Update Under Mouse option can be enabled or disabled in the Options button of the Preview Renderer.

You can now toggle a button in the Preview Renderer to suppress Irradiance Cache updates on complex scenes where it's taking a lot of time. This is useful when working on texturing since these types of changes usually do not depend heavily on the IC values.

Irradiance caching quality is improved in the Preview Renderer.

You can now set how much anti-aliasing should be performed (# of samples) by default in the Preview Renderer. The maximum number of samples/pixel that the Preview renderer uses with 'Extended Refinement Passes' on and off is set in the System Preferences.

MODELING »

modo now allows you to optionally use Pixar's industry-compliant subdivision surface representation. The PSub (Pixar Subdivision Surface) geometry provides a number of advantages including semi-sharp creasing and no texture warping. You can convert to the new PSub by using the Shift-TAB key combination.

The new Pixar Subdivision Surfaces support Boundary Rules. The Boundary Rules option, available in mesh properties, allows you to control the way points are moved on a boundary in three different ways:

- Smooth All: All of positions on the boundary are moved by the smooth rule.
- Crease All: All of positions on the boundary are moved by the crease rule (sharp edge rule).
- Crease Edges: The points that have two incident edges (valence = 2) are moved by the crease rule, others are smooth.

Using FBX 2010.2 and the new Pixar Subdivision Surfaces, you can now exchange the semi-sharp crease data between modo and Maya.

The polygon Subdivide command optionally uses the same algorithm as the Pixar Subdivision Surface representation does for the SDS Subdiv command. This new method also maintains UV textures and will work on curve polygons.

The Linear and Array generators now include a new "Between" option which establishes positions between the start and the end handles. This is useful when you want to align trees, buildings, fence posts or other objects with consistent distances between them.

A new Snap toggle (button) is provided in the user interface, which enables snapping behaviors, depending on the situation. The Snap toggle key is assigned to the global 'X' key. In any idle time, pushing the Snap key simply toggles the global snapping state. By LMB + the Snap toggle, the snapping state is temporary changed when LMB is down. The state comes back again as soon as the mouse button is released. This ability to temporarily enable snapping saves several mouse clicks over the old method, streamlining workflow.

A new snapping popover activated by the F11 key provides ready access to the current snapping state and also shows settings for snapping and constraint tools. You can also toggle snapping on or off from this popover. The tool attributes about snapping for the Pen and Mirror tools have been included in the popover.

The Geometry snap mode is improved to snap to a plane or the axis of the vertex position when you drag the constraint axis handle or plane handle.

With the new Freeze Replicator command, you can now convert replicas into instances. This allows you to edit them or export them to other software.

With the new Freeze Surface Generator, you can now convert a surface generator into a point cloud for individual control over replicator/instance items by editing the individual vertices.

Surface generators have a new "Ignore Deformations" option. This allows the replicas to "stick" on animated deformations. You can use this to make leaves "float" on an undulating lake surface for example.

Replicators have Time Offset and Time Variation parameters for random variations. This affects the transform and visibility of replicated child items. The Random Time Variation channel selects a window for replicas to vary from the current time. So if this is set to 1 second, then the replicas will have random transforms based on their animation between the current time and one second in the future. The Time Offset channel can be used to move the random window in time. For example, if this is set to 5 seconds and the Variation is set to 1 second, then the replicas will get their motion from the animation of the prototype between 5 and 6 seconds into the future.

The Edge Slide and Edge Extend tools now work with the background geometry constraint.

The new 'Drop' paint mode in the Mesh Paint tool lets you place a mesh while controlling the rotation and size at the same time (like the preset brush).

The Mesh Paint tool now lets you directly indicate a specific item to use as the source.

New tablet controls allow you to control the position and rotation of mesh paint elements using the angle of the pen on the tablet's surface. The new rotation modes are:

- Surface Align with tablet (no pitch), aligns to the surface using the tablet heading but no pitch.
- Screen align aligns the mesh using the screen direction.

Diagonal Edge selection mode is introduced. modo can now automatically select edges which are shared by pairs of triangles. You can convert triangles to quadrangles by removing the selected edges.

The Loop Slice tool is enhanced with a new Preserve Curvature option that lets the new position be calculated on a cubic curve to avoid flattening and thus maintain the curvature of the edge.

The new Add Loop tool is the interactive version of Loop Slice tool. Just click on an edge and you can see a pre-highlighted span to slice at the mouse position.   This adds a "1-Click" edge loop creation capability to modo. Several options are provided in the tool, including distance and position indicators, splitting at the middle of the selected loop and creating new parallel loops.

