A DECADE OF GPU RENDERING:
My first GTC 2010 talk…
A DECADE OF GPU RENDERING:

GTC 2013…
A DECADE OF GPU RENDERING:
OTOY’s Mission:

- Practical digital holographic* content creation and publishing for everyone

*(Digital Hologram: 8D light field volume + depth + reflectance)
A decade of GPU rendering phases in ~2 year increments:

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0..1..2..3..4..?

2010 ... 2012 ... 2014 ... 2016 ... 2018... 2020

1.0 Images
A decade of GPU rendering phases in ~2 year increments:

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1.0 Images
2.0 Animations
A decade of GPU rendering phases in ~2 year increments:

2010 ... 2012 ... 2014 ... 2016 ... 2018... 2020

1.0 Images
2.0 Animations
3.0 Cinematic VFX
DCC ecosystem – 26+ plugins with ORBX I/O support:

- PhotoShop
- C4D
- Houdini
- AfterEffects / Nuke+
- MODO
- Blender / Poser +
- Autodesk Max / Maya / Revit +
A decade of GPU rendering phases in ~2 year increments:

2010 ... 2012 ... 2014 ... 2016 ... 2018... 2020

1.0 Images
2.0 Animations
3.0 Cinematic VFX
A decade of GPU rendering phases in ~2 year increments:

0..1..2..3..4..?

2010 ... 2012 ... 2014 ... 2016 ... 2018... 2020

1.0 Images
2.0 Animations
3.0 Cinematic VFX
4.0 Real Time (+AI)
Create hyperrealistic assets using the cinematic power of OctaneRender in Unity

Render the future with Octane. What will you create?

Unity’s first path-traced render engine enables a new generation of immersive games, VR, and AR. Hollywood-grade VFX are now available inside of the world’s most popular game engine.
- Physically correct VFX GPU rendering in the free version of Unity
- Hollywood Grade VFX for millions of developers
- Full royalty free ORBX interchange for all Unity (and Blender, UE4) users
Brigade Game mode in Octane for Unity

- Game Mode - Octane / Brigade runtime:
3DS MAX -> ORBX -> Unity:
A decade of GPU rendering phases in ~2 year increments:

0..1..2..3..4..X

2010 ... 2012 ... 2014 ... 2016 ... 2018... 2020

1.0 Images
2.0 Animations
3.0 Cinematic VFX
4.0 Real Time (+AI)
5.0 Holographic (+AI)
octane render
2019 Recap
2019 Improvements:

- Better AI Denoising + AI Light: Final renders in seconds
- Better Scene AI: Faster out of core Geometry (+NV Link)
- Vectron + Spectron - Procedural OSL lights/shapes/volumes
AI Denoiser + AI Light – Real Time Viewport
Fast Procedural Volumetric Lighting
AI Volumetric Denoiser
Vectron + Spectron – Fast OSL Surfaces / Lights
OSL & Vector Displacement:
OSL Volume Shaders
Complex Layered Material Substrates/Coats:
Material Layers – Artist friendly alt. to OSL closures:
Universal Camera with OSL Distortion Maps:
Optix 7 – New RTX backend
RTX ON = 2-3x faster in real production scenes:
RTX ON + Optix 7 = up to 15x faster in some scenes!

Scene and images from @nessgraphics
Vulkan RT + CUDA was best option last year (Optix 6 at the time was too slow)

However - mixing CUDA and Vulkan was (and is) experimental

We uncovered blocking issues - some at driver level beyond our control
Why Optix 7?

- Optix 7 API = better, lower level API than Optix 6
- Optix 7 RTX in Octane 2020.1 – fixes our Vulkan/CUDA interop issues + better NV Link support
- Optix 7 - faster, more stable & uses less memory than Vulkan RTX backend in 2019.2
New Features
2020.1
New Features
C4D Native GPU noises -> OSL = No Texture Baking!
C4D Native GPU noises - Volume Displacement:
Vectron Volumes:
Vectron Volumes:
Vectron Mesh vs. Volume Operators:
Vectron Volume Operators:
Fast Spectral Random Walk SSS / Skin:

Octane images by Riccardo Minervino
Fast Spectral Random Walk SSS / Skin:
Fast Spectral Random Walk SSS / Skin:
Fast Spectral Universal Hair Material:
Fast Spectral Universal Hair Material:
Fast Spectral Universal Hair Material:
Volumetric Displacement
OSL Volume Sample Displacement:
New Universal Dirt System:

