Production-quality, final-frame rendering on the GPU
2017 New Features

• Tri-Planar shader
  – Great for objects that are difficult to unwrap for uvs
  – Works with bump and displacement maps
  – Works with root pose data too!
• Trace-sets
  – Works with reflections and refractions, with SSS coming soon
  – Technology allowed us to expand AO/Curve/RoundCorners shaders to include only ‘self’
• Render View
  – Improved interactivity
  – Open Color IO support
  – AOV visualization in the viewport
• Custom AOVs
  – Deviated from our original plan - we consolidated AOV shader nodes to be both beauty ‘pass-through’ and file output capable
  – Building blocks for new tech to come – had to be fast!
Big Ticket Features (1)

• Light Group AOVs
  – Popular request from SpecialFX studios
  – Lights can be assigned a group name
  – Group names can be assigned to lighting AOVs
    • Separate direct and indirect lighting contributions
    • Captures deep bounces correctly
  – Add all the results together and you have the beauty!
  – Generated concurrently with the beauty render, so it has minimal impact on rendering performance
Big Ticket Features (2)

- Ray-Traced SSS
  - Great for capturing fine geometric details, has no problems with flicker or geometric edge-cases
  - Needed for progressive/IPR rendering
  - Slower than point-based though, but we wanted to make it fast!
    - Worked hard to get high performance importance sampling
      - Important for not wasting samples
      - Essential for multi-layered SSS
  - Results have to be comparable to point-based
    - No area normalization, though!
- Flexible
  - Future profiles will be easy to add with limited programming effort
Redshift 2.6

• Denoising
  – Denoisers are all the rage!
    • But Redshift’s fast enough, right?
  – Denoisers add that final polish
  – No denoise technique is perfect, so...
  – We chose two solutions...
Redshift Denoisers (1)

- Altus – Been talking to us since we saw their demo back in 2015
- First denoiser integrated into Redshift
- Uses tried and tested algorithms, with secret sauce
- Yields the best results for production rendering

- Built to handle difficult to clean, heavy scenes
- Built to handle animations
- Discount for Redshift customers!
Redshift Denoisers (2)

- OptiX – OptiX AI denoising is MAGIC!
- Uses deep learning algorithms to ‘best guess’ what an image should look like
- Trained for many hours with iRay images
- We were skeptical, but…
- The results were surprisingly good – and fast!

- Great for pre-viz
- Should be even better when properly trained
2.6 - Other Cool Stuff

- Global Volume Shaders
  - Procedural noise now affects the scatter color
  - Affecting transmission involves ray marching – slow
- Cryptomatte
  - Attempts to solve the matte ‘coverage’ problem
- Area Light Spread / Barn Door
  - Allows you to focus area lighting, like a spot-light
- Refracted specular lighting
  - Required for realistic lenses, crystals
  - Most noticeable with dome lights
2.6 - Post FX

- **Bloom**
  - That dreamy effect, popular with glamour shots in the 1960s!

- **Flare**
  - Cool lens effect based on bokeh hexagonal shapes, with tweakable chromatic aberration

- **Streaks**
  - Make those hot-spots pop!
  - Fully directional, with tweakable tails

- **Color Control / LUTs**
  - Great for applying a final color grade to make the image more dramatic

- Intuitive controls but tons of flexibility
- Real-time in the RS RV, but available in batch too
- A separate AOV coming soon
Redshift 3.0

- Let’s make Redshift even faster and easier to use!
- Refactoring the core
  - Increasing the trace-depth limit
    - More indirect light bounces
    - Deeper transparencies / cut-outs
  - Faster rendering for deep bounces
    - Keep the GPU busy
    - Requires less VRAM than ‘ray reserved’ AMM
    - 3x faster for really horrible rough glass scenes, with many bounces!
    - 10% faster for regular scenes
  - Ready for RTX
    - Using Nvidia OptiX library to support Turing architecture hardware ray-tracing
- Automatic sampling
  - Let Redshift choose how many samples to use for acceptable noise
  - Faster rendering, fewer options - easier to use!
- Even more aggressive optimizations
  - Faster transparencies, especially for hair
  - Better importance sampling for scenes with many lights
- Faster rendering = better looking images
The Future

• More features
  – Light blockers
  – Toon Shading
  – Distributed/remote rendering
  – LPEs
  – Maya Fluids
  – XGen IGS
  – Shader SDK / OSL support
Thanks!

• For more information, please contact us at info@redshift3d.com
• Or meet us at booth #515!