

Ruud op den Kelder
Mixed Reality Development | Portfolio

roboruud.nl

[LinkedIn](#)

info@ruudopdenkelder.nl

[+31644053772](tel:+31644053772)

Technical Skills

Programming Languages

- C#
- C++
- Rust
- Python
- Javascript

Practices

- Agile
- SOLID Design patterns

Software Design

- User story drafting
- System design
- API design

Software

- Unity3D Editor
- Rider
- VSCode
- Blender
- Miro
- GIT

Expertise

- Data Visualisation
- Augmented Stage Performance
- Immersive Experience Development
- Mixed Reality Development
- Mobile Development
- Rapid Prototyping
- Motion Capture
- Volumetric Capture
- Procedural Animation

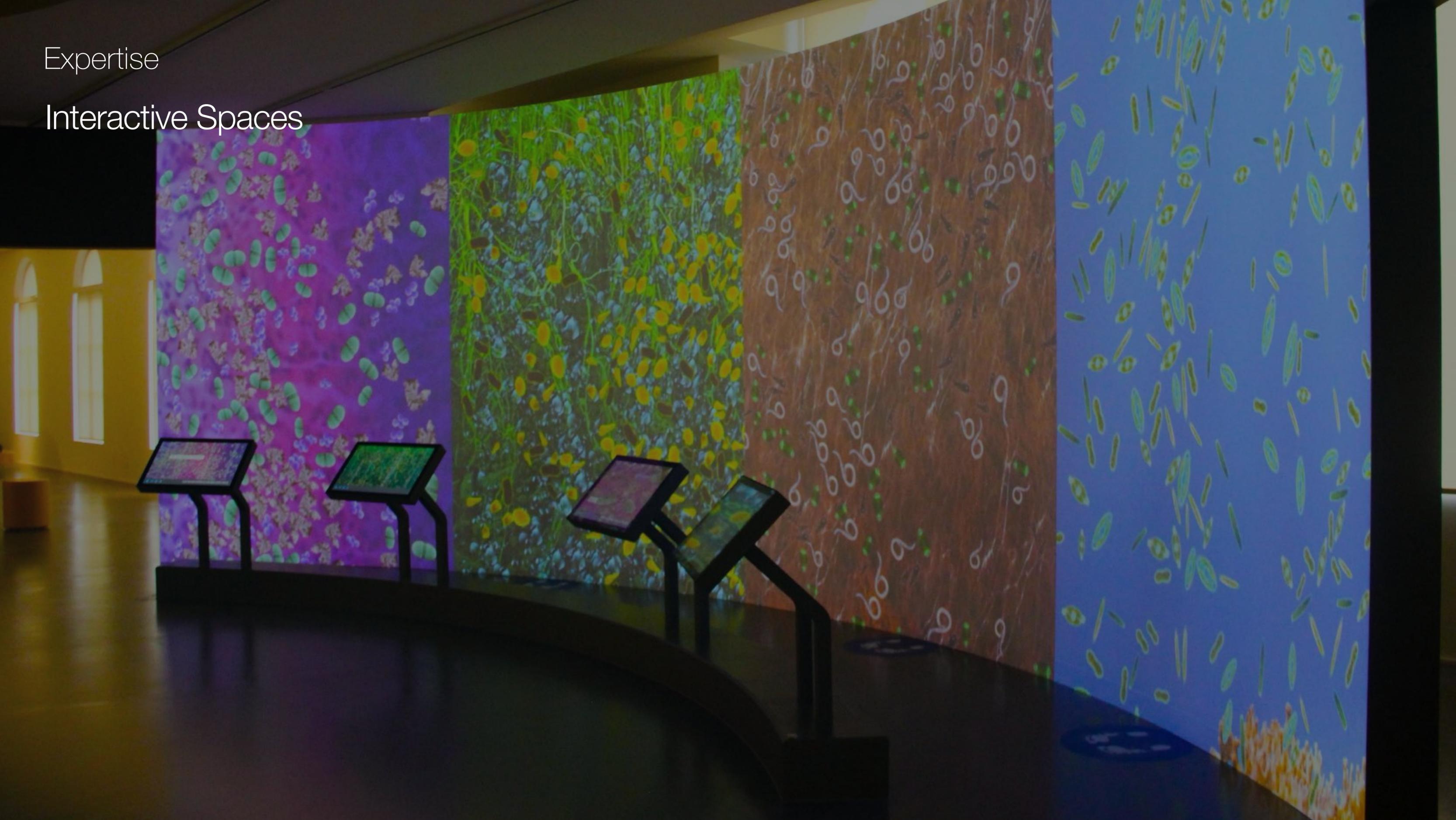
Expertise

Interactive Stage Performance



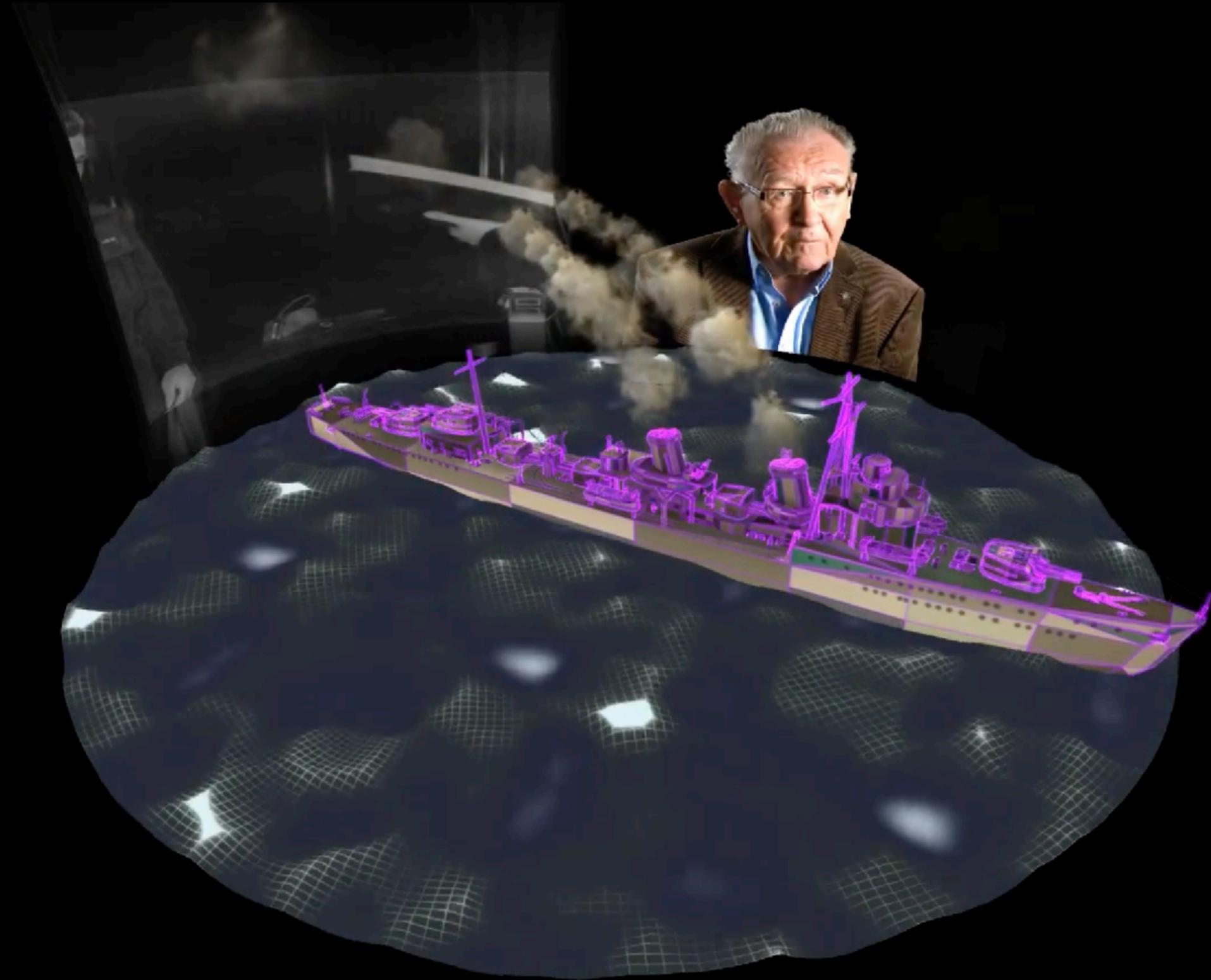
Expertise

Interactive Spaces



Expertise

Mixed Reality



Services



Unity3D Development (10+ years)

Over 10 years of experience delivering award winning playful interactive applications and experiences for Mixed Reality Devices, Immersive Exhibits and Interactive Stage Performances using Unity3D.



Technical Project Lead

My methods allow a team to thrive by creating an environment that fosters communication and frictionless workflow.



Game Development Education

Creative Development & Interactive Design workshops designed to ignite the creative spark and empower the next generation of creators.



Collaborations



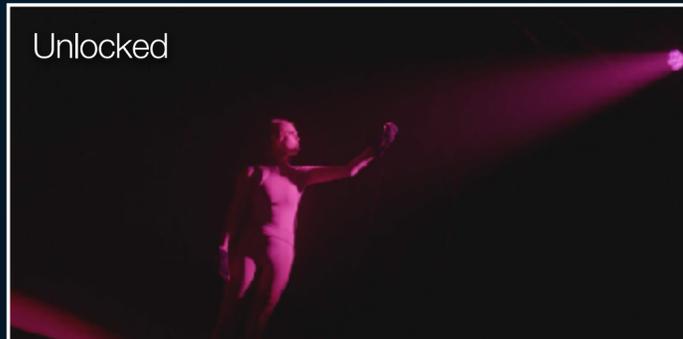
Cases

Click on a project to learn more

Immersive Spaces

Interactive Stage Performances

VR & Mixed Reality



Habitat

Interactive Installation | Heleen Blanken

An interactive immersive exhibit about the spiritual experience of nature



Habitat

Interactive Installation | Heleen Blanken

An interactive immersive exhibit about the spiritual experience of nature

HABITAT is a data-driven projection where 3D scans of organic specimens such as stones, corals, and fossils from the biodiversity center Naturalis are transformed into a game-like meditative environment. The work presents a series of ever-evolving digital worlds each accompanied by its own soundscape.

HABITAT was my first foray into the creative coding framework NAP by NAIMI labs. For a week I was immersed in a NAIMI led hackathon where I worked on the transition system between interactive nature scenes.

