

Gaze-Based Interaction in Cinematic 360 VR

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Outline

- Cinematic 360 VR
- Gaze-Based Interaction
- Non-Linear Storytelling
- Media Authoring
- Case Study

Cinematic 360 VR

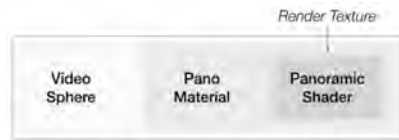
Omnidirectional Video

- Equirectangular Format
 - Latitude / Longitude Parametrization
- Stereoscopic Layout



360 Video Player

- Texture Map to Sphere
- Skybox / Panoramic Shader

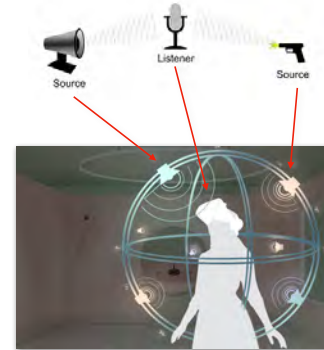
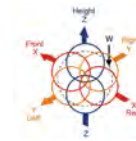


Spatial Sound

- 3D Sound



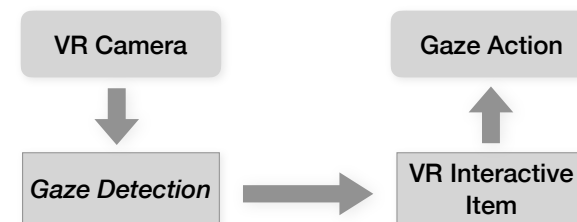
- Ambisonics Format



Gaze-Based Interaction

Interaction Mechanism

- Flow of Control



Gaze Detection

- VR Eye Raycaster



VR Camera



VR Interactive Item

ROI

The Hot-Spot

- Creates Interaction Event



ROI Rectangle

Gaze Action

- Action Trigger



Button

Box Collider

VR Interactive Item

Hotspot Button

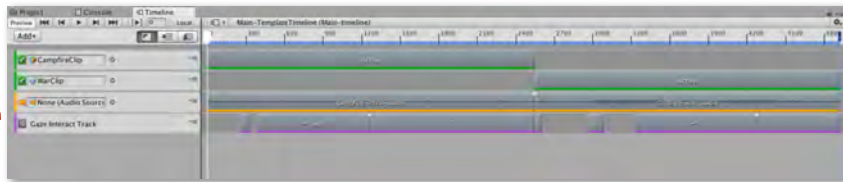


Box

Non-Linear Storytelling

Timeline

- Narrative Structure

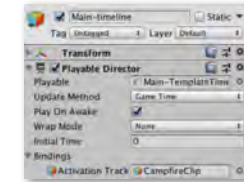


Tracks

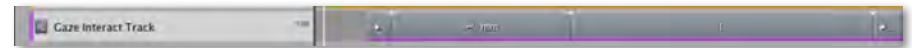
Clips

Time-Flow Control

- Playable Director

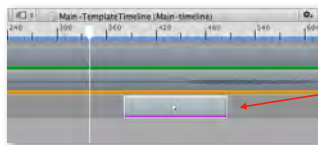


- Gaze Interaction Track
 - Non-Linear Narratives
 - Viewer's Gaze Direction



Clips

- Clip Element (Gaze Track)
- Clip Types (Gaze Interact)
 - Marker
 - Player
 - Jumper
 - Spotter
 - Trigger
 - Timer
 - Choicer



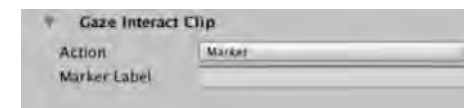
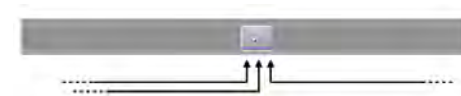
Clip Object



