

WELCOME TO VFX BOOT CAMP!

VFX & The Rise of Real Time

10:00a–11:00am

Artistic Principles of VFX

11:20am-12:20am

How to go from Good to Great

1:20pm-2:20pm

Like a Mace to the Face: Leaving the Battlefield to go it Alone

2:40pm-3:40pm

Rapid Talks

4:00pm-5:00pm

Keith Guerrette

Drew Skillman

VFX & THE RISE OF REAL TIME

ONE THING

Real Time VFX is expanding beyond games.

It's never been easier to get started.

Let's build the future together.



OVERVIEW

Why a VFX Boot Camp Now?

Building our Community

VFX Gems from our Community

Tilt Brush: Old Tricks in New Places

The Rise of Real Time

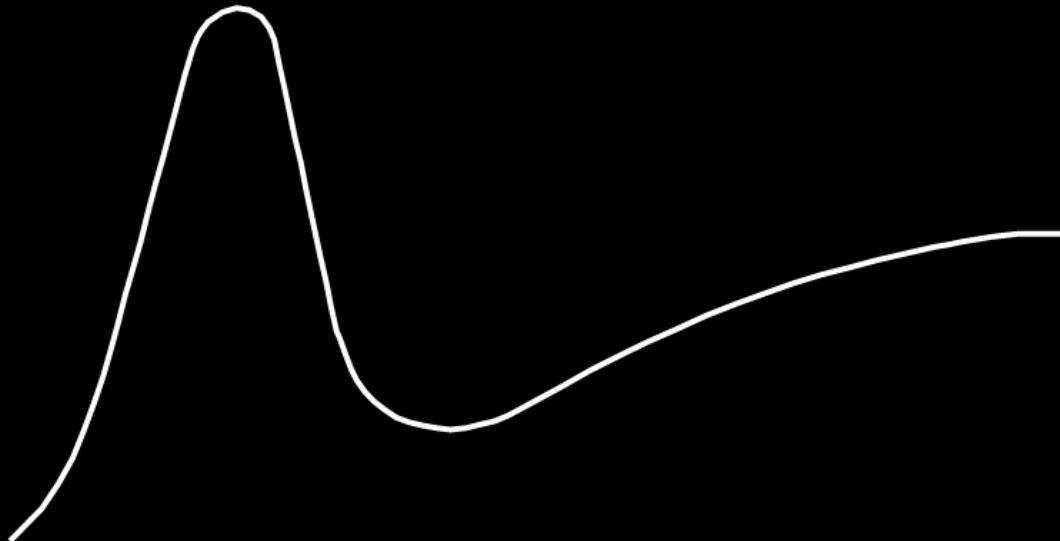




Why a VFX Boot Camp now?

Why a VFX Bootcamp Now?

We're at an inflection point.



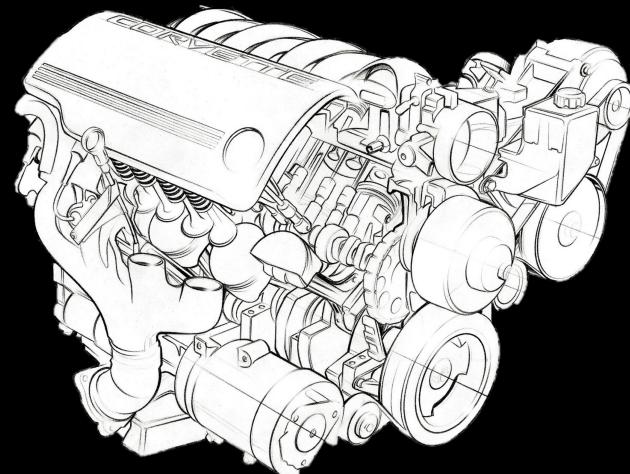
Why a VFX Bootcamp Now?

We're at an **inflection point**.

Powerful, common baseline for tools and engines



**UNREAL
ENGINE**



Why a VFX Bootcamp Now?

We're at an **inflection point**.

Powerful, common baseline for tools and engines

#Jobs > #VFX Artists

Why a VFX Bootcamp Now?

We're at an **inflection point**.

Powerful, common baseline for tools and engines

#Jobs > #VFX Artists

Platform Explosion!



Why a VFX Bootcamp Now?

The screenshot shows the Facebook group page for "Real Time VFX". The main header features the group's name in large, bold, black letters inside a white rectangular box. Below the name, a subtitle reads "A community for effects artists in the video game industry". A section titled "For your health:" provides guidelines for posting. At the top right, there are buttons for "Joined", "Share", "Notifications", and three dots. The main navigation bar includes tabs for "Discussion", "Members", "Events", "Videos", "P", "Files", and a search bar. Below the navigation, there are buttons for "Write Post", "Add Photo/Video", "Create Poll", and "More". A red arrow points from the "Members" tab towards the member count. The member count is displayed as "1,858 Members (16 new)" in a blue box. The bottom of the screen shows a preview of member profiles.

REAL TIME VFX

A community for effects artists in the video game industry

For your health:

- Check out www.realtimenvfx.com for our public forum
- Check out the "Files" tab for more resources
- Keep discussion relevant to game artists, not film/TV.
- It's OK to post open VFX position, but please be respectful.

Joined Share Notifications

Real Time VFX

Closed Group

Discussion Members Events Videos P Files

Search this group

Write Post Add Photo/Video Create Poll More

1,858 Members (16 new)

Why a VFX Bootcamp Now?

REAL TIME VFX

General Resources References Jobs Events

SEARCH D



THE GAME MAKERS
The Game Makers: Inside Story
by Keith



GDC - Riot Games Creative Mixer Info -
AT CAPACITY
by ShannonBerke



Oskar Larsson: Sketch #4 WIP
by Limeslushie



Summoner's Rift Water fall Break down
by Mark

all categories ▾ Latest Unread (16) Top Categories Bookmarks + New Topic

Topic	Category	Users	Replies	Views	Activity
Official VFX Sketch #4: Stormy Skies [image] Welcome to the fourth Official VFX Sketch! The Challenge (create an effect based on the following): "Stormy Skies" Submitting: Create a new topic in the "Events > 04 - Stormy Skies" category with your name ... read more	04 - Stormy Skies		14	640	21d
Radial burst unreal	General Discussion		8	153	1h
Your favorite VFX What inspires you?	General Discussion		11	697	7h
Fluid Sims and the Future of VFX stafpicks	General Discussion		27	1.0k	9h
Business Cat's Particle Artistry Gallery • new vfx	WIP & Critique		0	49	11h



THE GAME MAKERS

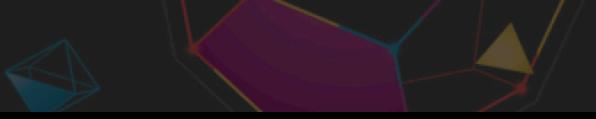
Inside Story

Hear the
stories
behind
the games.

Available Now

B E Y O N D - F X

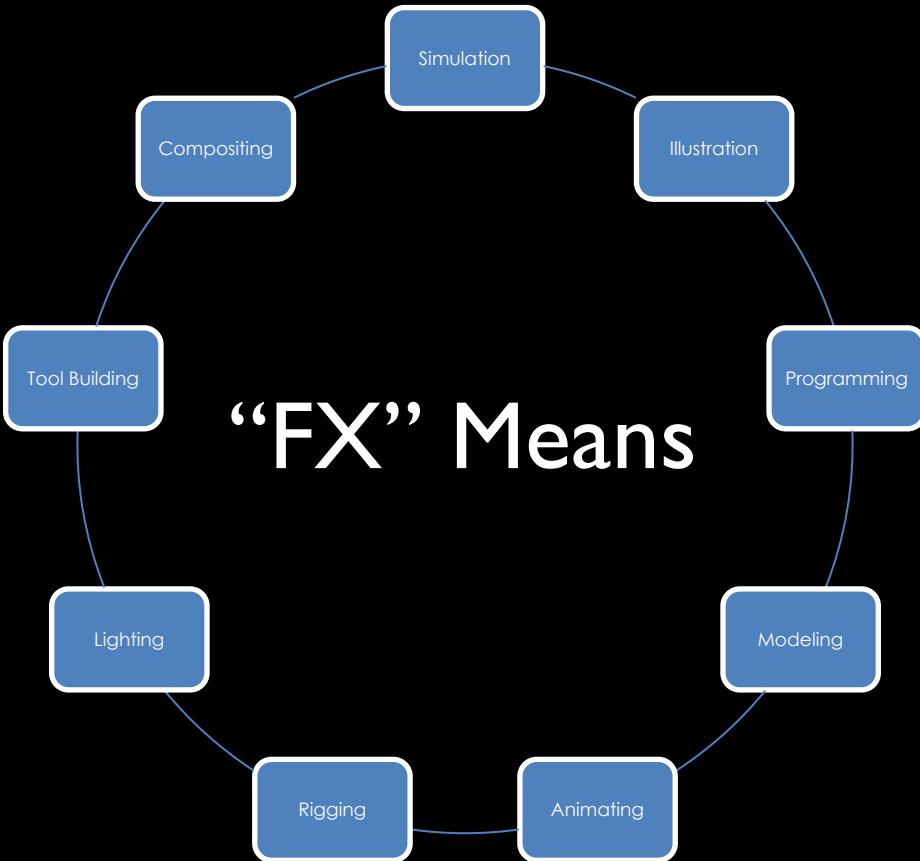
A VISUAL EFFECTS STUDIO





REAL TIME VFX.com

“FX” Means



MAR
29

Visual Effects Artist Roundtable Notes

GAME DEV, PRESENTATIONS AND PAPERS

Here are all of my notes from the last 4 years of the **Visual Effects Artist Roundtable** sessions at GDC. Each year I moderate these and they're incredibly awesome. If you haven't been try and join us next year!

- [VFX Roundtable Notes 2016](#)
- [VFX Roundtable Notes 2015](#)
- [VFX Roundtable Notes 2014](#)
- [VFX Roundtable Notes 2013](#)
- [VFX Roundtable Notes 2012](#)

And don't forget to join us for awesome VFX conversations all year round at facebook.com/groups/realtimenvfx

REAL TIME VFX

A community for effects artists in the video game industry

For your health:

- Check out www.realtimenvfx.com for our public forum
- Check out the "Files" tab for more resources
- Keep discussion relevant to game artists, not film/TV.
- It's OK to post open VFX position, but please be respectful.

Real Time VFX

 Closed Group

Joined 

 Share

 Notifications

...

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[Videos](#)

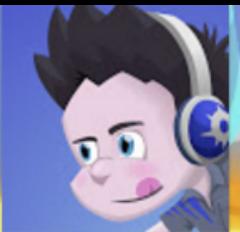
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[Files](#)

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<https://www.facebook.com/groups/realtimenvfx/>



Jason Keyser



Keyserhouse.com



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Already subscribed



<https://www.youtube.com/user/jasonkeyser>



imbuefx

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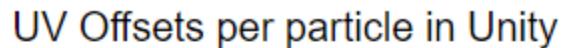
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<https://www.youtube.com/user/imbuefx>



REAL TIME VFX.com

UV Offsets per particle in Unity[All](#)[Videos](#)[Shopping](#)[Images](#)[News](#)[More](#)[Settings](#)[Tools](#)

About 4,190,000 results (1.12 seconds)

[Unity - UV Offset per particle - Is it possible? - Real Time VFX](#)

[realtimenvfx.com](#) › General Discussion › unity ▾

Sep 12, 2016 - Hello, Does anyone know how to change **UV Offset per particle** in a ... in Unity 5.5, you also have access to vertex streams **per particle**, which ...

Real-Time VFX Job Board

 Keywords

 Location

 Distance 

Search

<https://jobs.realtimevfx.com/>



Community Competitions, and VFX Challenges oh my!

Events ► all ► **Latest** Unread Top Bookmarks [Edit](#) [New Topic](#) [More](#)

Topic	Category	Users	Replies	Views	Activity
Parag Ponkshe: Sketch #3 WIP	03 - Dragon's Breath	S	9	7.5k	Jan 23
Oskar Larsson: Sketch #3 WIP	03 - Dragon's Breath		20	4.8k	23d This topic has 20 replies with
Marcus Bruzzese - Sketch #3 WIP	03 - Dragon's Breath		12	4.3k	20d
Kevin Leroy: Sketch #2 WIP Portal vfxsketch, unity	02- Portal/Wisp	T	53	2.3k	Jan 3
Sam Perzanowski: Sketch #2 WIP Portal vfxsketch, unreal	02- Portal/Wisp	S	23	1.8k	Jan 11
Official VFX Sketch #1: A Haunted Halloween	01- A Haunted Halloween		16	1.2k	Nov '16

<https://realtimevfx.com/c/Events>



IN PARTNERSHIP WITH:

REAL TIME VFX.com

PRESENT

YOU ARE



**We're all in it together...
a big cheesy FX family**

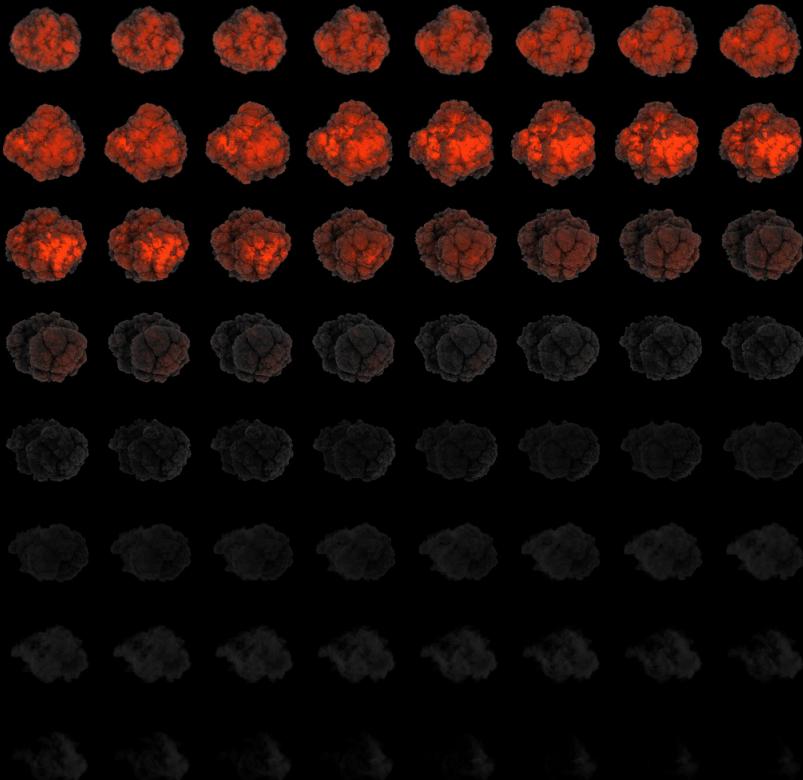
Innovations from the Community



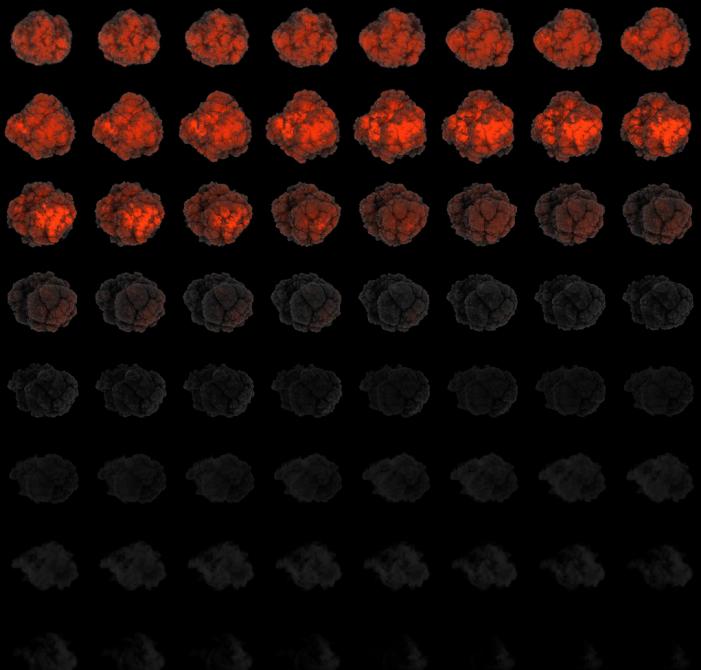
2013



Flipbooks

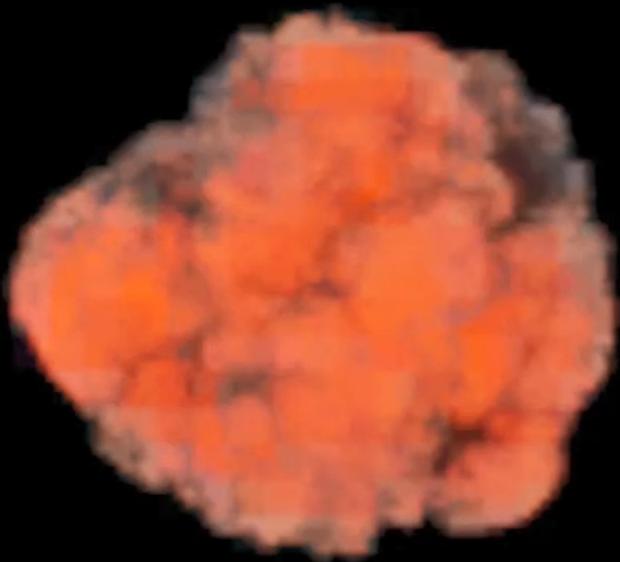
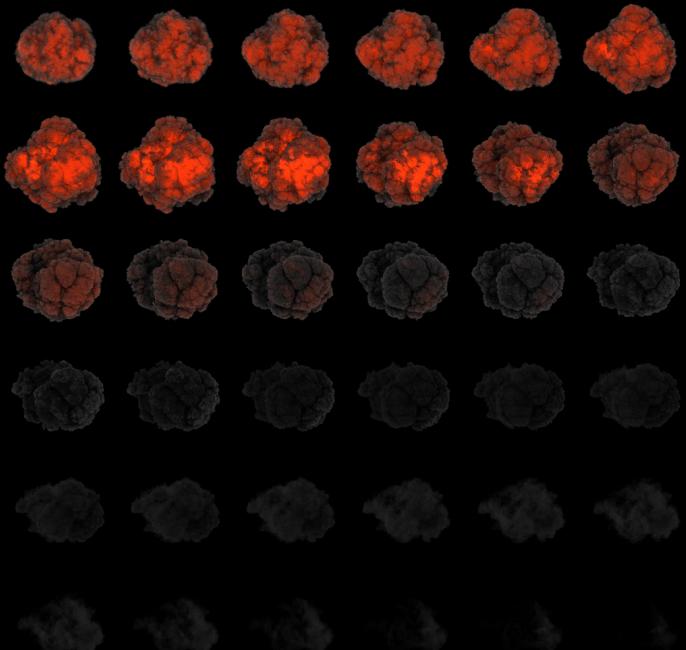