- dirt w/ spread 1.0
- dirt w/ spread 0.2
- dirt w/ spread 0.0
- no dirt
Spectron: Quad and Point Lights – 4x Faster!
Spectron: Area Light (Mesh)
Spectron: Area Light (Quad) – 4x Faster!
Spectron: OSL Spotlight | Area Spread
Spectron: OSL Spotlight | Gobo Filter
Native Curve and Point Primitive Attributes
Volume Shadow Step Length Improvements
Universal Camera | Split-focus diopter:
Universal Camera | Even More Features:

- Split-focus diopter
- Optical vignetting
- Aperture texture and advanced DOF
- Aberration and distortion
New Daylight System:
Improved Rounded Edges System:
New Utility Nodes + LiveDB OSL Procedurals:
Hydra Render Delegate (Solaris / Houdini 18):
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Hydra Render Delegate (Solaris / Houdini 18):
Introducing RNDR

Rendertoken.com

Render Token: distributed GPU rendering on the blockchain
From smartphones to 8K televisions to the latest augmented reality devices, our visual world is evolving at breakneck speed.

GPUs are now a standard component on every phone and PC as the most efficient rendering hardware. Yet, single GPUs on devices, and even those in the cloud, are unable to individually handle the most intensive image processing demands.

Authoring and publishing state-of-the-art graphics is an immense challenge that is growing each day.

WORLDWIDE - GPU PUBLIC CLOUD GAP

▲ 265 million GPUs in circulation**

▼ <50K GPUs for public cloud rendering

**Source: John Peddie Research, Market Watch, GPU Quarterly Market Report, 2nd Quarter, 2017
RNDR – Phases 1 to 3

- ERC-20 RNDR tokens used to pay for cloud rendering jobs via MetaMask (same workflow as ORC)

- RNDR tokens pegged to same $/OB hour of work done on AWS GPU instances = by ORC since 2015

- System tray applet runs decentralized RNDR jobs instead of public cloud
RNDR – Beta
RNDR – Beta

GPU Cloud Rendering Test on RenderToken.com

3840x1780 Pixels, 779 Frames, 5000spp, Path Tracing

Rendered on 212 Distributed GPUs
Total Cost 2300 RNDR
Using RNDR, graphics pioneer John Knoll rendered a 4K imagery of the Apollo 15 lunar module for New York’s Hayden Planetarium over a single weekend.

“On RNDR, I was able to scale up a project from my local workstation to thousands of high-end NVIDIA GPUs, allowing me to meet an ambitious deadline without making compromises in final image quality,”

“Tapping unlimited capacity is a first for GPU cloud rendering, and I can see this becoming increasingly important as the industry transitions from 2K to ultra-high-resolution 4K, 8K, and immersive formats.”

John Knoll, Graphics Pioneer
More very exciting news to share...
Is coming to RNDR!
“We are really excited to be partnering with OTOY to bring Arnold onto the RNDR Network,”

“Demand for advanced rendering only continues to grow, putting pressure on artists and studios to produce more high-quality and complex content, faster than ever before. “

“By collaborating with OTOY, we hope to provide Arnold customers with the speed and scalability they need to meet demand and stay productive.”

- Frederic Servant, Senior Software Development Manager for Arnold at Autodesk
OTOY and Autodesk are collaborating on making Standard Surface work between Octane and Arnold.

OTOY is making standard surface a core node in Octane.

This is a template for other renderers joining RNDR down the line...
Much more to share in the coming months!
RNDR

Next up – our public launch...
RNDR

RNDR is finally out of beta 😊
RNDR

RNDR is finally out of beta 😊

Public launch this month – open to all!
Finally out of beta - public launch this month:
Finally out of beta - public launch this month:

- RNDR Enterprise Tier – RNDR now fully replaces ORC
Finally out of beta - public launch this month:

- RNDR Enterprise Tier – RNDR now fully replaces ORC
- RNDR credits – simple way for artist to pay for jobs
During beta we saw friction for artists using crypto wallets for the first time on RNDR.

RNDR credits address this..
During beta we saw friction for artists using crypto wallets for the first time on RNDR.

