REVIEWING PRODUCTION OPENEXR FILES On the web for ML

Max Grosse, Principal Software Engineer DisneyResearch|Studios

PRODUCTION IMAGES?

- OpenEXR files
- High resolution, 1080p and up
- Extended / High Dynamic Range
- 16-bit or 32-bit floating point
- Not only final composed color data
 - Alpha masks
 - Feature buffers from the renderer
 - Error maps

. . .

EXAMPLE USE CASE: DENOISER

- Kernel-Predicting Convolutional Networks for Denoising Monte Carlo Renderings, Rousselle et al, ACM SIGGRAPH 2017
- Deep learning for denoising rendered images
- Suitable for production

INTRODUCTING: JERI.IO

- The JavaScript Extended-Range Image Viewer
- HTTP server directly serves OpenEXR images with config
- Pure client-side app to decode EXR directly in the browser
- Thus, client receives original, unmodified pixels
- Like a very fancy, configurable, tag for EXRs

EXR ON THE WEB

- OpenEXR compiled to WebAssembly
- Emscripten did the job
- Speed is fine for our use cases, in particular when caching
- Now we have EXRs in the browser!



USABLE EXR ON THE WEB

- Want to be able to change gamma, exposure
- Want to visualize error metrics and compare inputs
- Use WebGL for all image processing client-side
- Done in TypeScript with support for React.js



CONFIGURATION

- JSON to configure viewer
- Images to load and from where
- How to group these images
- Which metrics, images to compare

```
const config = {
  title: 'root',
  children: [
    { title: 'Improved', image: 'glass.exr' },
    { title: 'Reference', image: 'glass-ref.exr
    {
      title: 'SSIM',
      lossMap: {
         'function': 'SSIM',
         imageA: 'glass.exr',
         imageB: 'glass-ref.exr'
      }
    },
]
```

JERI DEMO



INTEGRATION

\mathbf{O} id \Rightarrow 12147 id $=$ 11865 id \Rightarrow 11530	Images Job info Reports Logs Statistics TensorBoard
Xg Att-Mts-EO: Replace one scene from layerdenoise test set	Eliter
12147 W EO Win1 MtsV1 NewA H Half PIF A4 MSC	12147AV EO Win1 MixV1 NewA H Half PIF A4 MEC img/1800002/eval greenest latest
Xg Att-Mts: Balance variance penalty between different levels	maseval2_00 miseval2_miseval
11865 W Win1 MtsV1 NewA H Half PIF A4 MSC	Code: De def_ def_ def_ def_ def_ def_ def_ def
Xg Att-LD: Add kernel-splatting op (weighted_average_transpose)	
11530 W Win1 MtsV1 NewA H Half PIF A4 MSC	
	confidential ·(
	conjidentidi .(
-	2 January 1 market for a part of 2000 10000 100 markets German 120 Commun 130

HTTPS://JERI.IO Released as open source

THANK YOU

max.grosse@disneyresearch.com





o unauthorized copying or use