Overview

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

Technology Platform

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

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.

People’s Roles

Creative Infrastructure for: Virtual Reality / Cinema / Theatre

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

Architecture

- System Components
- Physical Environment
- Data
- Timeline

System Components

- Kino+Theater Engine
- Action Manager
- Sound Manager

Kino+Theater Engine

- Based on Unity

Action Manager

- Uses Holojam

Sound Manager

- Uses Mumble
Physical Environment

• Network
  - Real-Time Data Streaming
  - Server-Client Interconnectivity

• Audio/Visual Hardware & Software
  - VR Stages
  - Other Spaces & Equipment

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

Timeline

• Session (.ks file)
  - Dynamic Data of a Performance

• Structure (Layers)
  - Data
    - Motion / Events Stream
    - Audio Stream
    - 3D Graphics
  - Metadata
    - Tags / Markers
    - Etc.

Spaces & Presentation

• Functional Areas
• VR Spaces
• Presentation

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.

VR Spaces

• Types
  - Immersive VR
  - 2D / 3D Screen Projections

• Virtual Reality Stages
  - Actors
  - Participants (and Actors / Supervisors)

• Shared Virtual Environments
  - Multi-User
Presentation

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

Main Theater

VR Experience - Level 1

• View Only (360)
  - Audience

VR Experience - Level 2

• Head Tracking
  - Participants
  - Staff

VR Experience - Level 3

• Positional Tracking
  - Participants
  - Actors
  - Supervisors
  - Staff

Concepts

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

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

Conceptual Framework

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

OBS: Dependent Variable
- Number of Participants

Participation

- Commitment / Involvement
  - No Voice
- Levels
  - Observer / Fixed POV / Invisible
  - Observer / Fixed POV + Tracked View / Visible
  - Observer / Restricted Movement / Invisible
  - Participant / Limited Action / Visible
  - Participant / Guided Action / Visible

Mobile Participation

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

Software

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

Servers

- Holojam
- Mumble
Sensing

- Optitrack cameras
- Markers

Generators

- Director
- Actors
- Audience Participant

Director

- Camera Switcher

Actors

- Unity VR Scenes

Participants

- Mobile App

Receivers

- Projector
- Audience Viewer
### Projector

![Projector Image]

### Content

- Recorder
- Player

### Recorder / Player

![Recorder / Player Image]

### Production

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

### Blocking Planner

- Choreographics

![Blocking Planner Image]

### Experiments / Applications

- Platform 1.0
  - First Test
- Platform 2.0
  - The Tempest
Ongoing & Future Work

- Probabilistic Player
- Recorded VR
  - Director
  - Multiple Spaces

Related Research

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

to be continued …