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Art Directing VFX for Stylized Games

Jeremy Mitchell - Double Fine Shen-Ming Spurgeon - Motiga Bill Kladis - Epic Bryanna Lindsey - Volition

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Microtalks!

•Real world examples from 4 projects covering a broad range of visual styles, each with their own techniques and subjects.

- •4 Speakers
- •11 minutes each
- •Time at the end for questions.



Motivations

- VFX teams can be short staffed with an enormous scope of content to build.
- VFX often left to self-direct. Detailed concept art is rare.

•Games with a more realistic visual style have their own unique challenges, but the artistic path to success is often clear.

Introductions

Jeremy Mitchell - Double Fine Shen-Ming Spurgeon - Motiga Bill Kladis - Epic Bryanna Lindsey - Volition

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Jeremy Mitchell - Double Fine

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Jeremy Mitchell Senior VFX Artist Double Fine Productions

Making VFX for games for 10 yearsDouble Fine, id, Raven













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BAD ANIMATION



































Screen Space Effects





























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Final thoughts



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Shen-Ming Spurgeon Senior FX Artist , Motiga, Inc.

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What is Gigantic?

A MOBA and third-person shooter with 5-on-5 PvP action

- CHOOSE from a huge roster of unique heroes with fantastical weapons and abilities
- FIGHT against enemy teams, summoning incredible creatures to combat the foe
- POWER UP your Guardian before your enemy does
- GO GIGANTIC with your fully powered Guardian to ensure victory



PERSONALITY

REALISM





HK-206



Shapes Anatomy





Uncle Sven
















GoGigantic.com @GoGigantic



PROCESS



Beckett

- Professional Adventurer
- Former test pilot
- Makers her own equipment

Armed with...

- Machine Pistols
- Cannon
- Grenade
- Jetpack



Exploratation

- •Personality?
- •Attitude?
- •Plays well with others?



Exploratory Goals (vs. Designers) What kind of weapons do they have?





HK-206 Beckett





Exploration

Who is this character?
What does the weapon do?
What is the unique visual language for them?



GOALS 8 RESTRICTIONS



Gigantic FX Tools









FX Goals

- •Create a hybrid stylized visual effect
- •Needs to be observed from 360°
- •Ensure that the visuals fit the character
- •Visuals should not take away from gameplay

FX Goals

A personal goal: Creating an effect that I want to see over and over again



Restrictions

- Should not be solely sprites
- •Can work on uneven terrain
- Performance
 - Potential for two Becketts in a game
 - Meshes are expensive

PROTOTYPE



How am I going to turn this into 3D??



Prototype (Meshes)





Mesh + Material







Mesh + Material





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Mesh + Material





Mesh + Material





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Final Asset (Grenade Explosion)

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Conclusion

- Establish rules for your stylized VFX
- •Break the effect down into simple shapes
- Immerse yourself in as much stylized imagery as possible
- Always get feedback
- Get weird

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Art Directing VFX for Stylized Games

Bill Kladis Senior FX Artist, Epic Games

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What is Fortnite?

Team up with other players to build massive forts and defend against hordes of monsters, all while crafting and looting in giant worlds.

EXPLORE – Completely dynamic apocalyptic world.

BUILD – Your fortress with traps and walls to protect.

DEFEND – Against the monsters of the storm.

RESCUE - Save the survivors of the storm.





VFX Art Direction



Anime



Pixar



Vertex Animation Tool



Final animated rig in Maya



Final effect in engine Static Mesh used inside of Cascade Not a skeletal mesh!

Vertex Animation Tool – Is it Magic?



X axis is # of vertices in the meshes (1,030 in this example image) – Vertex Positions

Y axis is # of frames in the animation (13 in this example image) – Vertex Normals

• Created by Jon Lindquist, can be used in 2 methods

- Method #1 Texture based (most commonly used in Fortnite)
 - Bakes down vertex positions and vertex normals to 2 uncompressed textures.
 - Uses World Position Offset to move vertices frame by frame.
 - Uses a material function to allow explicit control of time / current frame.
 - + Provides smooth interpolation between frames, so time dilation has a lot of wiggleroom
 - - Limited to 8k texture
 - Requires 2 texture lookups, memory
 - - Single mesh, topology must remain the same

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Vertex Animation Tool - Modeling



Spheres stretched and warped vs. Zbrush's ZRemesher Output

- Where to start? Working backwards tends to work best
 - Start with the final shape in the animation as your model.
 - Work smart In this example, I took spheres and deformed them in a hysterically simply way to achieve a rough shape.
 - Then using ZBrush's Dynamesh & ZRemesher, it automatically creates a single manifold mesh with clean topology that's ready to be rigged and animated.
 - Final topology on the right is 1,030 vertices.



Vertex Animation Tool – Rig Like It's 2D



Rigged and animated inside of Maya

- Make rigs that support the intended motion and final shape
 - The end result has a very precise level of movement that would be difficult to attain with a fluid sim.
 - Using joints attached to a spline allowed me to quickly animate along a specific trajectory.
 - Utilize ALL of your tools for movement and motion Translate, rotate, scale, roll, and twist



Stylized Materials – Masked Blend Mode



- What material techniques can be used to sell style AND preserve perf?
 - Since we are aiming at stylized smoke (simple shading, 3-colored stepped cell highlights, hard erosion edge), masked materials are an excellent choice
 - Masked material is on the left, lit translucent on the right.