Flipbooks



**3 Seconds
64 Frames
 $512 \times 512 = 171$ kb
21.3 Frames per Second**

Flipbooks



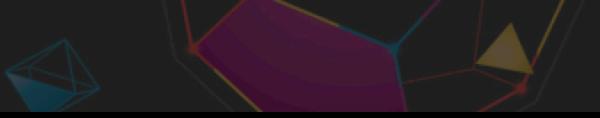
**3 Seconds
36 Frames
 $512 \times 512 = 171 \text{ kb}$
12 Frames per Second**



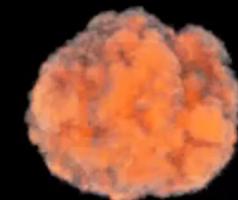
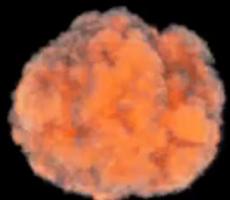
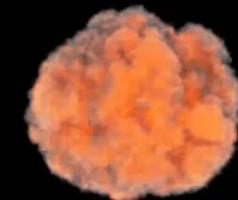
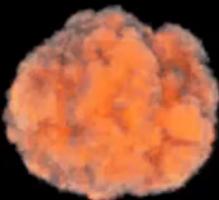
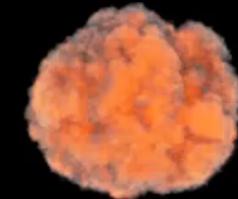
Flipbooks



**3 Seconds
64 Frames
 $1024 \times 1024 = 683 \text{ kb}$
21.3 Frames per Second**



Flipbooks



**Every time you use a flipbook
poorly, an innocent kitten is
strangled.**



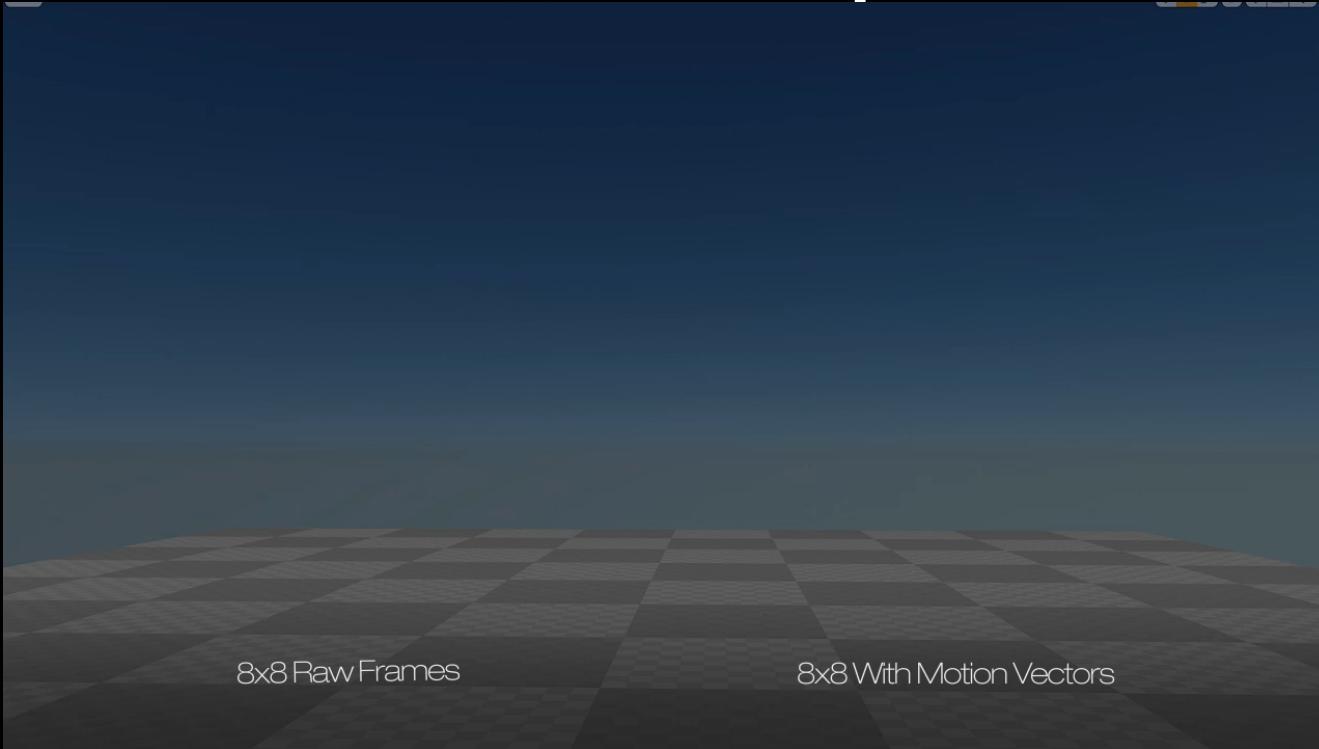


Flipbooks are the FX Artist's most powerful tool to achieve complex motion



Matt Radford. Uncharted 4, Naughty Dog

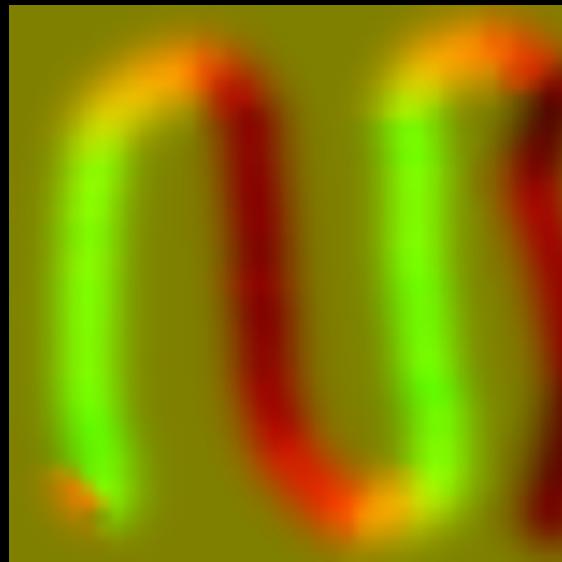
Motion Vector Flipbooks



Klemen Lozar. @klemen_lozar

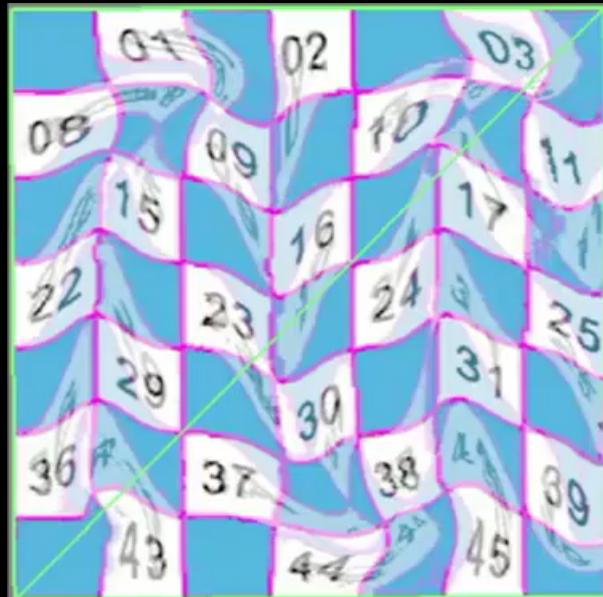
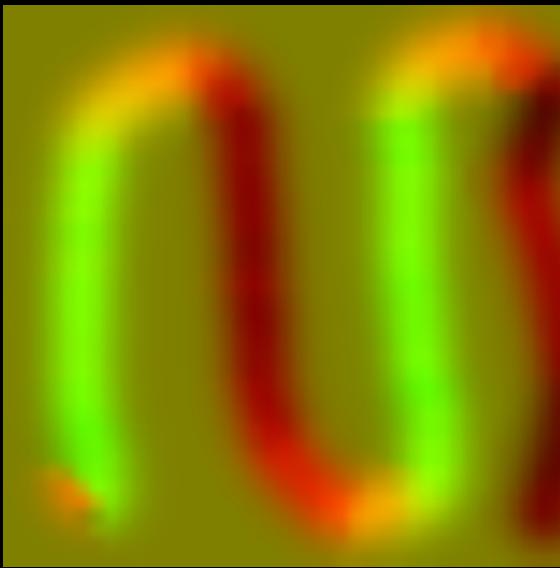
<http://www.klemenlozar.com/frame-blending-with-motion-vectors/>

Motion Vectors



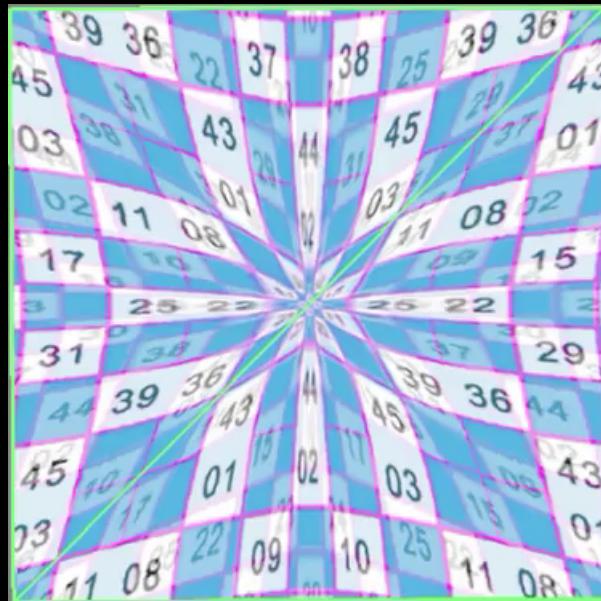
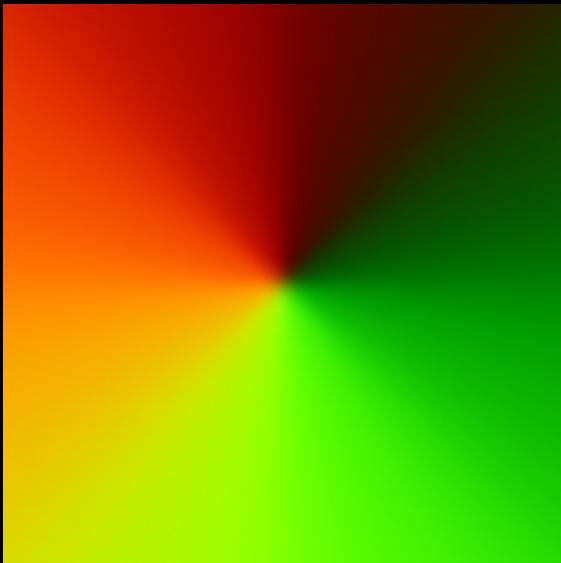
“The Tricks Up Our Sleeves” by Keith Guerrette, GDC 2012

Motion Vectors



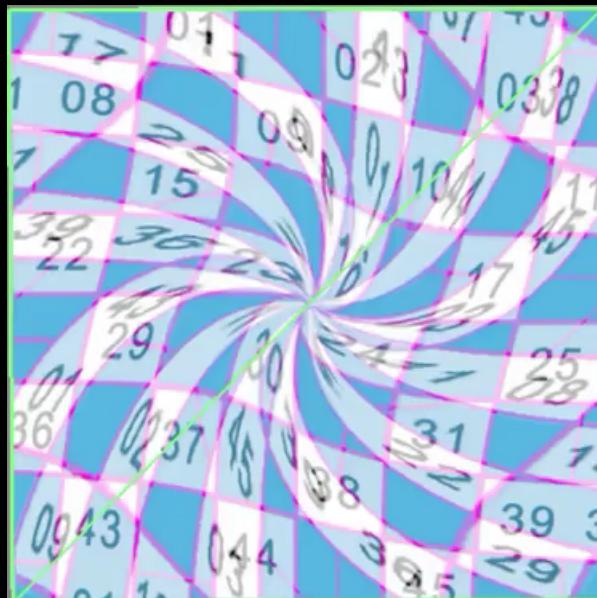
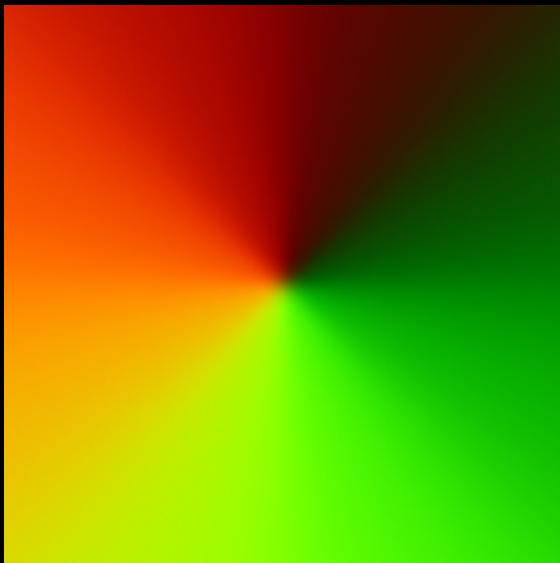
“The Tricks Up Our Sleeves” by Keith Guerrette, GDC 2012

Motion Vectors



“The Tricks Up Our Sleeves” by Keith Guerrette, GDC 2012

Motion Vectors



“The Tricks Up Our Sleeves” by Keith Guerrette, GDC 2012

Flipbooks



Really Bad Flipbooks



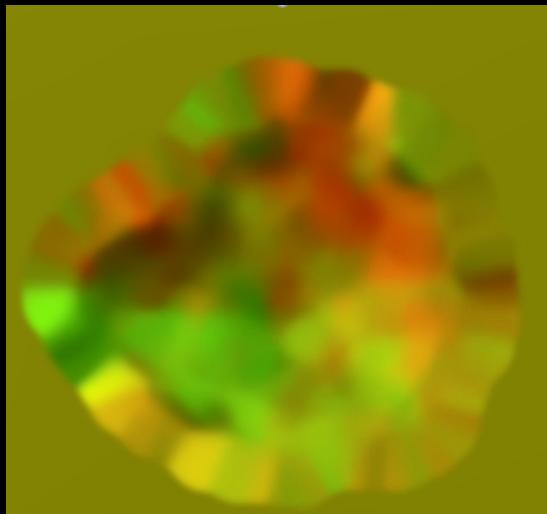
Computing Motion Vectors



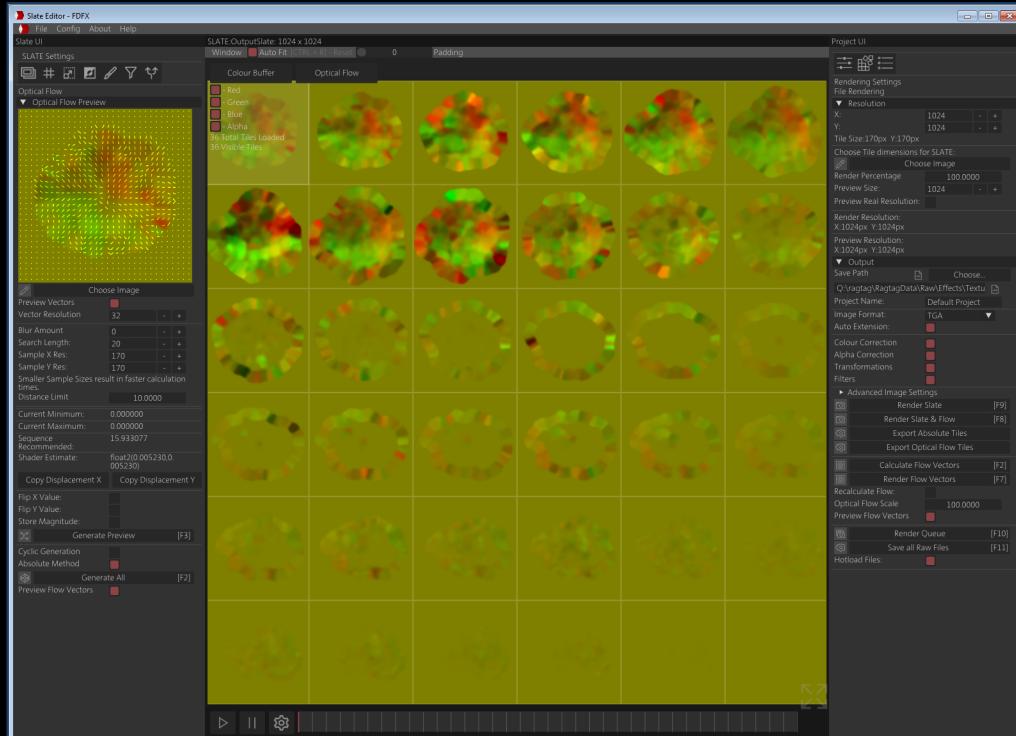
TO



=



The Slate Editor



Alex Underhill. <https://www.facedownfx.com/>

Motion Vectors Flipbooks



Motion Vector Flipbooks: Summary

- Allows less frames to be stored in a flipbook texture, while maintaining a decent frame rate within the effect.
- Requires 4 Texture Look Ups:
 - 2x Flipbook Texture
 - 2x Motion Vector Flipbook Texture
 - (These can be low res!)