Roles & Responsibilities

C++ developer

Technologies & Techniques

C++

NAP (Creative Coding Framework)

Team size: 6



Human Nature

Interactive Installation | Royal Belgian Institute of Natural Sciences

An interactive exhibit about humankind's interaction with nature



Human Nature

Interactive Installation | Royal Belgian Institute of Natural Sciences

An interactive exhibit about humankind's interaction with nature

This exhibit commissioned by the Royal Institute of Natural Sciences in Brussels as part of the "Living Planet" exhibition attempts to communicate humankind's place in the natural world. The exhibit consists of four distinct natural phenomena that we as humans are part of.

Each of the four stations are to be manned by a

duo; one at the screen and the other by the projection. A person's distance to the projection controls how alive the natural world at this station becomes. The exhibit consists of 6 computers, 2 projectors, and 4 touch screens.



Roles & Responsibilities

Technical Lead
Unity3D developer
Game Design

Technologies & Techniques

Unity3D
UDP Networking

Team size: 5

Advaita

Live Stage Performance | Chagall Music

Realtime motion controlled audiovisuals with 8 distinct realtime music experiences



Advaita

Live Stage Performance | Chagall Music

Realtime motion controlled audiovisuals with 8 distinct realtime music experiences

Oneness in audiovisual stage performance

Advaita is a collaboration with Dutch music artist Chagall van den Berg. Chagall is a performer and developer for Mimu, a company founded by Imogen Heap. Mimu's main product are the Mimu gloves. These gloves allow fine-grained control of music performance software using movement and gesture. Chagall has been performing with these gloves for some years and with Advaita we took it to the next level: full body motion control using live X-sens motion capture. Advaita is a platform that enables the artist with realtime control of virtual avatars, cinematic cameras, and a range of effects to connect visual and auditive expression through live movement. We set out to

create 8 distinct realtime music clips that augment Chagall's live stage performances.

