

VR Kino+Theater

VISGRAF Lab - IMPA

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Overview

VR Kino+Theatre is a media platform that combines *theatrical performance* with *live cinema* using *virtual reality* and *game technology*.

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Technology Platform

- The Three Pillars
 - Technology
- People's Roles
 - Applications

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Three Pillars

1. Exclusively 3D Content :
 - captured from real data with the help of advanced sensors and machine learning
2. Procedural / Real-Time Physical Simulations :
 - powered by high-end graphics hardware
3. Networked Distributed Systems :
 - interconnected by low-latency wireless networks.

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People's Roles

Creative Infrastructure for: Virtual Reality / Cinema / Theatre

- Producers
 - Directors / Art Designers / Cinematographer / Composers
- Performers
 - Actors / Musicians
- Participants
 - Audience / Aficionados

Interaction

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A Possible Embodiment



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Architecture

- System Components
- Physical Environment
- Data
- Timeline

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System Components

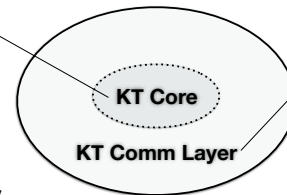
- Kino+Theater Engine
- Action Manager
- Sound Manager

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Kino+Theater Engine

3D Graphics / Simulation

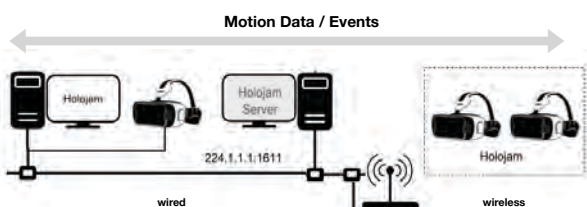
Network Environment



- Based on Unity

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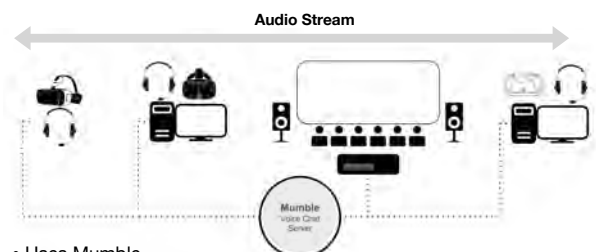
Action Manager



- Uses Holojam

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Sound Manager

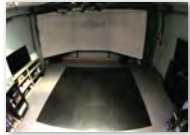


- Uses Mumble

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Physical Environment

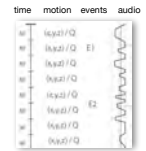
- Network
 - Real-Time Data Streaming
 - Server-Client Interconnectivity
- Audio/Visual Hardware & Software
 - VR Stages
 - Other Spaces & Equipment



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Data

- Dynamic Data
 - Motion (actors and objects)
 - Audio (actors and musicians)
 - Events (triggers of cameras / effects)
- Static Data
 - 3D Models (sets & props)
 - Avatars (characters)
 - Virtual Cameras
 - Light / Effects / Animation Procedures



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Timeline

- Session (.ks file)
 - Dynamic Data of a Performance
- Structure (Layers)
 - Data
 - Motion / Events Stream
 - Audio Stream
 - 3D Graphics
 - Metadata
 - Tags / Markers
 - Etc.

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Spaces & Presentation

- Functional Areas
- VR Spaces
- Presentation

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Functional Areas

1. VR Stages - for performance and interaction
 - used by the actors and active experience participants.
2. Control Areas - for operation of elements and parameters
 - used by the director to switch the cameras and staff members for general functions, such as sound / light changes.
3. Presentation Spaces - for content delivery
 - consists of the movie theater and other viewing spaces for the audience.

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VR Spaces

- Types
 - Immersive VR
 - 2D / 3D Screen Projections
- Virtual Reality Stages
 - Actors
 - Participants (and Actors / Supervisors)
- Shared Virtual Environments
 - Multi-User

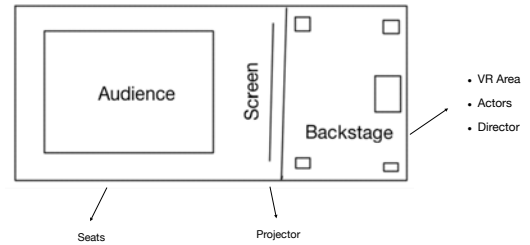
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Presentation

- Main Theater
- VR Experience Areas
 - Level 1
 - Level 2
 - Level 3

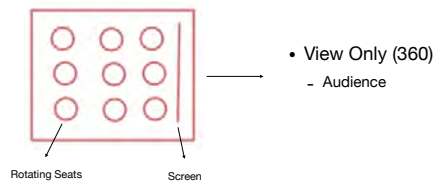
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Main Theater



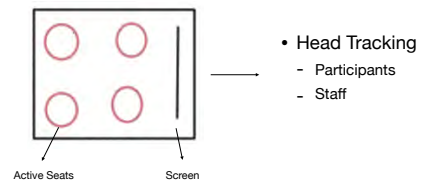
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VR Experience - Level 1



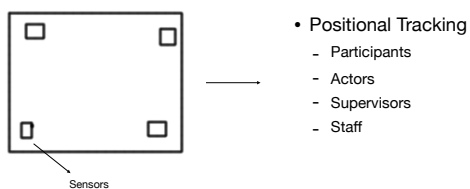
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VR Experience - Level 2