RNDR credits address this:

- RNDR credits can be purchased through artists’ existing OTOY / Octane account at launch
- Much simpler than crypto wallets for new users
During beta we saw friction for artists using crypto wallets for the first time on RNDR.

RNDR credits address this:

- 1 x RNDR credit = 1x RNDR token – (same OB/H)
- RNDR credits can be used on all RNDR tiers
New Enterprise tier rolling out with current Public tier as we leave beta:

- **Public Tier**: fully decentralized (but untrusted) nodes

- **Enterprise Tier**: trusted nodes (TPN) .... designed to fully replace ORC jobs on public cloud
RNDR – Public Tier

- Watermark/escrow system for proof of render
- Priority scaling / pricing
- RNDR tokens are directly accepted for jobs via MetaMask browser (full alt. to RNDR credits)
RNDR – Enterprise Tier

- TPN / MPA studio level security

- Highest end GPU systems – 8xV100 w/ 500 GB RAM

- Full replacement for ORC - with many new partners!
3. Network Settings
Tier selection will influence price and render speed.

Tier 1: Trusted Partners

Frame Approval
RNDR gives artists the opportunity to review frames prior to acceptance and the power to request a re-render if the frame does not look correct. Due to the requirement for approval, job outputs cannot be downloaded until the entire job is completed and approved. Selecting “Pre-Approve” removes the approval flow from the process and allows all outputs to be downloaded as they are completed. If selected, a new job will need to be created to re-render any incorrect frames.

4. Generate an Estimate
An estimate must be generated prior to job creation.
Estimates are not binding. Price will be determined based on actual render time.

Powered by MPAA Compliant Partners AWS and Google Cloud

Select Frame Approval Method
- Manually Review Frames
- Pre-Approve Frames
All ORBX asset and author hash and GUIDs are decentralized for IP rights systems in phase 4

Phase 4 will enable real time (low latency) streaming as RNDR work (essentially replacing x.io service today)
RNDR – Phase 4

- RNDR SDK will enable new extensions and services to be offered by anyone through the RNDR blockchain
RNDR SDK: Overview

- RNDR SDK is a fully portable graphics, AI and compute framework

- Used for internal and external development of software apps & modules on the RNDR network

- All OTOY software and services, from Octane X onwards, are built using the RNDR SDK
Creators, artists and developers can build and publish services on RNDR with the RNDR SDK.

- 3rd parties can create and publish RNDR modules that extend any part of the ORBX node graph.
- RNDR modules are published on the blockchain in ORBX packages (same as ORBX scenes for RNDR jobs).
Creators, artists and developers can build and publish services on RNDR with the RNDR SDK.

- RNDR modules are authored in GLSL and C++ - all inside Octane just like OSL/Script nodes.

- RNDR Binary linking system can be used to securely publish commercial RNDR modules (just as we do for Octane).
RNDR modules can replace or add to any aspect of real time or offline pipelines expressed in the node graph:

- Beyond Brigade and Octane: Mix or swap 3rd party Hydra Render Delegates in real time viewports or offline jobs on the RNDR network

- New modelling, Scene graph, layout, compositing, physics, simulation and dynamics modules are in development
RNDR SDK: GPU cross compiler

RNDR has backends for CUDA, x86, Vulkan, D3D & Metal:

- Octane and other software can reach millions of new devices!
Octane X
10th Anniversary
Octane X

- Octane X – our 10th anniversary edition of Octane

- Octane coming to millions of new devices – i.e. Intel MacBooks and iPhones!
Octane X -> Metal

- 10 years of Octane code - rebuilt from scratch, line by line, in GLSL and MSL (RNDR SDK)

- Metal version – full feature | pixel parity w/ Octane 2020.2 and later...
Octane X
Headless Mode
Headless Mode (LAN) Running over local Wi-Fi:

- Octane X Mac/iOS = host / master node
- Octane 2020.2 = GPU slave node
- CUDA slaves can use RTX, OOC, etc...
- Net render works over LAN or WAN
- HDR local tone mapping for WCG displays
Headless Mode (WAN)
Running on 4G Mobile Hotspot:

- Octane X Mac/iOS = host / master node
- Octane 2020.2 = GPU slave node
- CUDA slaves can use RTX, OOC, etc...
- Net render works over LAN or WAN
- HDR local tone mapping for WCG displays
Octane X running on Intel chips in MacBooks!
MacBook | Intel