References

- <http://www.klemenlozar.com/frame-blending-with-motion-vectors/>
- Slate Editor: <https://www.facedownfx.com/>
- <https://realtimevfx.com/t/motion-vectors-for-animated-textures-how-do-you-generate-them/575>

Real Time Motion Vectors (Oflow)

*“Chasing Film in 5ms: A Look at the
Real-TimeVFX of Uncharted 4”*

by Matt Radford SIGGRAPH 2015

www.fraps.com

Runtime Optical Flow
base

Lighting and Rendering

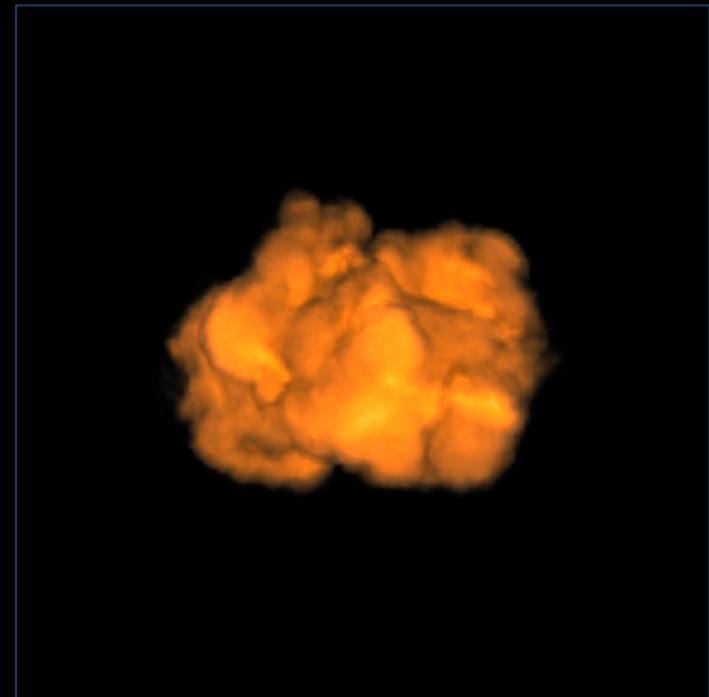
Lighting & Rendering



Mike Snowden & VFX Team at Cloud Imperium
<https://realtimenvfx.com/t/star-citizen-explosion-vfx-breakdown>



Lighting & Rendering



Seth Hall & Adad Morales, Visceral Games

Lighting & Rendering

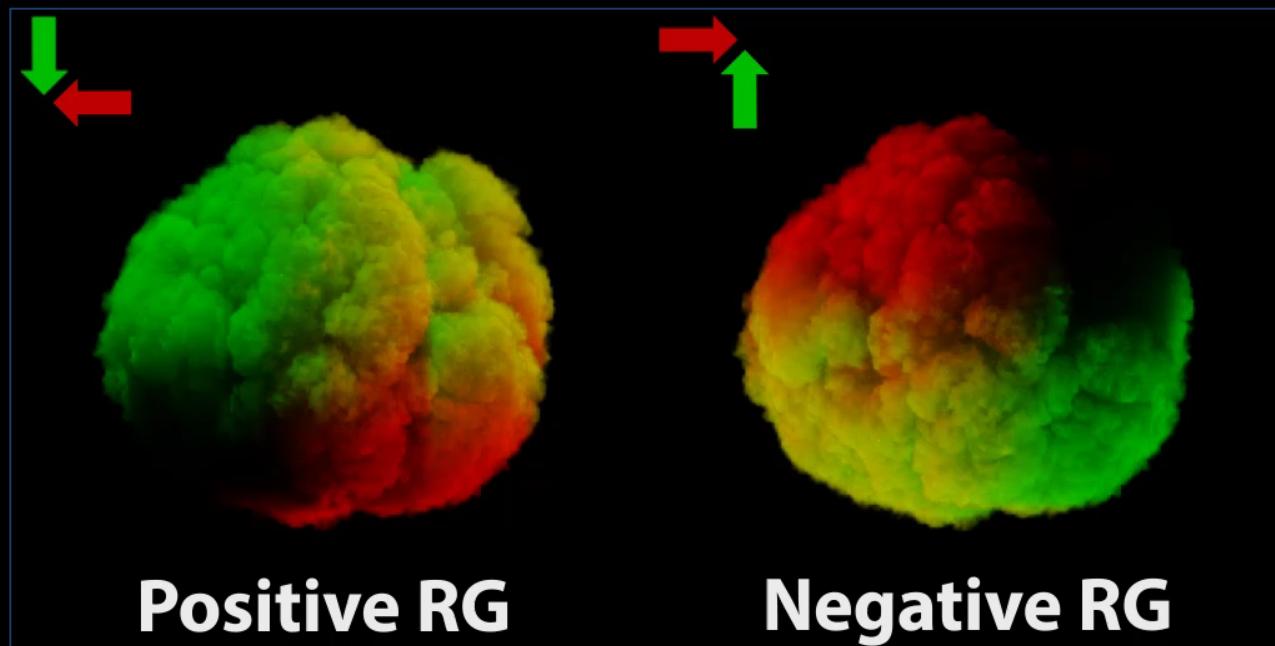
Red: Alpha

Green: Temperature

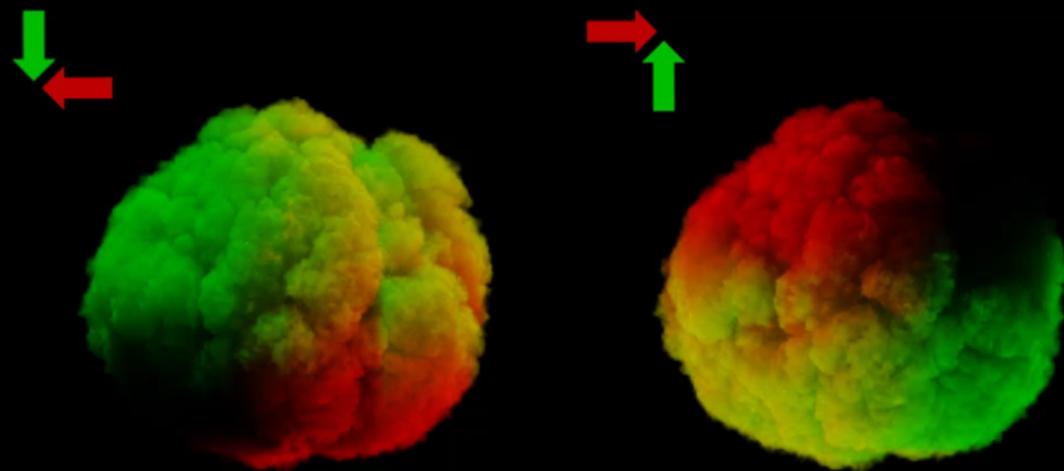
Blue: Diffuse



Generating Normals from Fluids



Generating Normals from Fluids



PositiveRender + (NegativeRender x -1.0) = Full Range Vectors (-1 o 1)

To make into a texture: **fullRangeVectors x 0.5 + 0.5**
(= a range of 0 to 1)

Generating Normals from Fluids

Blue channel mathematically calculated. So we can do that too:

$$B = \sqrt{1 - R^2 - G^2}$$





Lighting & Rendering



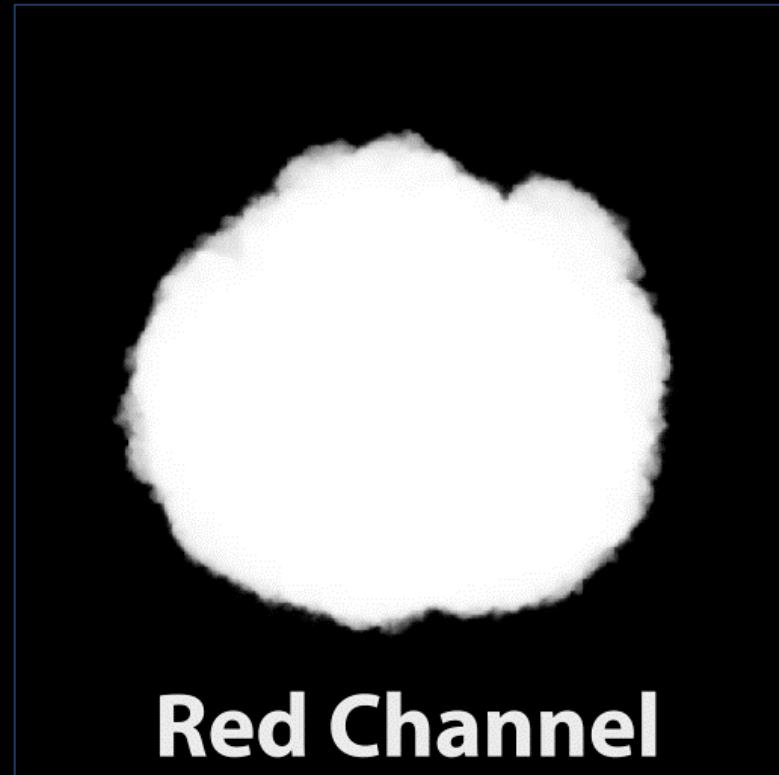
Seth Hall & Adad Morales, Visceral Games

Temperature / Black Body / LUT

Red: Alpha

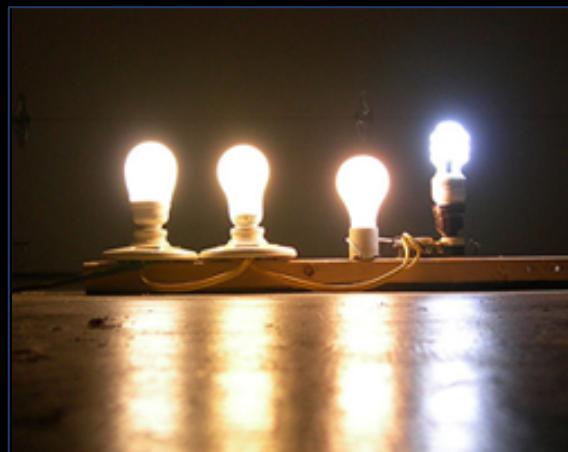
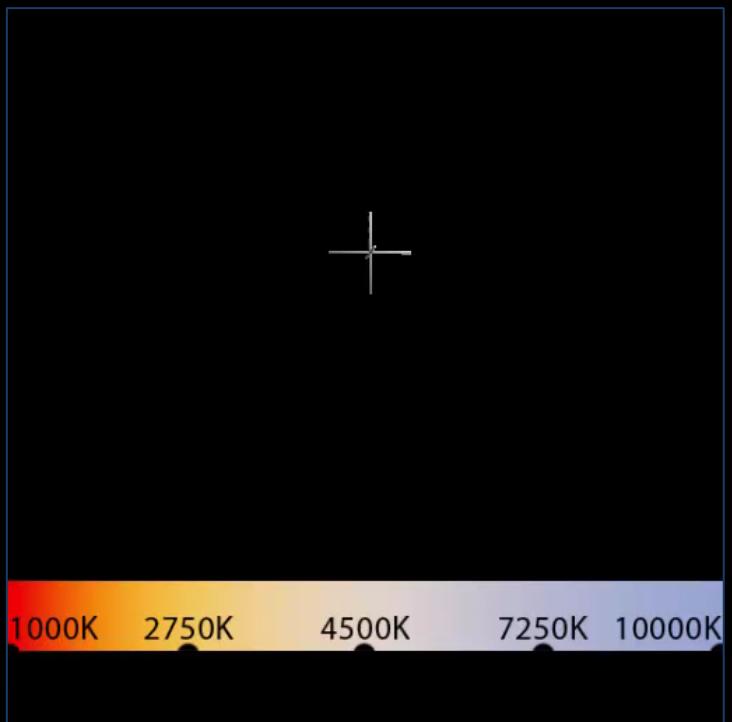
Green: Temperature

Blue: Diffuse

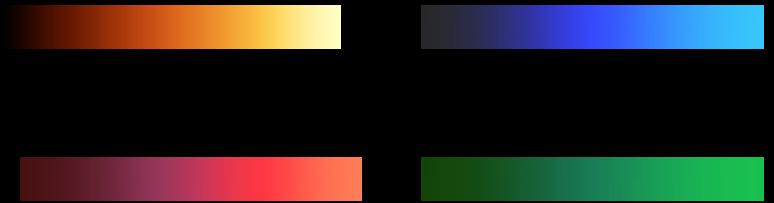


Red Channel

Temperature / Black Body / LUT



Applying non-HDR LUTS



Lighting & Rendering

LutTexture UV.x = Temperature

Intensity = (Temperature x 3)⁴

*Color = LutTexture * Intensity*



**Seth Hall & Adad Morales, Visceral Games
Inspired by VFX Team of DICE**

Lighting: Ray Marching

“Chasing Film in 5ms: A Look at the Real-Time VFX of Uncharted 4”

by Matt Radford SIGGRAPH 2015

2D Raymarching
12 samples



Lighting: Gnomon Lighting

Left



Bottom



Back



Right



Top



Front



Alpha



Terrence Kim & the VFX Team of DICE

Lighting: Gnomon Lighting



(Right, Top, Front, Alpha)