The Add Point tool is introduced. This is another "1-Click" interactive tool to quickly add a vertex on the clicked edge. Ideal for adding a vertex on a curve or Bezier spline.

Align Vertices is a command to align the selected vertices along the given axis or on the plane between the 1st selected vertex and the last selected one. This command requires three or more selected vertices and will align them by axis or on a uniform basis.

The Split Vertex command splits curve type polygons at the selected vertices. It takes a single vertex and creates multiple vertices in the same location, based on the number of polygons that share the point.

The Set Position command is enhanced with two options to specify the space of the input position:

• Work Plane: The input position is encoded from the current custom work plane to the model space.

• World Space: The input position is encoded from the scene space to the model space.

Smoothing Groups are introduced. Smoothing groups allow users to define specific areas for polygon smoothing in game engines and provide better control over vertex normal shading when making game characters.

modo now presents polygon statistic entries for concave and convex polygons and smoothing groups.

SCULPTING »

Multi-Res sculpting is now supported. This utilizes the newly introduced Pixar Subdivision Surface type of geometry.   You can sculpt on any subdivision level to make gross shape adjustments while preserving the fine details you added earlier at a lower subdivision level. This also lets you add extremely fine detail without having to explicitly add more geometry in detailed areas.

Sculpting has an improved stroke engine that provides less lag and greater speed.

Stroke interpolation options are provided:

• Stroke step: as a percent of the brush size, this controls the distance between each consecutive brush position. Smaller means smoother but slower strokes.

• Continuous Stroke: connects each consecutive brush position, making the stroke continuous

• Draw Stroke: draws the stroke as a yellow line in the OpenGL view, to help you visualize the stroke.

A multi-resolution palette is added to the Sculpt tool palette with the following controls:

• Multi-resolution: A toggle button to enable multi-resolution mode on the current mesh.

• Max Level: The maximum subdivision level allowed for the current SDS mesh.

• Current Level: The current subdivision level for the current multi-resolution level.

The Lock Borders option when sculpting will freeze the positions of any border areas (i.e. open edges) so brushes can't affect them. When sculpting this lets you relax a shape without changing its borders.

You can now invoke a Smooth Mode and apply smoothing during sculpting operations at will. This is very useful when using sculpting tools like Flatten.

Sculpting is now supported in the UV view. Sculpt tools in the UV view provide a very natural way to work on UVs: you can push, pull and smooth them just like you would do on a regular mesh with sculpt tools. You can use sculpting tools to interactively smooth (relax) a mesh with brush falloff and by using the Sculpt Move tool with Rigid UV's enabled, UV islands can be easily moved around. This can also be activated with the control key on the Move tool.

Sculpting now supports use of a Background Constraint to facilitate re-topology operations.

PAINTING »

Image ink UV Mask option lets you set an image to use as a mask (blocking areas from receiving paint) in UV space. This is convenient to use with baked textures like Occlusion passes - allowing you to paint on a face except for areas with deep (occluded) creases for example. The mask can also be inverted so you can paint in areas that are normally hard to access.

A new Clone View Projection option lets you paint using an image that is a clone of the 2D view of your painted scene.

HAIR/FUR »

You can now use two types of Billboard polygons in the Fur material, as a way to distribute flat polygons across a surface The Tree option replaces each fiber with a flat, upright simple polygon plane that always faces the current render camera. The Leaves option replaces each fiber with a flat simple polygon plane. Billboards are useful for mapping tree images to upright planes scattered on a landscape to create a forest or for adding leaf images to a tree branch, for example.

View Frustum Culling is a new Fur Material parameter that directs modo to disregard Fur outside the camera view at render time. This results in faster fur generation time and reduced memory usage. It is mostly useful on large landscapes covered with grass.

Preview now has options to disable Fur and to reduce the Fur density in Preview.

Guide source: Fur Guides can now be specified by item and polygon tag. This makes it possible to separate the Guides from the surface on which hairs are grown, so you could have a mesh with just the Guides controlling the hairs grown on another mesh. You can also tag the Guides for each Fur layer, which allows more sophisticated hair styling.

The Fur Material now offers Kink options. This applies a Perlin noise the root or tip of a fur strand to change the root direction smoothly. You have control over Scale and Offset parameters.

The Fur Material now offers Frizz options. This applies a Perlin noise the root or tip of a fur strand to change the hair direction at each node.   You have control over Scale and Offset parameters.

OpenGL Fur now works with Guides.