As the technical lead I was responsible for the architecture of the Advaita framework and translation of creative concepts into technical implementation. Chagall is currently touring all over the world with our show.



Roles & Responsibilities

Technical Lead
Unity3D developer
UX design

Technologies & Techniques

Unity3D
Live motion capture
OSC
HDRP
Cinemachine

Team size: 10

Advaita

Live Stage Performance | Chagall Music

Realtme motion controlled audiovisuals with 8 distinct realtme music experiences



"Wow! Nothing short of astonishing. a glimpse into the future of interactive entertainment and music."

- Catherine D. Henry SVP Accounts

Unlocked

Live Stage Performance | Chagall Music

A stage performance digital twin for real-time interactive stage light control



Unlocked

Live Stage Performance | Chagall Music

A stage performance digital twin for real-time interactive stage light control

Augmenting live artistic expression through real-time control of the stage

Unlocked is an iteration of Advaita in which the virtual environment is used as a digital twin control centre for the physical stage hardware. Unlocked allows control over an array of moving heads and a custom curved LED construction. Every physical stage prop 'knows' where in space the artist is and through OSC message bound to her glove gestures

(such as /stagelights/all/follow/feet) the artist can now command stage elements to her will.

In the latest iteration of Unlocked we are experimenting with realtime dome interaction making for an even more immersive experience.

Roles & Responsibilities

Technical Lead
Unity3D developer

Technologies & Techniques

Unity3D
X-sens Live motion capture
DMX
Protopixel
OSC

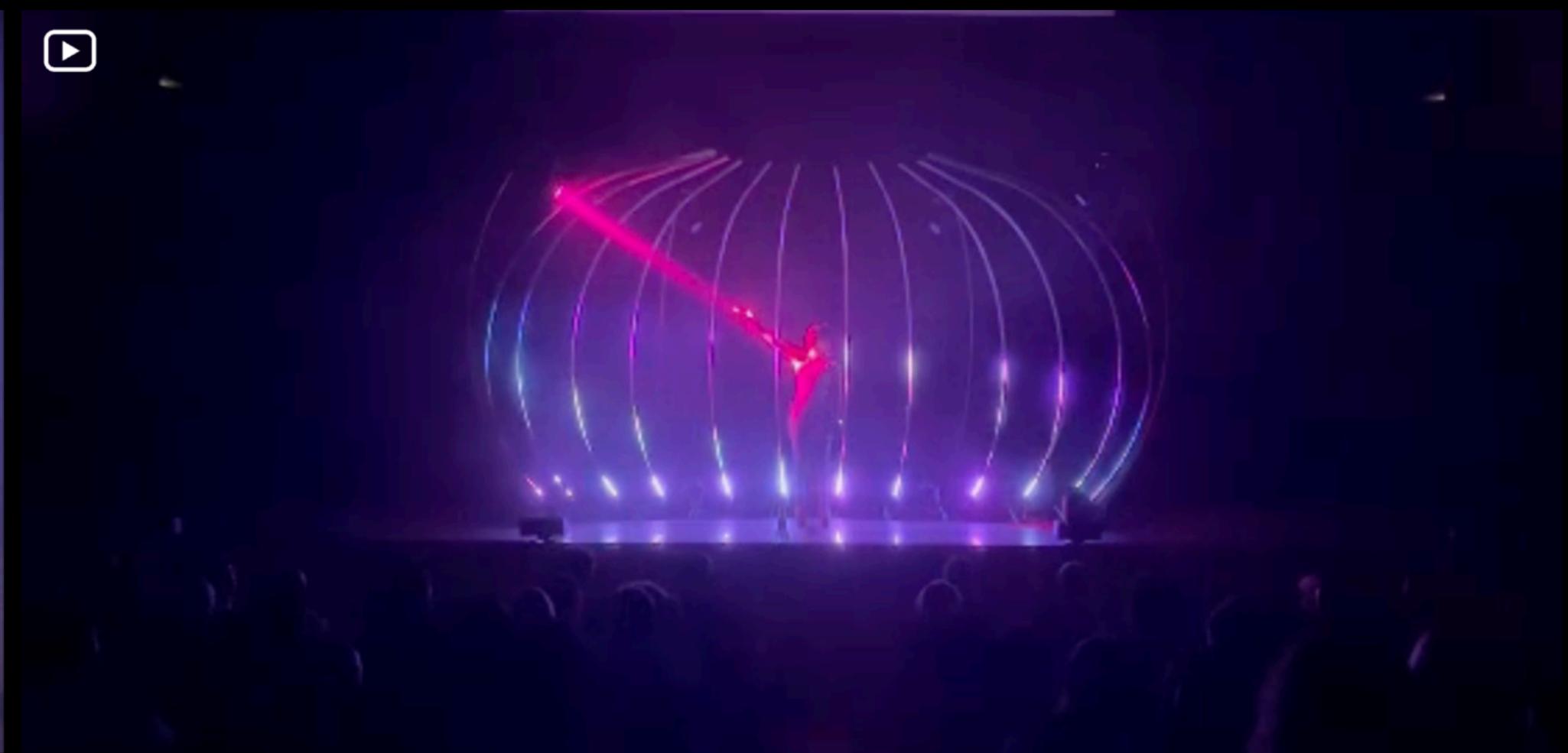
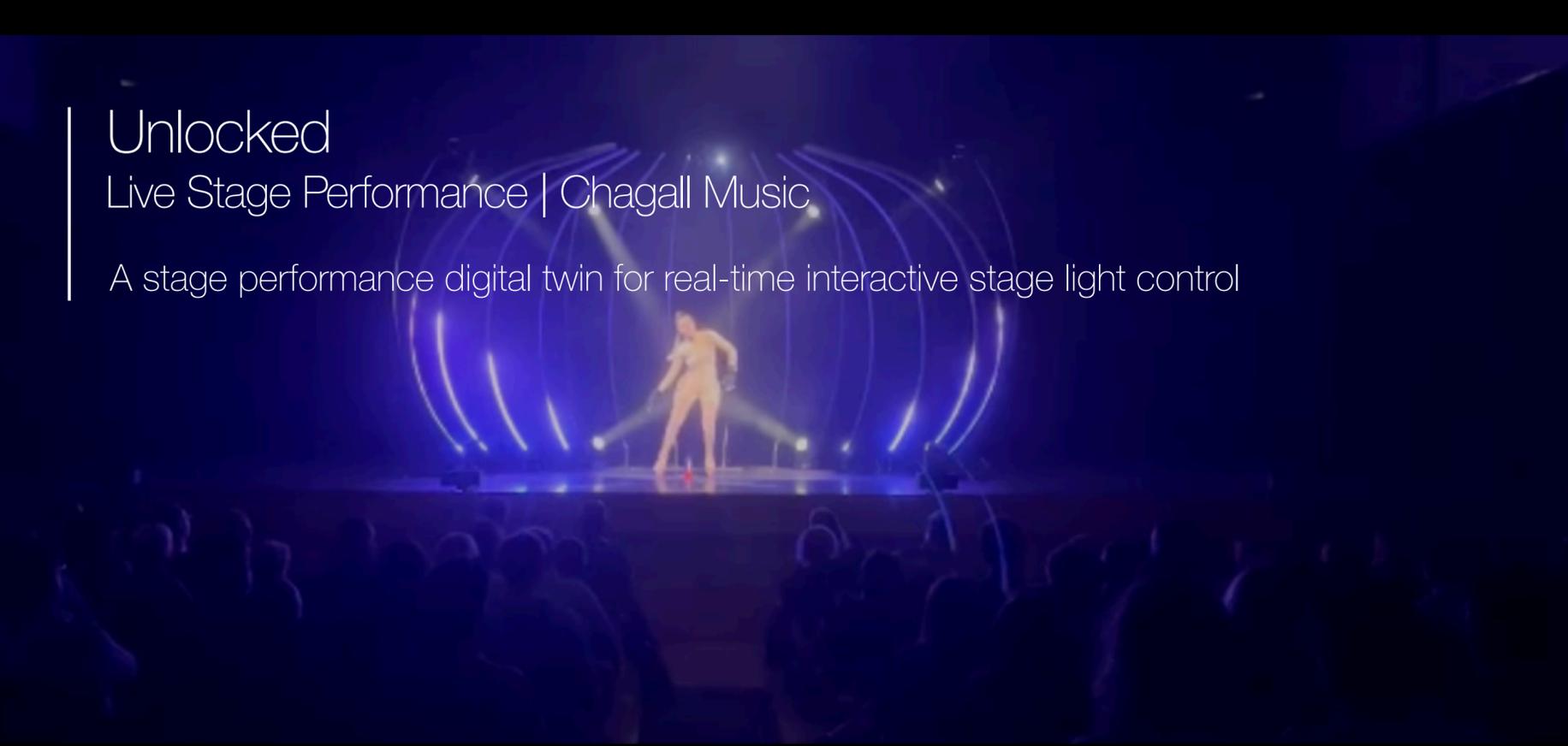
Team size: 6