Left, Back, Bottom

Terrence Kim & the VFX Team of DICE

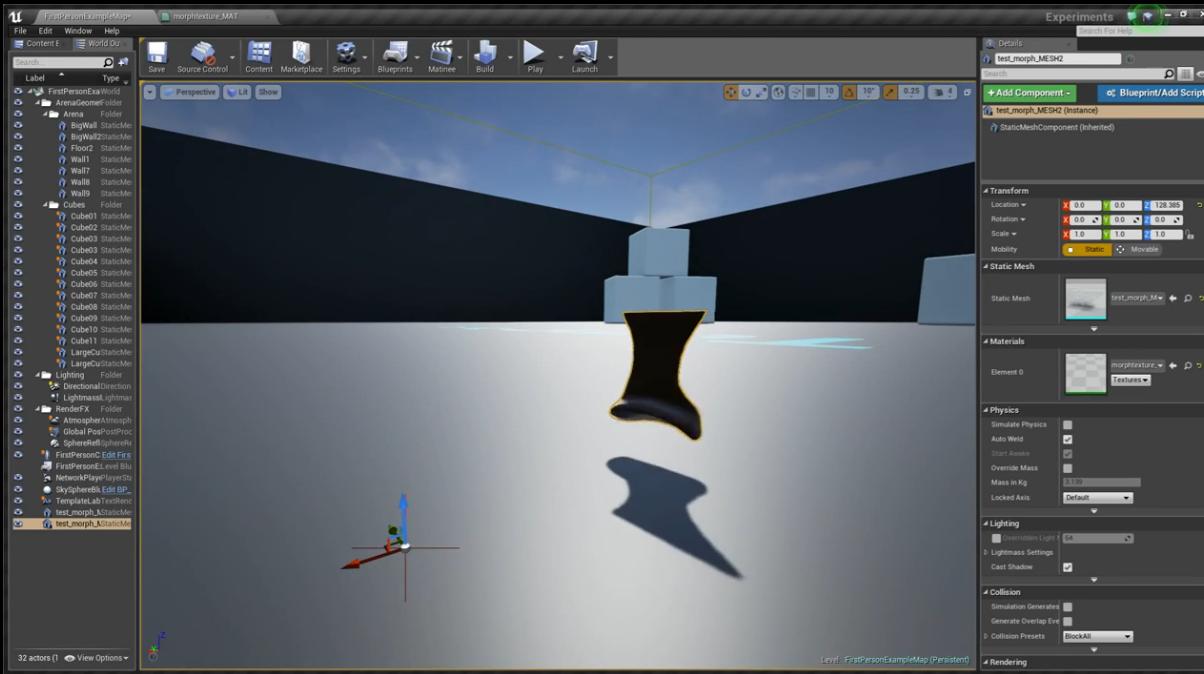
Lighting: Gnomon Lighting



Terrence Kim & the VFX Team of DICE

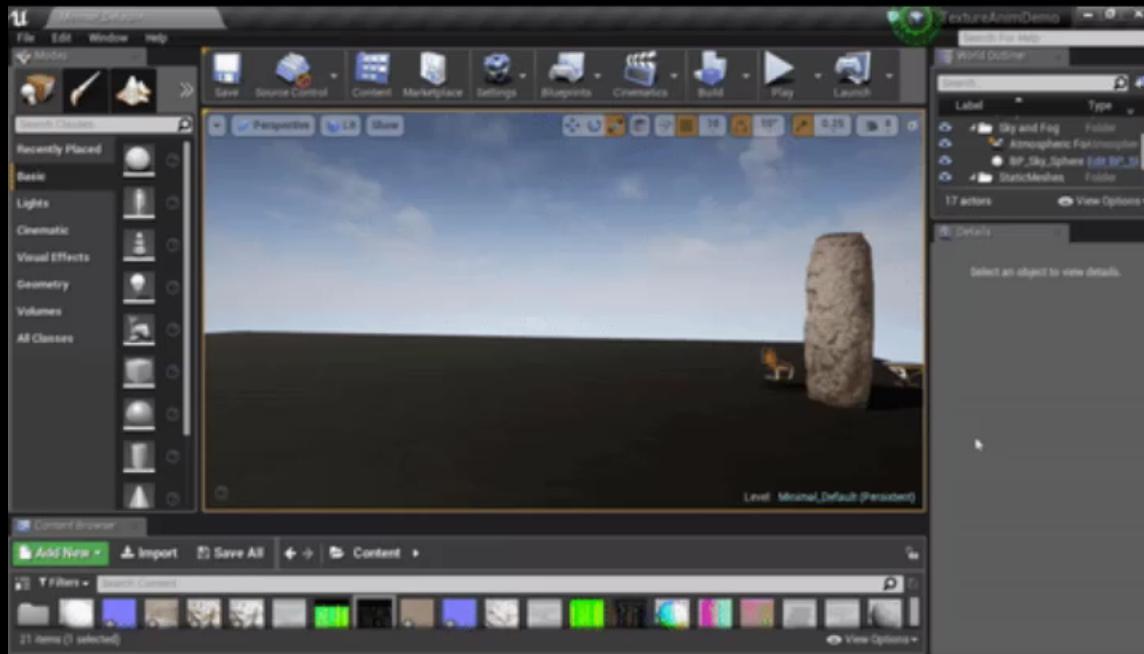
Vertex Animations

Vertex Animation: Animation Textures



Norman Schaar. Co-Founder/Technical Artist of Vertical Robot. @Norman3D

Vertex Animation: Animation Textures



Luiz Kruel. Sr. Technical Artist at SideFX. @luizkruel. luiz@sidefx.com

Vertex Animation: Animation Textures



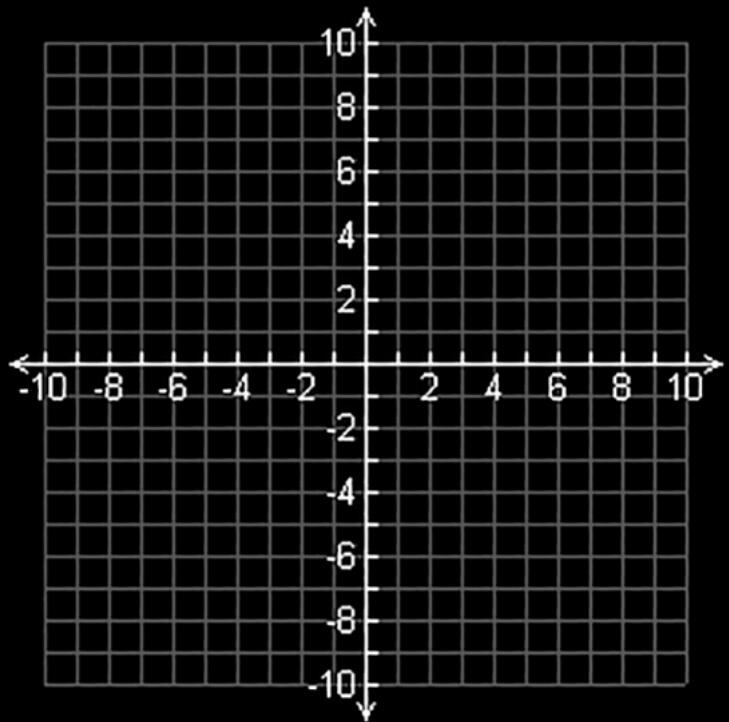
Luiz Kruel. Sr. Technical Artist at SideFX. @luizkruel. luiz@sidefx.com

Vertex Animation: Animation Textures

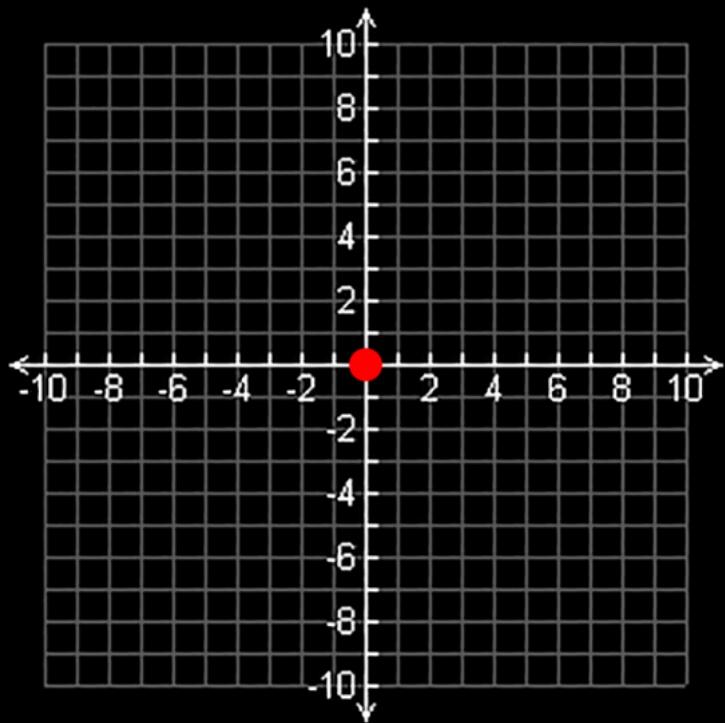


Raymond Poka & VFX Department, Naughty Dog

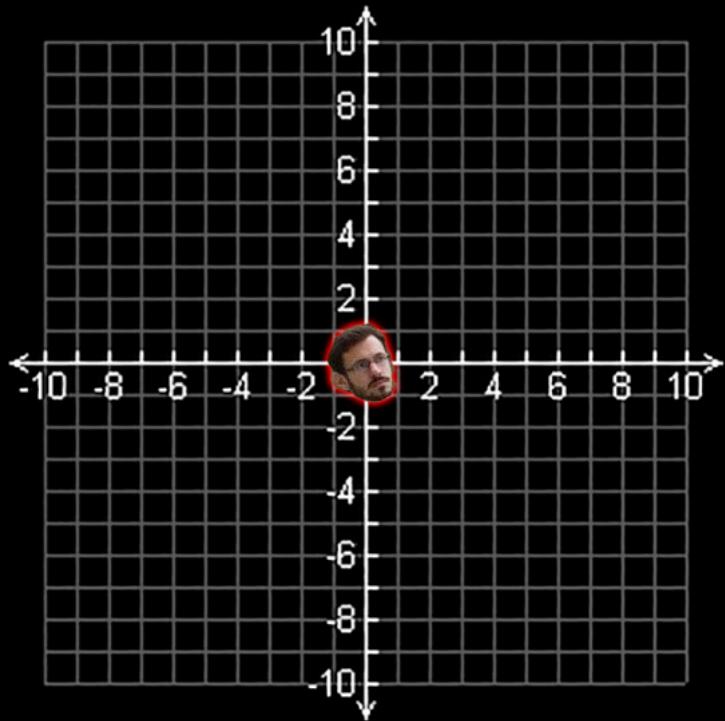
Vertex Animation: Animation Textures



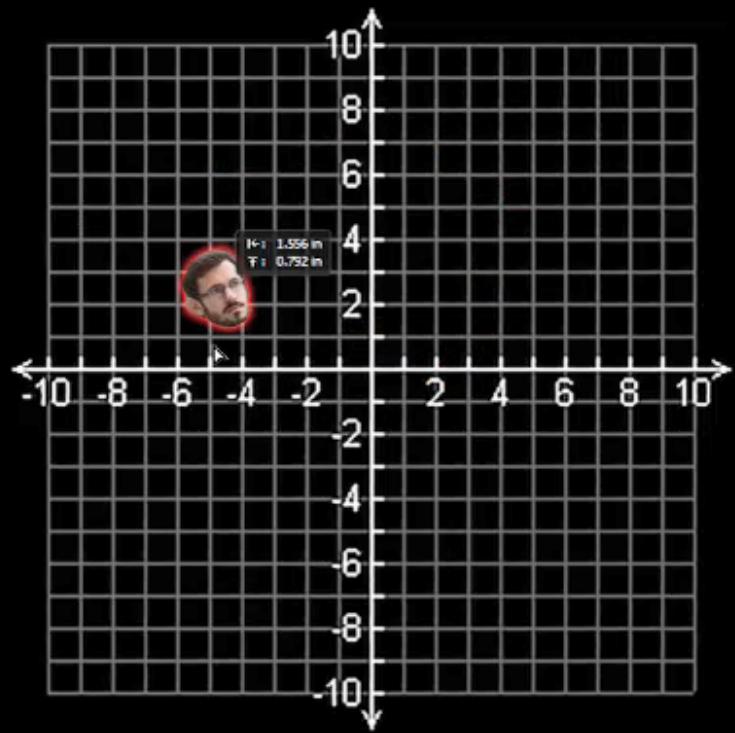
Vertex Animation: Animation Textures



Vertex Animation: Animation Textures

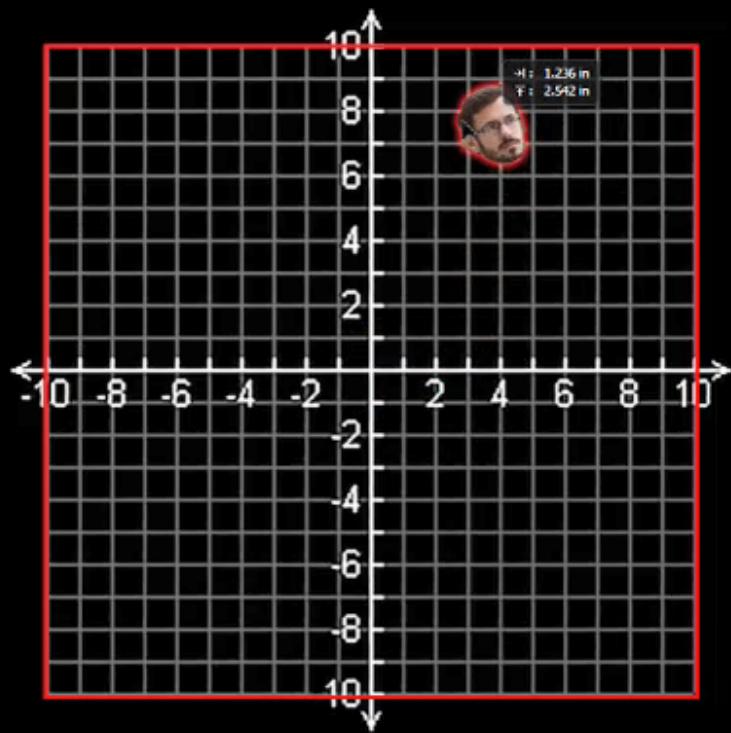


Vertex Animation: Animation Textures



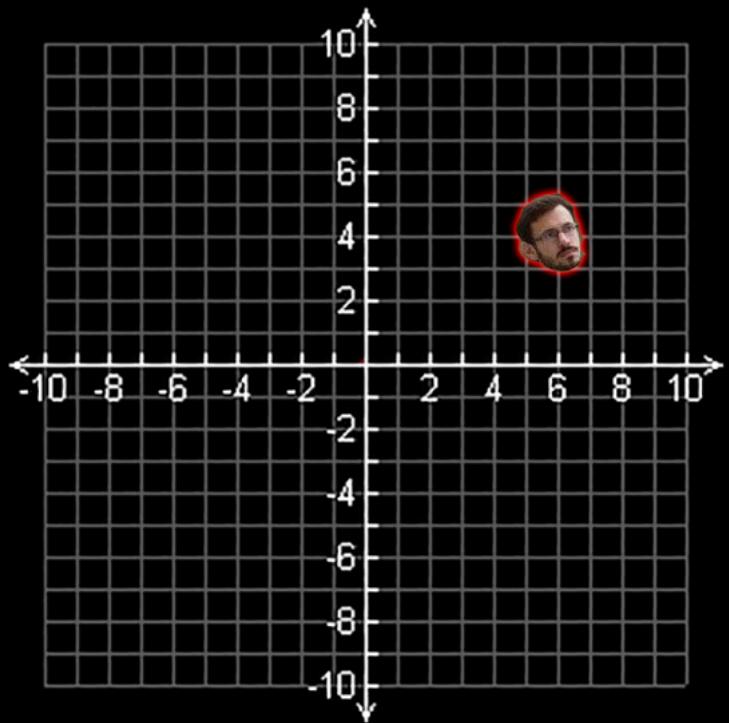
Vertex Animation: Animation Textures

Max Bounds = 10



Vertex Animation: Animation Textures

Max Bounds = 10

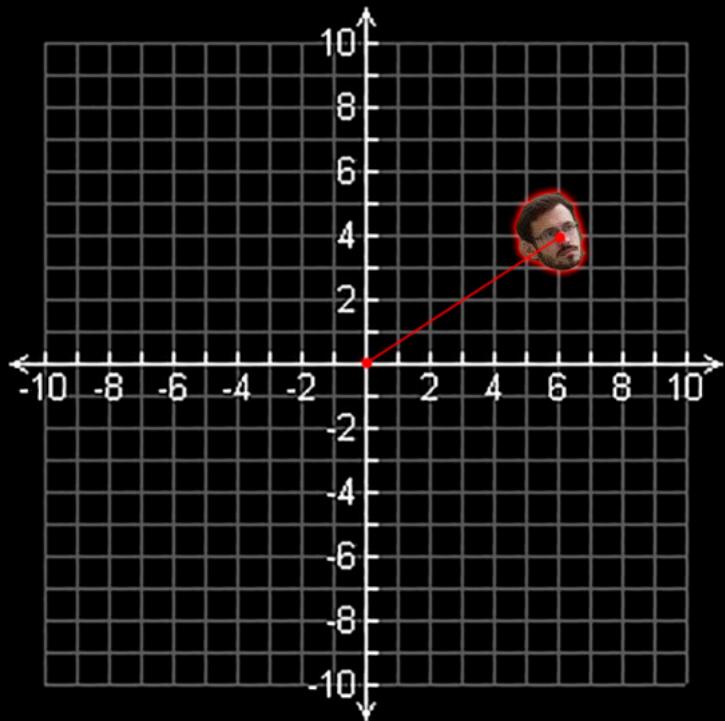


Vertex Animation: Animation Textures

Max Bounds = 10

X = 6

Y = 4



Vertex Animation: Animation Textures

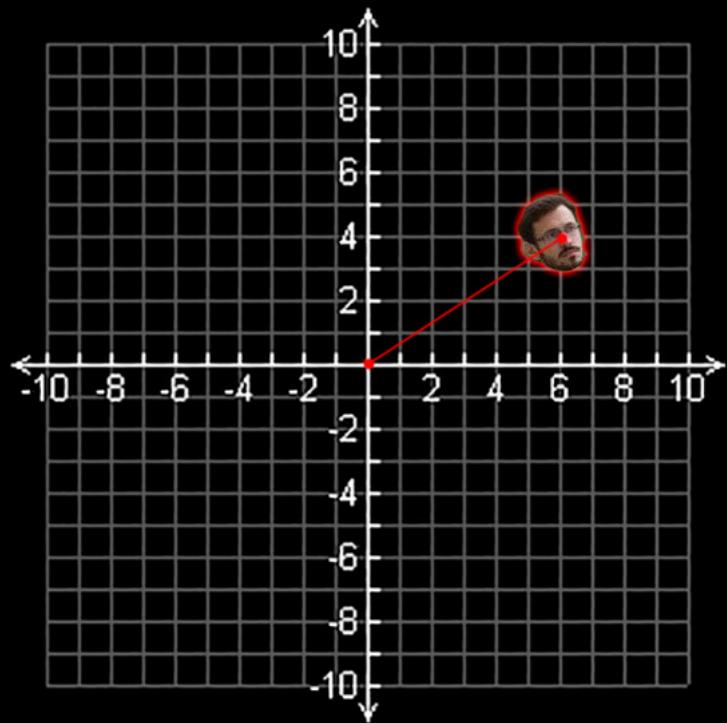
Max Bounds = 10

X = 6 / 10

= 0.6

Y = 4 / 10

= 0.4



Vertex Animation: Animation Textures

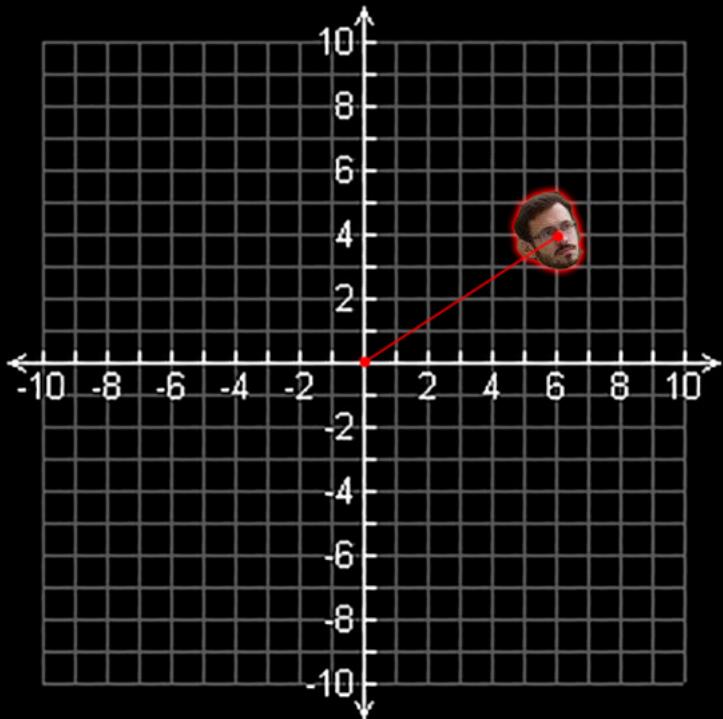
Max Bounds = 10

$$X = 6 / 10$$

$$= 0.6$$

$$Y = 4 / 10$$

$$= 0.4$$



Need to remap range:

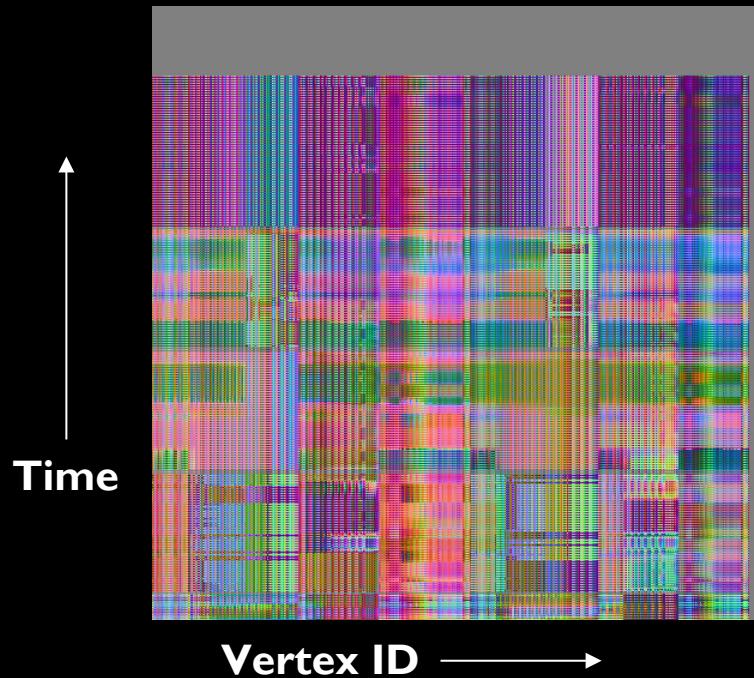
$$(X, Y) * 0.5 + 0.5$$

$$X = 0.8$$

$$Y = 0.7$$



Vertex Animation: Animation Textures



Vertex Animation: Animation Textures



Raymond Poka & VFX Department, Naughty Dog

Vertex Animation: Animation Textures

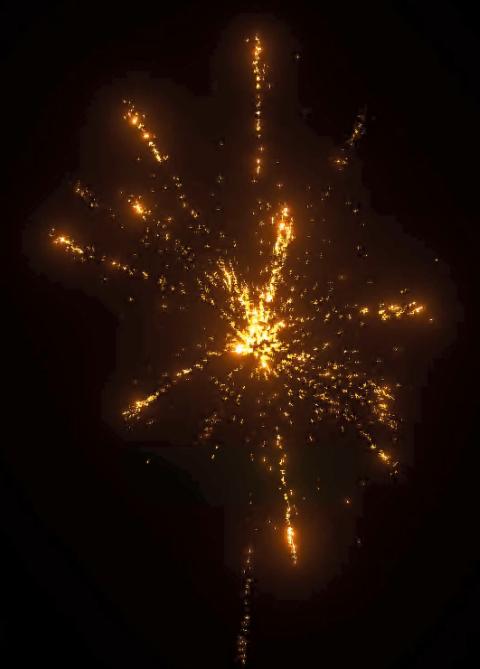


Raymond Poka & VFX Department, Naughty Dog

Vertex Animation: Animation Textures

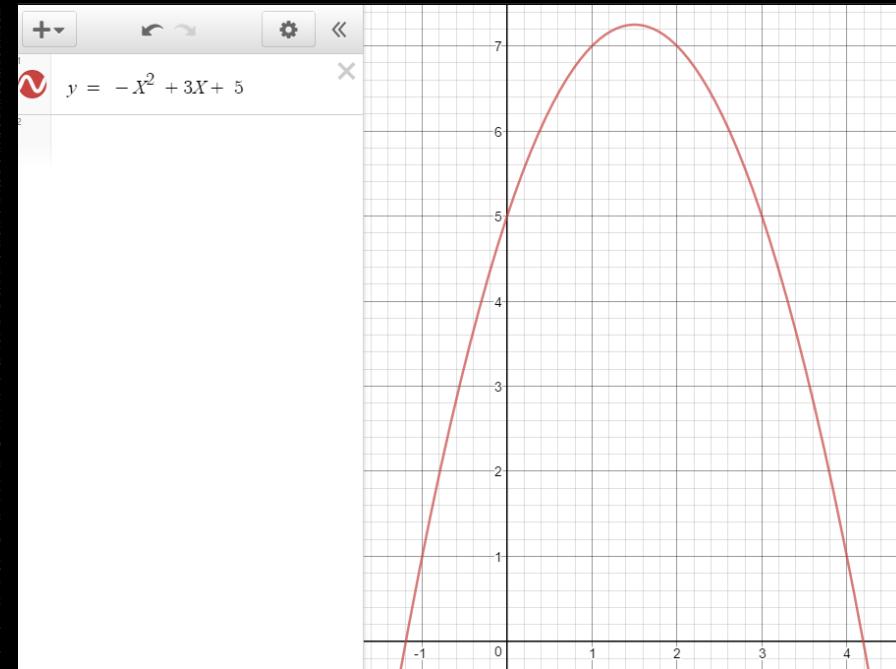
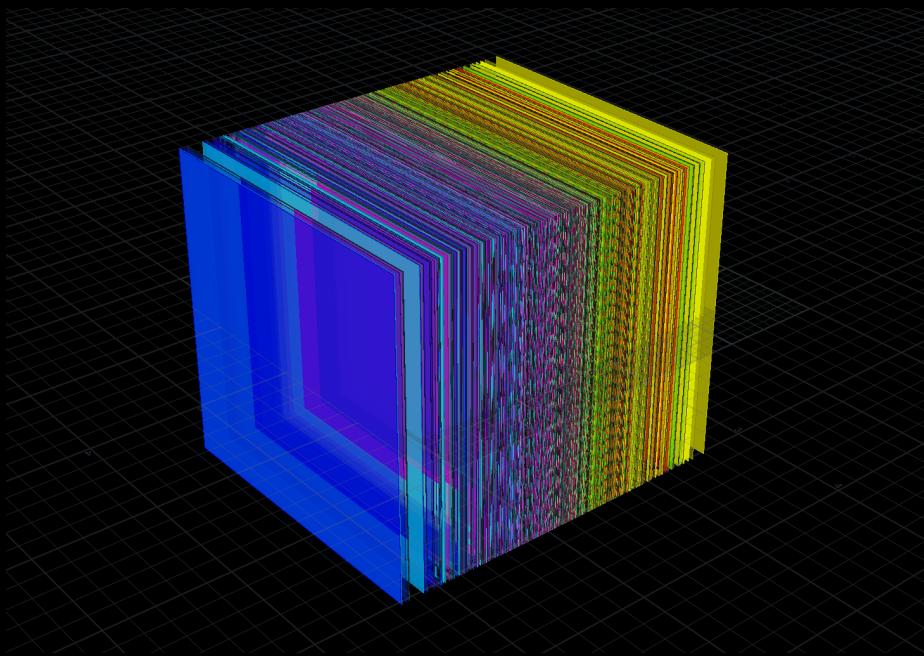
- Cautionary Note: If you push the vertices too far, you'll also need to update the *vertex normals*.

Vertex Animation: Stateless Particle Simulations



Terrence Kim & VFX Team of DICE

Vertex Animation: Stateless Particle Simulations



Terrence Kim & VFX Team of DICE

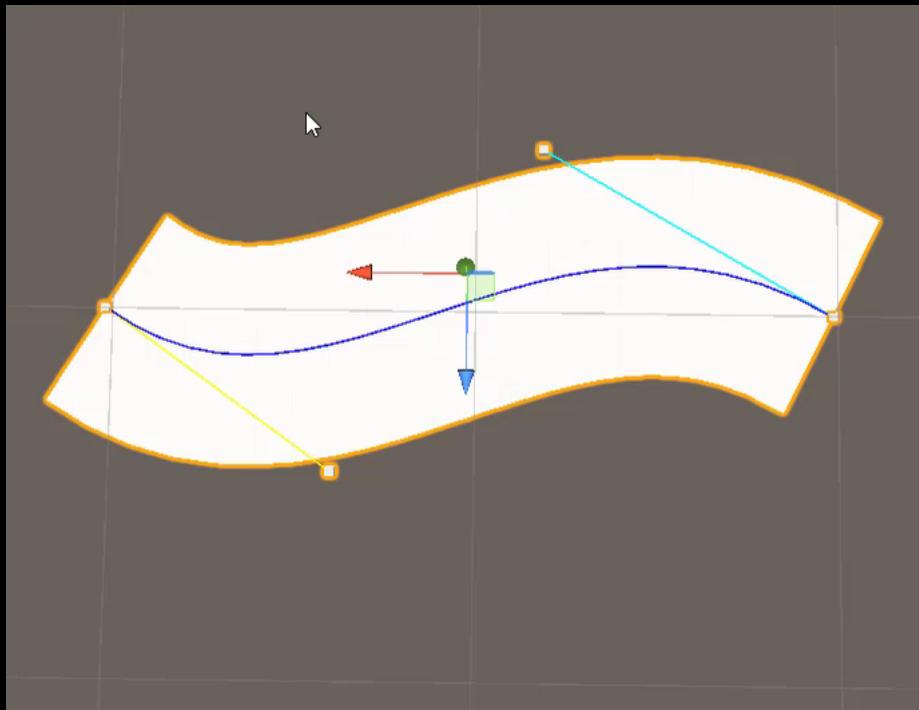
Vertex Animation: Stateless Particle Simulations



Terrence Kim & VFX Team of DICE

Trails

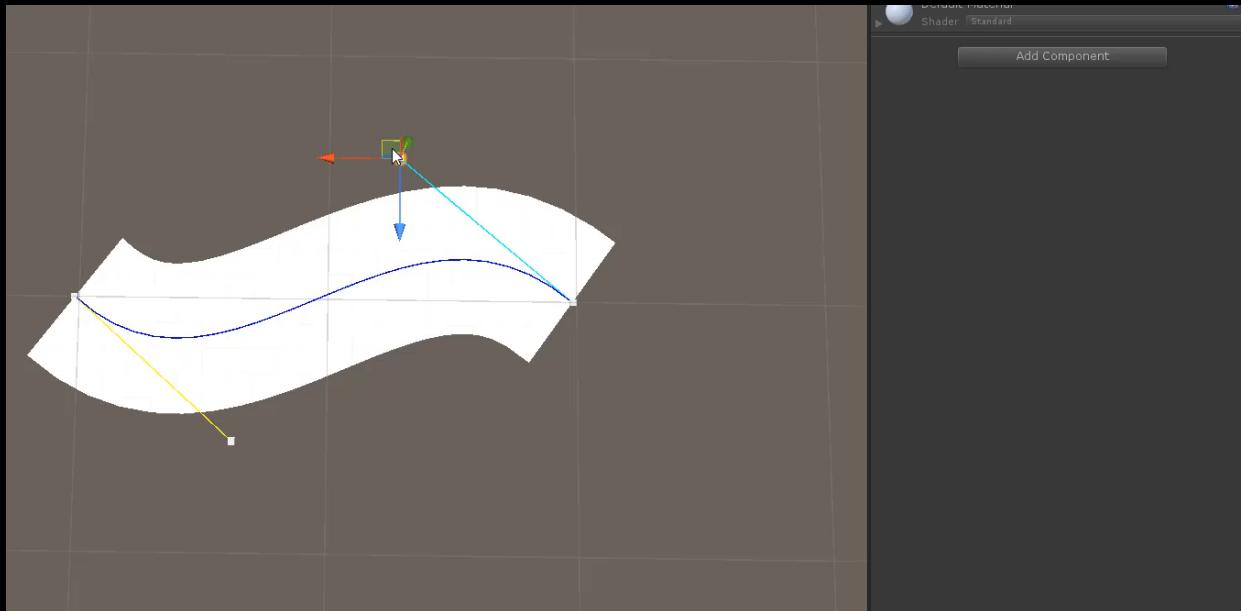
Custom Trail Tangents



Jae Hyun Yoo, Sr VFX Artist. Riot Games. @Fkkcloud



Custom Trail Tangents

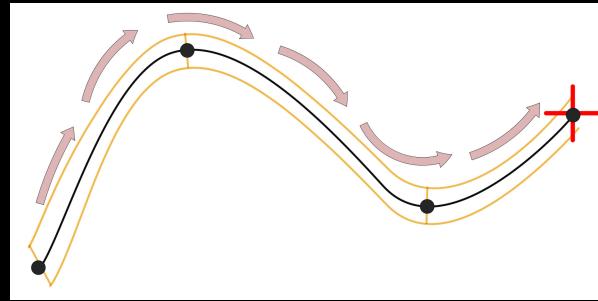


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Custom Trail Profiles



- Splines are typically used for modeling a, I saw the opportunity to create better “volume trails” to move past the deficits of ribbons from Cascade.
- The blueprint updates on tick reading a socket from a specified skeletal mesh’s socket in world space.
- Connect the dots - One spline mesh is created for every two spline points (i.e. 4 spline points should have 3 meshes).



Custom Trail Profiles



Spline blueprint running in “debug” mode
to visualize the trail in motion

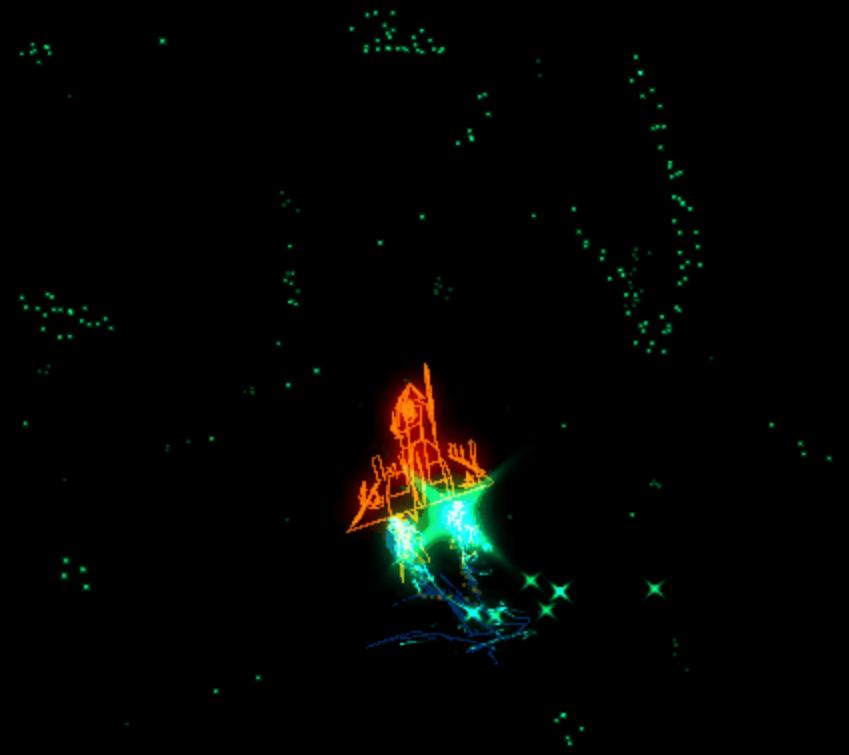
- Uses a specified mesh, set of curve assets, and parameters nomenclature similar to Cascade.
 - Size Over Life, Color Over Life, etc
- Free to use (ask me for the blueprint)!
 - bill.kladis@epicgames.com