- Octane X running on Intel chips in MacBooks!
Octane X | IOS – years of work – finally done!
Octane X | IOS – Low DPI UI scaling (local iPhone/Touch Display)
Octane X | IOS – High DPI UI scaling (external TV/ UHD monitor)
Octane X | IOS – sync ORBX files from MacOS...
Octane X | IOS – or load ORBX files from iOS files app...
Octane X | IOS – then render! 100% identical to Octane on desktop!
Octane X | iOS – then render! 100% identical to Octane on desktop!
Octane X | IOS - ORBX renders identically to Octane 2020.2 desktop!
Octane X | IOS – Final frame iPhone 11 - ~speed of 13” MacBook Pro!
Octane X | IOS – Mobile standalone app... everything just works!!
Octane X | IOS – Path Tracing Kernel:
pixel parity with Octane 2020.2+ on desktop!
Octane X | IOS – Path Tracing Kernel: pixel parity with Octane 2020.2+ on desktop!
Octane X | IOS – PMC Kernel! 😊
pixel parity with Octane 2020.2+ on desktop!
Octane X | IOS – PMC, Random Walk SSS – pixel parity w/ Octane desktop!
Octane X | IOS – PMC, Random Walk SSS – pixel parity w/ Octane desktop!
Octane X | PMC Kernel
iOS A13 iPhone (left)

Octane 2020 | PMC Kernel
Win10 GTX 1080 (right)
Octane X | IOS – UHD final frame output – my iPhone is a render farm!
Octane X | IOS – OSL & Script Node Editor

![Script editor](image)
Octane X | IOS – OSL shader compiler fully working on iOS!
Octane X | IOS – OSL shader compiler fully working on iOS!
Octane X | IOS – Low DPI UI scaling (local iPhone/Touch Display)
Octane X | IOS – High DPI UI scaling (external TV/ UHD monitor)
Octane X for iPhone can also kick off cloud jobs to RNDR
Octane X for iPhone can also kick off cloud jobs to RNDR

iPhone 11 running Octane X as render slave can double the rendering speed of MacBook :}


We have added a ton of features in the last 12 months.... 😊
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Major new updates underway for the coming year – driven by user feedback
Our next update is 2020.2 – ETA summer
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Stability and performance will be the primary focus for this release...
Also a priority – a major RTX overhaul...
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GOAL: No need for “RTX off” anymore!
“RTX on” will now support out of core memory – even faster than OOC with “RTX off”!
▪ “RTX on” will now support out of core memory – even faster than OOC with “RTX off”!

▪ New RTX speed optimizations for splines, curves, dirt, round edges
"RTX on" will now support out of core memory – even faster than OOC with "RTX off"!

- New RTX speed optimizations for splines, curves, dirt, round edges

- Much lower memory footprint for RTX meshes
Stability | Core

- Multi-Process Mode (i.e. GPU render failures don’t take down host DCC app)
Stability | Core

- Multi-Process Mode (i.e. GPU render failures don’t take down host DCC app)

- Automated GPU Error Reporting System
Stability | Core

- Multi-Process Mode (i.e. GPU render failures don’t take down host DCC app)
- Automated GPU Error Reporting System
- AI Denoiser: AVX2 (CPU SIMD) fallback support
• Optimization and hardening of out of core

• Improve mixing of out of core and NV Link

• Auto-convert single channel RGBA image textures to greyscale image textures (less memory)
- Ignore volumes in the focus, target and material picker

- Make the random walk medium render to non-transparent if applied to volumes

- Fix invisible lights in volumes
RNDR Network

- Delta sync to RNDR in all DCC toolchains
▪ Delta sync to RNDR in all DCC toolchains

▪ Improved ORBX export for C4D / H18 procedurals
What’s next...
RNDR Modules

Plug-ins for all DCC integrations
We are Joining forces!
▪ Standalone tool this summer for all Octane users!