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Stylized Materials – Masked Blend Mode



Deferred Rendering is our friend!

- Since UE4 is a deferred rendered, overdraw is almost completely eliminated (still must do a 1-bit depth test).
- The diffuse pass doesn't require to render past the first geometry rendered in a single pixel, so overdraw is (nearly) eliminated.

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Stylized Materials – Cell Shading ToD



3-step cell shading highlights influenced by the sun/moon directional vector

<u>Light Vector</u>

- The time of day manager writes key data to a material parameter collection (Time of day, light vector).
- Now just dot between the vertex normal and this light vector, and the shading follows the sun/moon.
- LERP between this and a standard fresnel (0.55), and you get a softer mix that tends to face the camera (mostly), but still accounts for the light vector . . .to an extent.



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Stylized Materials – Cell Shading ToD

<u>Current Time</u>

• Now takes this day-phase RBGA value, and multiplies it against the input for each major part of the day.



3-step cell shading highlights - Colors are explicitly defined by artists (left) vs, colors that stay constant throughout day/night cycle (right)



Stylized Materials – Fresnel Erosion



- How do we get a masked material to disappear neatly?
 - Remember masked materials have 1-bit opacity
 - Since we're stylized, let's capitalize on it.
 - Use standard fresnel (vertex normal camera vector) and bias against this into our opacity mask.
 - Just animate from 1 to -1 to erode away.



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Stylized Materials – Explosions



- How can we get even *MORE* use out of our material and meshes?
- EXPLOSIONS!
 - The master smoke material in Fortnite has a static switch to enable heat for explosions.
 - Enables a transition from heat to density with a dynamic parameter.
 - The same techniques can be applied for secondary transitions (ie heat to density)
 - Take our Fresnel, invert, then round to achieve a hard edged transition.

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• Same 3 color cell shading going directly into emissive (artist derived "light vector").

Stylized Materials – Explosions & Sim



- Explosions in real life are complex, have lots of movement, undulation, eddies, etc.
- We can go past hand-animated assets and dive into more realistic motion and movement using fluid sims and the vertex animation tool.
- We can capitalize on our existing smoke and explosion style that has been established in this presentation thus far (continuous volumes, fresnel erosion, retopologizing)

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Stylized Explosion – Cleanup Time



Baked Mesh vs. Retopologized Mesh 31k verts vs 7.1k verts

- Convert fluid sim to mesh
- Take the final frame from the fluid sim as our starting point
- Retopologize in zBrush
 - Detail loss (accidental +, smoothed out surface works well with stylized FX / cel shaded material)
- Now working backwards from the last frame, shrink wrap to the previous frame
 - Cannot be completely automated, requires cleanup by hand



20 Frames used from original sim of ~50

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Explosion – End Results





Vertex Animation Tool



- Method #2 Model-sequence
 - Takes a series of models and "flips" through them, frame by frame via UVs:
 - + Doesn't require matching topology between frames, good for complex shapes.
 - + No textures, less complex material function.
 - - Large mesh asset size.
 - - No interpolation between frames, bad for time dilation.

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• - Difficult to UV.



Thank You

Fortnite

Matt Hancy Maury Mountain Pete Ellis Jonathan Lindquist Bob Tellez John Abercrombie Vitaliy Naymushin Jonathan Hau-Yoon Fred Kimberly Phil Cole David Hunt Kendal Tucker Brian Campell Kevin Vassey Zak Phelps

- Epic Games
 - Simon Tovey
 - Ryan Brucks
 - Olaf Piesche
 - Tim Elek
 - James Kincaid
 - Canon Pence
 - Tim Sweeney



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Agents of Mayhem

Bryanna Lindsey Senior FX Artist, DS Volition



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Bryanna Lindsey Senior VFX artist DS Volition



What is "Agents of Mayhem"?

- 80s cartoon nostalgia!
- Problem: how do we make "2D effects" for a 3D world?









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Simplifed





Vibrant,



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Theatrical!







What do "80s cartoons" look like?



"GI Joe"

Simplified

- Blood.
- Problem: How do you simplify blood and make it fit into your stylized, "80s cartoon" universe, when blood is usually absent from 80s cartoons?



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Vibrant in classic 80s cartoons



"Galaxy Rangers"



Vibrant - Color







Vibrant – Layering





Vibrant – Layering





Vibrant - Timing



Theatrical: What is it?

"Thundercats"

"Transformers"

Theatrical in VFX

- Big "theatrical" moments necessary to drive narrative
- Player reward for completion of missions
- Blowing stuff up is FUN, and fits in with the tone of 80s cartoons!

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Tips & Conclusion

- The best place to start is by breaking down your artistic influence/reference
- You may fail at first and that's ok simplify and iterate
- The fundamentals of layering, timing and presentation are keys to success



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Questions?

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