Unlocked

Live Stage Performance | Chagall Music

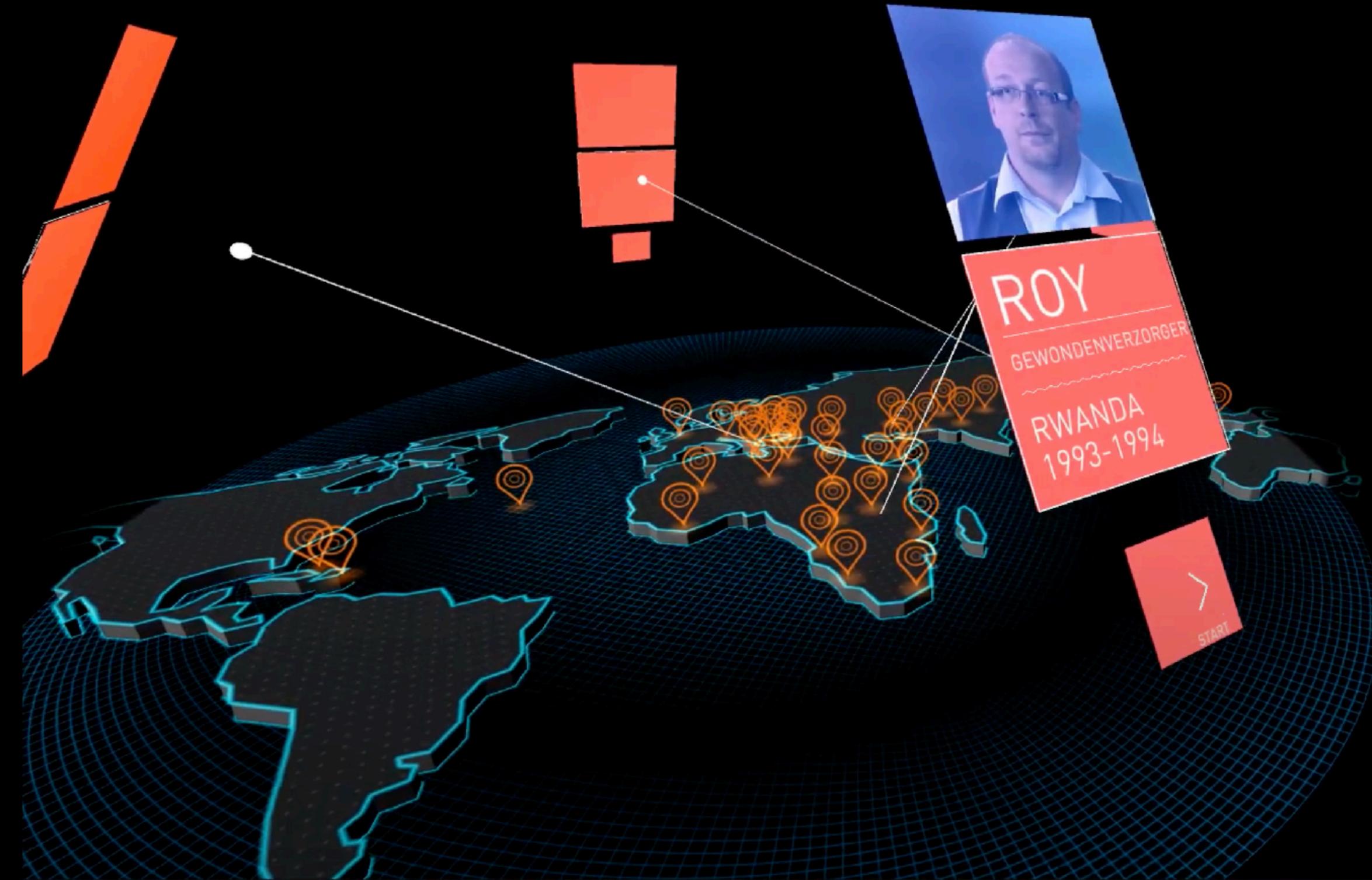
A stage performance digital twin for real-time interactive stage light control