▪ OTOY and JangaFX co-developing a full integration

▪ It will work inside of Octane and all DCC plug-ins!
Octane community is helping us rank this year’s highest priority feature requests:

<table>
<thead>
<tr>
<th>PRIORITY</th>
<th>FEATURES / IMPROVEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Stability (Octane running as independent process)</td>
</tr>
<tr>
<td>9</td>
<td>Scatter/Clones should either be baked on ORBX e</td>
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<td>9</td>
<td>Eevee-like &quot;fake&quot; Volumetrics</td>
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<td>Scatter should follow animated geometry</td>
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<td>Nested Instances</td>
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<td>6</td>
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<td>3</td>
<td>AOV Revamp</td>
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<tr>
<td>3</td>
<td>Trace Sets - Remove objects from reflections (make</td>
</tr>
<tr>
<td>3</td>
<td>Direct to RNDR upload from C4D plugin</td>
</tr>
</tbody>
</table>

Highest voted requests:

- Additive SubSurface Scatter (pass through by value 0/100) source
- Eevee-like "fake" Volumetrics
- Scatter should follow animated geometry
- Nested Instances
- ACES Support
- Faster Volumetrics
- Xp trails colors same as particle color
- Spline as render instances
- AOV Revamp
- Trace Sets - Remove objects from reflections (make
- Direct to RNDR upload from C4D plugin

Vectors feature suggestion:

03/23/2020
Sascha Mathis - Jesper Nybroe
Mathis Infosys

1. Vector volumes in cinema 4d, currently the only options are:
   - interactivity, gradient add script
   - the perfect way of doing emission vectors volume are based on iteration number like in this example
   - https://www.youtube.com/watch?v=omh70y12z4w
Fast Nested Dielectrics

Fully optimized - no speed hit 😊

Fluid/glass rendering is far simpler for scenes like this:

Octane scene and images by @silverwing
Curvature Node
UVW deformations from texture input
Chaos Texture Mapping | Tiling
New Gradient Tools

- Gradient generator node - creates a greyscale value from UVW position (e.g. "saw wave" or "sine wave")

- Gradient texture node - new static position inputs:
Native Utility Shaders

- RGB | HSV splitter / combiner
- RaySwitch nodes
- Math, Logic and State nodes
New Texture Features

- Mipmaps
- Parallax Occlusion Map
New Texture Features

- Rounded Edges Texture

- Random Color Texture - unique colors per object layers and instances
New BRDF Features

- GTR Microfacet BSDF - tail blurring factor for GGX
- Multi-scatter GGX – energy preserving BRDF
New Fabric Material
Spectral Fabric BRDF – micro-thread cloth and weaves
Improved fabric and cloth rendering in scenes like this one:

Octane scene and images by @LOCKEDnLOADING
Post Processing
Fast Fog – both as Post Effect and Shader
New Post Processing Stack

- Revamped Imager nodes (i.e. sharpening, contrast, gain, temperature based white balance, etc.)

- Compositor Node Graph – PS blending and processing render passes, multi-light with OSL, filers and shaders
Compositor Node Graph
AI Style Transfer Nodes

e.g. combine Octane + DeepDream – as in this video:

Octane scene and images by @shapiro500 and @moon_scooters
Major AOV Overhaul

- Custom AOV support via textures / shaders / LPE

- AOV driver nodes for explicit control of file format output per pass (e.g. DWAA, DWAB compression settings for EXR)
Rendering and Motion Sampling
New Camera Features

- Multi-Region Rendering
- Depth of Field - on/off toggle
- Lens FX – new physically based lens effects
Universal Camera: ‘Lens FX’

New **physically based** lens effects in Universal Camera:

- Chromatic Aberration
- Lens Flares
- Optical Zoom Motion Blur
Motion Blur Improvements

- Motion blur for HDRI environments
- Volume instance motion blur
- Motion blur for texture displacement
New Time Node

- Linear transformation of the time of nested node graphs
- Time shifting of animated geometry / ORBX proxy
- Granular time warping in scene graph or imager
Geometry
New Geometry Features

- Adaptive subdivision for vertex displacement
- New Parametric Spline and Curve primitives
- New Geometry Boolean operators
Coordinate Mapping Updates

- Smooth Tangents - vertex tangent Interpolation for anisotropic materials (and better parallax occlusion)

- UVW packing - for compiled DCC primitives (instead of UV). This can be used by plugins to "pin" procedural textures to deformed textures
New Spectron Lights

- Spectron parallel light
- Spectron parametric spotlight
- Spectron disc and tube light primitives
New Spectron Lights