Set OpenGL Color overrides the OpenGL color using the specified color, this can useful when working with Guides to distinguish them visually from the OpenGL Fur representation.

OpenGL Fur quality is much improved, and now follows the Render results much more closely.

Fur textures are now evaluated at each point along the hair, making it possible to change clumping along the length, for example.

Hair sculpting 'Tip mode' is introduced. Tip mode makes the tool work with maximum strength on the tip and reduces the effect on the root. This provides a more natural feel.

Fur Strays can now be generated. Strays are individual hairs that escape and protrude from Clumps. You can set their percentage probability and their Strength, which affects how far from the clump they diverge.

Fur IC is a new option that forces the Fur to use Irradiance Cache; by default Fur uses Monte Carlo which is usually faster.

ANIMATION AND RIGGING »

The new Schematic viewport provides the means to view and edit rigs in a visual manner. To add the necessary elements to the schematic view, drag any item from the 3D viewport, Item List, etc. and drop it in directly. You can then link elements, including constraints and modifiers, with visible connections. This provides an intuitive and powerful way to build rigs and animated scenes.

Assembly Groups and Sub Assembly groups are introduced. Assemblies can now be instanced and mirrored. An 'Expose External Channels' option for Sub-groups will create channels on the new group for each channel link within the group. This is useful for creating assemblies that can be re-used elsewhere; a kind of 'black box' that can be connected up without knowing about the internals.

Animation playback speed is optimized on multi-core machines, resulting in up to 2X speedup for some scenes.

modo now supports reverse playback of animation.

Channel links are now shown in the Channels viewport. Any channel that has incoming or outgoing links now has an attribute widget which, when expanded, lists the source or destination channels for each link. Clicking on the link will select it.

In Channel List, the order of user channels on an item may now be changed by dragging the channel to a new position.

User channels can now be added in the Channel List by clicking on the '(add User channel)' entry shown at the end of each item's channels when the viewport is set to group by items.

The attributes of User channels can be changed after creation. The Channel context menus have options to change their name, type and default value. Min and max values can also be set, changed or removed. User channels are now shown in the Properties forms, after the standard item properties.

The vertical divider between the Channel List and Graph Editor can now be adjusted by dragging with the mouse.

In the Graph Editor we added an option to show or hide the members of selected Groups. Another option is provided to show or hide the 'Add Transform' entries.

When Items are selected their animated channels are also selected and loaded into the Graph Editor (provided there are no channels already selected). Animated channels are now scrolled into view when items are selected (based on the first animated channel found).

Channel Modifiers can now be added from the Animate menu.

Channel Modifier additions include:

- Trigonometry: Functions for sin, cos, tan and their inverses.
- Vector: Creation of vectors, setting their length and normalizing.
- Vector Math: Math operations or vectors including add, subtract, cross product and dot product.

- Conditional: Provides logic operations (e.g. A is less than B) to be performed on the input channels with the option to define the output when the result is true or false.
- Simple Kinematics Channel Modifier: Provides a speed and constant acceleration to a channel at a given time and position. The main use for this is to produce a physically-based trajectory for something flying/falling through the air in gravity (much like the old gravity modifier, but without bounces).

Channel Modifiers can now be rearranged in the Item List by drag and drop.

You can now purge unused Channel Modifiers.

The Channel Haul tool now displays the slider for Channels beneath their name.

MODO PLUG-IN SDK (SOFTWARE DEVELOPER KIT) »

SDK build samples are now provided for Microsoft Visual Studio 2010 (in addition to 2008). The SDK also includes XCode example projects for Mac OS X.

Plug-ins can now create geometry parametrically, which can be also converted to a mesh. A sample 'gear' generator plug-in is provided with numerous options for gear spacing, spoke placement, etc. In addition to the gear item, there are also are 'orb' and 'gasket' examples that show how to procedurally create simple shapes.

Procedural textures can create keyframed, multi-channel textures for the Shader Tree. 2D and 3D procedural textures from Bentley Systems are included as new sample plug-ins in the SDK. Numerous examples are included for various types of textures, such as wood, marble, and tiled patterns.

Tool plug-ins extend the modo tool set by providing new ways to create and edit geometry. Samples in the SDK include the Arc, Seashell, and Spikey tools.

Command plug-ins enable the development of native C++-based actions. An example VertValue command is included that reads and sets vertex map values.

Color model plug-ins can enhance the Color Picker in modo. Samples in the SDK (also provided in the modo software itself) include the HSV (hue, saturation, and value) and Kelvin (color temperature) color models. The HSV color model includes rule-based color selection, so that sets of related colors can be quickly created using traditional color wheels.