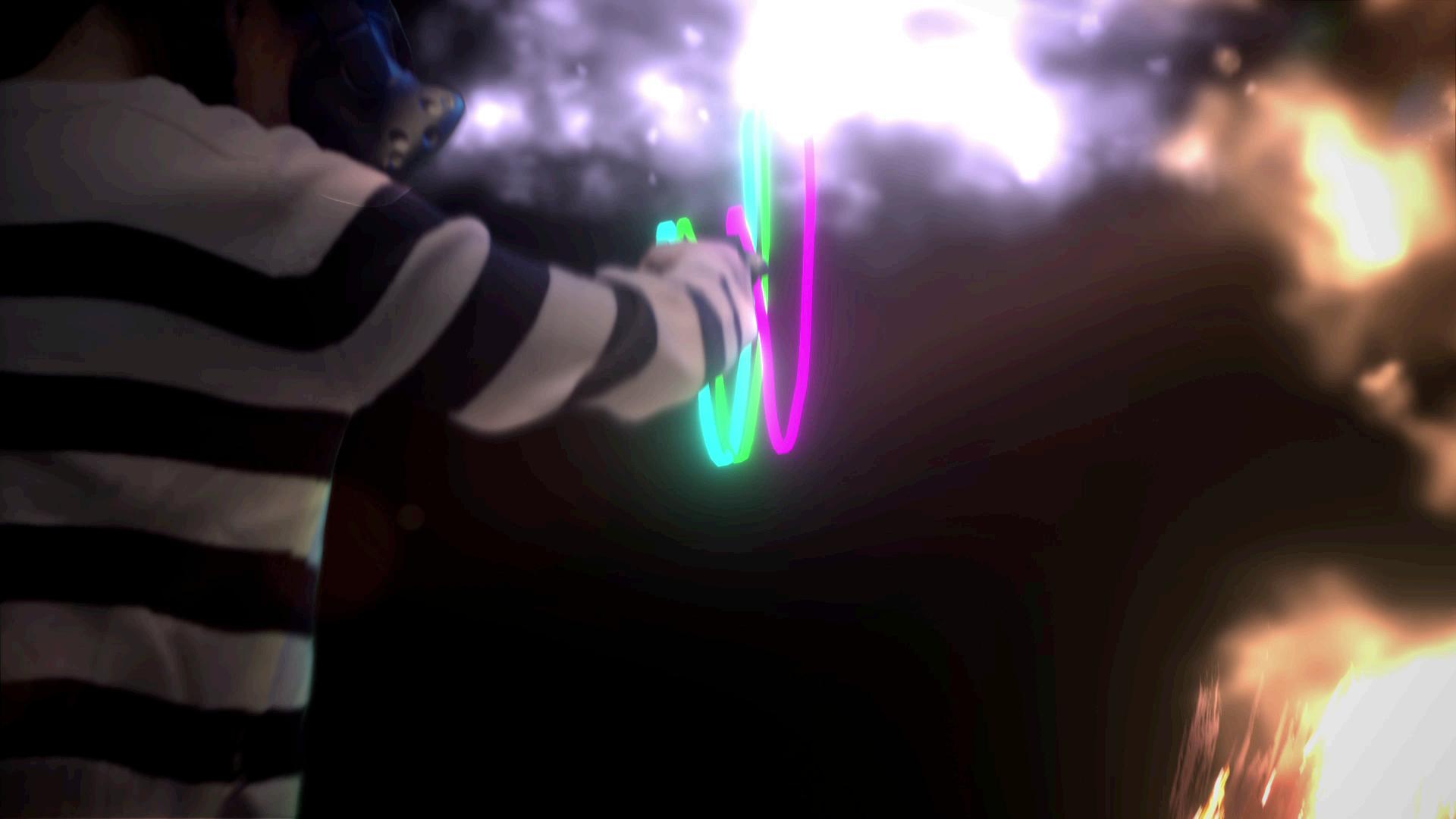


Tilt Brush

Old Tricks in New Places







Old Tricks...

Rock Show VFX: Bringing Brütal Legend to Life



Old Tricks...

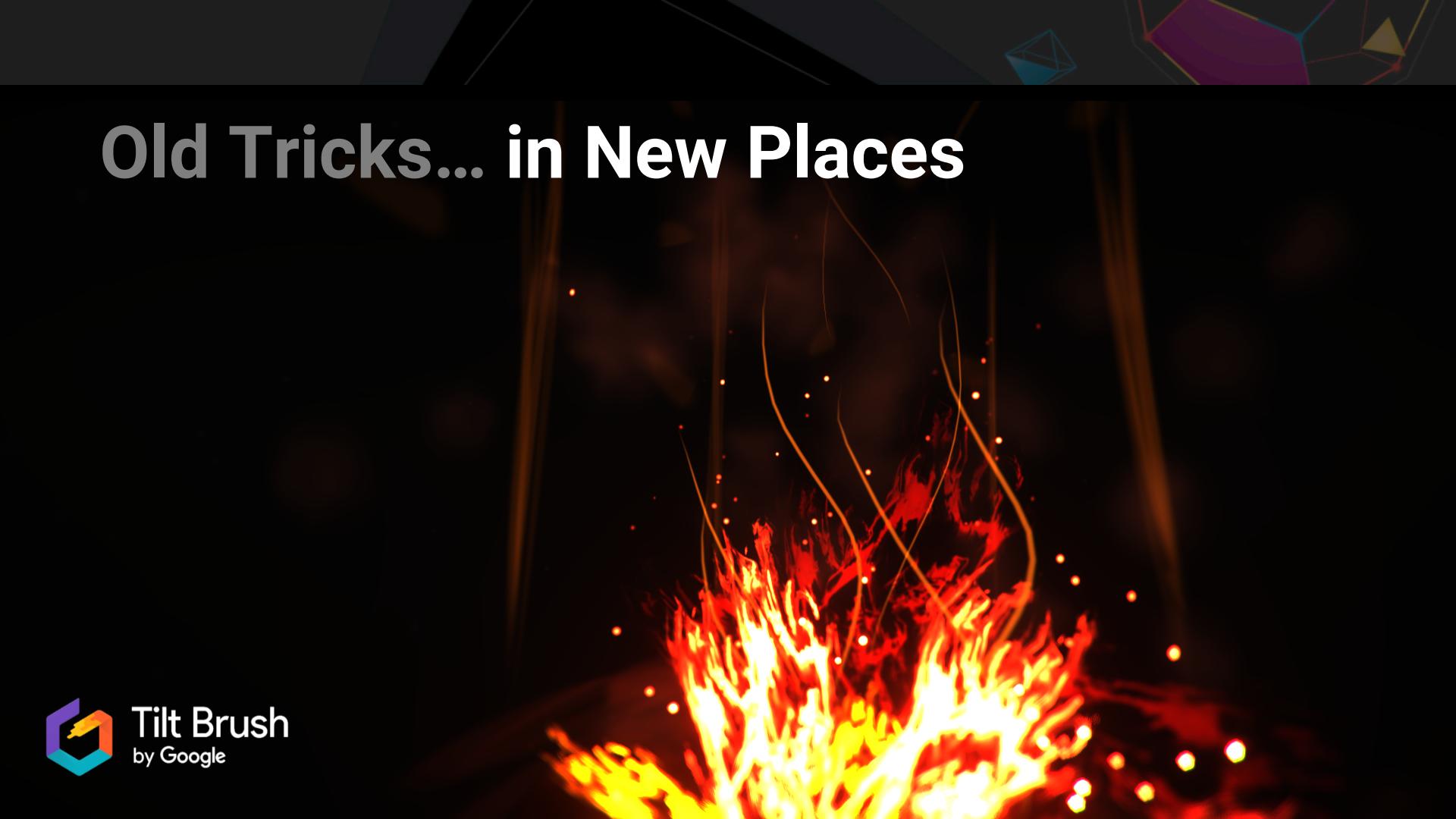


Disabled



Enabled

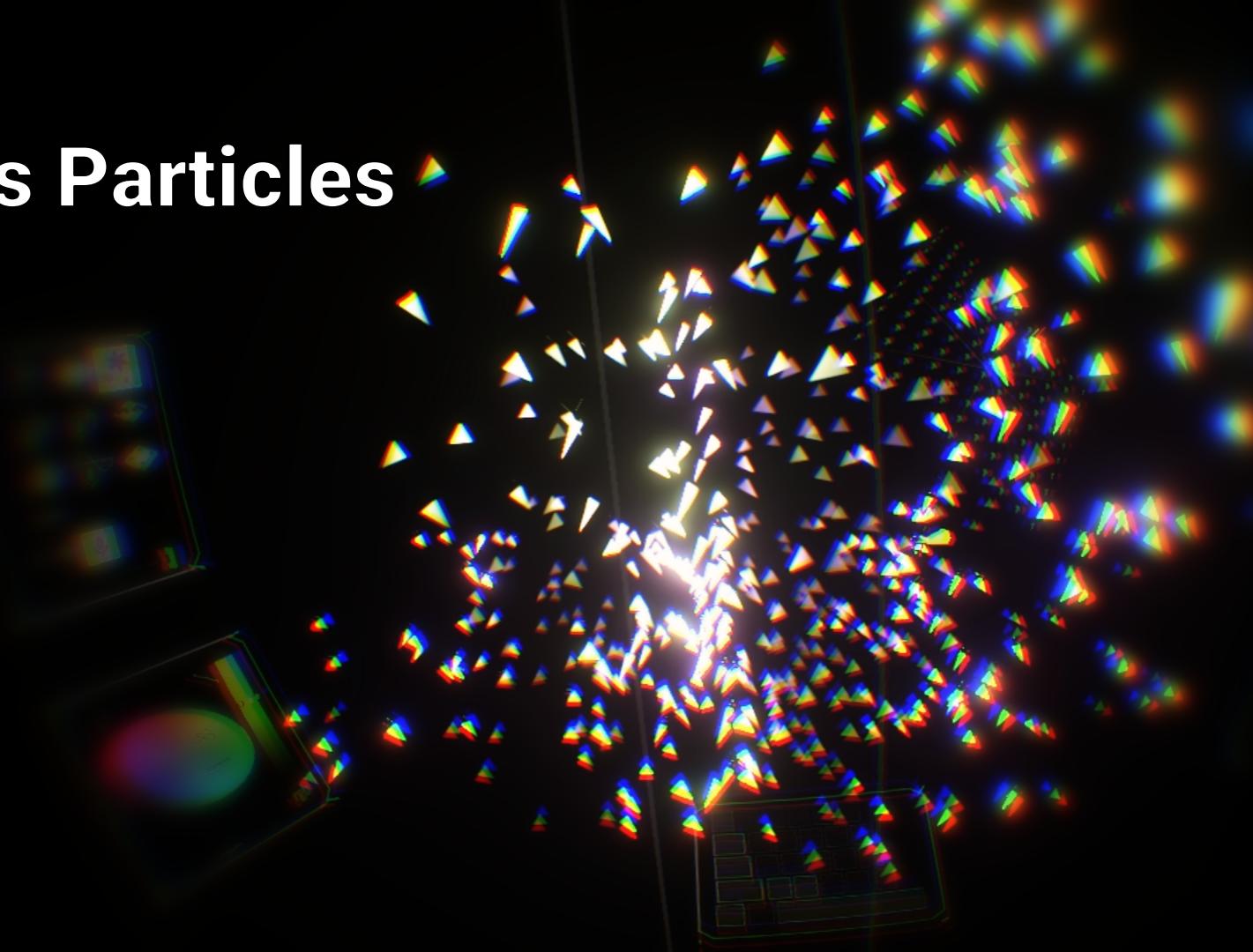
Old Tricks... in New Places



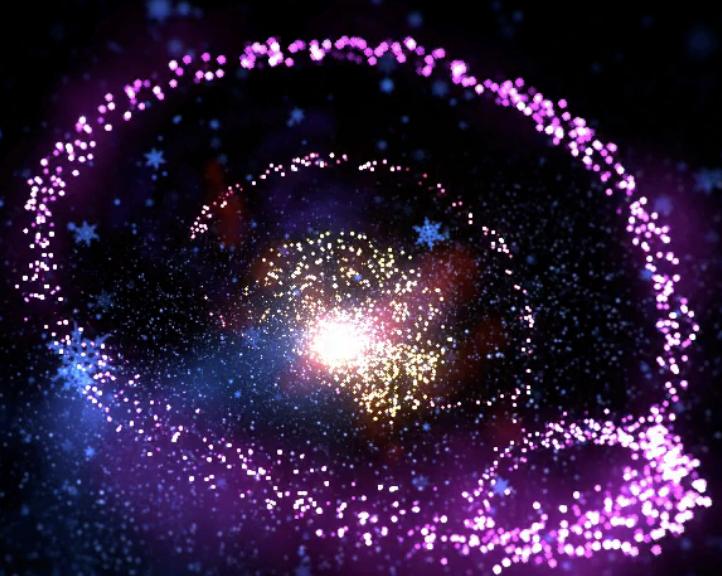
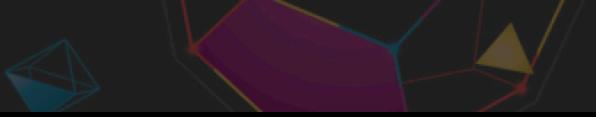
Old Tricks... in New Places



Stateless Particles



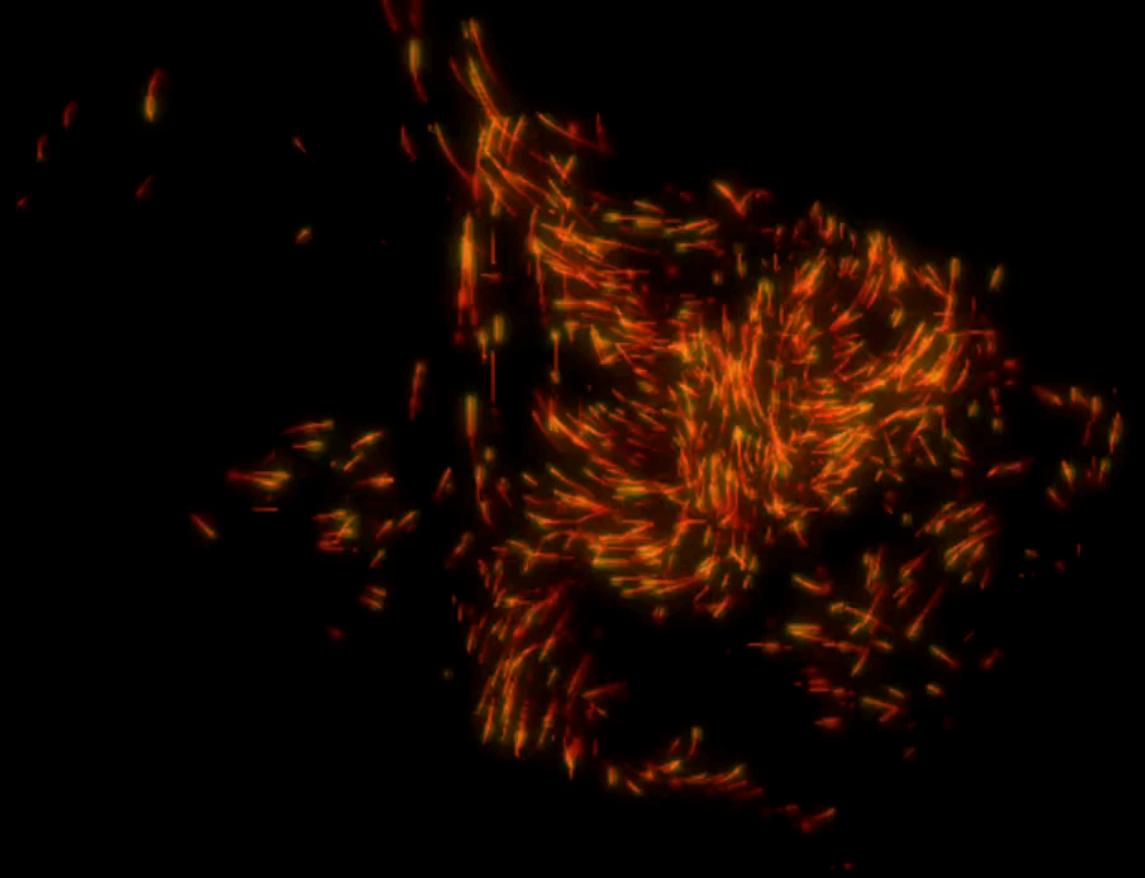
Stateless Particles



Stateless Particles

```
51         v2f vert (appdata_t v)
52         {
53             v2f o;
54
55             // Custom vertex animation
56             // Accumulate all displacement into a common, pre-transformed space.
57             float scrollAmount = _Time.y;
58             float t = fmod(scrollAmount * _ScrollRate + v.color.a, 1);
59
60             float4 worldPos = v.vertex;
61             PrepForOdsWorldSpace(worldPos);
62
63             float4 dispVec = (t - .5f) * float4(_ScrollDistance, 0, 0, 1);
64
65             dispVec.x += sin(t * _ScrollJitterFrequency + _Time.w) * _ScrollJitterIntensity;
66             dispVec.z += cos(t * _ScrollJitterFrequency * .5 + _Time.w) * _ScrollJitterIntensity;
67
68             dispVec = mul(xf_CS, dispVec);
69             dispVec.w = 0.0;
70
71             worldPos += dispVec;
72
73 #ifdef AUDIO_REACTIVE
74             o.color = musicReactiveColor(v.color, _BeatOutput.w);
75             worldPos = musicReactiveAnimation(worldPos, v.color, _BeatOutput.w, worldPos.y*5);
76 #else
77             o.color = v.color;
78 #endif
79
80             o.vertex = mul(UNITY_MATRIX_VP, worldPos);
81             o.color.a = pow(1 - abs(2*(t - .5)), 3);
82             o.texcoord = TRANSFORM_TEX(v.texcoord, _MainTex);
83
84             return o;
85         }
```