- Spectron Mesh Light (faster than emissive material)
- Spectron Portal light
- Spectron dome light (connectable to portals)
New Spectron Features

- Spectron OSL Filters: Light Decay | Blocker
- Spectron Light Manager
- Spectron Scatter (high performance particle shaders)
Spectron Scatter

- Massive Procedural Particles – all OSL shaders/nodes
- GLSL reader (e.g. Touch Designer Vertex Shaders)
- Faster and lighter rendering vs. external sim / cache
Vectron Displacement

Combines best of Texture + Vertex Displacement

- Vectron / OSL mesh surface shaders
- Geometry is modified live at render time on GPU
- Millions of mesh instances / clones can each have unique dynamic procedural displacements – with zero memory used!
Vectron Scatter

OctaneScatter (C4D) in core - baseline for new features
Vectron Scatter

OctaneScatter (C4D) in core - baseline for new features
 Vectron Scatter Node

- Scattering on animated surfaces, volumes, vectron etc.

- Complex procedural GPU scattering at runtime
Vectron GeoScatter

- Combines Vectron Scatter + Vectron Displacement
- Mesh fitting on any surface –like VrayPattern
Vectron World Shaders

- Sparse volumes - not limited by voxel / VDB buffers
- Infinitely large procedural worlds
Material and Shading Roadmap

- OSL Trace Sets
Material and Shading Roadmap

- OSL Trace Sets
- OpenColorIO
Material and Shading Roadmap

- OSL Trace Sets
- OpenColorIO
- Material Layer Operators (i.e. OSL closures via nodes)
Fluorescence & Phosphorescence:
Polarized Lighting:
Polarized Lighting:
Polarized Lighting:
Native USD support in Octane and ORBX
3rd Party Format Roadmap

- Arnold Standard Surface / Volume as core node
- Material X (in USD at minimum)
- Hydra
‘Anime’ Kernel – Raytraced Edges:
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‘Anime’ Kernel – Raytraced Edges:
New Progressive Photon Mapping System
New ‘PPM’ Hybrid Kernel

Progressive Photon Mapping System (mixed with PT)

- Fast AND accurate caustics!
- Speed of GOBO caustics (left) - at PMC quality (right)
New ‘PPM’ Hybrid Kernel

- GPU Photon Mapping and Diffuse Irradiance Cache
  - Can be used for biased GI, volume and SSS options
  - Light Cache can be used by Brigade GI on AR/mobile
Extending Octane...
RNDRR Modules
RNDR Modules

- Physics
- Procedurals (Geometry/Volumes)
- rendering (via Hydra)
- New Soft and Rigid Body physics nodes
- Bullet and PhysX backend modules (default)
- New Soft and Rigid Body physics nodes
- Bullet and PhysX backend modules (default)
- 3rd party Physics modules can extend this.
- All 20+ Octane DCC plug-ins – will be refactored as RNDR DCC plugins – to operate as Hydra as scene delegates

- RNDR DCC plug-ins can load any valid Hydra Render delegates supporting standard surface or ORBX: Octane, Brigade, Arnold and more!
- All 20+ Octane DCC plug-ins – will be refactored as RNDR DCC plugins – to operate as Hydra as scene delegates
BRIGADE

GPU Powered
Real Time Path Tracing
‘Brigade’ 2019 RTX Kernel – Noise Free 60 fps (AO):
Path Tracing Comparison: Single Frame (4 Spp)
Octane | Path Tracing
Offline (but near RT)

Brigade | Path Tracing
60 fps (full real time)
Brigade RTX Path Tracing Kernel - 60 fps on a single RTX 2080
Brigade RTX Path Tracing Kernel - 60 fps on a single RTX 2080
Brigade RTX Path Tracing Kernel - 60 fps on a single RTX 2080
Path Traced Caustics

Brigade RTX Path Tracing Kernel - 60 fps on a single RTX 2080
Path Traced Volume Caustics!