Channel modifier plug-ins can be created. These appear in the new Schematic viewport. Examples include Linear Blend, Math Multiple, and Simple Kinematics.

Replicator point generators can be introduced via the SDK, and we provide an example Gasket item that generates points in various fractal patterns.

Time-based image items can be introduced via the SDK. The sample Mandelbrot plug-in can be keyframed to vary its settings over time, for example.

OTHER IMPROVEMENTS IN FILE AND IMAGE I/0:

The file I/O support in the SDK provides automatic triangulation APIs for scene savers, so that models can be saved as triangles without first manually freezing the meshes.

The Wavefront OBJ and COLLADA plug-ins provide additional options to control how they save and load scenes. These are also supplied as working examples within modo 501 itself.

For the OBJ format, new features are Export Meshes as Groups, and Import Groups as Separate Meshes (both of these options control the grouping of items). The modo 501 OBJ importer is also slightly faster than it was in modo 401.

The image I/O support in the SDK enables pyramidal, tiled image formats.

The PNG image saver now has various stereo options.

WORKFLOW AND USER INTERFACE »

A new in line help system is provided.   The content has been rewritten to be easier to understand, while retaining the more technical info of the older version. Many new videos are provided. The information on how to use modo is now easier to navigate and it is easier to discover related information. The search function has been overhauled and it now more robust.

The 501 documentation is now maintained online with community input. A new facility allows registered modo users to comment on, discuss and enhance the documentation directly. The docs also benefit from a ratings mechanism. The modo documention is a "living" document which will be updated between releases.

With the new RayGL(tm) viewport rendering mode you can see a ray-traced view of your scene in any OpenGL viewport, using any projection. This is a 'live' view that enables you to model or sculpt on an object while seeing the result in near final rendered quality. Numerous system preferences are exposed that let you define the style of updating, quality level and what specific visual effects (e.g. refractions) you wish to see in the viewport.

Render Region Tool lets you specify an area in an OpenGL view that is to be rendered. This enables the Render Region option interactively in the OpenGL view. Thus, you can transform the region and see the result in Preview. This is useful to concentrate updates to only specific areas which will update faster, giving more rapid feedback for complex scenes.

An improved Shader Inspector in the Preview Renderer is provided. It shows the evaluated value for each shader layer under the mouse along with the effect name. It also displays the light intensities reaching the point under the mouse: from global illumination and also from each light.

In the Preview Renderer, you now have a mechanism to easily see the impact of a single Shader Tree layer. The 'Effect' button will allow you to disable and enable a 'Current Layer Overlay' function which will (if enabled) display the currently selected Shader Tree layer as an overlay on the rendered image and display the raw value unaffected by things like blending mode, opacity or shading. So if you have a map on the subsurface color channel, it will display the raw color of the map. For groups, the popup will display the group mask opacity. This is very handy to debug texturing and see what is affecting what in your rendered image.

A multiplier now allows you to adjust how far the pointing device has to be dragged to rotate the view in Trackball mode when using either a mouse or tablet.

You can make item presets for your render settings. If you include a camera in the selection while making the preset, it will be included in the preset and added to the scene upon application. This is handy for setting up standard renderings that you want to perform on a scene repeatedly - for design review by others for example.

Visualizing UV distortion in 3D space is now easier. The UV view can now show the distortion of UV polygons against 3D polygons as RGB colors and you can display this as a vertex color map in a 3D view as well.

Project directories are now supported in modo. You can now create a directory hierarchy for a project and have modo remember all file dialog paths on a per-project basis.

A crash recovery dialog asks you if you want to reload your last auto-save on the next start.

The Linear Falloff in modo now has a popup labeled 'Symmetric' which makes the falloff extend in both directions from the end you choose. This makes it easier to mirror the impact of Linear Falloffs.

The Preset Brush tool has been renamed to Image Brush to more accurately describe what it is.

There is a new Camera View Heads Up Display that is shown in the viewport when you have a locked camera and it is the Render Camera.

Cameras have camera effects like DOF, motion blur and stereoscopic.

User Channels and Tags can be assigned directly in the Item's Properties. This provides a mechanism for adding (and removing) custom user channels, and tags (comments and descriptions).

A Preset browser showing available 2D profiles has been added to Bevel tool.

A Search function for the Items list and Shader Tree layers has been added. You can now perform simple search operations to quickly locate a material in the Shader Tree by searching for the name, such as, `Rusty'. Search results can be seen in a Flat list vieweing mode if desired.

