Changelog 12.x

12.5.8 - 2017-11-16

- Fixed linear interpolation of subdivision mesh attributes in NSI.

12.5.7 - 2017-10-17

12.5.6 - 2017-10-15

- Improved behavior of color override in outline rendering.

12.5.5 - 2017-10-12

- Fixed a bug which could cause extremely poor performance for some scenes.

12.5.4 - 2017-09-20

- Fixed multilight deepexr output.

12.5.3 - 2017-09-15

- Added 3Delight for Maya 2018 plug-in.

12.5.2 - 2017-09-14

- 3Delight for Katana:
    - The plug-in is not compatible with this version of 3Delight anymore and will only be offered in the 13.0.x packages from now on.

12.5.1 - 2017-07-21

12.5.0 - 2017-07-14

- 3Delight for Katana
    - The mesh light was split into a *Mesh Light* and an *Incandescence Light*.
    - The incandescence light now works on network materials which have a connection to the incandescence parameter.
    - Cylinder area light shape is now better positioned compared to other shapes (#6656).
- NSI: attribute nodes can now be connected to set nodes. Attributes will affect all objects in the set.

12.0.169 - 2017-07-07

- Improved threading performance on windows platforms. One can expect gains of up to 10% on a 16 core dual socket machine.
- NSI: Fixed a performance bug with scenes containing massive amounts of instances (speed gains can reach x50).
- 3Delight for Katana:
    - "Spherical" project in the environment lights has been renamed to "Spherical (latlong)" to give a clue about its meaning.

12.0.168 - 2017-07-06

- 3Delight for Katana:
    - Added VMPs for light filters.
    - Fixed float and color ramp widget (#6607).
    - Area lights are not normalized by default (this changes existing scene lighting)

12.0.167 - 2017-06-30

- 3Delight for Katana:
    - Added a default material to geometry. When no material is defined, an easy to spot material will be shown.
    - A tidier NSI graph state for materials (3dfk:05077d61cb6) and for live updates (3dfk:549ab2541). This doesn't affect the image but does affect memory usage minimally.
    - Correctly handle the "{attr:xxx}" syntax of shader parameters.

12.0.166 - 2016-06-23

- 3Delight for Katana
    - Add a layered menu for shading node creation. Presse the 's' key for shader selection. Textures are automatically connected to a place2dTexture or a place3dTexture node.
    - The mesh light now supports groups as well as single primitives.
    - Added a mode for the mesh light where it controls the incandescence of the original mesh instead of creating a light from it. This works if the material has proper incandescence shader parameters.
    - Fixed decay filter behaviour when the light is scaled. The distances in the filter now correspond to actual scene distances.
    - Add *Live Render Filters* to assembly and components.
    - Better handling of scene graph errors. Errors are now reported in the render log.
    - Revised the *DlYeti* node *Location* parameter. It is now called *Name* and specify the scene graph location of the *yeti* scene object.
    - Added mini state badges to DlYeti node.
- 3Delight: Radiance HDR images are supported directly (without the need to run `tdlmake` on them) although this step is still recommended.
- 3Delight Display: fixed inverted statistics in Statistics tab.
- NSI: some global host variables (licensing, network cache) can now be initialized through the "`3delight.config`" initialization file.

12.0.165 - 2017-06-17

- 3Delight for Katana
    - Implemented "Live Render from Viewer Camera" (#6630)
    - Changed default curve for decay filter and fixed catmull-rom and bspline curves.
    - Fixed default visibility of environment lights. Existing lights will need to be recreated or made visible with VisibilityAssign.
    - Fixed orientation of environmentLight and 3DelightSky shaders.
- Fixed a bug with CSG in secondary rays (#6624).
- NSI: Added support for deep output. Deep output is also support on AOVs and in multi-light renders.

12.0.164 - 2017-06-16

- 3Delight for Katana
    - The gobo light filter now follows manipulators used on its location by default. It can still optionally be made to track the light source instead.
    - DlYeti attributes are now editable during live render.
    - The VisibilityAssign node is now supported (#6537).
    - Both 3Delight Display and the Monitor are used as the default frame buffer (#6561).
- NSI: support live render changes to displacement (#6568)
- NSI: fix particles orientation. Disk particles were oriented the opposite way.

12.0.163 - 2017-06-14

- 3Delight for Katana
    - Added Yeti procedural hair support via DlYeti node.
    - Print 3Delight version when starting Katana (#6604)
    - Added multiplie area light shapes support (disk, sphere, cylinder).
    - Improve distant light attributes. Scope CEL was improved to include only distant lights. So the attribute no longer shows up in the attributes tab for other light types. The *Angular Diameter* has now a help text.
- NSI: Improved particles int two aspects: a) oriented particle disks are now supported and b) particles emitting light are now sampled with same quality as any other light.

