User's Manual

3Delight for Maya is a fully integrated *Maya* plug-in that lets you render *Maya* scenes using the powerful *3Delight* rendering engine. A wide support of all native *Maya* geometries, lighting, shading and FX features is provided. See Limitations for more details on what is currently unsupported. *3Delight for Maya* is compatible with:

Maya versions	2013	2014	2015	2016	2016.5	2017
Operating systems	Windows 64		Linux 64		macOS 64	

The *3Delight for Maya* plug-in is designed to be easy to use and integrate all the features needed in modern production pipelines:

- Production grade Path Tracing with highly optimized multi-bounce global illumination
- Programmable shaders with ability to easily deploy custom RSL and OSL shaders in Maya
- HDRI Image Based Lighting with higher quality environment sampling
- Physically/visually plausible BSDF-based materials, including:
  - a general purpose, dual-layer, PBR material (*3Delight Material*)
  - a physical solution for (human) skin (*3Delight Skin*)
  - a complete physical solution for hair (*3Delight Hair*), simulating primary reflections (R), secondary reflections (TRT), light multiple scattering and transmission through the hair fibers (TT) and glints
  - a physical glass material (*3Delight Glass*)
  - a physical metallic material with easy controls (*3Delight Metal*)
- Area Lights (support of builtin Maya Area Light and arbitrary geometric area lights)
- Progressive final frame rendering (using the same engine as final frame rendering: and converging to virtually the same results)
- Interactive Progressive Rendering (IPR) with scene edits support for: cameras, lights and materials
- Integrated Volume Rendering of OpenVDB caches (compatible with OpenVDB 3.0+)
- Fully automatic Color Management
- LRU Network Cache for textures and archives — requires 3Delight Studio Pro
- UDIM texture support (with Mari-style UDIM tile mapping by default)
- PTEX texture support
- Sub-Pixel Displacement (analytic, no pretessellation), with support for both scalar and vector displacement (typically from *ZBrush, Mudbox, Mari*)
  - Optional Vertex Displacement (for large displacements & VDMs)
- Infinitely-smooth analytic* subdivision surfaces with support for edge and vertex subdivision creases — (* no pre-tessellation)
- Real round corners on polygon meshes via subdivision surfaces
- Powerful scene elements (sets) and image layers AOV systems
- Multi-Light Output (lights, light groups, incandescent geometry, environment light) for Physically-Based Compositing — *Path Tracing only*
- Multi-Mask Output (masks for objects, materials, or both)
- EXR (multi-channel) image file output
- High performance Deep EXR image file output supporting highly efficient compression
- Efficient simultaneous Multi-Camera rendering — Stereo / VR is the case with 2 cameras
- Spherical, Cylindrical and Fisheye camera projection rendering, compatible with multi-camera rendering — *Path Tracing only*
- Physical Lens Shaders — *Path Tracing only*
- Caustics (via *Photon Mapping or forward path tracing in OSL*)
- Anti-aliased, sub-sampled, Outline Rendering with per-variable AOV component detection and varying color/width/depthfade
- A powerful system to assign shader collections and shader overrides.
- **3Delight Display** *(a-k-a "i-display"),* a powerful cross-platform interactive image viewer with:
  - multi AOVs
  - HDPI support
  - Multi-Light Mixer
  - OpenColorIO color profiles
  - "half" datatype support
  - 4K playback support at 60fps
  - statistic display
- Ability to choose the legacy *REYES* algorithm (typically for projects with lower pixel complexity) (see Pros and Cons of REYES vs Path Tracing)
- Ability to choose the legacy *Point-Based Global Illumination* and *Point-Based Subsurface* algorithm (typically for projects with lower pixel complexity)

The *3Delight for Maya* plug-in benefits from the powerful and many unique features of the *3Delight* rendering engine:

- Unidirectional, multi bounce, forward Path Tracing (default), using either the RSL or the OSL shading framework
- Legacy REYES rendering mode, using the RSL shading framework
- High performance Volume Rendering with support of OpenVDB 3.0
- Proprietary, higher quality, environment sampling
- Physical solution (interactive, no pre-computation) for Subsurface Scattering (SSS) using the `subsurface()` shadeop, with multiple and single scattering output and ability to resolve small geometric detail.
- Physically/visually plausible BSDF evaluation via the `bsdf()` and `trace()` RSL functions, featuring the following BSDFs for direct and indirect lighting:
  `uniform, cosine, oren-nayar, blinn, ashikhmin-shirley, cook-torrance, ward, ggx (glass-ggx), gtr (glass-gtr), hair`
- Transformation and Deformation Motion Blur with support for topological changes
- Advanced OSL (Open Shading Language) support with full support of both *closures* and *patterns* in path tracing.
- RSL1.0 / RSL2.0 Shading Language support with optimizing compiler and very efficient last stage JIT compilation
- Procedural Geometry / Archives (with delayed or immediate loading)

- Dynamic Space Partitioning
- RIB I/O — *feature available with 3Delight Studio Pro*
- Distributed Rendering — *feature available with 3Delight Studio Pro*
- Full geometry support, without any tessellation, of higher order geometry such as: *subdivision surfaces*, *NURBS*, *curves*, *points*, *implicit surfaces, constructive solid geometries (CSG), quadrics, patches...*
- Massive instancing of geometry with tiny impact on memory footprint
- Bake to texture (bake2d) and bake to pointcloud (bake3d) functionalities