Veteran View

HoloLens 2 | Dutch War Veteran Organisation

Immersive interactive holographic documentary content anchored in physical space

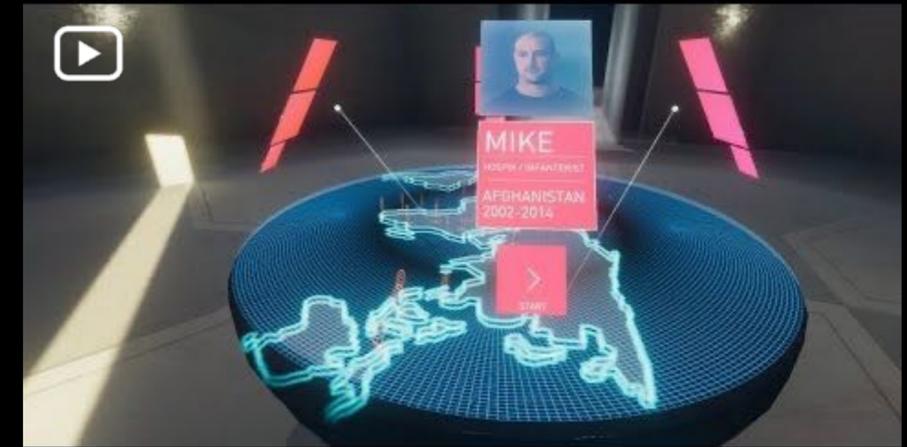


Veteran View

HoloLens 2 | Dutch War Veteran Organisation

Immersive interactive holographic documentary content anchored in physical space

Veteran View is a holographic documentary storytelling exhibit powered by the HoloLens 2. It features 4 distinct short stories each focused on a true war story told by a Dutch war veteran. Each of the experiences is narrated by a war veteran through video content that sits across the round table relative to the user, meanwhile the holographic table depicts a dramatic 3D visualisation of the situational context.