12.0.162 - 2017-06-07

- 3Delight for Katana
    - Fixed rendering of materials baked into a look file.
    - Material overrides on groups or geometry are now supported.
    - Fixed python errors on plug-in load for some systems.

12.0.161 - 2017-06-07

- 3Delight for Katana
    - Added decay light filter.
    - Added aim constraint option to spot and area light.
    - Fixed barn doors on spot light.
    - Fixed rendering of assemblies and components.

> ⊘ 3Delight for Katana has issues in this build and we do not recommend to install it. Version 12.0.162 will fix the problem.

12.0.160 - 2017-06-02

- *NSI*:
    - Add support for "named coordinate systems. Any transform node can now be used as a coordinate system.
    - fix a crash bug with live edits of environment nodes.
- 3Delight for Katana:
    - Introducing a mechanism to declare light filters. First available filter is the Gobo filter.

12.0.159 - 2017-05-31

- *3Delight for Katana*:
    - Fixed a bug which caused the plug-in to not load when not first in KATANA_RESOURCES.
    - Rendering without a DlSettings node now works (uses default render settings).
    - *Maximum Distance* behaviour change: 0 means no indirect bounces (does not disable maximum distance feature as before).
    - Maximum distance setting is now set to 1000 by default
    - Use asset widget (`assetIdInput`) for input file parameters in OSL shaders.
- *3Delight Display*: fixed a key repeat problem on OS X 10.10.x

12.0.158 - 2017-05-26

- *3Delight for Katana:* Overrides, except resolution, can now be changed in Live render.
- *3Delight Display: fixed export of EXR files (*some resolutions produced bad EXRs*).*

12.0.157 - 2017-05-19

- 3Delight for Katana:
  - The region of interest may now be changed during a live render.
  - The frame outside the region of interest is now rendered as well in preview and live renders. It is simply rendered after the region of interest.

12.0.156 - 2017-05-17

- NSI: Up to 40% faster render of cubic curve geometry.
- NSI: added support for Hair ray types visibility (`visibility.hair` attribute on an `attributes` node).
- NSI: improved general performance of live scene edits
- 3Delight Display: fixed refresh problems of buckets' outlines.
- 3Delight for Katana:
  - Light edit UI now show upstream values.
  - Use proper data format when saving images to file (was always using *half* floats).
  - Added Maximum Ray Trace Distance parameters in DlSettings' Quality group.

12.0.155 - 2017-05-04

- NSI: optimisation brings a 2% to 7% speed boost, depending on scene complexity.
- 3Delight for Katana:
  - Better performance for OSL shaders and texture lookups.
  - Fix vertical scroll bar behaviour in the Multi-Light section.
  - The render progress bar is now functional.
  - Allow adding a rig during live render.

12.0.154 - 2017-05-01

- NSI: Fixed a crash in motion blur (#6589).
- NSI: subdivision surfaces render about 10% faster.
- NSI: smoother live render experience.
- NSI: Added some missing statistics.
- NSI: fix shading problems due to absent ray normalisation.
- NSI: fixed a crash in editable renders when statistics were enable.
- NSI: adding a "matte" attribute that can be set on attributes nodes.
- 3Delight for Katana:
  - Fix rendering to Monitor.
  - Fixed a bug which caused some scenes to render several times too
  - Various UI adjustments in DlSettings.
  - Subdivision surfaces are now exported without normals for a much smoother look.
  - Enable "Duplicate" button in the Layers section.

12.0.153 - 2017-04-25

- 3Delight For Katana:
  - Adding the "matte" attribute to DlObjectSettings to make the underlying object "matte"
  - Fixed layer ordering bug (#6462)

12.0.152 - 2017-04-21

- OSL: surfaceara() on NSI's environment node now returns the real area on the sphere, which is the solid angle in this case.
- Fixed numerical stability issues with tiny angles.
- NSI: added space partition statistics.
- 3Delight for Katana:
  - Add "Display all Lights" toggle in the Multi-Light section (#6443)

12.0.151 - 2017-04-12

- Improved compatibility with older linux distributions.

12.0.150 - 2017-04-12

- Fixed NSI camera location. They were incorrectly offset by the near clipping plane (#6560)
- NSI/OSL: fix a bug that allowed rays to travel past their max depth limit.
- Live render produces smoother renders at te 1st and 2nd corse layers.

12.0.149 - 2017-04-11

- Fixed shader getattribute() on NSI face sets.
- NSI: fix a bug with faceset nodes (#6576)
- NSI: Better sampling of directional lights.
- NSI: The C++ interface now supports NSI::DoubleArg as a parameter to NSI functions.

12.0.148 - 2017-04-09

- OSL: we now support the holdout() closure
- NSI: better texture filtering at gazing angles
- 3Delight for Katana:
  - Added distant light.