Filter Items in Shader Tree allows you to restrict your view to any desired combination of the following categories; meshes, lights, cameras' textures, backdrops, instances, deformers, groups and locator items.

Tool Stacks are introduced. These let you set the default Action Center, Action Axis, Brush, and Snap behavior that you prefer. For example, if you specify that Grid Snapping is on by default, then Pen Tool is used, Grid Snapping will be turned on if you toggle on the Snapping state.

When you drag a transform handle, you now have 1D snapping to background elements.

A Fixed Snap toggle has been added to Geometry Snap. This toggle, when enabled, forces modo to only position the moving element to snapping positions. Normally moving elements would move, and then snap as they neared an element, but 'Fixed Snap' jumps the elements between snap-able positions.

The Preset Browser can now be scrolled horizontally.

Zooming in the Preset browser is modified such that dragging the zoom slider now is changing the number of thumbnails that fit across the browser, as opposed to the pixel size of the presets. Detents drawn in the slider's slot help identify where the steps are.

You can now right click on the Items List to open the context menu and select the Lock/Unlock option and, if locked, a small lock icon will appear next to the item name to indicate its state.

A new Color Picker is added with HDR support and extensible color models (via the modo Plug-in SDK). The new color picker is customize-able and lets you set the way the color space is displayed so that it matches your workflow.

New stereo camera move controls are provided as stereoscopic handles on Camera Transforms. You can now interactively set the convergence distance, which specifies where the 'screen' is in the 3D space, with things closer to the camera than that distance apparently coming out of the screen, and more distant objects appear to be going into the screen. There are two new handles when using the move tool on a stereo camera. One handle lets you adjust the convergence distance, by moving a virtual screen plane back and forth in the frustum, the other is the "parallax offset probe" (see below).

A new "Parallax offset probe" option in a stereo-enabled camera lets you measure the parallax offset at any point in your scene. The reported values can help you in calculating the 'stereo budget' of the shot, which is the total amount of parallax offset between the foreground and background. You can move the camera around your scene to see the parallax offset at any point.

Photometric Light shape preview is introduced. When you apply an IES light profile you can see a wireframe representation of the profile in OpenGL . A displaced wireframe sphere is drawn at the light position with its radius based on the intensity of the associated photometric data file (IES or EULUMDAT).

There is a new System preference to let you enable or disable displacements in OpenGL. This can be useful for improving display performance on heavy scenes with a lot of displacement.

UV tiles can now be rendered, displayed in OpenGL and painted on.

Tool buttons are now automatically disabled when activating the tool at a time when the buttons are not useful in that context.

It is now easier to load "Kits," which are a collection of configs, resource images, scripts, plug-ins and content that add a specific set of features to modo.

The referencing system in modo 501 has been re-factored and is now more robust.

modo can now be commanded remotely by an external application through a socket using something similar to the telnet protocol to issue commands and read out queries.

Crtl-Shift-S is a new key combination to open the Save Scene As dialog box in modo.

Scripts can now suspend the undo function of modo, offering significant memory savings in complex scripts.

A 64-bit version of the SolidWorks file loader is provided for use on 64-bit Windows. The plug-in can load SolidWorks 2009, 2010, and 2011 .SLDASM and .SLDPRT files.

COLLADA Export Scene I/O options are now displayed in System Preferences.

User Configs and User Scripts directories can now be opened from the System menu.

The Paint layout has been updated to provide access to content and tool presets as well as Image Inks in a Preset browser tab section.

Many tool bars have been streamlined to reduce clutter.

You can now ask modo to check for updates daily, weekly, every launch or never in the System Preferences.

Item Tag definitions can now be set in System Preferences and you can also create new tags there.

In System Preferences, you can now set the max recents displayed for categorized lists and searches.

In System Preferences you can now reset dialogs previously suppressed by the "In the future" popup.

You can now add your own custom thumbnails from images or the last render to Presets.

Additional access to various Luxology website pages such as the User Gallery are provided from the Help menu.

Many new scene files and presets are provided in modo 501 that provide brushes, meshes, rigs, materials - even a set of handy monster teeth! Much of this new content is designed to specifically use new modo 501 features and workflows.

modo for Windows can now work with RPC(tm) Content from ArchVision. This provides a new way to populate scenes with people, automobiles, furniture, animals and other content with a very low polygon count. Added primarily for AEC visualization.

For more information on modo 501 and the modo community, please visit www.luxology.com.