Roles & Responsibilities

- Technical Lead
- Creative direction
- Unity3D developer

Technologies & Techniques

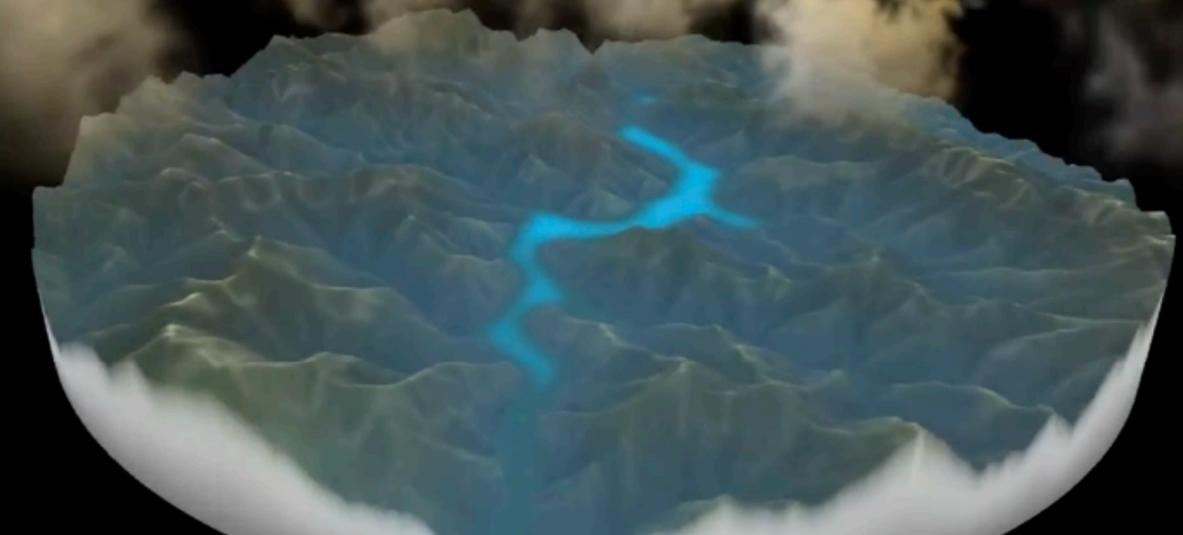
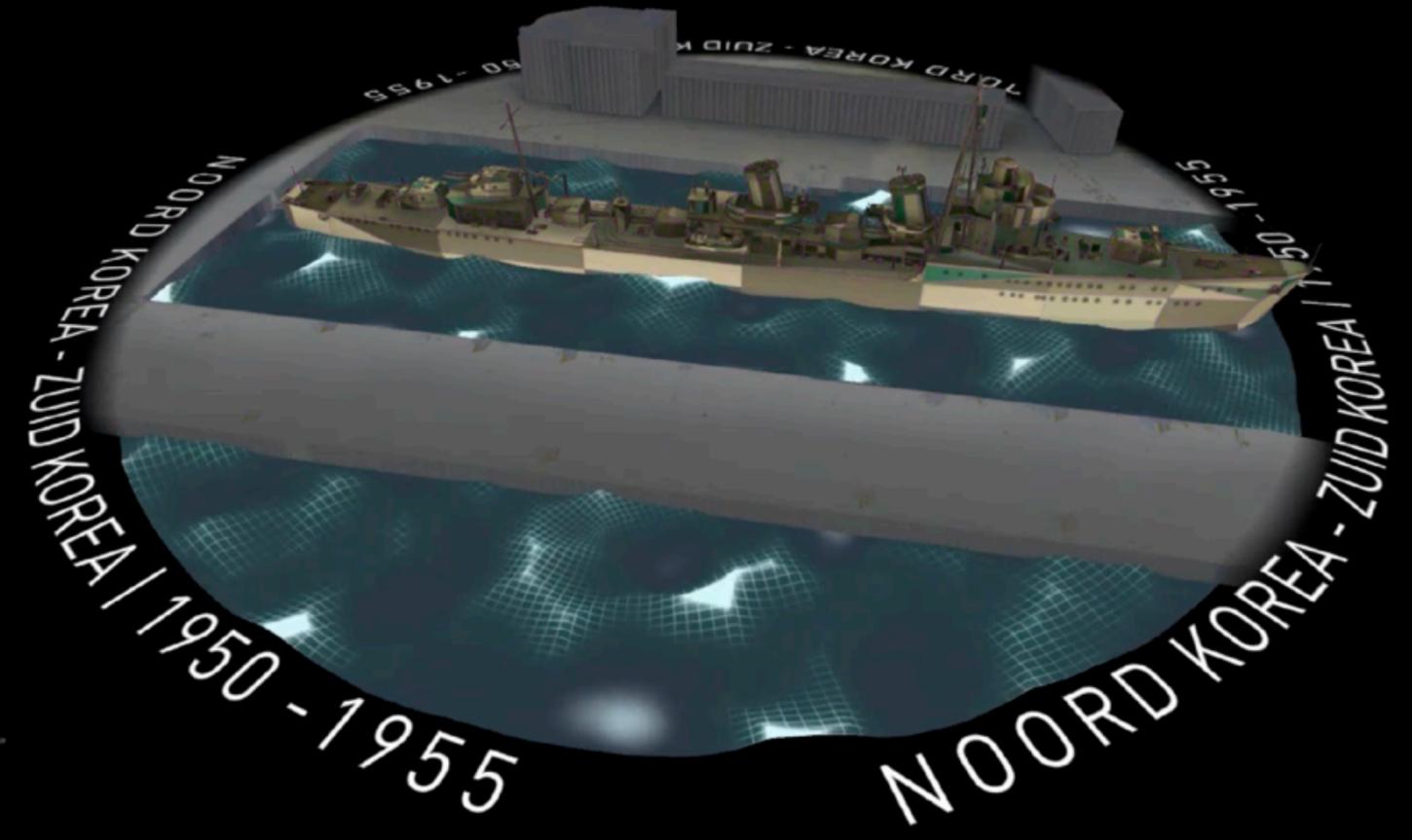
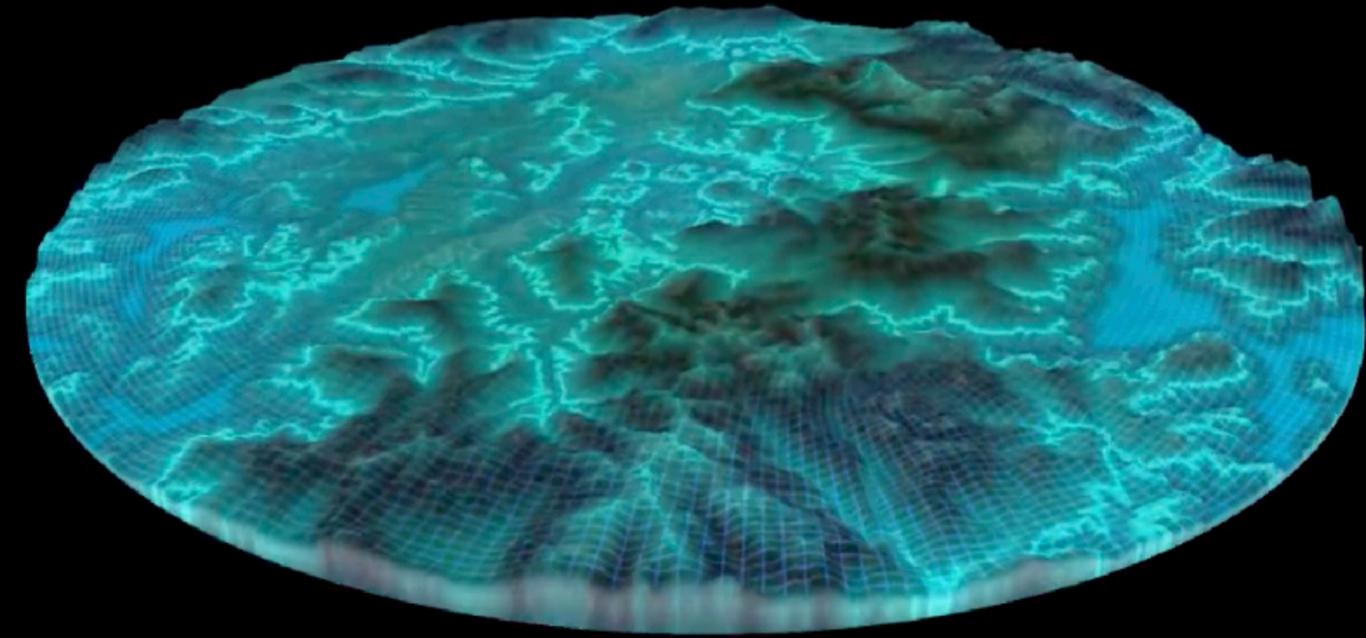
- Unity3D
- HoloLens 2
- MRTK
- Unity Timeline
- Shader development

Team size: 5

Veteran View

HoloLens 2 | Dutch War Veteran Organisation

Immersive interactive holographic documentary content anchored in physical space



Microsoft Mesh Developer Sample Project

Multiplatform SDK sample project | Microsoft

A virtual conference sample project to showcase the Microsoft Mesh SDK



Microsoft Mesh Developer Sample Project

Multiplatform SDK sample project | Microsoft

A virtual conference sample project to showcase the Microsoft Mesh SDK

Microsoft Mesh is an SDK that enables users to communicate through avatars and shared visual holographic sessions mediated through mixed reality devices and traditional screens and is part of the Azure cloud suite.

The brief for this project was to build a virtual conference experience for multiple platforms (HoloLens 2, HP Reverb and Desktop) highlighting the strengths of the Microsoft Mesh SDK and integration with the broader Azure ecosystem. With the purpose of the project being educational and promotional with Unity developers as the target audience, the main release target was a clean and self explanatory Unity project.