12.0.147 - 2017-04-04

- NSI: Add support for directonal lights as defined by NSI's specs.
- NSI: fixing crashes related to Live Render and displacement shaders (#6558)

12.0.146 - 2017-03-31

12.0.145 - 2017-03-31

- NSI: added support for multiple environments in one scene.
- NSI: basic support for distant lights. Sampling is not optimal.
- NSI: adding "angle" attribute to environment nodes.
- NSI: better derivatives computation for displaced surfaces.
- *3Delight for Katana:*
    - Use circular bucket scanning for live renders.
    - Allows switching between subdivisions and polygonal meshes in live renders.
    - Removed location widget from *DISettings* SuperTool.
    - Implemented Mute and Solo features.
    - Fixed initial light linking condition bug.

12.0.144 - 2017-03-30

- NSI: renaming "glossy" rays to "specular" rays. This is the case both in OSL and in NSI.
- NSI: better derivatives on fine displacement.
- *3Delight for Katana*:
    - Implemented subdivision mesh export.

12.0.143 - 2017-03-29

- Fixed a crash when OSL environment shader is invalid.
- NSI: introducing smooth subdivision surfaces
- NSI: fixed a memory leak
- NSI: Adding *face sets.* A new NSI node allowing to set attributes on arbitrary geometry faces. Attribute can be anything from visibility to surface or displacement shaders.
- NSI: better displacement.
- NSI: Fix a bug with instances. The bug was slowing down startup time and leaked memory.
- *3Delight for Katana*:
    - Honour number of threads set in *RenderSetttings.*
    - Added "Visible to Camera" toggle on light SuperTools.
    - Skip some shaders when listing materials.
    - Filter shaders by their type in Material lists.
    - Renamed "Glossy" to "Specular" ray depths. We will be sticking with this nomenclature in NSI and OSL.
    - Revised light super tools material assignment: they now use the same mechanics as normal material assignments and go by the *Katana way.*
    - Added support for Matrix shader parameters.

12.0.142 - 2017-03-21

- NSI: improved render initialization performance.
- NSI: added support for inter-object visibility. This is a generalization of such features as *Light Linking.*
- NSI*:* improved live render performance *snapy-ness.*
- NSI: robustness fix in Python binding: SetAttribute can now receive 0x0 data for string parameters (will be considered as empty).
- Fixed a potential crash bug in 3Delight statistics. Also fixed a memory leak in the same area.
- 3Delight for Katana:
    - Output primitive variables attached to XGen curves (When using DIXGen SuperTool).

12.0.141 - 2017-03-16

- NSI: added support for environment nodes, as per the specification. As with everything else, environment nods live edits as supported.
- NSI: added a configurable trapezoid filter for motion sampling.
- 3Delight for Katana:
    - Hide area light meshes from camera by default.
    - Added support for light linking.
    - Fix camera XForm live update.

12.0.140 - 2017-03-05

- NSI: added particles node support. As per the specifications, this node allow rendering of tiny particles.
- NSI: added support for all visibility attributes.
- NSI: improved documentation formatting.

12.0.139 - 2017-03-03

- Changed naming of channels in exr layer which is geometric data (point, vector or normal) to more compatible R, G and B instead of the more descriptive x, y and z.
- NSI: curves can now support deformation blur.
- NSI: curves can be specified as a b-spline, in addition to the already supported catmull-rom basis.
- NSI: update particles node documentation.

12.0.138 - 2017-02-28

12.0.137 - 2017-02-23

- NSI: slight improvement in memory consumption for geometric primitives.
- NSI: full support for OSL displacement shaders. Note that displacement shaders are run in *object* space*.*
- NSI: update nsi.pdf manual.
- NSI: `NSIDisconnect()` now accepts a ".all" first parameter for mass connections deletion.
- NSI: transformation edits (live render) are now supported on objects.
- NSI: add a "`.global`" node for global scene configurations/settings (refer to manual).
- NSI: enable memory statistic in NSI renders.
- NSI: fixed a memory leak.
- NSI: updating *Lua* interface to accept geometry attributes.
- NSI: fixed a bug in `NSIDeleteAttribute()`.
- **`renderdl`** can now execute *Lua* scene descriptions directly using the '`-lua`' command line argument.
- *3Delight for Katana*:
    - Handle material assignments live updates
    - Export ID pass for Katana monitor
    - Re-worked the DISettings dialog

12.0.136 - 2017-02-10

- NSI: embryonic support for OSL displacement shaders.
- *3Delight for Katana:*
    - Enable live update of light material
    - Enable live material updates
    - Export rigs as NSI sets for grouping of lights (Multi-Light feature ported to NSI)

12.0.135 - 2017-02-09

- Due to some changes in our build system to support C++11, **a more recent version of glibc and libstdc++ are now required to run 3Delight**.
- NSI: fixed a problem which cause some textures not to load at all.
- NSI: fixed issues with back facing geometry. This also fixes OSL's `calculatenormal()` shadeop in NSI's context.
- NSI: added a "sortkey" attribute to the output layer node to enable layer sorting in an output driver.
- **NSI: changed camera handedness to better conform to most VFX packages. The camera now looks towards -Z (right handed).**
- Can send normal channels exr and deepexr in the same file.
- 3Delight is now 5 to 10% faster on linux.
- *3Delight for Katana:*
    - Camera now move in live render
    - Removed *Image Resolution and Camera* in DISettings (redundant)
    - Introducing DlObjectSettings

12.0.134 - 2017-01-30

- Fixed a bug which could sometimes cause renders to take extremely long to finish.

