EVOLUTION OF THE OPTIX AI DE NOISER

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OVERVIEW

Why denoise?

Deep Learning for Noise reduction

Access to the OptiX AI Denoiser

What is new for 2018: Improvements and issues fixed
WHY DENOISE?

In interactive navigation, images can look very noisy giving a hard time to spot the details.

Final frame rendering of complex scenes requires a very long time to fully resolve noise for professional delivery.
AI DENOISER

- **Training Data**: Rendered 20,000 training images
- **Training**: Training on progression of images
- **Trained Neural Network**: Trained network detects noise and reconstructs
- **Inference**: Apply trained network to noisy images
ACCESS TO THE OPTIX AI DENOISER

- Use an Application with integrated AI Denoiser support
  - Redshift, Arnold, Vray, Clarisse, Solidworks, Iray, and more to come.
- Use the OptiX API for denoising to integrate it into your own application.
- You can train your own dataset, see the training tutorial “Rendered Image Denoising using Autoencoders” published at the Deep Learning Institute
WHAT IS NEW IN 2018 IMPROVEMENTS
SPEED IMPROVEMENTS

- Huge improvements in performance in Volta and Turing thanks to better utilization of TensorCores.
- No speed difference between LDR and HDR
- OptiX 5.1 is not tuned for Turing (new kernels improve performance in next version)

<table>
<thead>
<tr>
<th>Card</th>
<th>Denoising time</th>
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<tbody>
<tr>
<td>Pascal</td>
<td>125 ms</td>
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<tr>
<td>Volta</td>
<td>17 ms</td>
</tr>
<tr>
<td>Turing</td>
<td>39 ms</td>
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BETTER QUALITY

- Improve performance in low sampling areas for interactive use cases
- Less painterly effects
- Better denoising of color channels
- See also Carsten Wächter presentation “Adaptive Rendering powered by new OptiX SDK AI features”
DENOISING HDR IMAGES

- Support for High Dynamic Range image denoising
- Improved quality with very dark and very bright images due to autoexposure
- No performance hit
Thank You!