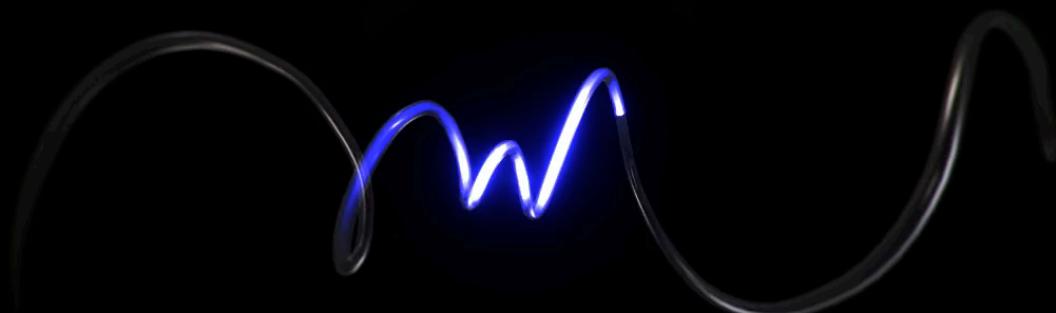
Curl Noise



Stateless Particles



Neon



Neon

MonoDevelop-Unity File Edit View Search Project Build Run Version Control Tools Window Help

Linux Standalone <OpenGL 4.1>

Debug Unity Editor MonoDevelop-Unity

NeonPulse.shader

```
// NEON!

void surf (Input IN, inout SurfaceOutputStandardSpecular o) {

    // Glass
    o.Smoothness = .8;
    o.Specular = .05;

    // Animate texcoord x
    IN.tex.x += _Time.x*5;
    IN.tex.x = fmod( IN.tex.x,1);

    // Neon pulse is narrow band in texcoord x
    float neon = saturate(pow( 10 * saturate(.2 - IN.tex.x),5));

    // Vertex colors
    IN.color = pow(IN.color, 2.2);
    float4 bloom = IN.color * exp(_EmissionGain * 10);

    // Rim light diffusion
    float3 n = WorldNormalVector (IN, o.Normal);
    half rim = 1.0 - saturate(dot (normalize(IN.viewDir), n));
    bloom *= pow(1-rim,5);

    // Glow
    o.Emission = neon * bloom;
}
```

Game

Display 1 Free Aspect Scale 1x Maximize on Play Mute audio Stats Gizmos

Toolbox Properties Document Outline Unit Tests

Audio Reactive Brushes



Audio Reactive Brushes



Overview Repositories 346 Stars 109 Followers 3.1k Following 9

Popular repositories

KinoGlitch
Video glitch effects for Unity
C# ★ 418 ₩ 53

Skinner
Special Effects with Skinned Mesh in Unity
C# ★ 417 ₩ 38

KvantSpray
Object instancing/particle animation system for Unity
C# ★ 358 ₩ 55

Reaktion
Audio reactive animation toolkit for Unity
C# ★ 273 ₩ 52

Klak
Utilities for creative coding with Unity
C# ★ 264 ₩ 38

Retro3D
A shader that imitates low grade 3D graphics.
C# ★ 229 ₩ 24

Keijiro Takahashi
keijiro

[Block or report user](#)

 Unity Technologies Japan

 Japan

 keijiro@gmail.com

 <http://keijiro.github.io>

Audio Reactive Brushes

The image shows a GitHub profile page for a user named Keijiro Takahashi. The profile picture features a man with glasses and a white 'Thank You!' written across it. The page includes sections for Overview, Repositories (346), Stars (19), Followers (3.1k), and Following (9). A large, hand-drawn 'Thank You!' is written in white over the profile picture and the top part of the page. Below the profile picture, the user's name 'Keijiro Takahashi' and handle 'keijiro' are displayed, along with options to 'Block or report user'. The page lists several popular repositories: KinoGlich, KvantSpray, Klak, Skinner, and Retro3D. A callout box highlights the 'Reaktion' repository, which is described as an 'Audio reactive animation toolkit for Unity'. An arrow points from the main text area to this callout.

Overview Repositories 346 Stars 19 Followers 3.1k Following 9

Popular repositories

KinoGlich
video glitch effects for Unity
C# ★ 418 ⚡ 5

KvantSpray
Object instancing/particle animation system for Unity
C# ★ 358 ⚡ 55

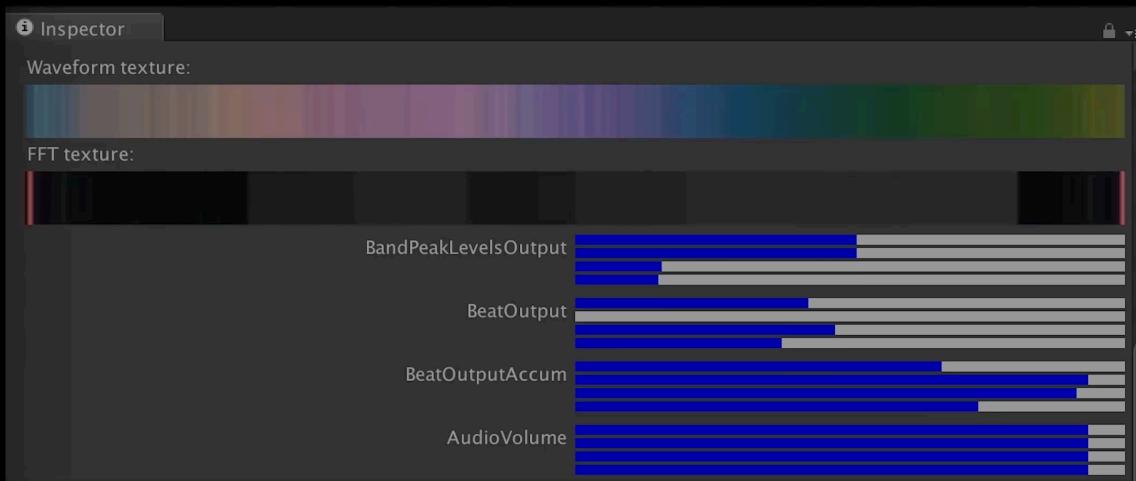
Klak
Utilities for creative coding with Unity
C# ★ 264 ⚡ 38

Skinner
Special Effects with Skinned Mesh in Unity
C# ★ 17 ⚡ 38

Reaktion
Audio reactive animation toolkit for Unity
C# ★ 273 ⚡ 52

Retro3D
A shader that imitates low grade 3D graphics.
C# ★ 229 ⚡ 24

Audio Reactive Brushes

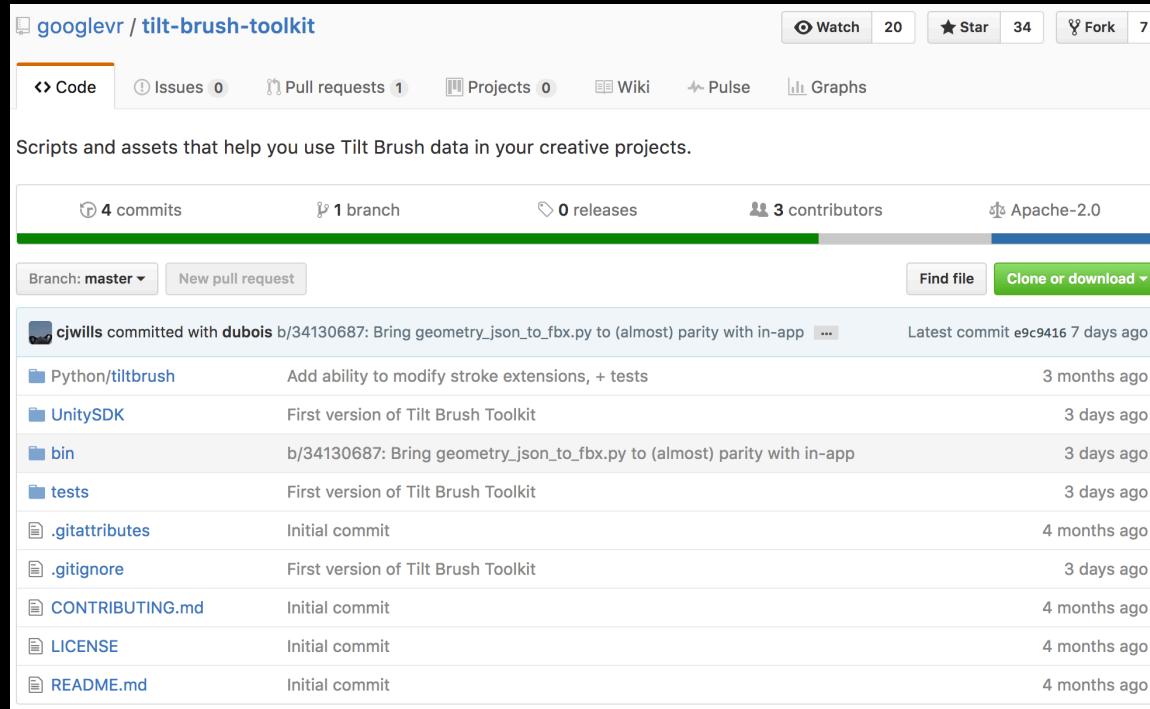


Keijiro's GPU Particles



Tilt Brush Toolkit

<https://github.com/googlevr/tilt-brush-toolkit>



The screenshot shows the GitHub repository page for "googlevr / tilt-brush-toolkit". The page has a dark theme with a header featuring a stylized geometric logo. The repository name is at the top left, followed by a "Watch" button (20), a "Star" button (34), a "Fork" button (7), and a search bar. Below the header is a navigation bar with "Code" (selected), "Issues 0", "Pull requests 1", "Projects 0", "Wiki", "Pulse", and "Graphs". A main heading says "Scripts and assets that help you use Tilt Brush data in your creative projects." Below this is a summary bar with metrics: 4 commits, 1 branch, 0 releases, 3 contributors, and Apache-2.0 license. It includes dropdowns for "Branch: master" and "New pull request", and buttons for "Find file" and "Clone or download". The main content area lists files and their details:

File	Description	Last Commit
cjwills committed with dubois b/34130687: Bring geometry_json_to_fbx.py to (almost) parity with in-app	Add ability to modify stroke extensions, + tests	7 days ago
Python/tiltbrush	First version of Tilt Brush Toolkit	3 months ago
UnitySDK	b/34130687: Bring geometry_json_to_fbx.py to (almost) parity with in-app	3 days ago
bin	First version of Tilt Brush Toolkit	3 days ago
tests	Initial commit	3 days ago
.gitattributes	Initial commit	4 months ago
.gitignore	First version of Tilt Brush Toolkit	3 days ago
CONTRIBUTING.md	Initial commit	4 months ago
LICENSE	Initial commit	4 months ago
README.md	Initial commit	4 months ago

Tilt Brush Toolkit

<https://github.com/googlevr/tilt-brush-toolkit>

Thank You!



Fernando Ramallo
@compositedfox



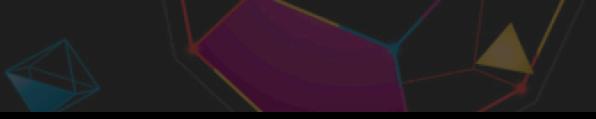
The Rise of Real Time



Traditional **Real Time** VFX



The Future of **Real Time** VFX



The Future of **Real Time** VFX



The Future of **Real Time** VFX



The Future of **Real Time** VFX



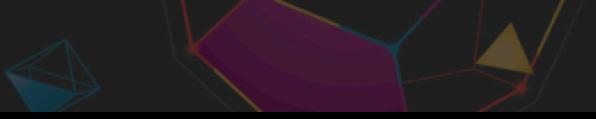
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The Future of **Real Time** VFX



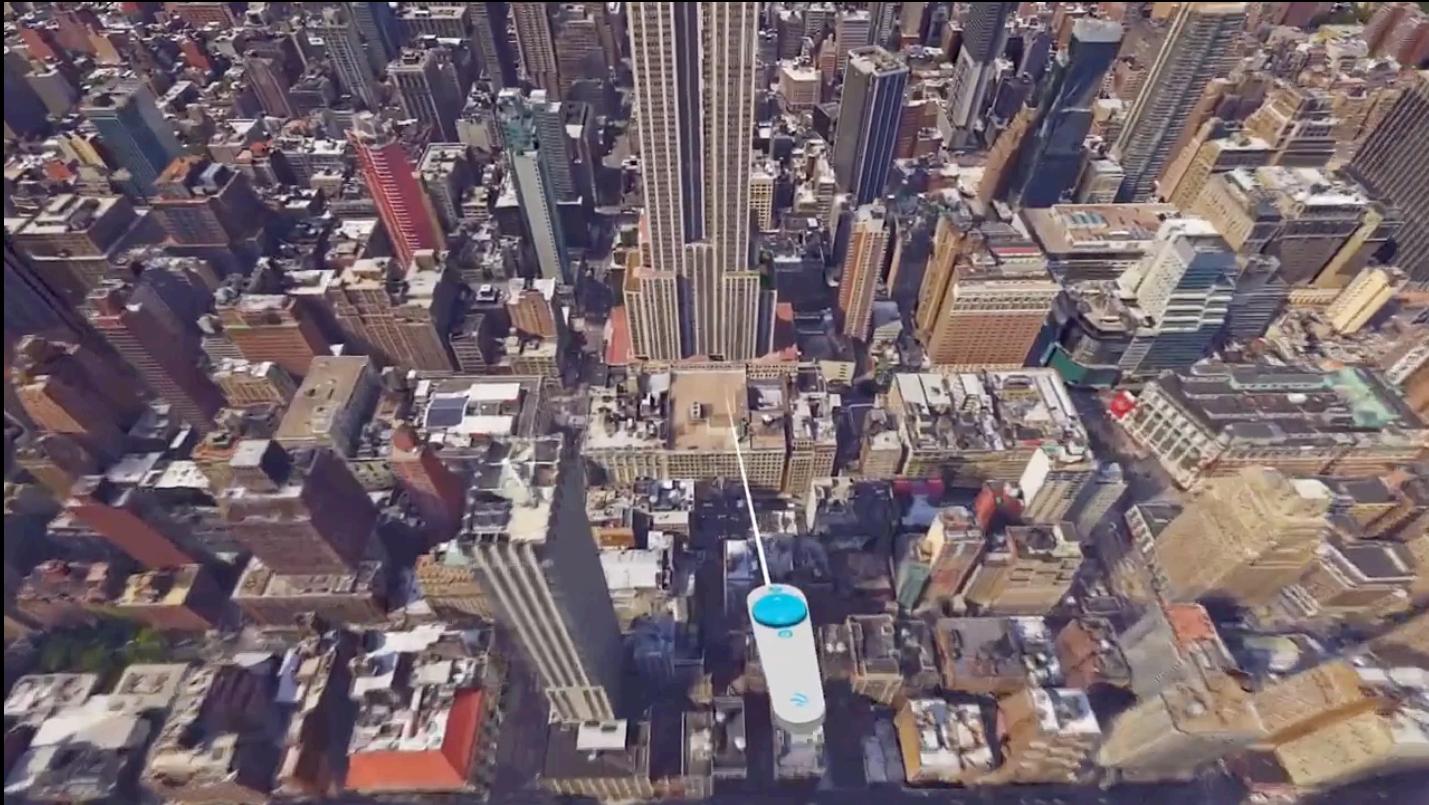
The Future of **Real Time** VFX



The Future of **Real Time** VFX



The Future of **Real Time** VFX



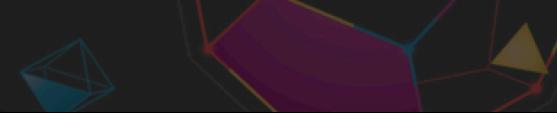
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The Future of **Real Time** VFX

DYNAMIC LIGHTING!