12.0.133 - 2017-01-25

- Fixed a bug which could cause uneven displacement quality over a primitive when it is very large on screen.
- Added support for single channel exr files to tdlmake.
- NSI: added support for light sets.

12.0.132 - 2017-01-12

- Fixed a potential crash introduced in 12.0.131.

12.0.131 - 2017-01-11

- **`i-display`**: fixed navigation key problem on OSX 10.12.
- Fixed light sampling issue with some motion blur settings.

12.0.130 - 2017-01-10

- Fixed artifacts in some environment lookups with trace().
- Added "apertureaspectratio" parameter to RiHider().

12.0.129 - 2017-01-08

- Fixed some speckles with subsurface.

12.0.128 - 2017-01-04

- Fixed raytraced subsurface intensity with large pixel samples setting.
- Fixed possible raytraced subsurface artifacts with thin objects and large pixel samples setting.

12.0.127 - 2016-12-27

- **`i-display`**: first step for a better ETA. Replaced "Estimated Render Time" by "Estimated Remaining Time"**.**

12.0.126 - 2016-12-21

- **`i-display`**: fixed a crash for Mac with improvement of speed navigation frame.

12.0.125 - 2016-12-17

- **`i-display`**: improvement of speed navigation frame with shorcuts left and right for Mac.
- **`i-display`**: fixed a crash which occurs with info dialog opens when render many layers with Maya.
- **`i-display`**: added new item "Render started" in Summary tab.

12.0.124 - 2016-12-07

- **`i-display`**: fixed a crash which occurs after images have been deleted.
- NSI : Camera is now configured using the attributes from the "perspectivecamera" node.
- **`i-display`**: Load/save "Enable interactive adjustments of lights in the scene" in preferences.
- **`i-display`**: Clicking on texture name in scroll list of scene tab info opens texture image.
- *3Delight for Katana*: add support for IDs which allow selecting objects from the *Monitor.* Note that for now only 3Delight materials support IDs.

12.0.123 - 2016-11-25

- Fixed a bug with single sided OSL lights which don't have quadratic decay.
- *3Delight for Katana:* fixed EXR file output.
- Improved scalability and performance of the OSL path tracer. Gains are especially visible on Windows where a 15% performance improvement is possible (scene dependent).

12.0.122 - 2016-11-23

- 3Delight for Katana is now included in the packages.

12.0.121 - 2016-11-18

- OSL path tracer has been improved in speed and threading scalability. Scenes will render 10% to 30% faster. Scenes relying heavily on textures will improve the most.
- NSI: introducing a C++ wrapper (include "nsi.hpp").

12.0.120 - 2016-11-14

(internal build)

12.0.119 - 2016-11-14

(internal build)

12.0.118 - 2016-11-13

- New light sampler performance has been slightly improved (5%).
- **`i-display`**: *Save as JPEG* sometimes produced bad images when exporting many files; this has been fixed. Improved behaviour of "*Actual Size*" button: it is now lit differently when the image is already displayed in its original size. Improved display of timing statistics.

12.0.117 - 2016-11-06

- Fixed a crash in the new OSL light sampler with some shaders.
- **`i-display`**: performance of the contact sheet mode have been improved and the effect is now smoother.

12.0.116 - 2016-11-02

- New light sampler for OSL. This new technology allows rendering of vast amount of area lights. See Geo Light Sampling Algorithms Comparison for a comparison with existing technology.
- Fixed a bug which would cause some trim curves to hang.
- Fixed accuracy of smoothstep().
- Fixed wrong statistics in ray counts when using the OSL path tracer.

12.0.115 - 2016-09-28

- Improved performance and quality of texture lookups in OSL. We timed the filtering code to be x3 to x4 times faster. The system now offers three different filters: linear, quadratic and cubic.
- Implemented mirror wrap mode in OSL texture() call.
- Implemented "missingcolor" in OSL texture() call.
- NSI: primitive variables and their derivatives are now correctly transformed.
- NSI: fix shading of instances. The shading space was incorrect.
- **`i-display`**: fix banding issues in the thumbnail.
- NSI: completed implementation of NSISetAttributeAtTime.

12.0.114 - 2016-09-12

- NSI: added support for holes in polygons.
- NSI: optimized general scene parsing operations.
- NSI: fixed an IPR crash bug.
- NSI: added basic support for primitive variables in NSI.