A typical conference experience centers around meeting people, presenting ideas and receiving ideas. For the multiplatform virtual conference application to enable this without friction we were faced with interesting design challenges. Questions like "How do we make the presenter and the audience feel connected?" What does a

presenter see in VR vs AR? How do you move around and mingle in VR vs AR?

What resulted was a powerful set of features built on top of the Mesh SDK to communicate and present with a variety of UX differences between platforms. The features were combined into an integrated whole and individually presented in separate scenes for frictionless digestion.

As the technical lead it was my responsibility to turn requirements into user stories, delegate tasks to other unity developers, design the architecture of the conference application, implement features and create explanatory video material for each of these features.

To date the project deliverables are still under NDA as Microsoft hasn't released Microsoft Mesh publicly yet.

Roles & Responsibilities

Technical Lead

UX design

Unity3D developer

Technologies & Techniques

Unity3D

MRTK

Microsoft Mesh

Azure services

VR

AR

Team size: 12

Spatial Anchors Scanning UX prototype

Hololens 2, Azure | Microsoft

An UX exploration into improving the process of scanning a space for spatial anchor calibration



Spatial Anchors Scanning UX prototype

Hololens 2, Azure | Microsoft

An UX exploration into improving the process of scanning a space for spatial anchor calibration

After the first successful collaboration with Microsoft on Microsoft Mesh we continued our collaboration with another Mixed Reality team at Microsoft. This time we were tasked with prototyping novel ways to improve the experience of scanning large spaces for spatial anchor calibration and positioning. Spatial Anchors allow holographic content to be positioned in shared physical space.

Over a 3 month period we explored a range of different approaches. Every two weeks we presented our

research to the Microsoft team. My role was to come up with new ways to visualise the quality of a scanned area whilst also conveying how to improve upon the scan in a simple way. From the Spatial Anchor SDK we could query for a set of feature points and based on the density of the feature point cloud we could place visual markers to communicate how well an area was scanned. We came up with engaging visual feedback that makes the user intuitively understand how to orient through a space to maximise the quality of the calibration.

Roles & Responsibilities

Technical Lead
UX design
Unity3D developer

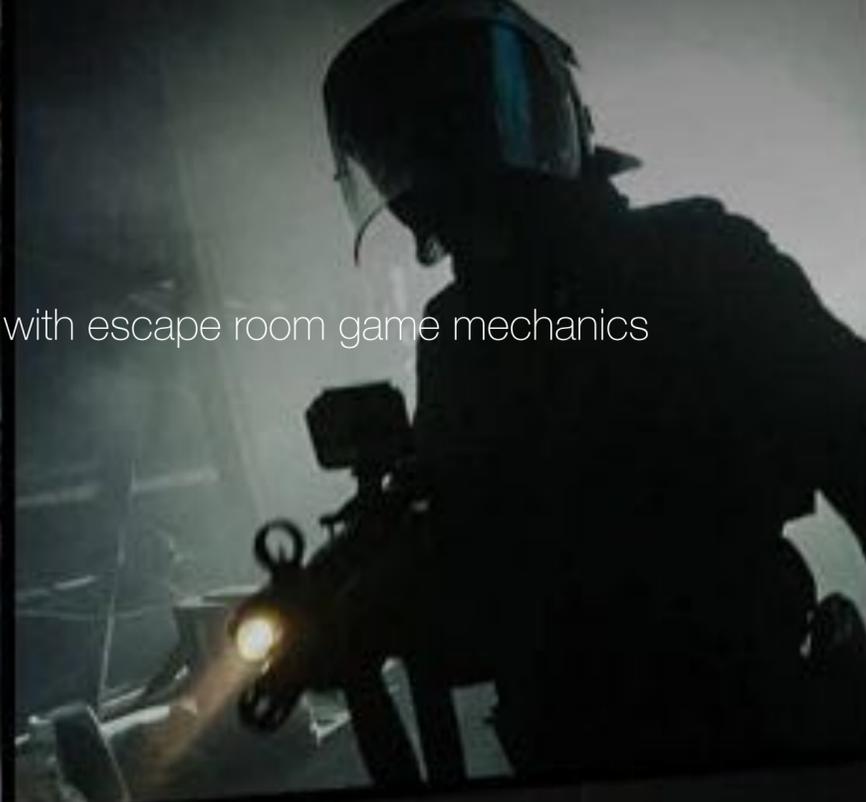
Technologies & Techniques

Unity3D
MRTK
Spatial Anchors
Hololens 2

Team size: 6

The Lockdown
Mobile AR | ABN AMRO

An augmented reality immersive narrative with escape room game mechanics



The Lockdown

Mobile AR | ABN AMRO

An augmented reality immersive narrative with escape room game mechanics

The Lockdown is an AR game for iOS and Android made with Unity3D. We partnered with Sherlocked, one of the top escape room game designers, to develop custom games that would work well in a mobile AR context. These games let you play as an elite financial crime white hat hacker in an exciting block buster story about blockchain gone wrong.

I had several roles in this project; technical lead, Unity3D educator and Unity3D developer. The challenge of the Lockdown game was that it needed to be build in 3 months for Android and iOS with a range of novel game design ideas. We took the first weeks to prototype and educate the design team before we moved into full production. We made the deadline and received several awards for the game.

More Info about this case

Roles & responsibilities

Technical Lead
Unity3D educator
Unity3D developer

Technologies & Techniques

Unity3D
ARKit
ARCore

Awards

3 Lovie awards
2 Spin Awards

Team size: 16



RECREATE
God Mode

Mobile AR | Harvard Business Review

Interactive HBR business cases mediated through augmented reality



God Mode

Mobile AR | Harvard Business Review

Interactive HBR business cases mediated through augmented reality

God Mode is one of three mixed reality prototypes that we created for Harvard Business Review to experiment with bringing Harvard Business Review content to users using immersive technologies. In God Mode you see a scenario play out from a bird's eye perspective on your desktop using AR. You are following the merits of a small game studio in the future that is dealing with problematic interpersonal relationships. At certain moments in the narrative you have to make decisions that improve or worsen company culture.

In my role as technical lead I turned requirement into user stories. In my role as Unity developer I helped design certain gameplay aspects and developed the full game using Ready Player Me avatars, Move.AI powered humanoid and facial animation.

