



Sky VR - an immersive journey

Richard Mills: Technical Director - Sky VR Studios

XR/VR/AR/MR– Where are we now?



VR
Vive Pro Eye



VR
Oculus Quest



AR Kit/Core
Better tracking



MR
MagicLeap

Hardware technology has evolved, with accelerating change
Trend to Standalone, Inside-out tracking
Better AR Tracking
Mixed Reality – here at last
Haptics
The biggest advance has occurred in:
Understanding of the Medium, Ideas and Creativity



VR and Entertainment

What should VR achieve?

A unique experience, designed expressly for VR

Credible Immersion in an environment

Achieve a true sense of presence

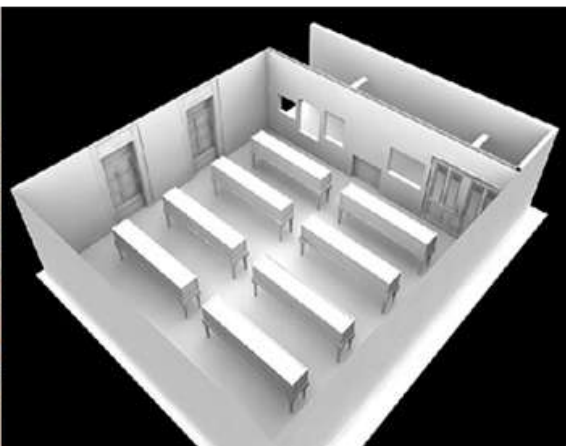
Immersion into the narrative

Best of all:

Involve a viewer in the action and outcomes by giving them agency

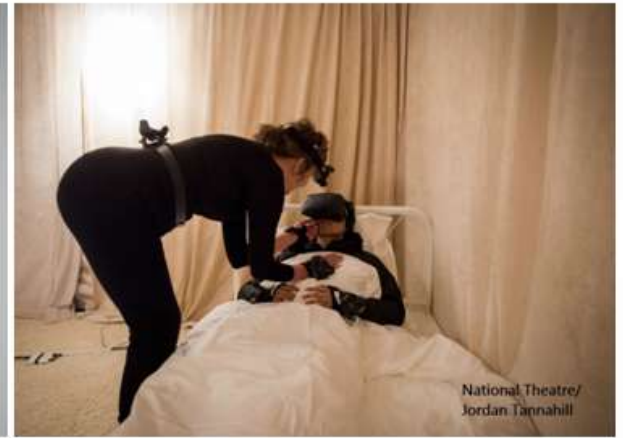


VR Storytelling worldwide – significant Works



- **Mat Collishaw – Thresholds**
- **Installation work – premiered at Somerset House 2017**
- **Accurate real-world tracking of Practical set,**
- **Atmospheric Audio and Visuals**
- **Leap Motion Hand Tracking, Multi-player tracking**

VR Storytelling worldwide – significant Works



- **Jordan Tannahill, National Theatre – Draw me Close**
- **Installation work: one-on-one with an Actor**
- **Accurate real-world tracking of Practical set,**
- **A really emotional experience**

VR Storytelling worldwide – significant Works



- **Star Wars – Secrets of the Empire, ILM/The Void**
- Installation work: Team multiplayer
- Accurate real-world tracking
- Haptics, Motion simulation, weapons, Headgear and backpack
- Convincing and Fun – significant because of the revenue stream

VR Storytelling worldwide - significant Works



- SANDBOX VR– The Curse of Davy Jones and Deadwood Mansion
- Installation work: Team multiplayer
- Catchphrase: “Basically– it’s the Holodeck”
- Haptics, Props, weapons, Headgear and backpack
- Proven revenue stream

Sky VR – The Journey



**April 2016: Formation of
Sky VR Studios**



**1st UK broadcaster to
launch VR app – Oct 2016**



**Sky VR Productions &
Commissions**



**Engagement &
Interactivity**

Content genres/types

Sports



Entertainment



Doc/News



Drama/Entertainment



Sky VR – Research and Learnings

Extensive Audience research: How can VR be best employed?

- **Original content – novel and unique, designed for VR**
- **Live/event content – alternative approaches**
- **Extension to existing content – Bonus experiences**
- **Extensive research into favorite genres**

Audience research: Quality of experience

- **Best Playback quality important**
- **Comfortable experience**
- **Less fiddly the better**
- **Long battery life and no overheating**



Sky VR – Techniques



360 Shooting



**Volumetric Capture and
Visual Effects**



**Photogrammetry and
Scene Scans**



Character Scans

Case Study – Documentary: Arctic Mission

- **Genuine concern for destruction of environment**
- **Contributors addressing the camera – personal and engaging**
- **Location: wide landscapes that make you want to look around**
- **Contrasting scales: bottle caps and drone shots**
- **Wildlife shots: rare, emotive – captured thanks to specialists who knew where to find them**
- **Voice over – poignant, real, sense of subject**
- **Sense of Community and team efforts**



Case Study – Entertainment: Revolution

- The first of its kind worldwide – a companion 360 production released each week at end of each TV episode
- VR team were involved early in the process, giving a better shooting experience
- A gap in the market with an existing audience hungry for this kind of content
- Shot in 360 and 180 using 18 cameras
- Shooting style complemented TV show



Volumetric capture use cases

Assets can be deployed in:

VR, AR, and traditional broadcast

Sky VR has captured VolCap assets for:

Sports talent showcase – Anthony Joshua

Sports analysis – demonstration

Meet your heroes – David Attenborough

VR Drama – Principal Characters

On-stage assets for events



Volumetric capture – Process and Management

Two Major systems:

Microsoft: Dimension and MetaStage

Fraunhofer: Volucap

Post Process similar:

- Drive PointCloud,
- Create Mesh,
- Add Video Texture,
- Create Volumetric Video



Volumetric Capture: use cases

Sky VR's first Volumetric production:

Hold The World (2017)

Extensive research undertaken into the existing VolCap technologies during 2016

Volumetric Capture of Sir David in Seattle

Vol-Cap optimised for best performance

The assets can be given atmospherics and re-lit



Pic: Factory 42/Sky

Hold The World - Techniques



**Photogrammetry
and Scene Scans**



Volumetric Capture



Object Scanning



**Creature
Animations**

Volumetric Capture: use cases

Sky VR's Volumetric Productions:

Anthony Joshua - Champion

A Discovery of Witches

Britannia – Series II

More has been learned : Costume, Make-up

MoCap of Scanned character assets

Used to increase number of characters in scene



Pictures: Sky UK

Photogrammetry: use cases

Process involves capturing real scenes and objects

Photography forms the basis of the technique

Can be used for fine detail and reconstruction

Produces heavy-duty highly accurate assets

Requires Decimation and Polygon reduction

Can be combined with CGI - Photo-modelling

The models can be given atmospherics and re-lit

Deployed by Sky for VR Drama & Entertainment



Pics: Sky UK

VR Storytelling – a new genre

Sky VR has explored:

- VR Scripting
- Spatial narrative
- Embodied narrative
- Branching narratives
- Location-based experiences
- Audience research:
- Testing on Naïve and habituated audiences



Pics: Sky UK

Sky VR themes: Embodied Narrative – A Discovery of Witches

- Premiered at:
- Created using:
- VolCap
- Character scanning
- Photogrammetry
- Aims and concepts:
- Who am I in this experience, and how does my body affect my experience and the narrative?
- Experiences should be translated through senses
- The more senses used, the more immersive it feels





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