- NSI: reduced global memory usage. Large scene can take up to 30% less memory.
- NSI: lua scripts can now receive double precision values.
- Upgraded OSL library version.
- Made texture statistics more readable.

12.0.113 - 2016-08-26

- NSI: fixed matrix orientation, it now matches OSL matrix orientation.

12.0.112 - 2016-08-24

- Fixed a precision problem when reading 32-bit float OpenEXR files
- Fixed a crash in `i-display` occurring during image loading while using the *Contact Sheet* (#6368)
- NSI: minor corrections to the documentation
- OSL: implemented debug() closure

12.0.111 - 2016-08-11

- `i-display` : better handling of color space conversions. PNG and JPEG images are now considered to be in sRGB space when loaded.
- `i-display`: don't change thumbnail selection when playing (#6110)
- NSI: started implementation and tests of scene edit operations

12.0.110 - 2016-08-08

- NSI: starting documentation of nodes related to image output
- NSI: make some standard libraries available in a LUA context
- NSI: Implemented `NSIDisctonnect` (nsi.Disconnect in LUA)
- Minor optimisations to the ray-tracer when using motion blurred light sources. Performance gains are measurable only on relatively trivial scenes.
- Fixed naming problem in EXR files.
- `i-display`: fix color space of the drag & drop cursor when dragging an image from the thumbnail (#5769)
- `i-display`: draw a graphical hint when dragging many images at the same time from the thumbnail
- `i-display`: properly scroll thumbnail when selecting images (#5348)
- `i-display`: apply reference white and black points to the background plate (#5347)

12.0.109 - 2016-07-26

- Fixed a crash with the OSL renderer on windows 10.

12.0.108 - 2016-07-19

- OSL: improve motion blur sampling in the OSL renderer

12.0.107 - 2016-07-11

- OSL: Updated OSL libraries to the following head: d3abea49b89872bc1358714a
- `i-display`: added graphical representation (docked view) of statistics inside the rendering window. Statistics are saved along with the file and can be viewed when the file is reloaded into i-display.
- NSI: enable area light sampling for area lights declared using `NSIMeshNode`
- OSL: invert normal and *eta* when shading back-facing surfaces. This simplifies shader writing and avoids using un-desirable faceforward() in OSL shaders
- OSL: Adding "curve:t" to known OSL attributes (#6328). Returns a quantity varying from 0 at the base of the curve to 1 at the tip. This is the equivalent of the "v" parametric coordinate in the RenderMan World.

12.0.106 - 2016-07-06

- `i-display:` Disable *Save As ...* while rendering an image
- `i-display:` Don't crash saving empty JPEG images

> ⊕ Due to a potential crash, do not use this version if you use the OSL renderer.

12.0.105 - 2016-07-01

- `i-display`: fixed performance issues when rendering in *Contact Sheet* mode. The animation of the *Contact Sheet* is now smooth.
- `i-display`: fixed a crash occurring when rapidly manipulating the thumbnail view with the mouse.

12.0.104 - 2016-06-29

- **i-display**: disable color space transformations when viewing JPEG images.
- Fixed incorrect raytraced subsurface with multicamera render.
- Fixed matte support in deep exr output.

12.0.103 - 2016-06-28

- **i-display:** Only list "displays" OCIO profiles in the *View Color Profile* menu.

- Changed behavior of edge color override so an object without the override in front of one which has it can have priority.

12.0.102 - 2016-06-23

12.0.101 - 2016-06-18

- Fixed a bug with vertex displacement on subdivision meshes (#6320).

12.0.100 - 2016-06-14

12.0.99 - 2016-06-09

- Fixed deep exr compression with filters which contain negative lobes (eg. sinc).
- Fixed output of alpha channel to exr when a display subset is used.
- Improved DeepEXR compression algorithm. Opaque areas can now contain only one sample instead of a minimum of 2 or 3 previously. This considerably reduces the file size without affecting quality.

12.0.98 - 2016-06-03

- Introducing a new deep EXR compression algorithm that runs up to x20 times faster.

12.0.97 - 2016-06-01
12.0.96 - 2016-05-29

12.0.95 - 2016-05-26

- A different MIS sampling strategy for the GTR brdf helps fight noise artefacts with low "gamma" values (long highlight tails).

12.0.94 - 2016-05-25

- OSL: fixed support inside 3Delight for Maya. Previously, only environment was rendered properly when using Multi-light (#6287).
- Fixed rendering of very thin curves in some scenes.

12.0.93 - 2016-05-19

- Fixed a crash in **i-display** that happened when opening very large textures with mipmaps inside (#6279).

12.0.92 - 2016-05-13

- Fixed deep output when using OpenVDB volumes.

12.0.91 - 2016-05-10

- Added support for __edgethresholdscale. This shader specified variable scales the threshold used to perform edge detection.

12.0.90 - 2016-05-08

- Fixed a crash with very large shaders compiled with -O0.
- Fixed attribute() sometimes not working when reading point, vector or normal attributes.