Clip Parameters

Marker

- Identifies a Time Instant in the Timeline



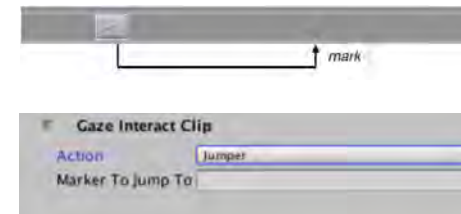
Player

- Activates Playback of Audio or Effect



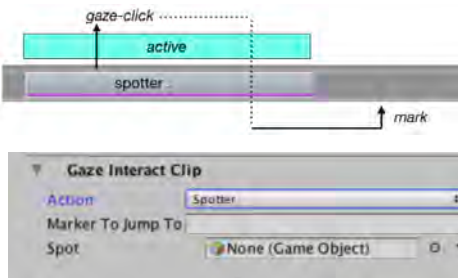
Jumper

- Changes Current Time to Marker Location



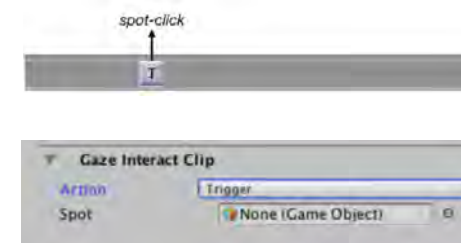
Spotter

- Implements Hot-Spot for Audio



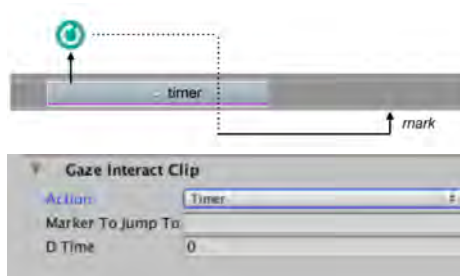
Trigger

- Triggers an Action of Interaction Game Object



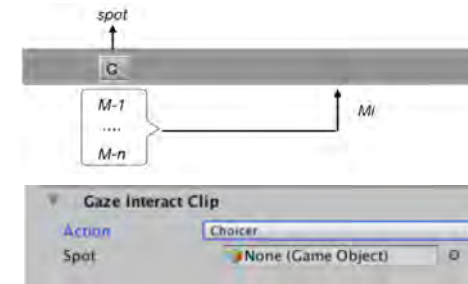
Timer

- Start Time-Dependent Jump to a Mark



Choicer

- Controls Jump to Element of a Markers Set (based on interaction behaviour)



Media Authoring

Interaction Objects

- Perform Action Based on Narrative Interactivity
- Connect with Clips of the Gaze Interaction Track
- Incorporates a VR Interactive Item Component

- Basic Interaction Objects
 - Audio Source
 - Gaze Rotation
 - Gaze Marker Selector

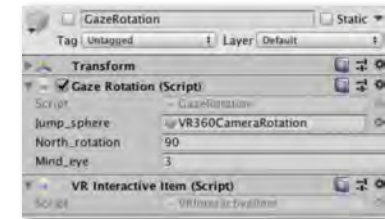
Audio Source

- Controls Audio Playback
- Used for
 - Voice-Over
 - Music
 - Ambient Noise
 - Sound Effects



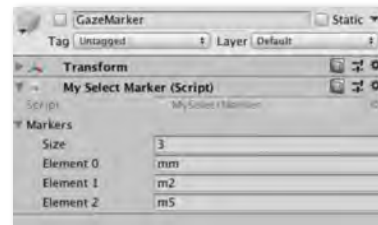
Gaze Rotation

- Changes the VR Camera Direction
- Cut Viewer's Gaze
 - Location in Panoramic Image



Gaze Marker Selector

- Selects a Marker Label
 - Based on Procedural Criteria
- Used in Combination with Choicer Clip



Interaction Idioms

- Language of Non-Linear Interactive Narrative
- Defined by Combination of Gaze Interaction Clips
- Some Useful Idioms
 - Jumper + Marker
 - Trigger + Player
 - Spotter + Player + Marker
 - Timer + Jumper + Marker
 - Choicer + Markers

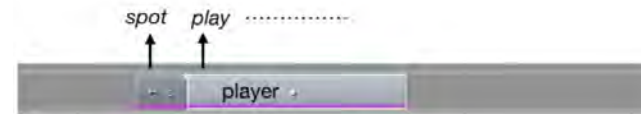
Jumper + Marker

- Skip to a Different Time



Trigger + Player

- Gaze-Based Play of Game Object



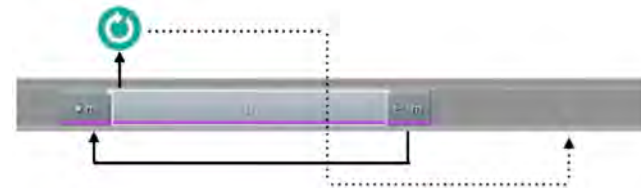
Spotter + Player + Marker

- Selective Temporal Play of Alternative Audio Clips



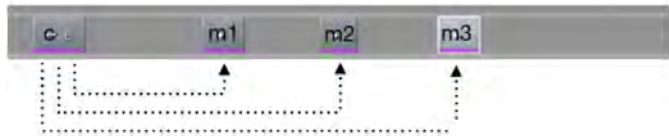
Timer + Jumper + Marker

- Loop in a Sequence until Time Expires



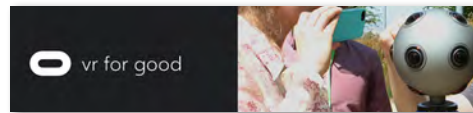
Choicer + Markers

- Jump to Selective Time Locations

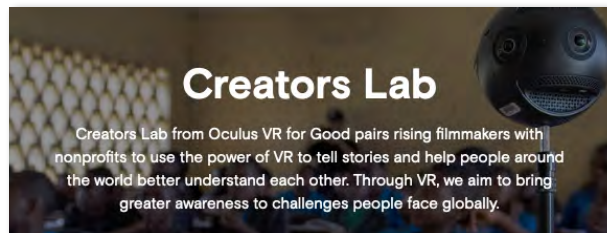


Case Study

Context



- Oculus / Facebook



Searching for Aloyo

- 2017 Creators Lab 2.0 Program
- Partnership



- Synopsis

Aloyo, a twelve years-old girl living in Lira, Uganda, sits among other children around the fire to tell their story during war, what they saw, where they went. Mixing early oral storytelling tradition and contemporary Virtual Reality narrative, blending fiction and non-fiction elements, CHILDREN DO NOT PLAY WAR narrates the memories, dreams and daily lives of the children who returned from the war and about how they recovered their childhood.

Children Do Not Play War



"Thanks."

- Luiz Velho