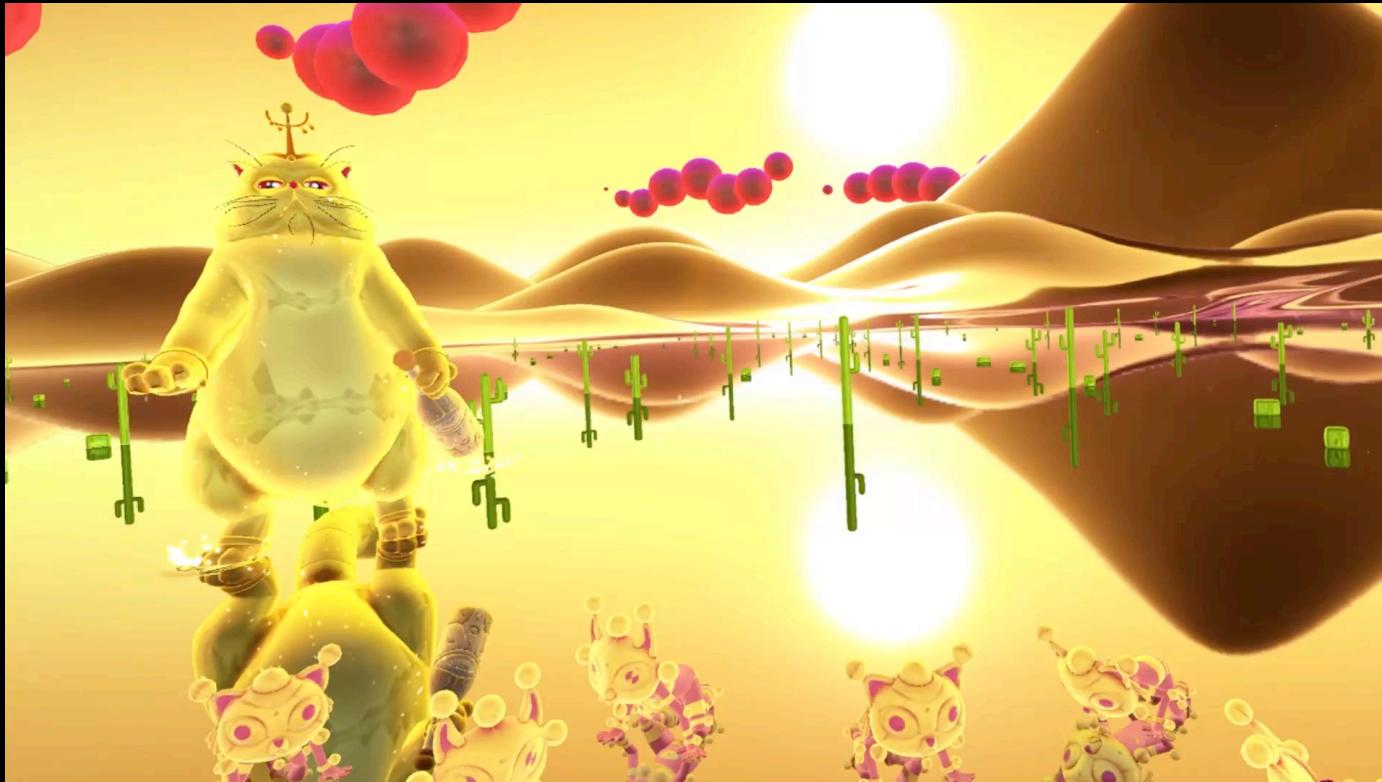




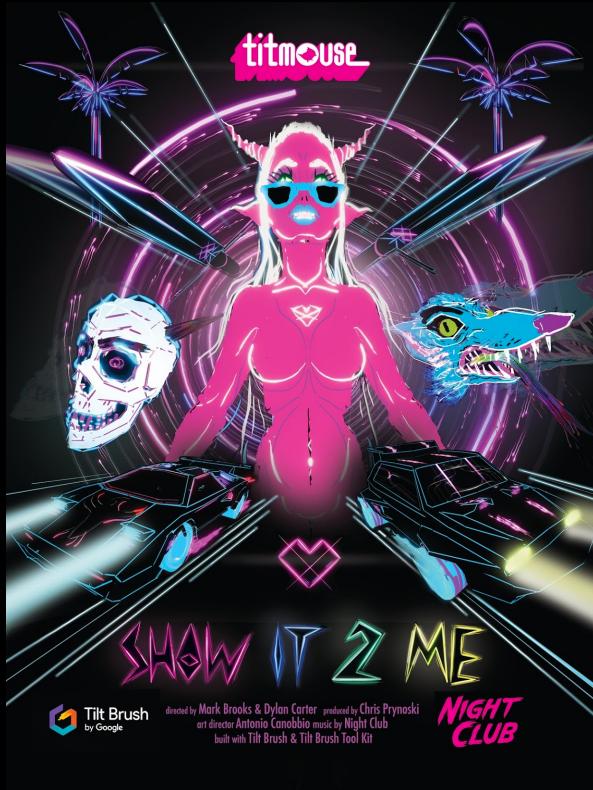
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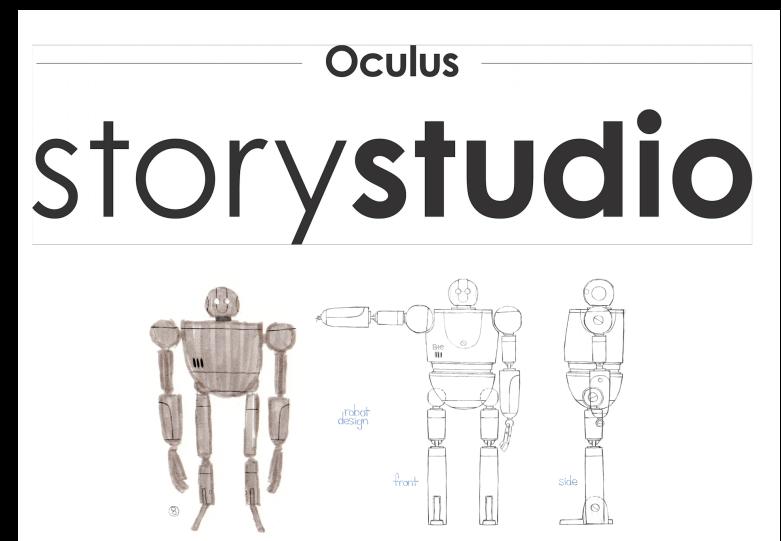
The Future of **Real Time** VFX



The Future of **Real Time** VFX



The Future of **Real Time** VFX



The Future of **Real Time** VFX



Real-Time Rendering for Feature Film: Rogue One, a Case Study

Speakers:

John Knoll | Chief Creative Officer, Visual Effects Supervisor, ILMxLAB

Naty Hoffman | Principal Engineer & Architect, ILMxLAB

Roger Cordes | Digital Production Supervisor, ILMxLAB

Location: Room 135, North Hall

Date: Wednesday, March 1

Time: 5:00pm - 6:00pm

Format: Session

Track: Visual Arts, Programming

Pass Type: GDC All Access, GDC All Access + VRDC, GDC Main Conference, GDC Main Conference + VRDC - [Get your pass now!](#)

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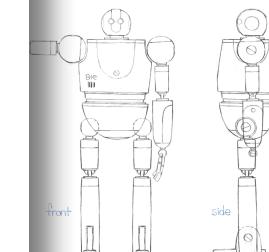
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With all of the challenges posed by the groundbreaking visual effects work on *Rogue One: A Star Wars Story* you wouldn't think visual effects supervisor John Knoll would look for yet another area to push the bounds of visual fidelity with production underway but that's exactly what happened. Knoll challenged the ILMxLAB team to take a handful of shots for the film and render the lead character in them at cinematic fidelity utilizing RT rendering. Join speakers from Lucasfilm's ILMxLAB and Industrial Light & Magic as they discuss the proprietary rendering technology that the team created and the challenges and lessons learned by creating a real time hero character for *Rogue One: Star Wars Story*.

culus

studio



The Future of Real Time VF



Real-Time Rendering for Feature Film: Rogue One Case Study

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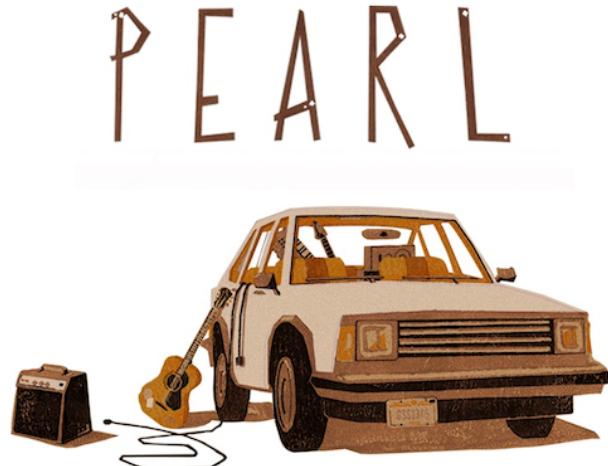
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With all of the challenges posed by the groundbreaking visual effects work on *Rogue One: A Star Wars Story*, you might not have thought visual effects supervisor John Knoll would look for yet another area to push the boundaries of real-time rendering. After all, the team had to maintain fidelity with production underway but that's exactly what happened. Knoll challenged his team to create a real-time rendering pipeline to render a handful of shots for the film and render the lead character in them at cinematic frame rates. In this session, speakers from Lucasfilm's ILMxLAB and Industrial Light & Magic as they discuss the process of creating the first real-time rendering pipeline for a feature film, the technology that the team created and the challenges and lessons learned by creating a real time hero character for *Rogue One: Star Wars Story*.



The Future of **Real Time** VFX



DIRECTED BY PATRICK OSBORNE



Interview: Patrick Osborne's Pearl Is the First VR Oscar Nominated Short

February 16, 2017 • 0 Comments • Jazz Tangcay • Posted in ANIMATED SHORT, Interviews

A A A



The Future of **Real Time** VFX





The Future of **Real Time** VFX



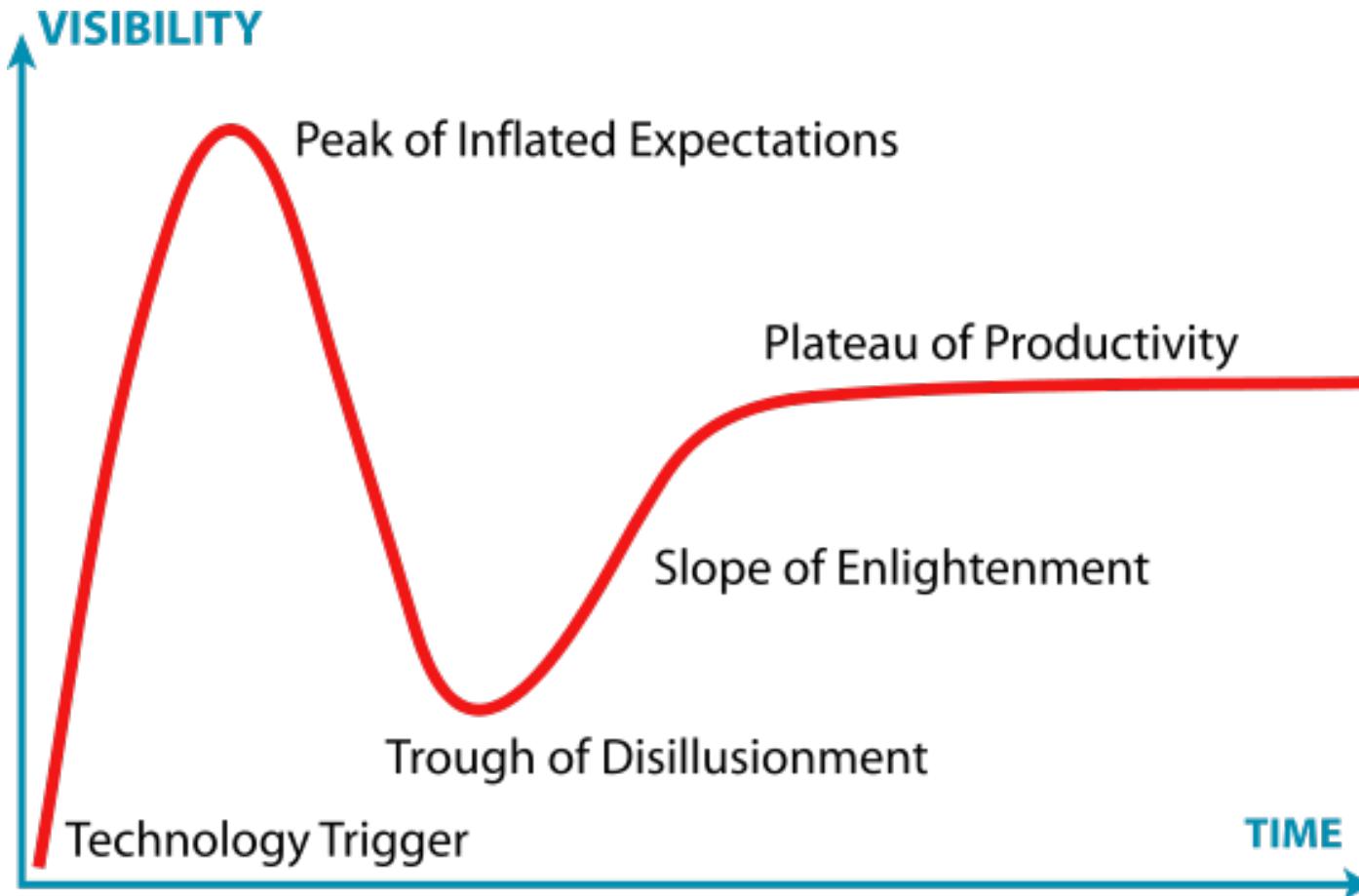
The Next Computing Platform

Driven by the need to

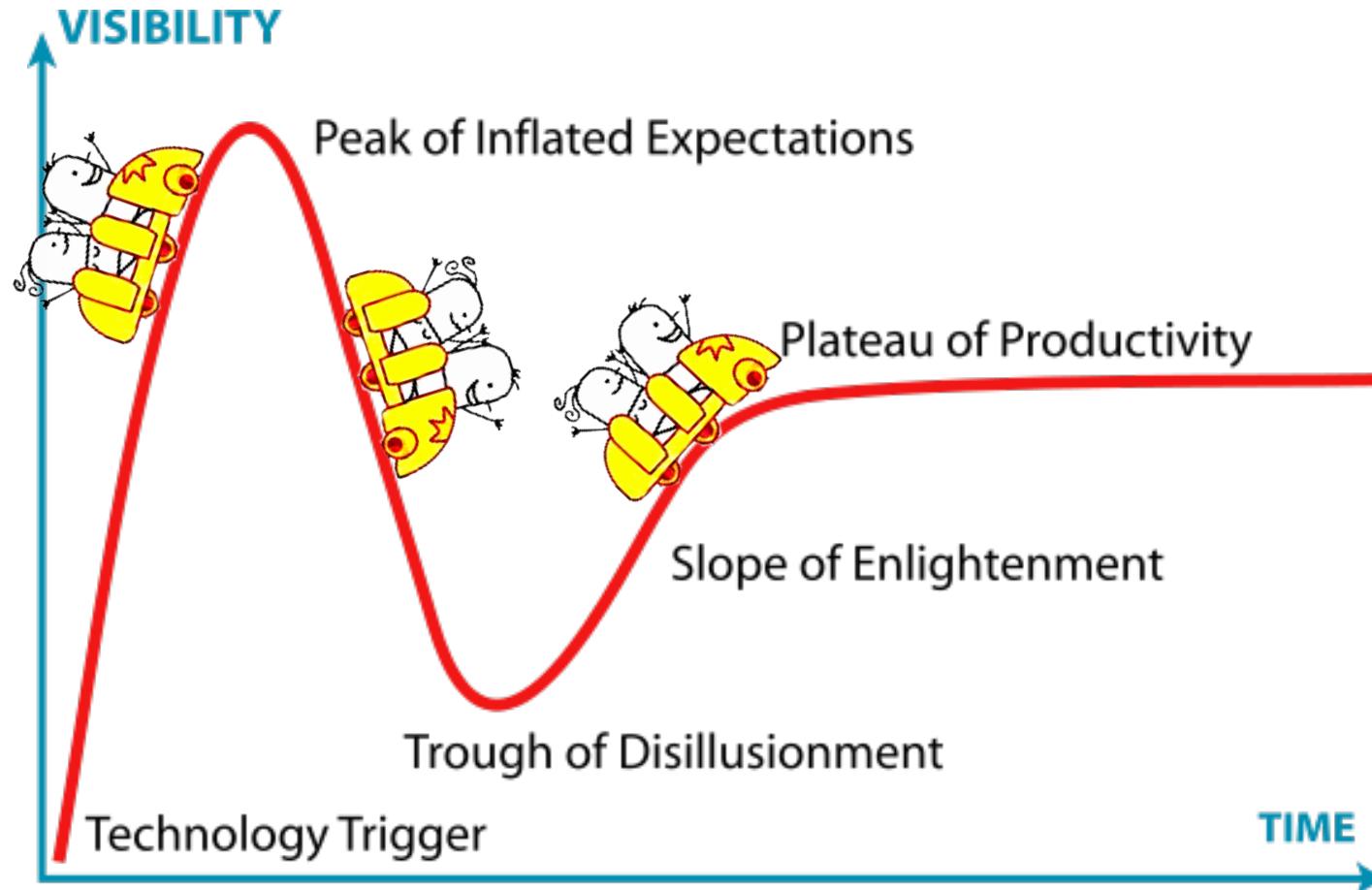
- Influence anything
- Look anywhere
- **90FPS+**



New Technology Hype Cycle



New Technology Hype Cycle



ONE THING

Real Time VFX is expanding beyond games.

It's never been easier to get started.

Let's build the future together.

THANKS



Boot Camp!

Making it happen...

- Christina Wun
- Jason Keyser
- Keith Guerrette
- All our Speakers
- Megan Bundy
- David Johnson
- Matt Oztalay
- Volunteers



Boot Camp!

Making it happen...

- Jeff Hanna



Boot Camp!

Making it happen...



→ YOU

Boot Camp!

Feedback

REAL TIME VFX

General Resources References Jobs Events

all categories ▶ Latest Unread (15) Top Categories Bookmarks

Topic	Category	Users
Official VFX Sketch #4: Stormy Skies	04 - Stormy Skies	
Raed AlAmoudi - VFX Demo Reel (Feedback please <3)	• new	General Discussion
Jake Mandel Student Work	• new	WIP & Critique
Slate Editor - Released!	staffpicks	Resources



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For **Everybody**



Boot Camp!

Parties!

- VFX / Tech Art Hangouts @ Jillians 7:30-9:30

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- VFX Mixer @ St. Regis Thurs 6:00-8:00

THANKS

PARTIES!

VFX / Tech Art Hangouts @ Jillians tonight 7:30-9:30

VFX Mixer @ St. Regis Thursday 6:00-8:00

REFERENCES

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shadertoy.com

drewskillman.com/GDC2010_VFX.pdf

MUSIC

"Show It 2 Me" by Night Club

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