12.0.89 - 2016-05-05

- `i-display`: Avoided using TIFF as the default file type when saving rendered images. Complete image name is used instead.

> ⊕ The `<rif.h>` file has changed in this in this version meaning that Rif Plugins need to be recompiled.

12.0.88 - 2016-04-28

- Fixed artifacts with edge detection depth based fadeout.
- Implemented facevaryinginterpolateboundary subdiv tag value of 2 to make facevarying variables behave like facevertex.

12.0.87 - Removed because of crash

12.0.86 - 2016-04-25

12.0.85 - 2016-04-19

- OSL: Completed support for multi-light rendering.
- `i-display`: improved playback speed. Sequences now playback at 60fps without "glitches".

12.0.84 - 2016-04-13

- OSL: Implemented partial support for light categories.

12.0.83 - 2016-04-05

- Improved performance of some cases of volume rendering.

12.0.82 - 2016-04-04

- Improved rendering of multiple volumes.

12.0.81 - 2016-04-01

- Fixed unstable displacement with instances.

12.0.80 - 2016-04-01

- Fixed output to deepexr with multiple cameras.

12.0.79 - 2016-03-31

- Fixed Z output with motion blurred camera.

12.0.78 - 2016-03-28

- OSL: Fixed incorrect indirect illumination. Namely, indirect illumination originating from environment lighting was not properly computed. Renders would appear darker than normal when using environment lighting.

12.0.77 - 2016-03-25

- Fixed a crash.
- Fix a problem that caused renders to wait a couple seconds before finishing when statistics where enabled. This issue has been introduced in package 12.0.75.

12.0.76 - 2016-03-23

- OSL : improved sampling of subsurface closures so it matches the noise level of other closures.
- OSL : implemented clipping planes.

12.0.75 - 2016-03-22

- Fixed a bug which caused some renders to take a very long time to finish.

12.0.74 - 2016-03-18

- Fixed a memory leak in the OSL renderer.
- Better memory management on Windows systems when using large amounts of subdivision surfaces. A 5% memory improvement has been observed on test scenes.

12.0.73 - 2016-03-17

- Improved crack-removal strategy for displaced surfaces.

12.0.72 - 2016-03-17

- Fixed RiAttribute "displacement" "level" functionality when using the REYES renderer.

12.0.71 - 2016-03-16

- Fixed a precision problem with vertex displacement.

12.0.70 - 2016-03-16

- Fixed a precision problem with instances.

12.0.69 - 2016-03-14

- OSL: fixed subsurface scattering bug (subsurface effect had wrong intensity).
- Fixed displacement quality issues when rendering instances (#6199).

12.0.68 - 2016-03-09

- Fixed some interior shaders not being rendered (#6198).
- Fixed occasional hang of deep exr output (#6200).

12.0.67 - 2016-03-07

- Fixed a problem in i-display that caused renders to abort as soon as they start (#6197).

12.0.66 - 2016-03-03

🛇

> ⊕ Due to a bug in i-display, renders would abort after launch. Do not use this version. Previous available and stable version is 12.0.64. Version 12.0.67 fixes the problem.

- OSL: 20% performance improvement on production scene with medium quality settings (shading samples of 200 to 300). For high quality settings (300 to 1000), one can expect 40% performance gain.
- OSL: pre-pass performance scales better with *Shading Samples* setting. When using relatively low settings (about 50 shading samples) can make the pre-pass go x4 faster.

12.0.65 - 2016-02-26

- OSL shaders are now found using the search paths.

12.0.64 - 2016-02-25

- Speed improvements to the GGX BRDF. We timed up to 3% acceleration on scenes that use this BRDF heavily (e. g. OSL 3Delight Material).
- `i-display:` zoom in and zoom out transitions are now smooth. Added short cut "Ctrl +" and "Ctrl -" to the zoom action in the menu.
- Fixed a bug where setting the matte attribute on one instance would affect all instances of the same object.

12.0.63 - 2016-02-23

- Fixed a crash when using progressive rendering with the OSL path tracer introduced in version 12.0.62.
- Optimized renders with global illumination. Some scenes may be up to 10% faster.
- Fixed a bug with OSL and UDIM textures (#6176).

12.0.62 - 2016-02-18

- Added support for AOVs in the OSL path tracer.

12.0.61 - 2016-02-17

- OSL: Improved sampling of the GGX and GTR functions (removal of noise or "speckles").

12.0.60 - 2016-02-16

- Fixed some valid OSL networks being reported as having a cycle (#6161).

12.0.59 - 2016-02-14

- Fixed OSL transparency bug when a given closure had a negative weight.
- Fixed crash bug with Open EXR files that used to "autocrop" option.

> ⊕ Due to a bug introduced in 12.0.55, renders that save EXR files could produce random crashes. Please update to this version or higher.