The collaboration with Harvard Business Review was fruitful and of the back of the prototypes we are now in the process of creating a product that could be used by millions of people.

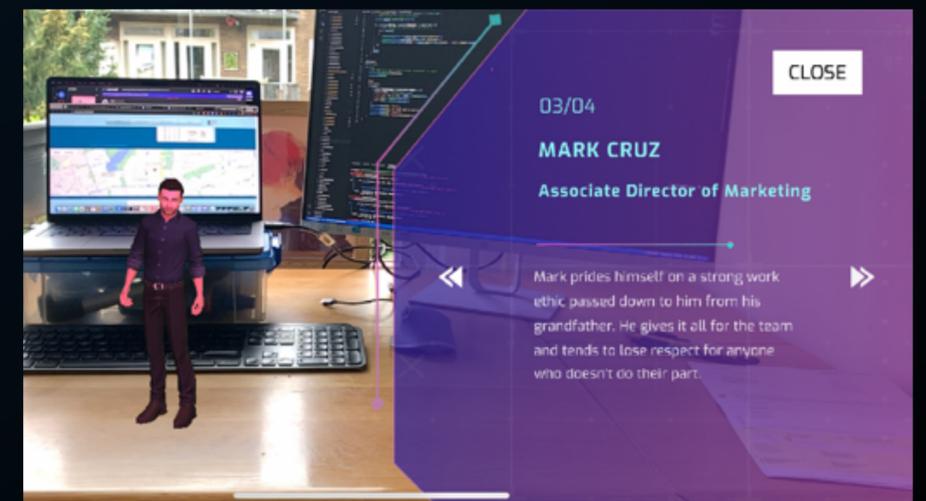
Roles & Responsibilities

Technical Lead
Unity3D developer
Narrative Designer
Animator

Technologies & Techniques

Unity3D
ARFoundation
Ready Player Me
Move.AI

Team size: 6



Scores Of Chaos

Virtual Reality | Muziekgebouw aan het ij, Amsterdam

A mathematically inspired VR music experience about Hungarian composer Georgi Ligeti



Scores Of Chaos

Virtual Reality | Muziekgebouw aan het ij, Amsterdam

A mathematically inspired VR music experience about Hungarian composer Georgi Ligeti

A journey into a musical genius' creative process

Scores of Chaos is one of several virtual reality music experiences that I have produced over the years. For this project I collaborated with creative coder Sander Sneek and fractal artist Julius Horsthuis. Scores of Chaos is divided into two parts. The first part is a choreography of note sheet lines following the music using a combinations of keyframes and audio-reactive animation. The second part is an exploration into three dimensional fractal space.

The choreography of the line animation was my responsibility. The main challenge for this project was that we had two weeks to create this choreography from scratch to make it in time for the Georgi Ligeti festival. The response to the finished experience was overwhelmingly positive.



Roles & Responsibilities

Unity3D developer
Animation choreography

Technologies & Techniques

Unity3D
Audio Analysis
Timeline Animation

Team size: 8

Here Happened A Murder

Immersive Volumetric Video | Finish broadcaster YLE

An immersive Nordic Noire True Crime narrative using volumetric video



Here Happened A Murder

Immersive Volumetric Video | Finish broadcaster YLE

An immersive Nordic Noire True Crime narrative using volumetric video

Step into the mind of a murderer

In collaboration with the innovation team at Finish Broadcaster YLE, renowned for its crime drama storytelling, we set out to experiment with an interactive, immersive approach to true crime storytelling using volumetric video.

Based on a true story, it follows the tragic story of a young man in the army during the Finnish civil war. As the viewer you investigate the scene of the crime and with each new piece of evidence you unravel the tragedy that took place in this train compartment.

The ghost of the killer, who follows you on your journey, is mediated with volumetric video using 4D view volumetric capture solution. Through color, light and soundtrack a grim mood is established. As animator, color grader and developer I was responsible for making this grim mood a reality and communicate the motives of the troubled man.

The experimental result has been met by much enthusiasm from YLE and they are looking into using the technology for upcoming productions.

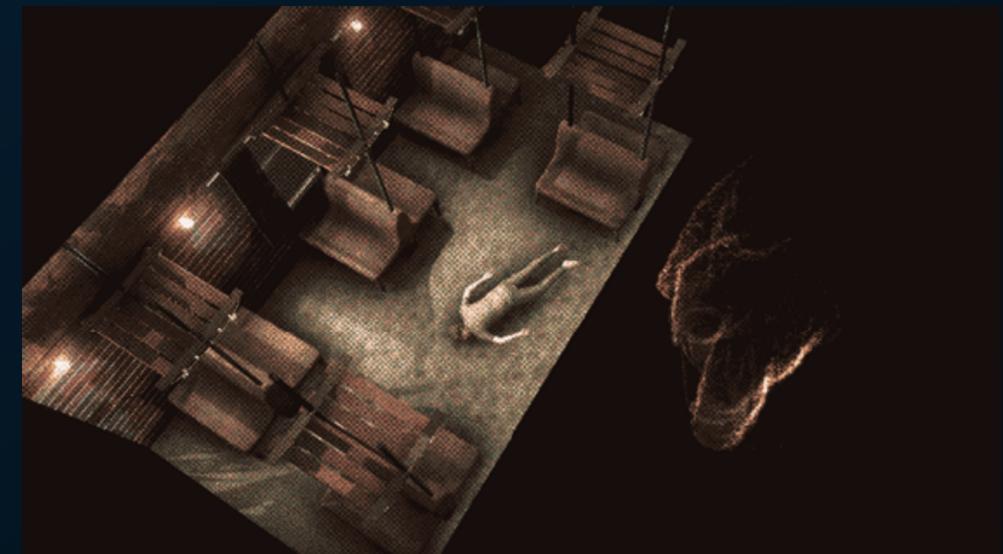
Roles & Responsibilities

Narrative Designer
Unity3D development & animation
Color grading

Technologies & Techniques

Unity3D
Volumetric Video
Shader development
Unity Timeline

Team size: 5





Openingstijden
zondag t/m vrijdag 17.30 u.
zaterdag 17.00 u.
We are open at:
Sunday till Friday 5.30 pm
Saturday 5.00 pm

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