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VR Experience - Level 3



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Concepts

- In-Situ Virtual Reality
- Dimensions of Shared VR
- Participation

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In-Situ VR

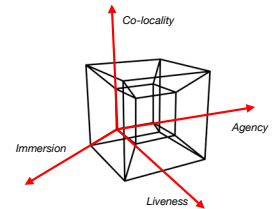
- Situated Participatory Virtual Reality
 - full body tracking (avatars)
 - tangible spaces (real / virtual objects)
- Shared Environment
- Multi-User



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Conceptual Framework

- Dimensions of Shared VR (4D)
 - Co-Locality
 - Agency
 - Liveness
 - Immersion



- * OBS: Dependent Variable
 - Number of Participants

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Participation

- Commitment / Involvement
 - No Voice *

Levels

- Observer / Fixed POV / Invisible	Level 1
- Observer / Fixed POV + Tracked View / Visible *	Level 1
- Observer / Restrained Movement / (In)Visible	Level 2
- Participant / Limited Action / Visible	Level 3
- Participant / Guided Action / Visible	Level 3

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Mobile Participation

- Sensing App
 - Local
- Interaction App
 - Local
 - Remote
- Social Media
 - At Home

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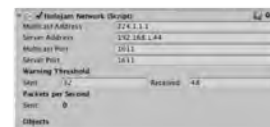
Software

- Servers
- Sensing
- Generators
- Receivers
- Content
- Production

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Servers

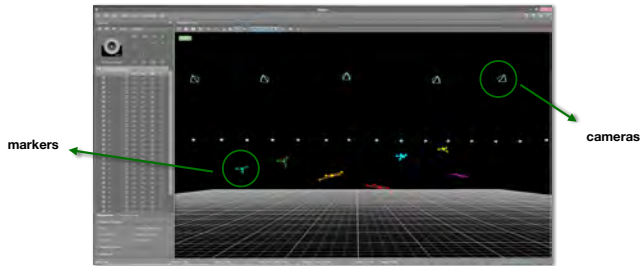
- Holojam
- Mumble



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Sensing

- Optitrack



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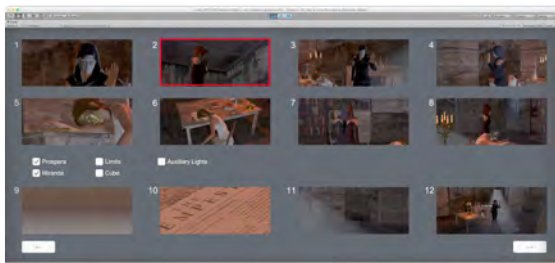
Generators

- Director
- Actors
- Audience Participant

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Director

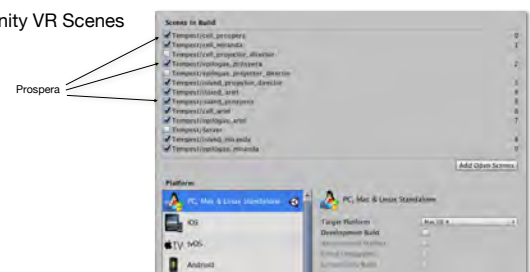
- Camera Switcher



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Actors

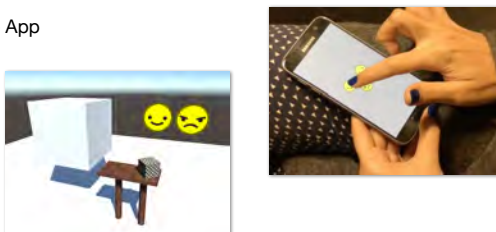
- Unity VR Scenes



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Participants

- Mobile App



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Receivers

- Projector
- Audience Viewer

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Projector



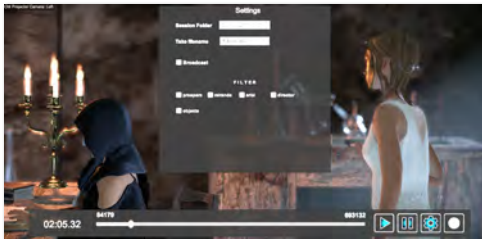
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Content

- Recorder
- Player

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Recorder / Player



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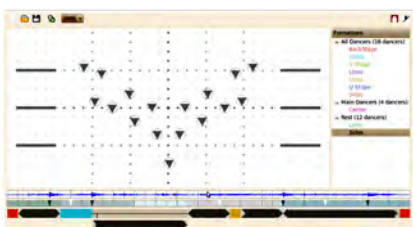
Production

- Kino Session Editor
- Blocking Planner
- Set / Stage Modeler

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Blocking Planner

- Choreographics



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Experiments / Applications

- Platform 1.0
 - First Test
- Platform 2.0
 - The Tempest

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*Shakespeare's
Magical Masterpiece*

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Ongoing & Future Work

- Probabilistic Player
- Recorded VR
 - Director
 - Multiple Spaces

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Related Research

- New Realities
- VR - Blender
- Media Integration
- Choreographics
- Expressive Trajectories
- Dance / Music

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Tech Report



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to be continued ...

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