12.0.58 - 2016-02-12

- Fixed problems with edge detection when output to a single exr file with other layers (#6150).

12.0.57 - 2016-02-09

- Fixed a bug with OSL GI and transparent surfaces (#6144).

12.0.56 - 2016-02-05

- Fixed visibility of volumes in some cases (#6141).
- Fixed a potential OSL rendering performance issue introduced in 12.0.50.

12.0.55 - 2016-02-02

- `i-display:` now takes half the memory when rendering floating point data (such as data saved to EXR files).
- Technical: display drivers can now ask for "half" data type (16-bit floats). This is done using the `PkDspyFloat16` (refer to the `'ndspy.h'` file).

12.0.54 - 2016-02-01

- Fixed a crash with message passing from light shaders (#6136).

12.0.53 - 2016-01-31

- i-display: Fixed some UI glitches in the toolbar (#6127).
- i-display: Fixed layer name display consistency in various UI elements (#6127).
- i-display: Now support half-float natively. Before, half images (such as EXRs) were stored as 32-Bit floats in memory. The net effect of this change is lower memory usages in most common situations.

12.0.52 - 2016-01-27

- Added basic support of spot lights in OSL renders. The following parameters are supported: `color`, `intensity`, `decayRate`, `coneAngle`, `penumbraAngle` and `dropoff`.
- Fixed an OSL subsurface bug.

> ⊙ OSL Rendering passes area not working in *3Delight for Maya*.

12.0.51 - 2016-01-26

- Fixed an OSL subsurface bug introduced in 12.0.50.

12.0.50 - 2016-01-25

- Fixed infinite values caused by subsurface scattering in some OSL renders.
- Fixed output of multiple deepexr files.
- OSL texture() call now supports UDIMs.

12.0.49 - 2016-01-18

- Improved environment map sampling for some maps.
- Fixed a source of speckles in some renders.
- i-display: Now supports trackpad multi-touch input. Two fingers swipe scrolling (with inertia) and pinch zooming gestures are supported.

12.0.48 - 2016-01-12

12.0.47 - 2016-01-04

- i-display: Fixed troubles when rendering from inside *Maya.*

12.0.46 - 2015-12-29

> ⊙ i-idisplay doesn't properly accumulate images rendered from Maya. Please use 12.0.47.

- Improved OSL statistics.
- Added high quality environment sampling to the OSL renderer.
- Fixed subtle problems with displacements when using the OSL renderer.
- Improved transparency in the OSL renderer.
- i-display: Now supports OCIO configurations.
- i-display: Fixed rendering issues in thumbnails.
- i-display: Better rendering of the region tool when in *Contact Sheet* mode.

12.0.45 - 2015-12-19

- i-display: Added an application icon.
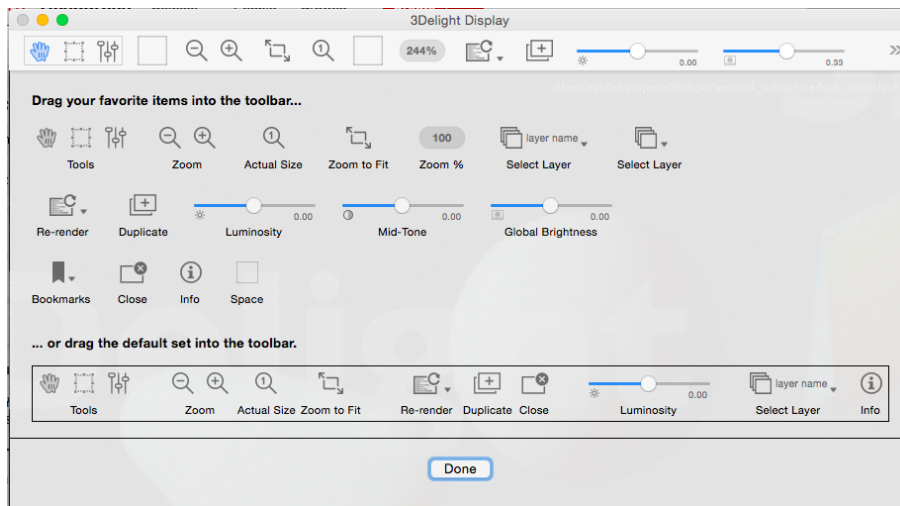- Small optimizations in the OSL renderer.

12.0.44 - 2015-12-17

- i-display: Fixed aspect ratio problems.

12.0.43 - 2015-12-12

- Improved rendering of edge detection width varying width.

12.0.42 - 2015-12-11

- i-display: Added a toolbar. It can be customised using *Windows -> Customize Toolbar.*

- Fixed a crash with interior shaders using `outputvolumefragment()` to output AOVs.

12.0.41 - 2015-12-10

- Fixed getvar(null, ...) with vertex displacement.

12.0.40 - 2015-12-04

- i-display: Added a region tool. The tool allows for easy re-render on specific image regions.