Brigade RTX Path Tracing Kernel - 60 fps on a single RTX 2080
**BRIGADE | Path Tracing : 60 fps (1x RTX 2080)**

**Instant Path Traced DOF (WIP)**

Brigade RTX Path Tracing Kernel - 60 fps on a single RTX 2080
Octane DL Kernel (Left) vs. Brigade LC+DL Kernel (Right)
Irradiance Cache from Octane PPM
Octane X on iOS (AR Kit – Brigade | Irradiance Cache)
Octane X on iOS (AR Kit – Brigade | Irradiance Cache)
Octane on iOS (AR Kit)
RNDR: Octane X/AR Kit in action:
RNDR: Octane X/AR Kit in action:
WE ARE ALL GOING TO DIE. RT
@GustavoVela71: Robot
Say Hi to our new office pet 🐉

#motiongraphics #3d #animation #3danimation #octane #octanerender #c4d #mograph #tracking #skyrim #elderscrolls #dragon

By @LekTrix
2019 OTOY® Inc. All rights reserved.
Sculptron™ and OTOY® and their logos used are trademarks of OTOY® Inc.
“Alien Bust” by Lino Grandi.
Sculptron™ | Vectron/Spectron Temporal Brush Tool
Volume/VDB Temporal Brush Tool
New Timeline & Keyframe System

sculptron™ Alpha 2
New UI and Workflow

sculptron™ Alpha 2
Alpha 2 – over 10x faster!
New Viewport Modes

sculptron™ Alpha 2
Wireframe Overlay Mode
sculptron™  What’s Next...
Long Term Goals

- Full USD Scene Editor: instancing, bones, animations
- GPU mesh modifier stack: user editable geo-shaders
- Simple layout, sculpting, painting for iPad / AR
- Forces and fields authoring
Feature Roadmap

- Topological Grab
- Wrinkle Tool
- Animated Deformers + Falloffs
- Heat Maps
- Compress/Stress calculation
- Weight Map Painting
- Volume Channels Painting
- Dynamic Meshes Sculpting
- Polygon Masking
- Alpha Brushes
- Presets for Procedural Textures
- Expansion of Brushes
- Displacement Map Live Brush
- Bone Deformation Editor
- Local Space Deformations
- Keys: Stepped, Bezier, Hermite
- Graph Editor
- Orthogonal Views
- Statistics (Number of Polygons)
- 3D Perspective Reference
- OpenSubdivision in IPR
- Alembic Import/Export with Camera support
- Item Transformations (Position/Rotation/Scale)
- Support for mesh sequences with different topology
- Multiple meshes VDB export
- Full USD scene editing
- Octane/Brigade module
- Scatter paint and particle tools
- Cloud, terrain and foliage scatter tools
- Octane X – Apple Pencil / AR
Towards the Star Trek Holodeck...
ORBX Light Field ‘Surface’: Holographic Portals & Viewports
ORBX LF ‘Volume’: Holographic Spatial Rendering in 6DOF
ORBX LF ‘Video’: Holographic navigable XYZT World-Line
Towards the Holodeck:

2020’s
The Star Trek Holodeck (1987)
OTOY Partners With Light Field Lab On Holodeck Display Tech

Light Field Lab and Otoy team up to make Star Trek’s Holodeck a reality

Holographic display maker Light Field Lab and graphics software firm Otoy have teamed up to turn the Star Trek Holodeck into a reality.

The Holodeck, which Star Trek movies and shows depict as a perfect virtual reality space where people can live out their fantasies, is one of the long-sought dreams of the technological world.
2020’s

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- 2 foot tile panels can be configured to any size (like Samsung Wall shown at CES)
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- First adopters: parks, concerts, conference rooms, billboards, desks and workstations
RNDR SDK XR Light Field Test
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LFL Holographic Display Simulator
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Towards the Holodeck:

2030’s
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- Windows in vehicles and homes are replaced with holographic panels – anyone can have a park avenue view for example, or see ‘through’ a car or plane as if it were made of glass.
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- Room sized holodeck may be built into homes (or converted)
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2040’s
2040’s and Beyond…

- Holographic surfaces are cheap – applied like wallpaper – telepresence for billions
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- Holographic clothing and wearables
2040’s and Beyond…

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- Holographic clothing and wearables

- Buildings have entire surfaces covered in holographic panels - making them invisible or have them look like anything we want
Why we need a truly open Metaverse…

This summer, Octane uses "24501" (not his actual account ID, but close enough) was giving me feedback on the site and the Maya plugin, and we got to talking about ORC (which was about to launch to a wider audience the following month).
THE FUTURE OF GPU RENDERING

JULES URBACH - CEO OTOY INC.