12.0.39 - 2015-12-02

- Fixed evaluation of interior shaders for transmission rays which end inside a volume box (#6061).

12.0.38 - 2015-11-21

- Added support for OpenColorIO transforms on display drivers.

12.0.37 - 2015-11-15

12.0.36 - 2015-11-14

12.0.35 - 2015-11-11

- Fixed result of shadow(), gather(), occlusion() and indirectdiffuse() with multicamera rendering.
- Fixed crashes with "osltracer" when using progressive mode.

12.0.34 - 2015-11-09

12.0.33 - 2015-11-04

- New "horizon" parameter added to trace().

12.0.32 - 2015-10-30

- Fixed DoF with spherical camera.

12.0.31 - 2015-10-24

- Fixed bad sampling of GGX and GTR distributions in some cases.

12.0.30 - 2015-10-20

- Fixed a crash with Rif filters and IPR.

12.0.29 - 2015-10-17

12.0.28 - 2015-10-10

- Improved sampling of GGX ("glass-ggx") and GTR ("glass-gtr") distributions when used to render reflection. Sampling of refraction alone, or sampling of reflection and refraction together is unchanged.
- Corrected bad area light sampling in the first passes of an IPR session (#5994).

12.0.27 - 2015-10-06

- The deepexr output now supports arbitrary pixel filters.

12.0.26 - 2015-09-25

- i-Display: a visual glitch when switching to and from full screen mode has been fixed (Mac OS X only).

12.0.25 - 2015-09-23

- Fixed subsurface sometimes being too blurry with low samples count (#6016).

12.0.24 - 2015-09-18

12.0.23 - 2015-09-17

- Added "label" parameter to subsurface() shadeop.

12.0.22 - 2015-09-17

- Fixed __edgewidthscale, __edgecolor and __edgealpha variables sometimes not working when edge detection is used with display subsets (#5995).

12.0.21 - 2015-09-10

12.0.20 - 2015-09-08

- Fixed behavior of random() with light categories. It is now the same for all light category AOVs (#6006).
- Fixed a case of incorrect texture() filtering of diffuse rays with blur (#6007).

12.0.19 - 2015-08-25

- The __edgewidthscale variable used for outlines is now selected by depth instead of using the maximum value.

12.0.18 - 2015-08-04

12.0.17 - 2015-08-01

- i-display: Fixed handling of EXR files. Features such as "data window" and "display window" were not working.
- i-display: Can now read Deep EXR files.
- Fixed uniform primitive variable output as AOVs with the raytrace hider.

12.0.16 - 2015-07-31

- Improved memory use of deepexr display driver.

12.0.15 - 2015-07-25

- **hdri2tif** is no longer part of the package.

12.0.14 - 2015-07-15

- i-display: Added multi-layer support for *openEXR* (reading and writing).

12.0.13 - 2015-07-11

- subsurface() now accepts the "subset" parameter (#5972).

12.0.12 - 2015-07-10

12.0.11 - 2015-07-10

- rayinfo("depth", ...) now correctly accounts for hair bounces.

12.0.10 - 2015-07-09

- i-display: Fixing a crash related to the *Light* Mixer (#5964).

12.0.9 - 2015-07-02

- i-display: Fixed a bug where switching to the *Contact Sheet* mode would show black images (#5957).
- Removed the different tiling choices in multi-host rendering. Only the "balanced" strategy has been retained.

12.0.8 - 2015-06-29

- i-display: Fixed a bug introduced in 12.0.7.
- Fixed artifacts (occasional bright pixels) with subsurface single scattering.

12.0.7 - 2015-06-26

🛇

⚠ In this version, *i-Display* has a bug that causes a bad refresh of incoming renders.

- Added spherical projection support for cameras (#5930 and #5948).
- Added "hairdepth" query to `rayinfo()`.

12.0.6 - 2015-06-18

- Improved sampling of area lights. Long and thin area lights are faster to sample and exhibit less noise.
- Fixed an IPR bug in with camera manipulations (parts of screen not being rendered). Issue #5946.
- i-display: Fixed a bug that affected the Drag & Drop feature (on Linux platforms only it seems but could also affect other platforms). The symptoms were the subject of a [topic](#) in the forum.

12.0.6 - 2015-06-15

- In Contact sheet mode, draws image's (or layer's) name over each image.

12.0.5 - 2015-06-11

- i-display: Fixed a crash.

12.0.4 - 2015-06-10

- Fixed a crash in raytraced subsurface scattering.

12.0.3 - 2015-06-08

12.0.2 - 2015-06-04

- trace()'s glass-ggx distribution now accepts anisotropic parameter specification ("udir" and "roughnessv").
- Fixed raytraced subsurface scattering of very thin objects.

12.0.0 - 2015-06-01

- i-display: Now supports Retina (high DPI*)* displays.

12.0.83 - Upcoming

- Improved performance of some cases of volume rendering.